universität wien

MASTERARBEIT

Titel der Masterarbeit

At the Edges of the Pacific: What the California School Means for Japan

Verfasser

Carmen Gruber

angestrebter akademischer Grad

Master of Arts (MA)

Wien, 2010

Studienkennzahl:	A 066 805
Studienrichtung:	Globalgeschichte und Global Studies
Betreuer/Supervisor:	Univ. Prof. Dr. Peer Vries

English Abstract:

One of the main concerns within the field of economic history is analyzing and understanding how and why one part of the world got rich at a certain period in time while the rest of the world languished in pre-modern poverty. This study intends to expand the debate by analyzing the case of Japan within the framework of the California School, which seeks to reorient the study of the great divergence to Asia but focuses almost exclusively on China. If we accept the premise of the Californian School that Britain was no more advanced than other countries such as China in the early modern period and that her successful transition to modern economic growth was largely contingent and based upon escaping Malthusian pressures through colonies, coal and good fortune how, then, can we understand Japanese industrialization? Japan was in all likelihood even more Malthusian than either Britain or China, had neither the coal reserves nor the colonies of Britain, and yet managed to be the only country outside of Europe to industrialize prior to World War I. This study contributes to the on-going discourse by applying the Californian units of analysis to Japan in order to tease out what factors allowed both Britain and Japan to break through to modern economic growth while China, for all her wealth, remained a pre-modern society.

Eine der Hauptfragen der Wirtschaftsgeshichte ist wie und warum ein Teil der Welt zu einem bestimmten Zeitpunkt reich wurde während die restliche Welt in vormoderne Armut weiter lebte. Die vorliegende Studie versucht durch eine Analyse des Fall Japans innerhalb des Gerüsts die auf Asien mit schwerpunkt China fokusierte Kalifornische Schule die Debatte zu erweitern. Akzeptieren wir die Voraussetzung der Kalifornischen Schule, daß Großbritanien in der Frühen Neuzeit nicht höher entwickelt war als Länder wie China, und daß ihr erfolgreicher trotz kontingenter Übergang auf modernes Wirtschaftswachstum großteils auf das Entkommen den malthusianistischen Druck durch Kolonien, Kohle und glücklicher Zufall zurüchzuführen ist, wie wird dann die japanische Industrialisierung wahrgenommen? Japan war in aller Wahrscheinlichkeit noch malthusianistischer als Großbritannien oder China, hatte weder die Kohlenreserven noch die Kolonien Großbritaniens, schafte es aber trotzdem das einzig industrialisierte Land ausserhalb Europas vor dem Ersten Weltkrieg zu sein. Um in diesen Dialog einzutreten und den Diskurs zu erweitern werden in dieser Arbeit die Kalifornischen Analyseeinheiten auf Japan angelegt um festzustellen welche Faktoren es Großbritannien und Japan zu den modernen wirtschaftswachstum Durchbruch erlaubte während China bei allem Reichtum eine vormoderne Gesellschaft blieb.

ACKNOWLEDGEMENTS

This thesis is dedicated to all those who helped me along the way: to Mr. Shih-Chen Peng, who first inspired my interest in Japan; to all my colleagues and friends in Japan who taught me so much but most especially to Ms. Tomoko Kotake and Ms. Kaori Kojima who supported and guided me; to Mag. Leopold Kögler and Dr. Margarete Grander, without whom I would have been utterly lost; and especially to Dr. Peer Vries who has both challenged and inspired me and without whom this thesis could never have been realized.

I would also like to thank all my friends and family who have encouraged me and tolerated many rambling conversations about Japan.

TABLE OF CONTENTS

1. INTRODUCTION

The question of economic history, or more precisely divergent economic histories, has become an important and debated topic within the discourse of global history and in our understanding of the rich-poor divide which to a large extent defines the world in which we currently live. The question, of course, has and continues to be the following: how did some get rich while others were left behind? Was there something special about Great Britain that allowed it to break away from Malthusian constraints[1], while others continued to languish in traditional poverty and relative stagnation? What allowed some countries to catch up, while others were left ever further behind?

Much has been written about this topic, from the influential writings of Max Weber to the more recent publications of such leading scholars as David Landes, Kenneth Pomeranz, Andre Gunder Frank, and Roy Bin Wong. Much of this scholarship can be categorized into three schools of thought: the traditional school, dependency or world systems school, and the California school. Landes, along with Weber, falls into the traditional school of thought which looks at Europe as unique and looks within Europe to explain the perceived "europäischer Sonderweg" through culture and certain aspects of the state supposedly absent in other parts of the world and, according to them, fundamentally necessary for sustained economic growth. Landes, in particular, cites democracy, private property and science as defining characteristics found in Europe but absent in what he calls "Asian despotisms"[2]. In utilizing this dichotomous democracy versus despotism characterization, coupled with the fact that Landes devotes a scant fifteen pages to the Celestial Empire, it quickly becomes evident that, regardless of whether his true aim "… is to do world history"[3] as he claims in the opening line of his book, in the final instance Landes makes very little serious attempt at truly writing world history.[4]

In response and opposition to this type of Eurocentric approach arose what is known as the California School of economic historians, in reference to the fact that most of them worked at

[1] Thomas Malthus, a British economist, theorized that as population increases, output also increases, but at a diminishing average rate. Malthusian constraints refer to the point at which population growth outstrips land productivity, thereby limiting the size and growth of the economy. For more on Malthusian theory, see Miller and Upton, *Macroeconomics: A Neoclassical Introduction*.

[2] David Landes, *The Wealth and Poverty of Nations*, pp. 31-2.

[3] Ibid., p. xi.

[4] This opinion echoes the critiques of world historians William McNeill and Andre Gunder Frank.

universities in California[5] These economic historians, among whom Kenneth Pomeranz is perhaps the most prominent, stress the need to "re-orient"[6] away from the traditional Eurocentric approach to focus much more extensively on China and elucidate the contingent and circumstantial nature of the British industrial revolution. Pomeranz, in his ground-breaking book *The Great Divergence,* which has become a staple in the field of economic history, claims that China was just as, if not more, advanced than Great Britain leading up to the Industrial Revolution, thus making British industrialization hardly likely and certainly not inevitable.[7]

Naturally any investigation of the industrial revolution and its causes will deal, at least to some extent, with Europe and specifically with Britain. However, the work of Pomeranz and others has made it clear that British industrialization cannot be understood within a European vacuum but must rather be considered within the context of global conditions and interactions. However, while this reorientation has unquestionably enriched the debate and scholarship of industrial development, Pomeranz attributes much of Britain's accomplishments to lucky happenstance, such as having coal[8] in the right places and having colonies[9] but neglects to explain how the rest of Europe or Japan industrialized.

Japan in particular presents an interesting case, being the only non-European country to begin to industrialize in the nineteenth century. While much has been written about Japanese development, the work of the Californians raises the question of how Japan fits into this concept of reorientation. If we accept the Californian theory that Britain developed due to coal and colonies and that China suffered overpopulation and resulting involution[10], then how are we to understand Japanese industrialization? To what extent was Japan similar and yet also different to Britain? What about China? It is my intent to examine these questions, and to explore whether and to what extent Japan fits into the Californian theory or whether and to what extent it refutes the Californians.

---

[5] Peer Vries, *The California School and Beyond: How to Study the Great Divergence?*, p. 3.
[6] Taken from the title of Andre Gunder Frank's influential book *ReOrient: Global Economy in an Asian Age.*
[7] Kenneth Pomeranz, *The Great Divergence,* p.16.
[8] Ibid., p. 66.
[9] Ibid., p. 264.
[10] For more about economic involution in China, see Philip Huang, *The Peasant Economy and Social Change in North China*, pp. 69-218.

In order to thoroughly examine this question, I will first concentrate on previous scholarship and lay out in detail both the traditional Weberian/Marxist approaches to economic history as well as the Californian approach[11], delineating the particular economic or societal characteristics that are considered fundamental in the differing approaches. Within the California School, I will then analyze in a Japanese context the various arguments and critiques put forth regarding China. Japan, like China, was a rice economy with a large population, for the most part devoid of colonies or large coal deposits.[12] Why, then, did one develop while the other stagnated? In an attempt to answer this question, I will in chapter 4 first look at demographic and population statistics in an effort to determine the true extents of the Malthusian crisis with which Japan was faced. This analysis will also include considerations of Malthusian checks such as famine and disease as well as an investigation of farming techniques and agrarian conditions. Within the general category of land-resource restraints as posited by Malthus, I will in a sub-chapter 4.1 take a closer look at resource use in Japan and consequently, the energy-intensity of the farming and mining sectors in the pre-modern and early modern economy.

In chapter 5, the importance of empire and the extent to which colonies are necessary or helpful to industrialization will be assessed. This includes a brief sketch of British colonization and the integration of the American colonies into the British Empire, taking into consideration the slave-labor system as well as the central commodities of sugar and cotton. This is then followed up by a look at the Japanese imperial system and the extent to which the colonies of Korea and Taiwan were or were not instrumental to the industrialization of the Japanese motherland. Lastly, in chapter 7, I will attempt to determine any factors which may be missing from the Californian analysis which nonetheless may be prime factors in explaining Japanese industrial development and therefore might enhance the strength and validity of the California theory. In this, amongst other factors, I will look at the importance of the state, the importance of institutions, and the role of culture and technology in driving the industrialization process. In this analysis, I will ultimately endeavor to tease out the decisive factors that allowed both Britain and Japan to industrialize while leaving China to wallow in a continuously pre-modern world beset by Malthusian limitations.

[11] Vries, *California and Beyond*, p.3. The most significant writers within the California School are Kenneth Pomeranz, R. Bin Wong, Jack Goldstone, Dennis Flynn, Arturo Giraldez, and Andre Gunder Frank.
[12] Pomeranz, *Divergence*, pp. 58-60. Japan did of course have colonies in East Asia after the Sino-Japanese and Russo-Japanese wars, the relevance of which will be later addressed in Chapter V.

2. THEORY

There is a long tradition of literature dealing with the divergent economic paths of "the West" and "the Rest", stemming from the inception of the industrial revolution in England with writers such as Adam Smith, who still lived in a pre-modern world and did not anticipate the extraordinary changes which were arguably already beginning to manifest themselves around the time *The Wealth of Nations* was written in the latter half of the eighteenth century. Nonetheless, Smith's writings, along with those from Karl Marx and Max Weber, form the foundation upon which later literature would build. These early writers, particularly Marx and Weber, wrote very much from a Eurocentric perspective, endeavoring to explain European (or British) superior economic performance by looking primarily within Europe for criteria that made the continent inclusive its British isles unique or more likely to industrialize than other regions in the world.

Marx in his various writings characterized the "orient" as stagnant and despotic, operating within a vaguely defined but supposedly primitive Asiatic mode of production. In contrast to this, the discovery of the Americas and the increase in the means of exchange and in commodities coming from Europe are heralded as watershed events that led to rapid development.[13] As such, a progressive and dynamic Europe is juxtaposed against an Asia characterized by stagnation and backwardness. To be sure, Asia, and especially China, had not always been seen in such a negative light. In fact, until well into the eighteenth century, China was greatly admired by Europeans for its culture of refinement, luxury and ingenuity.[14] Even Adam Smith, writing in 1776, acknowledged that China was far richer than any place in Europe and he did not seem to anticipate any change or reversal in this relationship.[15] Though Smith was not so critical of Asia and Asian methods of production, by the time Marx and Weber were writing in the nineteenth century, European attitudes toward China had changed drastically. Weber followed in the footsteps of Marx in championing European superiority and rationality, but expanded beyond the Marxist interpretation by conducting a comprehensive study of world religions from which he cites Richard Baxter and concludes that, amongst other things, waste of time through socializing or inactive contemplation was time "…lost to labour for the glory of

[13] Marx and Engels, *The Communist Manifesto*, p. 9.
[14] David Martinez-Robles, "The Western Representation of Modern China: Orientalism, Culturalism, and Historiographical Criticism". In: Carles Prado-Fonts (ed.), Orientalism [online dossier] Digithum, No. 10 UOC.
[15] Frank, *ReOrient*, p. 13.

God" in the Protestant tradition.[16] By this he sought to define the relationship between labor and religion under the assertion that work and productivity were an expression of devotion to God while idleness, in any form, was time wasted from actively and productively serving God. Even worship and prayer on any day other than Sunday, which was specifically designated for this activity, could therefore be regarded as a sinful waste of precious time.[17] Thus, for Weber, the Protestant ethic found in Europe was uniquely suited to capitalism and economic advancement in a way not found in other regions of the world.

This Eurocentric, Europe-as-unique interpretation of economic history has been the pervasive, predominant view of scholars of the industrial revolution. Writers such as Eric Jones and David Landes continue to espouse this view. Jones claims that in terms of standard of living and energy efficiency, Europe was superior to Asia already well before the commencement of industrialization.[18] Landes, meanwhile, titles his chapter on China in *The Wealth and Poverty of Nations* as "Celestial Empire: Stasis and Retreat", which is still comparatively optimistic in relation to his chapter on Muslim nations entitled "History Gone Wrong?".[19] Echoing Weber to a degree, Landes places great value on culture being conducive to innovation and invention and goes so far as to claim that for the last one thousand years, Europe (or the West) has been the prime mover of development and modernity.[20] This belief in the overwhelming importance of Europe's role in world history is not unusual; however, the claim that it has been so for the last one thousand years is perhaps a bit extreme. Such a time frame suggests that Europe in the middle ages was already more dynamic and involved in global processes than other parts of the world. Landes does not properly justify this statement but rather presents it as though European superiority were an accepted truth. Though these types of Eurocentric interpretations have lasted from Marx down to the present day, they have not been without challenge and dispute. Out of this tradition has grown a counter-response which seeks to redress the negative image of "the Rest" in much of the classic literature and re-direct the focus from Europe to Asia.

[16] Weber and Parsons, *The Protestant Ethic and the Spirit of Capitalism*, pp. 157-158.
[17] Ibid., p. 158.
[18] Jones, *The European Miracle*, pp. 3-4.
[19] Landes, *The Wealth and Poverty of Nations.*
[20] Ibid., p. xxi.

Though there are various schools of thought that counter the traditional, Eurocentric views including World System Analysis and Dependency Theory, the one of prime concern within this study is the California School. Though perhaps an imprecise term without wide recognizability, the California School essentially encompasses those writers who seek to explain not necessarily why Britain industrialized but rather why other parts of the world, most specifically China, didn't. The predominant writers within this school of thought are Kenneth Pomeranz, Roy Bin Wong, Andre Gunder Frank, and Jack Goldstone. Other scholars such as Dennis Flynn and Arturo Giraldez can also be counted as members of this school. The primary focus of this study will however be on the definitive work by Kenneth Pomeranz, *The Great Divergence*, the title of which has become standard terminology within economic history. This fact alone conveys the importance of the work as well as the impact it has had on the field. This work arguably serves as the most balanced, clear, and comprehensive volume to be found within the California School and therefore also serves as the main point of departure for this study. Frank and Wong will also be referenced occasionally but do not serve as the focal point of the study in the manner that Pomeranz does. Though Frank argues very much in a similar vein as Pomeranz, he takes a more extreme view in entirely discrediting the idea that Europe might have had some advantages that other regions did not. As such, much like Pomeranz, he seeks to re-direct attention from Europe to other regions of the world but is left in the end with the fundamental problem of convincingly explaining why it in fact was in Europe that the industrial revolution occurred. If Europe indeed remained a marginal player in the world economy even with its cheap and easy access to American money[21], as Frank claims, it is difficult to reconcile this enduring European marginality with the later break-through to sustained economic growth. Pomeranz, though facing essentially the same dilemma, at least leaves himself an out through his emphasis on the exploitation of foreign ghost acres. Roy Bin Wong, on the other hand, directs his focus almost exclusively toward China in an effort to interpret state-making not only as seen from the European perspective but also to conversely examine the Chinese perspective on European state making. The question for him is not so much the change that happened in Europe but rather explaining the absence of change elsewhere while also challenging the western categories from which success and modernity are measured.

[21] Frank, *ReOrient*, p. 75.

These Californian writers all take a somewhat different approach to the fundamental question of the diverging eastern and western economic trajectories. What ties them all together, however, is the preoccupation with understanding why China couldn't break through the pre-modern barrier despite her esteemed wealth and culture; or perhaps more to the point, why Britain did not turn out more like China. They also share the view that industrialization was not inevitable anywhere and was for the most part not more likely to occur in Europe than elsewhere. The acquisition and utilization of colonies is also cited by the various authors as a windfall for Britain that later translated into advanced economic growth. Though both Frank and Pomeranz devote some time to regions such as India and the Ottoman Empire, the overwhelming emphasis for all of the writers within the California School is on China. China seems by all accounts to have been the region most likely to industrialize on account of wealth and weight in international exchange.

Despite the central focus on China and the endurance of explaining Chinese non-development, it was Japan that first managed to industrialize in Asia. To be sure, the Japanese case is not entirely ignored by the authors of the California School, but it is very much marginalized and never examined in any sort of comprehensive manner. The fact that it was Japan and not China that was able to follow the European lead in achieving sustained economic growth is a point that desperately needs to be addressed within the Californian framework. This study is an attempt to fill that gap in the existing scholarship. If the Californian theory intends to re-direct attention away from Europe and towards Asia, then some substantial account must be taken also of Japan. If China was much more fertile ground for industrialization, why was it then that Japan achieved this feat instead? To what extent did Japan differ from China? These are basic questions arising from the Californian emphasis on Asia which cannot be overlooked. However, it is important to note that this paper does not necessarily intend to comprehensively explain Japanese industrialization. The purpose is to apply the Californian Theory to the Japanese case and to determine the extent to which the Californian criteria are able to explain Japan as the first Asian industrializer. Though there will be some forays into providing a clarification of the Japanese case, the ultimate intent is to determine the applicability of the Californian framework to examples other than Britain and China. This study locates itself very definitively within the theoretical framework of the California School by re-focusing the gaze on Japan and applying the ecological criteria thereof in an attempt to understand the extent to which

these factors both differed in Japan and China as well as how necessary and sufficient they truly are in providing an adequate explanation for the pre-World War I Japanese success in economic growth.

3. METHODOLOGY

The question of Japanese development will be addressed in this study against and within the framework of the California School as detailed in the previous chapter. In keeping true to the main focus of the Californian theory, I will focus largely on ecological factors and the extent to which the Japanese population, resource distribution and land use compared favorably or unfavorably to Western Europe. These are the main factors in the California School analysis and they will therefore serve also as the skeleton of this analysis.

Within the field of economic history and in the context of explaining Japanese development there are a multitude of methodological departures one could take. Traditionally Japanese development and industrialization are said to have begun only with the Meiji Restoration in 1868, with the previous centuries of Tokugawa rule disregarded as a period of stagnant growth and relative unimportance.[22] Although there was a significant break in Japanese history at this time, it seems rash to assume that Meiji Japan was able to industrialize without building upon the foundation of the previous era; an assumption which more recent revisionist scholarship has attempted to correct.[23] As such it has become increasingly untenable to explain growth in Meiji Japan without taking into account the conditions which led to this significant break in Japanese economic history.

Methodologically the California School will serve as the backbone of this study. This provides not only a specific focus but will hopefully also add depth to the Californian theory, which has gained credence in recent years but largely neglects to explain the case of Japanese development. Within this framework, then, the units of analysis will closely mirror those units which receive the greatest amount of attention from the Californians: namely land-, labor- and energy-based analyses. I will attempt to address these same points in order to determine whether the Californian theory of development allows us a comprehensive understanding of Japanese development, which was in all likelihood much closer to a Malthusian ceiling than either Britain or China. Following this Malthusian analysis, I will then endeavor to provide a systematic

[22] Jones, *Growth Recurring*, p. 152. See also Kunio Yoshihara's *Japanese Economic Development: A Short Introduction* or Sydney Crawcour's "The Tokugawa Period and Japan's Preparation for Modern Economic Growth", In: *Journal of Japanese Studies*, vol. 1, no. 1 (Autumn 1974), pp. 113-125.

[23] See Eric Jones' *Growth Recurring* or Susan Hanley and Kozo Yamamura's *Economic and Demographic Change in Preindustrial Japan 1600-1868*.

comparison of the respective colonies and the degree to which ghost acreage was essential for industrialization.

Working within this methodological framework, another important consideration is the periodization of this particular study. In order to study or compare the economic developments of various regions of the world, it is imperative to first ascertain the appropriate time frame for study and comparison. Different scholars have suggested various periodizations for studying industrialization and the great divergence. The question really is where to start. A somewhat different but not entirely unrelated question that is often raised is: at what point in time do we begin to see globalization? In order to answer this, we must first have a clear definition of what globalization is. Scholars such as Janet Abu-Lughod point out that there existed an international trade economy stretching from northwest Europe to China between 1250 and 1350.[24] To be sure, trade routes and contacts between China and Europe were taking place already well before this time. The pacification of large areas of China and the establishment of the silk roads go all the way back to the Han Empire[25]; however, this was overland trade, which was necessarily focused primarily on high-value, low-bulk goods such as spices and silk.[26] Other scholars prefer to start in the post-Columbian period, with the contention that from 1500 there was an international division of labor and multilateral trade.[27] While there certainly was an expansion of overseas trade and an extreme increase in the distances traveled and contacts made, the post-Columbian period is still a pre-industrial period, meaning that transportation would have been almost prohibitively expensive for most non-luxury items. As a result, products traded were typically of high value and fairly easy to transport.

Arguing for even later periodization of globalization are Williamson and O'Rourke who, in their article "When did globalization begin?", look for price convergence across markets for various commodities. They define globalization in classical economic terms to mean the integration of markets across space, and, according to their findings, real price convergence

[24] Kevin O'Rourke and Jeffrey G. Williamson, "When did Globalisation Begin?", p. 23.
[25] The Han Empire lasted from about 130BC—157AD. For more information about the rise of empire and pacification of western lands, see S. Durrant, "The Rise of the Chinese Empire: Frontier, Immigration, and Empire in Han China, 130BC—AD157", *The American Historical Review*, 113(3), p. 803.
[26] Jerry H. Bentley and Herbert Ziegler, *Traditions and Encounters: A Global Perspective on the Past*, p. 290.
[27] Andre Gunder Frank, *Dependent Accumulation and Underdevelopment*, p. 13.

cannot be seen prior to the 1820s.[28] By this estimate, then, we cannot speak of globalization before the invention of the steam engine and the steamship. While this may be true, there were many contacts and many developments leading up to this period and, though there may not have been globalization in a strictly economic sense, the question at hand is *how* and *why* the steam engine came about when it did and where it did, along with why it could be quickly adopted by some countries but not by others.[29] Keeping this in mind, it may be most instructive to look at the timeframe leading up to and including the industrial revolution in Britain, or what is often called the long eighteenth century, beginning in the 1680s and running all the way to the 1850s.

The California School typically locates itself temporally in the long eighteenth century, though the exact dates that this term encompasses are not always clear. A central focus in any case is the examination of economies outside of Europe before 1800, the most dominant of which are claimed to have been in Asia.[30] However, despite this claim, the heart of the argument lies in China with very little attention being paid to Japan. The emphasis on the year 1800 come from the central claim, voiced most prominently by Pomeranz, that Europe and China were not significantly different until this point in time and that 1800 therefore marks the point at which a true divergence began. Other authors, such as the institutional economists Douglass North and Robert Thomas, analyze only the underlying structures of the pre-modern economy and end their explanation in the early eighteenth century under the assumption that by this time the relevant institutional safeguards for industrialization were in place and further analysis therefore unnecessary.[31] North and Thomas's *The Rise of the Western World,* as already evidenced in the title, focuses exclusively on Europe, with chapters devoted especially to explaining the "also-ran" cases of France and Spain, the successful economic growth of the Netherlands, and naturally the darling of industrialization: England. Economic growth is attributed to an internal dynamism in Europe which through population fluctuations and migration allowed ultimately for the institutional foundation and property rights necessary for industrialization to be laid, already in the eighteenth century according to North and Thomas.[32] Such supreme confidence in the institutional building blocks suggests an inevitability of industrialization in Western Europe, a

[28] O'Rourke, "Globalisation", p. 25.
[29] Pomeranz, *Divergence*, pp. 61-2.
[30] Frank, *ReOrient*, p. 5.
[31] North and Thomas, *The Rise of the Western World*.
[32] Ibid., p. 157.

position strongly contested by Kenneth Pomeranz.[33] While my opinion aligns itself more closely with Pomeranz's assertion that industrialization was nowhere inevitable, the question of where to position Japan within this debate remains. Indeed, as already mentioned previously, the Tokugawan bedrock is relevant and important, so I will include particularly the mid- to late Tokugawa period, starting with the eighteenth century. This brings up the larger question of where to end the analysis. It seems most conducive to continue the analysis up until the point where take-off had begun and the relevant elements to assure sustainability were in place. Though it is always difficult to locate any such particular moment in time, it seems that for Japan this would have been sometime in the beginning of the twentieth century.[34] Therefore, although the California School typically extends analysis only until the nineteenth century, the present study on Japan will necessarily have to expand this analytical window to include the Meiji era up through the first decade of the twentieth century. By the beginning of the First World War in 1914 Japan indisputably had embarked on a path toward sustained economic growth. By this time, Japan had successfully won two wars against major powers, had acquired Taiwan as a spoil of war, and had managed to annex Korea after a decade-long struggle to assert dominance. The First World War also marks a certain break in history which led to significant geographical and political changes, particularly in Europe; in any case, 1914 serves as both a logical and convenient moment in time at which Japanese take-off was all but assured and, as such, it will serve as the end date of our analysis of Japanese industrialization.

Regarding the figures and statistics found in the following chapters, I have to some degree made my own calculations pertaining to population density and land availability. For the most part I have relied upon previous research and accredited statistics in providing figures related to demographics and population. However, in a few cases, the data available to me was not quite adequate for the argument at hand. One example of this is land area and population density in Tokugawa Japan. I was not able to find any conclusive figures for this so I made my own simple calculations using accepted population projections and the estimated land area of Japan, excluding Hokkaido (formerly Ezo) since it was very sparsely populated and not officially

[33] Pomeranz, *The Great Divergence*. Pomeranz asserts that while there were certain factors that may have made industrialization more likely in western Europe than elsewhere, these were largely contingent upon colonies and good fortune, and in any case hardly made industrialization inevitable.

[34] Rostow suggests 1905 as the latest date by which Japan had clearly achieved the "take-off" stage in its economic development, as defined in *The Stages of Economic Growth* by W.W. Rostow. The legitimacy of this date will be further discussed in chapter 7.

a part of Japan at the historic time in question. Including the Hokkaido landmass would result in a downward skew of the population density and would therefore paint an inaccurate picture of the labor-land ratio and the seriousness of the Malthusian pressures that Japan faced in the pre-modern era. Where calculations have been made, the calculation methodology and the sources upon which these calculations are based are clearly indicated such that the reader may judge their validity.

The research methodology will be based exclusively on secondary, English-language sources, which immediately invites itself to critique and derision from the academic community. Although I do not dispute the value of primary sources, the inferior status assigned secondary materials and the automatic rejection of research based upon such sources seems to me a convenient scapegoat that somehow justifies the refusal to intelligently engage oneself in a topic. Secondary source literature can be of extreme value and should not be dismissed solely on the basis of some literary source hierarchy. The industrial revolution has produced a vast library of research, much of it based upon primary sources. New archival research, besides being beyond the fiscal and temporal parameters of this project, would be very unlikely to add anything new or productive to the debate. The secondary source literature available pertaining to industrialization is vast and provides fertile ground for new and continuing research.

The fiscal and temporal limitations to carrying out archival research bring me to a much more serious limitation: that of language. While I do not conceive the use of secondary materials to be a hindrance to legitimate research, the inability to effectively utilize Chinese or Japanese sources presents a much more serious limitation to the types of sources applied and to the scope of the research question. However, this is a problem which cannot be quickly or easily solved. Though the use of Japanese materials might have been feasible, it would have been tedious work likely fraught with inaccuracies and misunderstandings. Unfortunately, the Chinese language is entirely beyond my current language capabilities. Naturally this poses some constraint when dealing with Chinese or Japanese subject matter. However, this limitation is one which cannot currently be overcome and must be acknowledged simply as an inadequacy of the author and a potential restriction on the comprehensiveness of this study. It is important to note that it is only a potential restriction and not necessarily a realized limitation. Given the amount of English-language material available, both in the form of translations of Chinese or Japanese originals, as well as literature written originally in English but based upon Chinese or Japanese sources, it is

easily possible to do meaningful research without directly engaging the non-English materials. While I do not wish to claim that the abundance of English literature negates the importance of using non-Western or non-English sources, it does at least allow the possibility of worthwhile and productive research within the acknowledgment that one can never fully escape one's politics of location.

4. HITTING THE MALTHUSIAN CEILING?

Any analysis of Japan from a Californian perspective must address the question of Malthus and to what extent Japan was at or near a Malthusian ceiling. Questions of population and land as well as resource use figure prominently in Californian endeavors to disprove the mainstream argument that Britain was freer of Malthusian pressure than China, and thus more able to invest and develop; rather, the Californians assert that Britain was no freer and perhaps even more Malthusian than China, and thereby potentially at least as involutionary as China had she not had the good fortune to have colonies which made her far freer of her land base than other societies.[35] Pomeranz essentially argues that Britain was set apart not by some sort of inherent European uniqueness; rather, Britain could have easily followed a trajectory similar to China's had she not managed to escape Malthus through the acquisition of colonies and through the strategic location of her coal reserves. As such, according to Pomeranz, the question is not only why the Yangtze delta did not follow the European route but also, more compellingly, if industrialization was so unlikely, why Britain did not wind up like the Yangtze delta. If we accept, for the time being, Pomeranz's well-crafted and influential line of reasoning as valid, what, then, of Japan?

Japan receives relatively scant attention from the Californians. Though given occasional mention, especially in conjunction with conditions in China, Japan is largely left out of Kenneth Pomeranz's analysis in *The Great Divergence*, arguably the most influential work published within the California tradition. Similarly, Andre Gunder Frank devotes precious little time to an understanding of pre-industrial and early modern developments in Japan in his ground-breaking work entitled *ReOrient: Global Economy in an Asian Age*. Aside from casual references, Frank devoted a mere three pages to his assessment of Japanese economic developments and Japan's role in global trade. Roy Bin Wong, another prominent member of the California School, focuses exclusively on China and Britain in his well-written book *China Transformed: Historical Change and the Limits of European Experience*. The lack of attention to Japan in this work does not represent any particular failing of Bin Wong, since it is clear that his intent is to demonstrate, by way of examination of the Chinese and British political economies, the deficiencies in blindly applying western-based retrospective concepts to different historical and political processes. However, it does make plain the gap of scholarship and literature pertaining to Japan within this

[35] Pomeranz, *The Great Divergence*, p. 32.

particular tradition of economic history. Kaoru Sugihara is one writer outside the California School who has made substantial strides in re-defining our understanding of East Asian economic development. Sugihara has helped draw attention to the existence and importance of Japan's interactions with China and the intra-Asian competition that ensued; much of the analysis centers on remittances and capital flows, as well as overall trade and migration.[36] This research has been invaluable in furthering the discourse on Japanese industrialization as well as a general understanding of intra-Asian dynamism. Stephen K. Sanderson points to the fact that Japan was the one society outside of Europe to develop a genuine feudal system.[37] The accuracy of this may be disputed but Japan had in any case by the seventeenth century become undoubtedly a more-or-less secluded archipelagic state with growing population pressures. Indeed, Japan appears to have been as least as, if not more, Malthusian than either England or China and yet was the only country outside of Europe to industrialize before the First World War. How can we reconcile this with the Californian conclusion that Britain was able to industrialize primarily due to ghost acreage won through use of coal and colonies? First, it is instructive to look at how Malthusian Japan actually was, which leads us naturally into an investigation of the Japanese population in the decades leading up to the advent of modern economic growth.

Accurate population numbers are always difficult to attain and remain, today as in the past, mere estimates based upon the available data. In the case of Japan, territorial lords began to make great efforts at the end of the sixteenth century to determine the population figures for their respective regions.[38] Although these are useful for constructing national figures, they are not entirely unproblematic. Early surveys did not distinguish between households and individuals. Furthermore, these population registers focused initially on young, able-bodied men with the purpose of locating labor to requisition, which the subjects of the census naturally sought to evade.[39] Therefore, through the conflicting interests of the lords' attempts to locate potential labor and the subjects' attempts to evade the same, the numbers from these population registers are not entirely reliable. Additionally, it seems highly likely that women were undercounted in these early population registers.

[36] Sugihara, *Japan, China, and the Growth of the Asian International Economy, 1850-1949*, p. 2.
[37] Sanderson, *Social Transformations*, p. 147.
[38] Hayami, Saitō, and Toby, *The Economic History of Japan, 1600-1990*, p. 215.
[39] Ibid., p. 216.

However, despite inherent and unavoidable inaccuracies in population registers, it is still possible to make reasonable population projections for Tokugawa Japan. Various economists and historians have used population registers and estimated rice yields to generate plausible population numbers for Japan in the early modern period. The most widely accepted estimate of 18 million people in the early seventeenth century was promulgated by Togo Yoshida and derived from the Tempo period national rice yield of 30 million *koku* projected back in time.[40] Conrad Totman puts the population at around 12 million people for this same period of time[41] while Akira Hayami and Hiroshi Kito come to an estimate of around 10 million people for this period through the use of crop yield ratios derived from the Taiko land survey of the late sixteenth century.[42] The first national population survey conducted by the shogunate about one hundred years later in 1721 gives a population of about 26 million.[43] Although the pre-1721 estimates vary widely, it is evident from these estimates that the Japanese population increased by anywhere from 1.4 times to 2.6 times in a period of approximately 120 years. In contrast to this, the population of England grew in the same period from an estimated 4.1 million in 1601 to an estimated 5.3 million in 1721, or an increase of about 1.2 times.[44] During this period, then, it would seem that the Japanese population was growing at a greater average rate than the English population; both an indication that resources were not yet exhausted but likewise an indication that Japan was approaching her capacity at greater speed.

When looking at comparative population figures and their Malthusian implications, it is important also to consider land area as well as arable land. It is difficult to distill any concrete conclusion from the fact that Japan's population was five times larger than England's population in 1721 without knowing also the availability of land. Japan has a total area of 377,915 square kilometers, including Hokkaido.[45] However, Hokkaido was sparsely populated, with one person per square mile in 1750.[46] Thus, if we exclude Hokkaido, the total area drops to about 282,402 square kilometers, supporting a population of some 26 million in 1721, or a population density of

[40] Yoshida, *Ishinshi hakko,* p. 25.
[41] Totman, *Early Modern Japan*, p. 250.
[42] Hayami, Saitō, and Toby, *The Economic History of Japan, 1600-1990*, p. 217.
[43] Totman, *Early Modern Japan*, 251. Totman cautions that these figures be read with care since they omit several thousand court nobles, some two million members of samurai households, and their servants and subordinates. Hayami and Kito also state that these shogunal calculations omitted approximately 5 million people.
[44] Wrigley and Schofield, *The Population History of England, 1541-1871*, p. 528.
[45] "CIA - The World Factbook -- Japan."
[46] Taeuber, *The Population of Japan*, p. 22.

about 92 people per square kilometer.[47] However, it shall be remembered that Japan is a mountainous country meaning that not all of this land would have been livable or cultivatable. 16 percent of the total land area of Japan is today considered cultivatable, which would include Hokkaido.[48] Keeping in mind the sparse settlement of Hokkaido, as well as the fact that it was settled by the Ainu and not officially a part of Japan at this time[49], it becomes clear that Japan was supporting a fairly large population on a relatively small amount of land. By comparison, England in 1721 had a population of some 5.3 million living on a land area of 130,000 square kilometers, yielding a population density of about 40 people per square kilometer. For the sake of argument, we will assume that England has the same amount of arable land as Japan, though a cursory knowledge of geography will reveal that it certainly has more. In any case, it seems that Japan had more than twice the population density of England in 1721,[50] and correspondingly greater Malthusian pressures. The Japanese population trend parallels to some extent the population trends also seen in China. Population estimates for China vary, but it is approximated that the figures rose from about 125 million in 1500 to 270 million in 1750 to 345 million in 1800.[51] Though I do not have reliable figures for the amount of arable land and population density, comparing the population figures for both China and Japan in the 18th century indicates that China's population was about ten times larger than Japan's; the arable land mass of China during the Qing Dynasty was almost certainly larger than this, from which we can infer that although China had an incredibly large population, it was in all probability not as dense as the population of Japan. Pomeranz considers this ability to sustain a large population at a relatively high standard of living in both countries an East Asian miracle—a path which also England might have found itself on, had it not been able to effectively escape its land constraints.[52]

Given the high population density of Japan in the early eighteenth century even with our generously low estimates, it will hardly come as a surprise that the population began to stagnate

[47] This number would be even higher if we adjusted the population of Japan to include the court nobles, members of samurai households and servants and subordinates who were excluded from the shogunal calculations. If we assume 4 million uncounted people (less than the 5 million estimated by Hayami and Kito), Japan would have had a population of 30 million living on approximately 282,402 square kilometers, thus yielding a population density of 106 people per square kilometer.
[48] Taeuber, *The Population of Japan*, p. 22.
[49] Totman, *A History of Japan*, p. 219.
[50] Even if Hokkaido were included in the Japanese calculation, the population density still would have been 69 people per square kilometer, significantly higher than the English population density.
[51] Frank, *ReOrient*, p. 109.
[52] Pomeranz, *The Great Divergence*, p. 13.

in subsequent decades, showing signs of overpopulation and land exhaustion. According to census results the Japanese population remained stable in the 120 year period following 1721, rising only from 26,065,425 people in 1721 to 26,907,625 people in 1846.[53] This represents essentially zero growth in a period of relative peace and political stability. Can we conclude, therefore, that Japan had reached by the early eighteenth century a Malthusian ceiling? Mainstream analyses have tended to come to this conclusion but in order to properly understand the validity of this assertion we will first need to examine the causes and consequences of this stagnation.

Conventional wisdom would indicate that century long population stagnation implies some land capacity having been reached, given the agricultural methods and technology available at the time. It was also around this time that peasant unrest and uprisings began to become more frequent, another indication that land and resources were likely scarce. As a result, an increasing number of laws and edicts regarding peasant behavior began to be issued by the Tokugawa shogunate, with the first law specifically concerning peasant uprisings being issued in 1721.[54] In the subsequent decades until 1839, at least ten more laws specifically regarding the problem of peasant uprisings were issued, with increasingly strict regulations and severe punishments.[55] The causes of these uprisings were numerous, resulting not only from peasant discontent with shogunate policies and maladministration of fiefs as a result of the *sankin kotai* system of alternate attendance[56] but also from increasingly heavy tax burdens and demands on the part of the shogunate and domainal officials for the extension of the area of cultivated land.[57] Although an immediate conclusion might be that these instances of peasant unrest had a direct correlation to decreasing resource availability, many of them were in fact to demand social reforms to eliminate extreme disparities in wealth.[58] Indeed, through large-scale land reclamation

[53] Honjo, *The Social and Economic History of Japan*, p. 154.
[54] Borton, *Peasant Uprisings in Japan of the Tokugawa Period*, 35. Though there had been previous orders regarding the peasants' right to petition and the proper procedures for dealing with unruly peasants, the law issued in 1721 was the first to state that "all farmers were ordered to form five men groups (gonin kumi), and take joint responsibility for aiding each other. They were forbidden, under pledge taken by them, to form mobs (toto)".
[55] Ibid., pp. 35-36.
[56] The *sankin kotai* system required *daimyo* to spend alternate years in residence at Edo (now Tokyo), the shogun's castle town, and to leave his wife and children hostage in Edo in the years that he was not required to reside in Edo. This led to much absentee authority and thereby facilitated peasant uprisings. For more information, see *Peasant Protests and Uprisings in Tokugawa Japan* by Stephen Vlastos.
[57] Borton, *Peasant Uprisings in Japan of the Tokugawa Period*, p. 22.
[58] Nakane, Ōishi, and Totman, *Tokugawa Japan*, p. 59.

projects, the amount of land had more or less kept pace with the increasing population until approximately 1720, when both petered off.[59]

Therefore, on the one hand we have evidence of increasing uprisings and peasant unrest which might at first glance fall under the category of a Malthusian check reflecting the growth of population beyond the ecological limits[60] while on the other hand we must contend with the figures which indicate that the growth of land kept pace with the growth in population before both stabilized in the 18th century. It is true that this could very well also indicate the maximum capacity of both population and land, but there is also evidence that this coincided with an increase in wages and the availability of wage labor.[61] This will be analyzed in more detail in a later chapter but for our immediate purposes, it would appear that Japan was perhaps not as Malthusian as is often claimed.

The relative standard of living in China and Europe comprises a significant portion of Kenneth Pomeranz's thesis that prior to the nineteenth century the Chinese as well as the Europeans lived in a "world of surprising resemblances".[62] The main indicator normally cited for standard of living is life expectancy, which Pomeranz maintains was comparable in China and in Europe. Though his figures are a bit difficult to follow since his spatial and/or temporal units are often not clarified, Pomeranz bases himself on a study by Wrigley and Schofield to provide a life expectancy in English villages of mid- to high thirties through the eighteenth century, which climbed to forty in the nineteenth century and then remained fairly steady until after 1871.[63] However, he concedes that even these figures may be too high, since there may have been an underreporting of births and deaths in village communities. Pomeranz's figures for China are less clear, but he gives a figure for a "relatively prosperous area" of 39.6 in the eighteenth century which declined to 34.9 in the nineteenth century.[64] Which area this might be is not specified but, while even the lower figure might still be somewhat comparable to the English figures, the decrease in life expectancy indicates a negative trajectory at odds with the positive direction of

[59] Hayami, Saitō, and Toby, *The Economic History of Japan, 1600-1990*, p. 38.
[60] Malthusian checks refer to the positive checks on population based on the work of British political economist Thomas Malthus. These checks typically include war, pestilence and famine. For more information on Malthusian checks, refer to Conrad Totman's *Early Modern Japan*, pp. 252-259.
[61] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 153.
[62] Phrase taken from the title of Part 1 of *The Great Divergence* by Kenneth Pomeranz.
[63] Pomeranz, *The Great Divergence*, p. 36.
[64] Ibid., p. 37.

the English numbers. Despite this, Pomeranz does convincingly show that China was not the poor, involuted country it is often assumed to have been.

Japan also is often characterized as a poor country with a low standard of living before industrialization. Hanley and Yamamura, both of whom have done extensive research on Japanese demographics, find a life expectancy of between 34.9 and 41.1 for males and 44.9 and 55.0 for females in two villages in Japan in the late eighteenth and early nineteenth centuries.[65] The timing of this study is of particular value: these estimated life expectancies come during the period of "stasis", in which the population stagnated and Malthusian pressures are said to have been realized. However, the life expectancies for the time do not indicate that Japan was less able to feed its large population than Britain or China. In addition to this, Hanley has shown in the well-researched *Everyday Things in Japan: The Hidden Legacy of Material Culture* that, by making optimal use of resources in the long run rather than maximum use in the short run, Japan was able to maintain a dense population on a relatively small allotment of land.[66] Though per capita income may have been lower than in Europe other factors that influence the standard of living, such as hygiene and education, were comparably high in Japan.[67]Even Yasuba Yasukichi, who is skeptical of Hanley's data and methods, concludes that the Japanese standard of living would not have been much below the English standard of living before industrialization, even if per capita income appears to have been somewhat lower.[68] Overall, then, it seems Japan would have ranked favorably against both England and China in pre-industrial standards of living. Granted, this may not be a terribly revealing conclusion, since it is unlikely that there would have been extreme differences in wealth between any two pre-industrial countries; what it does serve to highlight however, is that the Japanese standard of living managed to keep pace with the growing population during the Tokugawa period, which signals that this epoch in Japanese history could not have been as static and backward as it is often characterized.

In order to more comprehensively understand the true extent to which Japan was headed for a collision with the proverbial Malthusian ceiling, it will be instructive to examine the other Malthusian checks which may have been present in late-Tokugawa Japan. Typically cited as war,

[65] Hanley and Yamamura, *Economic and Demographic Change in Preindustrial Japan, 1600-1868*, pp. 221-222.
[66] Hanley, *Everyday Things in Premodern Japan*, p. 53.
[67] Kaoru Sugihara, *Agriculture and Industrialization: The Japanese Experience*, 149. In: Mathias, Peter and John A Davis, eds. *Agriculture and Industrialization: The Nature of Industrialization*, vol. 4, pp. 148-166.
[68] Yasuba, "Standard of Living in Japan Before Industrialization," p. 224.

pestilence, and famine, we can immediately discount war as a major cause of death during the Tokugawa period, since, aside from occasional peasant protests, this was a period of relative peace and stability.[69] Famine, on the other hand, is a positive check worth investigating in the Tokugawa period. There were recurring famines during the time under consideration, with the most significant being the Kyoho famine of the 1730s, the Temmei famine of the 1780s and the Tempo famine of the 1830s.[70] Although these three are typically cited as the great famines of the Tokugawa period, by one count there were 154 crop failures in the early modern period.[71] These famines and crop failures led to widespread peasant hardship and were also a contributing cause to peasant uprisings. Though there had long been crop-related peasant protests, "…there was a marked increase in the number of uprisings resulting from the famines of 1783-1787 from thirty-five during the decade 1773-1782 to one hundred and one during the decade 1783-1792".[72]

The Kyoho famine of 1732-33 was the first of the major famines and, in conjunction with previously poor harvests and intensified rice-tax collection, led to a reported 12,072 deaths from starvation and the loss of 75 percent of their crop in forty-six southwestern han.[73] The great Temmei famine which followed in 1783 is still considered Japan's worst famine to date and resulted in a loss of about 920,000 lives over a period of six years, with an additional 200,000 deaths between 1786 and 1792, amounting to a loss of 1,100,000 lives.[74] These numbers must be treated with some caution however, as the effects were not uniformly distributed nor can they be considered fully accurate. However, it is clear that Japan suffered from regular famines during this time, culminating in the Tempo famine of the 1830's which again, though aggregate numbers are not available, wrought widespread destruction with reports that 35,600 people died in Hirosaki han alone between 1833 and 1839.[75] While this number represents only one han, and presumably one unusually hard-hit by the famine, it does indicate to some extent the scope of the famine. Additionally, Susan Hanley and Kozo Yamamura have shown that the Tempo famine

[69] Totman, *Early Modern Japan*, p. 252.
[70] Hanley and Yamamura, *Economic and Demographic Change in Preindustrial Japan, 1600-1868*, p. 63.
[71] Totman, *Early Modern Japan*, p. 236.
[72] Borton, *Peasant Uprisings in Japan of the Tokugawa Period*, p. 23.
[73] Totman, *Early Modern Japan*, 236-237. The term *han* refers to the domains of the feudal lords in Japan during the Tokugawa period. The number of these domains fluctuated but there were typically around 300 han during the Tokugawa (Edo) period.
[74] Honjo, *The Social and Economic History of Japan*, p. 167.
[75] Totman, *Early Modern Japan*, p. 241.

was likely slightly more widespread than the preceding Temmei famine.[76] In any case, it seems clear that there were repeated bouts of crop failure which produced at least some positive check on the population.

Although the reports of famine and crop failure are fairly well documented, the question that remains to be answered is how Malthusian these events really were. The main causes of the great famines were mainly exogenous, resulting from poor weather and natural calamities including volcanic eruptions, drought, floods, and frost.[77] The Temmei famine, for example, was caused by the eruption and aftermath of Mount Asama during the summer of 1783.[78] Thus, although the large Japanese population size was a contributing factor to the hardship of these years, even a sparsely populated area would have been affected by such exogenous disruptions to agricultural production; in fact, one third of the total losses recorded for the Temmei famine came from the thinly populated Tohoku region.[79] Admittedly, human behavior through deforestation and water management can have an effect on environmental conditions such that droughts and floods are not necessarily exogenous shocks as typically assumed by economists. Although volcanic eruptions fall outside of this, there is significant evidence of the consequences of human behavior on the environment even in the pre-industrial era. Increasingly during the 18th century areas of land became vulnerable to drought and flooding as a result of denuded hillsides and soil erosion; however, despite Malthusian appearances and the resulting potential for famine, Conrad Totman argues that this did not mean that the bio-systems had been devastated. Rather, in the mountainous and high regions of the land, which make up a good deal of the Japanese archipelago, wild realms still flourished.[80] While this may well have been the case, the mountainous areas most likely also account for regions of sparse population and poor soil conditions, therefore making these regions much less suitable for farming and human settlement. In any case, it seems reasonable to say that the great famines of the Tokugawa period certainly acted as some sort of positive check on the population which resulted partially from human behavior, but the number of deaths does not necessarily provide a convincing explanation of population stability and land exhaustion.

[76] Hanley and Yamamura, *Economic and Demographic Change in Preindustrial Japan, 1600-1868*, p. 63.
[77] Borton, *Peasant Uprisings in Japan of the Tokugawa Period*, p. 23.
[78] Totman, *Early Modern Japan*, p. 238.
[79] Ibid., p. 240.
[80] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 154.

The third factor often cited as a positive Malthusian check is pestilence and disease. Due to fortuitous geographical location coupled with the relatively restricted international contacts and trade permitted by the Tokugawa shogunate, Japan was spared many of the most destructive epidemic diseases such as bubonic plague, diphtheria, malaria and typhoid fevers.[81] Though it avoided some of the most notorious European killers, the realm did suffer bouts of dysentery, measles, smallpox, and influenza at increasing recurrence after 1700.[82] The increasing occurrence of these diseases presumably reflects the growing population density and mobility, which would have aided the ease and speed of transmission of contagions. However, though undoubtedly devastating to individuals and families, most of the epidemic diseases with the exception of smallpox seem to have had little impact on population figures.[83] Additionally, it is important to remember that Japan was becoming ever more urbanized at this time; urbanization could have catalyzed the spread of disease without necessarily indicating an asymptotic function of population growth towards its Malthusian limit. Therefore, pestilence may count as a positive check but offers also only a partial explanation.

Research by Hanley and Yamamura has shown that although the Tempo famine was surely a contributing factor in the population decline of the 1830s and 1840s, this does not explain why the population also failed to grow between 1804 and 1822, or 1822 and 1828 during which time there appear to have been no major famines or natural disasters, yet, according to their research, there does appear to have been an increase in the standard of living.[84] Through extensive analysis of family structures as well as marriage and fecundity patterns, Hanley, in an independent study, determines that the ideal family pattern in the Tokugawa period was the stem family which was restricted in size through limited and late marriages but effectively maintained in case of no male heir through adoption; additionally, Hanley finds that both abortion and infanticide were common and widespread practice.[85] Modern moral and ethical questions aside, Hanley points to this as an indication of conscious attempts to limit family size to just those members needed to continue the family line and no more. The question then arises whether this was a voluntary effort to improve quality of life in the densely populated Japanese archipelago or

[81] Jannetta, *Epidemics and Mortality in Early Modern Japan*, pp. 48-49.
[82] Ibid.
[83] Totman, *Early Modern Japan*, p. 252.
[84] Hanley and Yamamura, *Economic and Demographic Change in Preindustrial Japan, 1600-1868*, p. 182.
[85] See Susan B. Hanley, *Everyday Things in Premodern Japan,* chapter 6.

a forced result of resource scarcity and Malthusian pressures. In light of the evidence introduced by Hanley which show that existing data indicate that the Japanese standard of living and level of physical well-being likely did not lag much, if at all, behind Western standards in the nineteenth century, it is difficult to conclude that Japan was significantly worse off and more constrained by land availability than Western Europe.[86] Of course, this is the argument also made for China by the California School; if Britain was able to escape her land base and Malthusian constraints through colonies and coal whereas China was not, how did Japan escape? To some extent, Japan may have avoided the "involution" of China through family planning that apparently bore a striking resemblance to family patterns found in pre-modern Western Europe but diverges significantly from family patterns found in China.[87] Hanley bases her claim of Japanese-European similarity and Japanese-Chinese divergence on factors including age at marriage, ubiquity of marriage and stem versus nuclear family structure. However, writers such as Roy Bin Wong argue that Chinese marital fertility was much lower than people generally assume due to late onset and early cessation of child-bearing, and that infanticide was also widely practiced.[88] In short, depending on the scholar and the criteria used, one can find both similarities and differences in all three of these cases thus proving the question of similarity in family structures and fertility to be largely inconclusive. In accordance with this, the only real conclusion we can draw is that both China and Japan were densely populated, though likely not as Malthusian as is generally claimed. Both appear to have taken some measures to limit population growth, and both seem to have successfully supported large populations at standards of living at least as high as those found in Western Europe.

Apart from demographic considerations, land use and farming techniques also figure prominently into the Californian development analysis of Britain and China. Extreme euro-centrists such as David Landes claim that agricultural improvement including new techniques in watering, fertilizing and crop rotation were instrumental to Britain's industrialization.[89] As will become evident in the next chapters, however, such new techniques were not exclusive to Western Europe. Landes does not spare China much room in his analysis and although he does characterize the Japanese as learners**,** the implicit suggestion is that Western Europe and notably

[86] Hanley, *Everyday Things in Premodern Japan*, p. 129.
[87] Ibid., p. 140.
[88] Wong, *China Transformed*, pp. 23-24.
[89] Landes, *The Wealth and Poverty of Nations*, p. 214.

Britain had and made the most of these advantages while others did not. Japan for him represents an anomaly in which a collective national effort rather than the individualism of European industrialization showed the potential success of different strategies under different circumstances.[90] Eric Jones follows essentially the same line of argumentation by asserting that Europeans were uniquely wealthy in terms of capital and livestock, which could be accumulated by restricting population growth to slightly below its maximum.[91] In response, Pomeranz and other Californians are quick to point out that although Europe may have had certain advantages in terms of technology, her disadvantages were "…concentrated in areas of agriculture, land management, and the inefficient use of certain land-intensive products (especially fuel wood)".[92] Pomeranz goes on to argue that by European standards a very small number of animals sufficed to keep essentially all arable land under cultivation in areas of China[93] and that even with technological advantages in certain sectors, Europe would not have achieved self-sustaining growth without factors that allowed it to become far freer of its land base than other societies.[94] The essence of the Californian argument, then, is that China used land more efficiently and could adequately sustain a larger population than Europe but did not industrialize due to an inability to sufficiently escape the constraints of the land base. Keeping with this line of reasoning in terms of agriculture, labor and capital intensity, and land management, what sort of developments might we expect to find in the Japanese case?

Similar to China, particularly South China, the Japanese economy was centered on a rice-based agricultural system. This rice was grown in order to pay taxes in kind and therefore made up a large and important sector of agricultural activity; for the rest, soybeans, coarse grains, wheat and barley were grown for household consumption.[95] Indeed, as in all pre-modern societies, farm work formed the foundation of Japanese rural life and approximately eighty percent of the population consisted of peasants up until the Meiji Restoration[96]. Though the rural and village structure evolved throughout the Tokugawa era, of interest here is how the land and labor was utilized and on what sort of trajectory the economy seemed to be on, particularly in the

[90] Landes, *The Wealth and Poverty of Nations*, p. 391.
[91] Jones, *The European Miracle*, p. 14.
[92] Pomeranz, *The Great Divergence*, p. 32.
[93] Ibid., p. 33.
[94] Ibid., p. 32.
[95] Yamamura, *The Economic Emergence of Modern Japan*, p. 13.
[96] Tsuneo Sato, *Tokugawa Villages and Agriculture*, p. 37. In: Nakane, Chie and Shinzaburo Oishi, eds. *Tokugawa Japan: The Social and Economic Antecedents of Modern Japan*. Tokyo: University of Tokyo Press, 1990.

second half of the Tokugawa period. While it is inherently extremely difficult to definitively determine trajectory (which in and of itself implies a dubious claim of general linearity) from scattered reports and statistics, determining the extent to which the land was being exhausted or efficiently used can provide some insight into prevailing Malthusian conditions as well as solutions and likelihood of escape into modern economic growth within the Californian framework.

Writers such as Eric Jones characterize China as a densely populated area in which resources were scarce to the point that land "…was not spared for growing much cotton at the expense of food crops"[97] and in which internal colonization dead-ended in static expansion, structural stagnation and soil erosion.[98] In short, China was beset by Malthusian pressures which resulted in stagnation and involution; or, to quote David Landes, China represented a society that had "taken the wrong turning".[99] Jones also points to the higher use of draft animals, timber and charcoal iron as well as use of water power for energy as particular European advantages that resulted in a higher standard of living than elsewhere in the world, and ultimately a different developmental path.[100] In response to this, Pomeranz argues that while Asian societies may have reached densities that restricted the availability of livestock, this does not mean that agricultural production was inhibited; indeed, rice-farming did not require the large use of draft animals and Chinese techniques were in fact largely more productive than European techniques, allowing for a comparable standard of living.[101] Roy Bin Wong for the most part echoes these sentiments, pointing out also that in China, as in Europe, nonagricultural sources of income became increasingly available to rural households[102] while conceding that the fractal quality of Chinese society intended to, and succeeded in, replicating and maintaining order.[103] In essence, the argument can be made that while the Chinese people likely did not have a standard of living significantly below Western Europeans, they were on a different energy path, as well as a different ideological path which sought to maintain and sustain rather than to compete and change.

---

[97] Jones, *The European Miracle*, p. 220.
[98] Ibid., pp. 221-222.
[99] Landes, *The Wealth and Poverty of Nations*, p. 348.
[100] Jones, *The European Miracle*, pp. 4-5.
[101] Pomeranz, *The Great Divergence*, p. 33.
[102] Wong, *China Transformed*, p. 37.
[103] Ibid., p. 121.

In light of these assessments, where can we locate Japan within this argument? As previously mentioned, at first glance, pre-modern Japan shared basic agricultural and economic similarities with China. Following a period of intense land reclamation and socio-economic growth at the beginning of the seventeenth century in the wake of unification, by 1700 little more land was available for reclamation and there was heightened competition as well as increased disputes over water rights, rents, taxation, and other perceived inequities.[104] This would seem to indicate a society as close, or even closer, to its environmental limits than China. Evidence of this can also be seen in laws that were enacted as early as 1666 to curb excessive reclamation and protect the land—essentially a reversal from previous agrarian policies that emphasized land reclamation at all costs.[105] This indicates on the one hand concern for the environment and apprehension regarding overexploitation of the land as a result of noticeable soil deterioration and flooding and established on the other hand a new policy of increased efficiency that would increase the output of existing farmland.[106]

Around the beginning of the eighteenth century, Japan began to enter a period of both demographic as well as economic stasis. Leading up to this point there had been great improvements in agricultural techniques, including increased output through the expansion of both dry-field and paddy cropping as well as the use of fertilizers which allowed farmers to double and triple crop fields.[107] In addition to these improvements, there were also large strides made in water management, which was a vital development for effective and efficient use of reclaimed land. The construction of levees, dams and canals were not only essential in preventing rivers from flooding but also enabled peasants living toward the middle and lower reaches of large rivers to engage in farming and it helped draw water from swamplands to previously unproductive land and foothills.[108] This had a colossal impact both on the amount of available arable land as well as on the agricultural efficiency of said land. This was undeniably a period of rapid land expansion, with the amount of arable land increasing from an estimated 2,064,657 *cho*[109] in 1600 to 2,970,780 *cho* in 1730, and to a further 3,234,000 *cho* by the

[104] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 112.
[105] Nakane, Ōishi, and Totman, *Tokugawa Japan*, p. 66.
[106] Ibid.
[107] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 127.
[108] Nakane, Ōishi, and Totman, *Tokugawa Japan*, pp. 63-64.
[109] A *cho* is a Japanese unit of measure approximately equivalent to 1 hectare, which is equivalent to 2.47 acres.

beginning of the Meiji Period.[110] While this is an impressive growth, it coincided with a population growth at an annual average of .61-.96 percent until around 1720, which is surprisingly high for a pre-modern society.[111] After this, as already mentioned, both the population growth rate as well as the increase in arable land began to decline.

The decline and eventual stabilization in population and arable land growth would imply that Japan had reached a Malthusian limit by the beginning of the eighteenth century. Indeed, the limits on land were becoming apparent. However, Japan managed to support its large population through various innovations, including fertilizing techniques and farm tool technology. One of the early fertilizing techniques involved the use of fishmeal and sardines, which supplemented mulch and earlier materials.[112] The use of fishmeal as fertilizer was important for several reasons: it was not directly related to the geographical land boundaries of the country, and therefore represents to a small degree an escape from traditional land-bound fertilizers. It also spurred the fishing industry and promoted investment in larger fishing fleets and nets.[113] Though sardines were also caught for regular consumption, farms consumed sardines in much larger numbers than did urban consumers, which led to the establishment of sardine guilds which also cooperated in helping increase the size of sardine hauls.[114] Although this does provide one example in which Japan was able to go beyond its land base to improve agricultural output, the use of fishmeal would have been fairly marginal compared to other fertilizers, not to mention that it did not actually present an escape since fish stocks would eventually be depleted and did nothing to change the prevailing mode of production.

Developments in farm tool technology included the innovation of more effective hoes and sickles, such as the invention of the Bitchu hoe, which permitted deeper tilling and was instrumental in the initial stages of soil preparation.[115] In conjunction with new farming tools, there was an expansion in iron mining which drew on Chinese smelting techniques to provide the quantity and quality of the metal needed in order to make new tools.[116] Although these tools may seem quite simple, the processes involved in mining the necessary metals and the extent to which

[110] Hayami, Saitō, and Toby, *The Economic History of Japan, 1600-1990*, p. 39.
[111] Ibid., p. 41.
[112] Smitka, *The Japanese Economy in the Tokugawa Era, 1600-1868*, p. 66.
[113] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 147.
[114] Smitka, *The Japanese Economy in the Tokugawa Era, 1600-1868*, p. 66.
[115] Nakane, Ōishi, and Totman, *Tokugawa Japan*, p. 69.
[116] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 130.

they augmented farming capacity were anything but. Another important innovation was the so-called *semba-koki*, considered the only important mechanical innovation in farming during the Tokugawa period.[117] This new thresher consisted of a wooden frame with protruding teeth through which rice or wheat stalks were drawn to strip away the grain, improving significantly upon prior methods which consisted of two bamboo sticks across which the stalks were drawn.[118] The new method was certainly more efficient and illustrates the implementation of one type of labor-saving technology. However, even such seemingly labor-saving inventions through increased efficiency often mask the end result of such an efficiency increase: though the *samba koki* saved labor at the harvest, it also made possible for the first time to plant a winter crop immediately following the fall harvest.[119] Therefore, rather than really saving labor, it merely evened out the distribution of labor throughout the year.

Another interesting aspect of land management is the distribution and size of plots. Much is made by writers such as North of the tendency in Britain towards larger farming plots and the capitalization of economies of scale.[120] In what way does this compare to developments in Japanese agricultural distribution? The verdict in this case is a bit unclear. According to Kozo Yamamoto in his comparison of pre-industrial landholding patterns in England and Japan, there was a trend in both nations toward concentration in landownership such that wealthy farmers in Tokugawa Japan became large landowners much in the same way the nobles and gentry did in England.[121] However, if we are to believe other writers such as Thomas C. Smith and Matao Miyamoto, there was an overall trend toward smaller units of farming resulting partially from an increased population under which farming families divided their inheritance which led to a shrinking in the scale of agricultural operations over time.[122] Though it is difficult to say with certainty which view is correct, the argument for smaller farms over time is logical in light of the fact that farming methods were and continued to be heavily labor-intensive; had there been an increase in the size of agricultural plots as suggested by Yamamoto, one might also expect to find more use of mechanized tools or draft animals. However, this does not appear to have been the case.

[117] Smith, *The Agrarian Origins of Modern Japan*, p. 102.
[118] Nakane, Ōishi, and Totman, *Tokugawa Japan*, p. 69.
[119] Smith, *The Agrarian Origins of Modern Japan*, p. 102.
[120] North and Thomas, *The Rise of the Western World*, pp. 93-95.
[121] Craig, *Japan, A Comparative View*, p. 316.
[122] Hayami, Saitō, and Toby, *The Economic History of Japan, 1600-1990*, pp. 42-43.

In the agricultural aspects discussed in this chapter, conditions in Japan can be fairly closely compared to conditions in China. Both were rice-based agricultural economies with high population densities and general trends toward more labor-intensive farming practices. In fact, Conrad Totman asserts that by 1870, Japanese agriculture had become one of the world's most intensive in terms of both labor inputs and yield per arable hectare.[123] This indicates both the efficiency with which the Japanese were able to work their lands, but also an overwhelming reliance on labor inputs. Much of the efficiency can be attributed to improvements in farming tools and fertilizing techniques; while these certainly constituted technological advances, they resulted in the final instance in mere Smithian growth. Whereas the use of fishmeal as fertilizer did to some degree allow for an "extending [of] the realm"[124], and did perhaps even foreshadow a future escape from the land base, fish ultimately were also a limited resource. None of these innovations changed the mode of production; they merely augmented and improved the existing mode. As a result, in terms of population and agricultural structure, we cannot say that pre-modern Japan was much more likely to industrialize than China; and yet it did. As such, the Californian criteria of agriculture and land management do not yet suffice to explain the Japanese case. Next we will turn to questions of energy and resource use, including coal, timber, and the use of animals; perhaps there we will find conditions that explain the respective industrialization and non-industrialization of Japan and China.

[123] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 145.
[124] Ibid., p. 163.

4.1 RESOURCE USE

The availability as well as use of resources can also be instructive in painting a picture of the Japanese path to industrialization. As Pomeranz notes, energy and resource use is one of the critical points on which he and writers such as Kaoru Sugihara differ; both consider the maintenance of a remarkably high standard of living given the extraordinary population size of China and Japan an Asian miracle of sorts, but their views depart on the question of the internal dynamics of this "miracle". Sugihara suggests that a basic and crucial difference between the opposite ends of Eurasia is that already before the eighteenth century, Western Europe was on a capital-intensive path and East Asia was on a labor-intensive path.[125] Pomeranz, on the other hand, argues that as late as 1750 China and Europe were surprisingly similar and, had it not been for coal and colonies, England may very well have ended up on the same labor-intensive path as China, thereby inhibiting the possibilities of modern economic growth.[126] As we've already seen, Japan closely resembled China in agricultural practice and farming technique; how, though, does it stack up in terms of energy and resource use?

The existence and accessibility of raw materials, most notably coal, play an integral part in Kenneth Pomeranz's explanation of the Great Divergence. He paints a complicated and somewhat contradictory picture of Chinese coal mining, which appears to have been at its height in the 11th century, but declined thereafter as a result of Mongol invasions, civil wars, floods, and plague.[127] Additionally, Pomeranz argues that these mines were largely in the northwest of China, a fairly backward region distant from the rich and fuel-hungry Lower Yangzi region; the high transport costs and detachment from technical developments would have inhibited the sort of advances later made in Great Britain, where coal deposits were located near excellent water transport and near Europe's most commercially dynamic economy.[128] However, despite geographical disadvantages faced by China, Pomeranz asserts that the Chinese had long understood the basic scientific principle underlying the steam engine such that "Europe's advantage rested as much on geographical accident as on overall levels of technical skill and

[125] Kaoru Sugihara, "Agriculture and Industrialization: The Japanese Experience", 151-152. In: Peter Mathias and John A. Davis (eds.), *The Nature of Industrialization: Agriculture and Industrialization from the Eighteenth Century to the Present Day*, Volume 4, pp. 148-166.
[126] Pomeranz, *The Great Divergence*, p. 13.
[127] Ibid., p. 62.
[128] Ibid., pp. 64-66.

much more than on any (probably nonexistent) advantage in the market efficiency of the economy as a whole".[129] In essence, the argument then boils down to the location of coal mines and proximity to urbanized, fuel-hungry regions. Pomeranz drives home this point by claiming that although "…China may have had less chance than Europe to expand construction and fuel-intensive industries, it probably did not face a much greater threat to its ability to reproduce its existing standard of living than a hypothetical Europe without the Americas would have faced: indeed, it may have been slightly better-off".[130] The question of colonies and their importance in spurring industrialization will be addressed in the next chapter; however, for current intents and purposes, I will limit my analysis to fuel availability and energy production.

Historical records show that Pomeranz is not wrong in claiming that China had knowledge of coal and iron mining long before these became important sources of energy and production in England, or anywhere in Europe for that matter. The production of both coal and iron appear to have been at their height in the Sung Period (960-1279 A.D.), with North China producing annually more than 114,000 tons of pig iron by 1078—double what England would produce 700 years later.[131] It is relevant to note that this production was in North China, which seems to corroborate Pomeranz's view that mining centers were simply too distant from the main urban centers of the Yangtze Delta to be profitable. During the Northern Sung Period (960-1127) however, the imperial capital was situated at K'ai-feng, which grew into an impressive urban center and, according to Robert Hartwell, was quite likely unsurpassed by any other metropolis in the world prior to the nineteenth century.[132] Industry grew up initially to meet government needs and also as a result of large deposits of coal and iron which could be transported over waterways fairly easily to the capital.[133] The Sung capital was able to grow to its formidable size largely because of the availability of fuel and heating supplies in the form of coal and timber from the surrounding areas. Coal mines discovered and opened in the second half of the eleventh century were only 132 miles from the capital city and connected entirely by waterways, which was a distance less than one third the distance required for the British shipping of coal from

[129] Pomeranz, *The Great Divergence*, p. 62.
[130] Ibid., p. 226.
[131] Fairbank and Goldman, *China*, p. 89.
[132] Hartwell, "A Cycle of Economic Change in Imperial China," p. 125. Hartwell does concede that Hang-chou may have surpassed K'ai-feng in population and commerce in the thirteenth century, but insists that K'ai-feng remained the most important industrial, military and administrative center. In any case, no city outside China seems to have been anywhere near as important an urban center as K'ai-feng until centuries later.
[133] Fairbank and Goldman, *China*, p. 89.

Newcastle to London.[134] It is evident that coal and knowledge of coal processing as well as mining techniques existed in China at quite an early stage, and that at least during the Northern Sung period facilitated the growth of major conurbations in the vicinity of deposits. In fact, the extraction and use of coal was one of the things that Marco Polo was amazed by when he traveled in China towards the end of the thirteenth century.[135] The fact that coal was known and used at such an early stage of Chinese history makes even more pressing the question of why steam power was not already discovered at this time and why the industry had declined so dramatically by the time England began to industrialize. The reasons for decline seem to have been manifold, including those mentioned by Pomeranz, but also to the loss of the main market in K'ai-feng which apparently resulted from a dramatic shift in the course of the Yellow River after it burst its dikes in 1194 which severed the direct waterway connection between the mines and the metropolis.[136] The following Mongol invasions led to further devastation and depopulation in northern China, which resulted in economic and political reorientation away from mining such that "from at least the beginning of the twentieth century to the eve of the Second World War it would appear that not one ounce of metal was extracted from ores at these sites [in Central Shantung and Northern Kiangsu] which had yielded from 10,600 to almost 23,000 tons of iron *per annum* at the beginning of the last quarter of the eleventh century".[137] Although the question of why China did not develop steam technology during this time remains open and in need of further research—with Pomeranz's explanation of ventilation problems proving inadequate in light of the fact that mines in China were shallow and much more plagued by drainage problems due to a high groundwater level in Northern Kiangsu than by anything else[138]---it is clear that the industry had massively declined by the time steam power could have been introduced from abroad that it may have inhibited the successful transfer of technology.

To what extent can we conclude that Japan was similar or different to China and/or Britain in terms of coal availability and consumption? The research and data on this topic is surprisingly scarce, so it is difficult to draw any definitive conclusions. Conrad Totman devotes a few pages to the topic of ground coal and expansion of the realm which gives some insight into

[134] Hartwell, "A Cycle of Economic Change in Imperial China," p. 136.
[135] Fairbank and Goldman, *China*, p. 93.
[136] Hartwell, "A Cycle of Economic Change in Imperial China," p. 149.
[137] Ibid., pp. 145-153.
[138] Hartwell, "Markets, Technology, and the Structure of Enterprise in the Development of the Eleventh-Century Chinese Iron and Steel Industry," p. 48.

the situation, but quantitative data is scant.[139] However, from the research that does exist, we can determine at least to some extent the inception and development of a coal-mining industry in early modern Japan. Clearly one of the fundamental prerequisites for the construction of a coal mine is the presence of coal; this draws a direct parallel to the Pomeranz argument of geographical location being a primary determinant of effective coal use and coal-based innovation. Indeed, Japan does have large coal deposits but these are largely located at the peripheral regions of the realm. Most of these deposits can be found at the southern reaches of Honshu and northern parts of Kyushu, around the prefectures of Nagasaki, Yamaguchi, and Fukuoka; to be sure, endogenous coal mining, which germinated in the late seventeenth century, centered around these three prefectures.[140] Significant amounts of coal can also be found in Hokkaido; however, prior to the very end of the Tokugawa period, Hokkaido was an underdeveloped region with a sparse population and no industry to speak of besides the fishing industry, which mitigated both the need for coal as well as the feasibility of extracting coal in the area.[141]

Due to far more favorable geography and topography than the coal deposits in Hokkaido, the mines of Kyushu, particularly the Miike mine and the Takashima mine developed into large-scale mining operations around which the endogenous mining industry flourished.[142] These mines, though perhaps not as peripheral as those in northern China, also were located a fair distance from the urban centers of Kyoto and Osaka, and even further from Edo, or modern day Tokyo. In light of these relative proximities, it is perhaps not surprising that Osaka developed into the industrial core of Japan after the Meiji Restoration. Though the size and scale of Japanese mining operations prior to industrialization were naturally modest, it is important to note that an endogenous mining industry did exist as a result not only of increased fuel demands and somewhat conveniently located coal deposits, but also through state support.

In the early years of coal extraction, the people working in the mines were mere peasants and their families who were free of farm work; it was not until the late 18th century that mining became an independent industry through the establishment of professional coal miners and

[139] Totman, *Early Modern Japan*, pp. 270-279.
[140] Murakushi, "Coal Mining," p. 461.
[141] Kasuga, *Transfer and Development of Coal-Mine Technology in Hokkaido*, p. 1.
[142] Murakushi, "Coal Mining," p. 462.

managers.[143] This meant that in the beginning surplus agricultural labor could be utilized in coal mining, thereby increasing the efficiency of peasants and augmenting their output. As the industry developed, increasingly sophisticated techniques also came into use. As was also the case in British coalmines, Japanese mines tended to fill with water which necessitated the development of certain drainage techniques.[144] In addition to questions of geography and transport costs, Pomeranz also makes the point that Chinese mines tended to have ventilation problems rather than drainage problems, leading him to conclude that "…Britain was fortunate to have the mining problem that it did—a need to pump out water, rather than prevent explosions—since it led to engines with many other crucial applications".[145] However, it is in no way clear that drainage problems in coal mines would necessarily lead to the development of steam-powered technology or to the mechanized conversion of potential energy into kinetic energy. Japanese mines also faced drainage problems, yet this did not lead to the invention of steam-powered technology. Rather, hand pumps replaced suction-pumps, water wheels were introduced, and a pulley system was implemented that made it possible to work in pits as deep as 30 meters (as opposed to the conventional pits that were no more than 6 to 9 meters deep).[146] These developments allowed mines such as the Miike mine in Kyushu to produce approximately 30,000 tons annually.[147] Evidently, the drainage problems faced by the Japanese led not to the invention of the steam engine, but rather to new, more effective techniques that sufficiently solved the most pressing problems without fundamentally changing the mode of production.

Although the largest and most significant changes in the coal-mining industry came with the opening of Japanese ports in the 1850s, even the introduction of steam-power and modern techniques merely augmented rather than supplanted the endogenous methods. Coal mining essentially became a compromise between old and new methods; however, the existence of an endogenous industry and skilled workers greatly eased the transition and allowed selected modern techniques to be implemented much faster than they otherwise might have been.[148] The mines of Hokkaido provide an interesting study of contrast: these mines were only really developed after the Meiji Restoration in 1868, and had to do so in the absence of the

[143] Murakushi, "Coal Mining," p. 462.
[144] Murakushi, *Technology and Labour in Japanese Coal Mining*, p. 11.
[145] Pomeranz, *The Great Divergence*, p. 67.
[146] Murakushi, *Technology and Labour in Japanese Coal Mining*, p. 11.
[147] Murakushi, "Coal Mining," p. 463.
[148] Ibid.

accumulated endogenous coal-mining technology found in the southern mines.[149] Although steam engines by this time had been introduced into Japan (in fact most of Hokkaido coal was extracted for the purpose of fueling foreign ships), the effective operation of these mines required the transfer of labor and skills from the Kyushu mines to the Hokkaido mines, as well as the importation of foreign labor and skills.[150] Even so, due to an underdeveloped market and insufficient transportation infrastructure, this coal still cost 50 percent more than the average market price paid in Nagasaki, Kyushu.[151] Ultimately, it took the intervention of the Meiji government and a comprehensive program of acquiring modern technology as well as sending Japanese engineers abroad to learn the latest techniques in order to make the mines viable—a process not required in Kyushu due to the existence of an endogenous industry and the corresponding infrastructure upon which modern methods could simply build.[152]

The establishment of an endogenous mining industry in Japan was largely the result of increased fuel demands and diminishing resources at the end of the seventeenth and beginning of the eighteenth century. As the population continued grew and then stagnated around 30 million, resources began to become relatively scarce, prompting the use of new materials for fuel and heat. This search for new fuel resources and expansion into the coal mining field led to some extent to an early escape from the landbase:

> The potentially most profound expansion of the realm was temporal rather than geographical: the beginnings of ground-coal use, which marked the start of Japan's departure from total dependence on recently produced biosystem energy to partial dependence on the eons-old energy of fossil fuel. Much as in the British Isles, where people began using peat for fuel when wood no longer sufficed, mined ground coal when the peat became inadequate, and eventually developed steam-powered pumps to eject water from deep coal seams after shallow ones were exhausted, so in eighteenth-century Japan, where peat was unavailable, scarcity of fuel wood led to the burning of ground-coal. It was used mainly in the production of seasalt along the Inland Sea, but also for sugar processing and pottery firing. By the late eighteenth century the pollution produced by mine runoff and coal smoke was generating local opposition to coal mining and burning and eliciting periodic attempts to stop the practices. During the nineteenth century, however, regional fuel wood scarcities persisted and coal use slowly grew, foreshadowing the industrial age that lay in Japan's near future.[153]

[149] Kasuga, *Transfer and development of Coal-Mine Technology in Hokkaido*, p. 1.
[150] Ibid., pp. 2-4.
[151] Ibid., pp. 4-5.
[152] Ibid., p. 5.
[153] Totman, *A History of Japan*, p. 263.

While the use of coal may have marked a departure for Japanese energy use, China also had resource scarcities that led to the development of coal mines; however, as previously mentioned, these declined after the Song era due to a series of catastrophes exacerbated by unsupportive government policies under later dynasties.[154] From the tenth to the fourteenth century, China was undoubtedly advanced in areas of mathematics, medicine and metallurgy; coal, and even possibly coke, was used early on for the extraction of iron from iron ore under the impetus of supportive government policy.[155] However, the catastrophes of later periods dovetailed with less favorable government policies and increasing concerns about effective resource use.[156] In short, China surely experienced a scientific revolution of her own centuries before Europe and it is certainly true that much was lost due to famine, invasion, and other disasters—however, the sustained decline in coal use and innovation cannot be accounted for only by catastrophe and disaster. These may account for the initial decline, but cannot explain why industry and innovation had not recovered by the fifteenth or sixteenth century. Japan also faced opposition and complaints about pollution; however, the need for fuel and demand for energy ultimately eclipsed local complaints of contamination.

In a certain sense, Japanese coal mining and coal use can be said to have inhabited some sort of middle ground between Chinese mining conditions and those conditions present in Britain. Though the coal mines of Kyushu were not nearly as remote from urban centers as many of the Chinese coal deposits seem to have been, they also faced transportation problems. Prior to the construction of railways in the latter half of the nineteenth century, coal mines, even those which had been modernized, depended largely on conventional river transport which often led to an increase in the cost of coal due to high transportation costs.[157] Distance of mines to the core and transportation costs is one of the main factors cited by Pomeranz in accounting for the lack of an industrial revolution in China; however, it is clear that merely having coal does not an industrial revolution make, and having transportation problems does not necessarily an industrial revolution break.

In terms of coal production and use, the endogenous industry was fairly insignificant compared with output in Japan after modernization or to the industry in Great Britain even

[154] Pomeranz, *The Great Divergence*, p. 65.
[155] Elvin, *Pattern of the Chinese Past*, pp. 179-180.
[156] Ibid., p. 212.
[157] Murakushi, "Coal Mining," p. 474.

before the industrial revolution.[158] However, the existence of endogenous techniques and skills provided a foundation for later industrialization. Though it seems unlikely that Japan would have developed the steam engine on its own, once the technology was introduced as a result of opening ports to foreigners, this technology could be adapted and utilized in a way not found in China. Although perhaps not as dynamic as in Western Europe, Japan seems to have been on a slowly increasing path of energy intensity in terms of coal use, as opposed to China which appears to have been on a regressive trajectory of efficient coal and energy use. Another factor in determining energy use is the utilization of draught animals in agriculture. The question of capital-intensity and its significance is an important point of departure between Pomeranz and other scholars, with Pomeranz contesting the claim that the more capital intensive path of western Europe represented an ultimately crucial difference in development trajectory.[159] One of the main considerations is the implementation of capital in the form of animals used in agriculture, and their productivity in relation to labor inputs.

Rice economies for the most part are labor intensive. This does not mean that capital was unimportant but merely that "…the nature of inputs required to raise output in wet-rice cultivation was such that capital played a subordinate role to labor in developing the forces of production". [160] As already mentioned in our analysis of population demographics and agricultural systems, Pomeranz himself concedes that Europe had more livestock per person than Asian societies did.[161] While this does not preclude that productivity was higher due to use of animals, it may certainly indicate an inherent difference in energy use. As a rice economy, Japan's use of draught animals was similar to what was characteristic in China: indeed both were generally lacking animal husbandry. In Japan, it is estimated that fewer than 10% of all farm families engaged in animal husbandry and that only very few upper-class farmers used animals in their field work.[162] Europe by contrast, had a far higher proportion of livestock to land, with England having a particularly high proportion especially in arable areas.[163]

[158] Murakushi, *Technology and Labour in Japanese Coal Mining*, p. 5.
[159] Pomeranz, *The Great Divergence*, p. 13.
[160] Bray, *The Rice Economies*, p. 149.
[161] Pomeranz, *The Great Divergence*, p. 32.
[162] Nakane, Ōishi, and Totman, *Tokugawa Japan*, p. 67.
[163] Aston and Philpin, *The Brenner debate*, p. 188.

Whereas the agrarian structures of Western Europe tended to have higher capital inputs in the form of animals and livestock, the rice economies of East Asia relied much more heavily on labor inputs. Given the nature of rice farming, which remained the predominant crop in Japan as a result both of government encouragement and it's higher caloric yield per acre than any other crop, the maximization of labor potential became the primary concern.[164] This labor productivity was augmented by new farm implements and productivity-increasing instruments rather than through use of draught animals.[165] Though in retrospect it may be clear that capital inputs rather than labor inputs constituted a different, ultimately more promising approach to agrarian management, there is absolutely no a priori justification for this. Both China and Japan supported exceedingly large populations at relatively high standards of living for long periods of time through careful land and labor management. Only in retrospect can it be said that use of animals and livestock may partially account for the different development and energy path of England in the nineteenth century. Indeed, it has even been argued that the lack of horses and horse-drawn carriages made life in Japanese towns healthier than in England, thereby having a favorable impact on the quality of life.[166] In effect, given the high population and relative lack of land, Japan maximized output in such a way that best suited the circumstances of the time.

Overall, in terms of energy issues, though Japan and China are comparable in various ways, there also appear to be small dissimilarities which in the end may have made all the difference. Whereas Chinese coal production had been on the decline since the twelfth century, Japanese coal production made small but steady gains. The development of the endogenous coal industry relied mostly on new techniques and management; it was not until the ports were opened to outside influence that mechanization and modernization were brought to the Japanese mines. This indicates what while mining had government support and was actively pursued even prior to foreign intervention, attempts to deal with water drainage problems in Japan did not lead to the invention of the steam engine as it did in England. Therefore, the argument that Britain conceived of the steam engine due to access to coal coupled with the chronic need to relieve flooding in mines does not seem tenable; Japan faced a similar set of constraints, yet solved them in a different manner. However, the existence of and support for the endogenous coal industry in Japan may have been crucial—it was upon this foundation that the modernization of the industry

[164] Totman, *A History of Japan*, pp. 257-259.
[165] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 67.
[166] Yasuba, "Standard of Living in Japan Before Industrialization," p. 220.

could build. In this sense, Japan was able to fuse endogenous skills with exogenous techniques in a way in which perhaps China was not.

5. IMPORTANCE OF EMPIRE: COLONIES ESSENTIAL FOR ESCAPE?

In addition to availability and use of coal, the main argument of Californians such as primarily Kenneth Pomeranz boils down to the crucial importance of escaping the land base through colonies and empire. Pomeranz explicitly argues that western Europe "…was able to escape the proto-industrial cul de sac and transfer handicraft workers into modern industries…because the exploitation of the New World made it unnecessary to mobilize the huge numbers of additional workers who would have been needed to use Europe's own land in much more intensive and ecologically sustainable ways".[167] To illustrate his point, Pomeranz points to the importance of ghost acreage, slave labor, and a windfall of precious metals as having been decisive elements in British industrialization. In essence, all of these factors point to the importance of empire and exploitation of foreign land/labor; were colonies really so important though?

The concept of ghost acres comes originally from the food scientist Georg Borgstrom, who devotes an entire chapter to the concept in his 1965 book *The Hungry Planet: the Modern World at the Edge of Famine*.[168] Ghost acreage essentially refers to the idea of nations managing to expand beyond the carrying capacity of their own lands through the use and exploitation of lands located elsewhere on the planet.[169] Borgstrom's conception of ghost acreage consisted of two further subdivisions: trade acreage and fish acreage.[170] By each of these terms, he meant to express the additional farming that would have been necessary, in terms of land area, "…to provide from internal sources the net portion of a nation's sustenance actually derived from sources outside its boundaries and in excess of its own carrying supply".[171] This concept, if not necessarily the terminology, was foreshadowed by writers such as Walter Prescott Webb in his last major work *The Great Frontier*; it has since been appropriated by writers including Andre Gunder Frank, Eric Jones and Kenneth Pomeranz to refer to the importance of Europe's colonial possessions in spurring, or allowing at all, the industrial revolution.

The main tenet of this argument is that, in terms of raw material production, the amount of land and/or resources that Britain would have required in order to industrialize without the

[167] Pomeranz, *The Great Divergence*, p. 264.
[168] Borgstrom, *The hungry planet; the modern world at the edge of famine*, pp. 73-90. Chapter 5 deals exclusively with the topic of ghost acreage.
[169] Catton, *Overshoot*, p. 38.
[170] Borgstrom, *The hungry planet; the modern world at the edge of famine*, p. 75.
[171] Catton, *Overshoot*, p. 38.

benefit of far-flung land-abundant colonies would have far exceeded the carrying capacity of the British isles; indeed, Pomeranz argues that it likely would have put Britain on a similarly land- and labor-intensive path as China. The most significant and relevant resources typically cited in relation to ghost acres are sugar, cotton and timber. Both cotton and sugar were grown extensively in the British colonies in the Caribbean as well as in the North American colonies.[172] While cotton represents a somewhat special case which will be examined in detail later, sugar was of obvious caloric and nutritional value: according to calculations by Sidney Mintz, one hectare of millable sugarcane stalks under Caribbean conditions yielded 5.6 tons of high grade raw sugar—a quantity sufficient for 140 people, providing the equivalent of 420 kilocalories a day to each.[173] Since sugarcane required a tropical environment, Britain established sugar plantations on its Caribbean possessions, most notably on the islands of Barbados and Jamaica.[174] Using these calculations from Mintz, Pomeranz then estimates that the "…calories from the sugar consumed in the United Kingdom circa 1800 would have required at least 1,300,000 acres of average-yielding English farms and conceivably over 1,900,000; in 1831, 1,900,000 to 2,600,000 acres would have been needed".[175]

Timber was another important resource, especially during pre-industrial times. The extensive use of timber as a source of fuel was largely offset by the development of the coal industry; it is estimated that in the absence of coal, the timber requirements of England to provide the heat required to sustain its industry at the beginning of the nineteenth century would surely have denuded not only the forests of England but the forests of all Europe within a few centuries.[176] This conclusion is based on calculations that the production of 10,000 tons of charcoal iron required the felling of 40,000 hectares of forest.[177] These requirements would have been gargantuan and illustrate the extent to which Britain was able to move beyond traditional methods of providing heat and fuel. The use of coal certainly represents an integral element in escaping the land base and preserving timber for other uses; however, since this resource was mined at home and difficult to transport, it did not necessitate nor even encourage the exploration and colonization of new lands. Nonetheless, the American colonies were still relevant for timber

[172] Shlomowitz, "Plantations and Smallholdings," pp. 1-2.
[173] Mintz, *Sweetness and power*, p. 191.
[174] Ibid., p. 38.
[175] Pomeranz, *The Great Divergence*, p. 275.
[176] Wrigley, "The Supply of Raw Materials in the Industrial Revolution," pp. 4-5.
[177] Ibid., p. 5. Taken from Pierre Benaerts, *Les Origines de la grande industrie alleman de*, p. 454.

imports. Timber was used, of course, as firewood and charcoal but also as a building material. It was precisely an increasing scarcity in timber and fuel wood that led to an increased burning of ground coal.[178] However, whereas coal internally expanded the British land base and therefore also allowed for a growing population, it was not a perfect substitute for timber; coal could not, for example, replace timber in the building industry (though it did allow for an expansion in the brick industry).[179] In any case, timber exports from North America to Britain seem to have been negligible prior to 1800, but by 1825 had grown enough to replace the output of 1,000,000 acres of European forest.[180] These acres represent the amount of "ghost acres" that Britain was able to save at home by obtaining resources from abroad.

It is important to point out, however, that the import of timber from the North American colonies (which no longer included the Thirteen US American Colonies after their declaration of independence in 1776 and official renunciation of any British claim in 1783[181]) was influenced heavily by British timber duties: in the 17th and 18th centuries, Britain had been heavily dependent on Baltic supplies of timber but by the first quarter of the 19th century, the British government had imposed duties of approximately 100 percent on all foreign timber while colonial timber was accepted at nominal rates.[182] This indicates not only that Britain had colonies, but government policy dictated that colonies be used in a certain way; through protectionism and duties, the market was distorted to artificially raise the price of Baltic and Scandinavian timber, such that in every year from 1816 to 1846 Canadian timber accounted for at least 60%, and in most years for over 75%, of all unsawn timber imports into Britain.[183] This, despite the far longer distance in shipping required to transport timber from Upper and Lower Canada than Scandinavia or the Baltic states.

Cotton also figures largely into analyses of the British Empire and is often heralded as the pivotal industry during the times of early industrialization. E.J. Hobsbawm illustrates this by

[178] Totman, *A History of Japan*, p. 263.
[179] Wrigley, "The Supply of Raw Materials in the Industrial Revolution," p. 5.
[180] Pomeranz, *The Great Divergence*, p. 275.
[181] Cogliano, *Revolutionary America, 1763-1815*, p. 25. Although the Thirteen Colonies of the present day United States were no longer formally part of the British empire, they continued to be a major source of British raw material even after independence.
[182] Potter, "The British Timber Duties, 1815-60," p. 123.
[183] Ibid., p. 124.

showing that the pace of cotton largely measured the pace of the greater British economy and concludes that no other industry could compare in importance with cotton in the first phase of British industrialization.[184] The production of cotton textiles originated in India and demand for cotton soon spread to Europe, to the detriment of local textile producers. The main textiles in Britain prior to cotton were woolens, which were coarser and less desirable than the cheap, comfortable cotton textiles coming from India.[185] These cotton goods soon began to compete with the local textile industry, which led England in 1700 and 1720 to forbid the sale of Indian cottons on national soil; despite these protectionist measures however, the cotton kept coming.[186] The impossibility of keeping cotton out in turn stimulated a substitution market with the aim of producing fabrics of comparable quality at cheaper prices by imitating the Indian industry.[187] Cotton became the fastest growing major industry in the late eighteenth century, and was the first industrial activity to be organized in factories.[188]

Though the cotton industry rose up in England in part due to factory organization and improved techniques, the North American colonies also played an important role in the rapid expansion and growth of the industry. The eighteenth century was an era of extreme trade expansion, which can be seen in official figures showing that British exports increased from 6.47 million pounds in 1700 to 40.81 million pounds in 1800, while imports similarly grew from 5.97 to 28.36 million pounds over the same period of time.[189] During this same time, imports of raw cotton also increased drastically, rising from 0.9 percent of total imports and exports in 1750 to 6 percent in 1800; it was also during this time that the United States, despite its War of Independence, was starting to become Britain's most important supplier of raw cotton needed to feed the growing textile mills.[190] Over time, cotton grown in the United States became the main source of cotton used in the British mills such that by 1860, the United States supplied over 88 percent to the cotton imported into Great Britain.[191] This represented a vast amount of raw materials that Britain was able to import from abroad and thereby save land and labor at home

[184] Hobsbawm, *Industry and Empire*, p. 51.
[185] Mathias, *The First Industrial Nation*, p. 128.
[186] Braudel, *The Perspective of the World*, p. 572.
[187] Ibid.
[188] Wrigley, "The Supply of Raw Materials in the Industrial Revolution," p. 12.
[189] Mathias, *The First Industrial Nation*, p. 96.
[190] Ibid., 97; p. 102.
[191] Bailey, "The Other Side of Slavery," p. 40.

which could then be put to other uses. According to calculations by Pomeranz, the only home-grown textile that might have been able to replace cotton was wool; however raising enough sheep to replace New World cotton imports would have required 9,000,000 acres in 1815 and over 23,000,000 acres in 1830—more than Britain's total crop and pasture land combined![192] As such, the expansion of the British textile industry depended heavily upon American ghost acres to supply the required amounts of raw cotton processed in the British mills.

Though cotton normally plays a prominent role in explanations of the Industrial Revolution, there are also scholars who believe the importance of cotton to be overstated. Among these is E.A. Wrigley, who disputes the idea that the cotton industry can be regarded as a microcosm of the entire process of industrialization on the grounds that the great changes in inland transport and in power were not closely connected to the cotton industry; rather, he argues, these critical developments were tied much more closely to coal extraction and the mining industry.[193] Similarly, Braudel summarizes the arguments of other intellectuals, such as John Hicks and Ernest Labrousse, who argue that the total volume of cotton production paled in comparison with coal and the explosion of cotton production was accomplished without any major technical innovations.[194] This line of reasoning does not necessarily seek entirely to discredit the importance of cotton in industrialization, but it does strive to place it within a larger context and to emphasize that advances in the cotton industry represented merely the culmination of a long process of changes found also in the older textile industries. However, Braudel then insists that the cotton revolution should not be underestimated, that cotton was already one of the major users of steam-power in the 1820s, and that even if the industry didn't directly initiate the machine and transport revolution, it certainly did accumulate enough money to pay the initial costs of these nascent industries.[195] In any case, the absolute importance of cotton aside, it undoubtedly figured prominently into how Britain integrated her New World colonies and trading partners into a modernized division of labor and production.

An integral aspect of the colonial mode of production was the use of involuntary slave labor. Though there is substantial and ongoing debate about the actual importance of slave labor

[192] Pomeranz, *The Great Divergence*, p. 276.
[193] Wrigley, "The Supply of Raw Materials in the Industrial Revolution," p. 13.
[194] Braudel, *The Perspective of the World*, p. 571.
[195] Ibid., pp. 571-574.

in driving British industrialization, it is undoubtedly true that purchasing a labor force from one part of the world to produce in another part of the world for the benefit of people in yet a third part of the world represented a new and novel division of labor. The question of profitability, however, remains. The definitive work on this topic is *Capitalism and Slavery* in which Eric Williams argues that the "…commercial capitalism of the eighteenth century developed the wealth of Europe by means of slavery and monopoly".[196] For Williams, slave labor was crucial for British industrial development, and he cites a figure of annual profit of over thirty percent.[197] This stance is modified slightly by Robin Blackburn who considers slavery important but not crucial: "Nor does our study lead to the conclusion that New World slavery produced capitalism. What it does show is that exchanges with the slave plantations helped British capitalism to make a breakthrough to industrialism and global hegemony ahead of its rivals".[198] These claims are supported also by J.E. Inikori, who shows that the slave trade was uncompetitive and monopolistic, yielding abnormally high profits for British investors.[199] However, the suggestion that slavery was highly profitable to the British is not universally accepted and is contested by scholars including Roger Anstey who concludes that "…the most credible contribution of slave trade profits to capital formation is—at 0.11 percent—derisory enough for the myth of the vital importance of the slave trade in financing the Industrial Revolution to be demolished".[200] Robert Thomas agrees with Anstey's assessment, going so far as to say that at least as far as the sugar colonies were concerned Adam Smith was correct in his claim that they resulted in more loss than profit.[201] However, Barbara Solow uses a simple Cobb-Douglas function to show that, under the conditions of diminishing returns at home and constant returns in the colony as posited by Williams, the rate of return for investments in the British West Indies would have been far greater than the rate of return on the same investment at home; therefore, she draws the conclusion that "…the additional profits on capital generated by slave labor in the British West Indies were a source of a significant amount of saving, which found its way into investing in the

[196] Williams, *Capitalism and Slavery*, p. 210.
[197] Ibid., p. 36.
[198] Blackburn, *The Making of New World Slavery*, p. 572.
[199] Inikori, "Market Structure and the Profits of the British African Trade in the Late Eighteenth Century," pp. 773-774.
[200] Roger Anstey, "The Volume and Profitability of the British Slave Trade, 1761-1807", p. 24. In: Engerman and Genovese, *Race and Slavery in the Western Hemisphere*, pp. 3-31.
[201] Thomas, "The Sugar Colonies of the Old Empire," p. 38.

industrial sector of the home country".[202] An in-depth analysis of the extent of slave trading profits and critique of the various scholars who have researched the topic is outside the scope of this paper. However, it is clear that a substantial debate continues to surround the question of the economic benefits of the slave trade and its effects on British industrialization. In any case, while not taking a direct stance on the concrete profitability of the slave trade, Pomeranz does point to the slave trade as making Euro-American trade "…fundamentally different and more expandable than the more direct exchanges of raw materials for manufactured goods and silver between Old World cores and peripheries…[and] represented an indirect route through which Britain turned still more of its relatively abundant capital and labor into land-saving imports".[203] As such, though it is not his main focus, Pomeranz would certainly agree that the use of slave labor helped Britain to fully exploit and profit from its new-found ghost acreage in the new world.

Our excursion into the British colonies and their use of land and labor now brings us back to the question at hand: in what way does this compare with the Japanese route to industrialization? To what degree was Japan able to acquire ghost acres or expand her resource base? And to what extent, then, were colonies and ghost acres critical to early Japanese industrial development? While it is clear that Japan did not have a colonial empire anywhere near as vast as that of the British crown, one industry that warrants a closer look is cotton. As mentioned above, the cotton industry is often mentioned as the main impetus for early British industrialization, and even those scholars who are wont to downplay the significance of this industry will readily concede that its importance cannot be discounted altogether. Thus, particularly within the scope of Pomeranz's assessment of coal and colonies having been vital to British industrialization, it will be instructive to examine the Japanese cotton industry and in what measure it dovetailed with the coal industry to initiate industrialization in the absence of many of the characteristics that defined the British use of far-flung ghost acres.

The cotton industry of Japan was centered in the Kinai region of western Honshu, and constituted an important part of economic life for the people in and around the city of Osaka. Though it began on a small scale in the early seventeenth century, cotton growing in Japan would expand tremendously over the next few centuries, paralleling in many aspects the process

[202] Solow, "Caribbean Slavery and British Growth," p. 111.
[203] Pomeranz, *The Great Divergence*, p. 266.

also taking place in Great Britain.[204] Of course, merely growing cotton and building up a bona-fide industry are two very different things. Nonetheless, cotton seems to have often been at the forefront of shifting modes of productivity and technology. The Japanese cotton industry actually has its roots in Korea where cotton was already being grown by the end of the fourteenth century and in such quantities that from the 1420s onward it was being exported to Japan.[205] Though the crop was also grown in Japan starting in the sixteenth century, it was not until the seventeenth century that Japan became sufficient enough in growing and manufacturing to displace the Korean export market.[206]

The growth of the Japanese cotton industry both depended upon as well as encouraged the increasing trend toward wage labor and tenant farming. During the second half of the Tokugawa period, there was climbing demand for labor in the commercial and pre-modern manufacturing sectors of the economy which led to more and more peasants finding that they could increase their income be either leaving the land completely or partly in order to become full- or part-time merchants or else wage earners at the rising wage level.[207] These commercial crops included tobacco, rapeseed, and most importantly, cotton. Beginning in the early eighteenth century, cotton processing increased among cultivators and cotton ginning as well as carding, spinning and weaving became important and wide-spread forms of by-employment for villages.[208] Initially these activities were closely concentrated in the Kinai region around Osaka but they gradually spread. In a study of by-employment in 33 villages that today make up the modern cities of Amagasaki, Nishinomiya and Fuse reports as early as 1677 show women weaving cotton cloth and by the middle of the eighteenth century there are reports of women weaving cotton cloth in the off-season from all three of these regions.[209]

The weaving of cotton cloth was very often done by female workers in their spare time, offering an opportunity for off-seasonal and evening employment on a scale never previously

[204] Hauser, "The Diffusion of Cotton Processing and Trade in The Kinai Region in Tokugawa Japan," p. 633.
[205] Totman, *Pre-Industrial Korea and Japan in Environmental Perspective*, p. 126.
[206] Ibid.
[207] Craig, *Japan, A Comparative View*, pp. 292-293.
[208] Hauser, "The Diffusion of Cotton Processing and Trade in The Kinai Region in Tokugawa Japan," p. 634.
[209] Ibid., p. 635.

available to villagers as a whole, but to women in particular.[210] With the rising profitability of commercial farming, what began as an off-season by-employment activity slowly became an increasingly strong incentive for marginal peasants to shift their focus from agriculture to becoming merchants or wage-earners in commerce and pre-modern manufacturing.[211] This shift in the late Tokugawa period provided the foundation upon which a modern cotton industry would be formed in post-Meiji restoration Japan. The existence of pre-modern cotton production and an efficient, skilled labor force adumbrated future developments; indeed, factory production of textiles is often regarded as a decisive first step on the path to industrialization.[212]

In the early period of growth in cotton production, cotton processing was heavily dominated by specialized merchant organizations in towns like Osaka and Hirano who attempted to restrict trade to authorized merchants and regulate the distribution of cotton goods.[213] Despite having been granted monopsonistic rights from the Edo government, these organizations were gradually undermined by rural cotton processers who resisted urban merchant control by taking independent action and successfully petitioning for the retraction of exclusive rights to urban merchant organizations in 1823.[214] Following the diffusion of cotton processing, the industry began to grow rapidly, with the first cotton factories being established in 1881.[215] Of course, it must be kept in mind that the period between 1823 and 1881 was not just any ordinary 60-year period in Japanese history; rather, it was a time of revolution, political turmoil, and the beginning of large-scale interaction with foreign powers. Although cotton production and processing was already firmly established in Japan well before the Meiji Restoration, the technology transfer that accompanied the opening of Japanese ports contributed to the development of factories and the beginnings of true industrialization.

Reports of cotton manufacture in the 1830s indicate that cotton grown in Kinai was shipped by local merchants to Osaka, where wholesalers then distributed the ginned cotton to provincial merchants everywhere who in turn sold it to peasants who worked the raw material

[210] Hauser, "The Diffusion of Cotton Processing and Trade in The Kinai Region in Tokugawa Japan", p. 636.
[211] Craig, *Japan, A Comparative View*, pp. 294-295.
[212] Clark, "Why Isn't the Whole World Developed?," p. 141.
[213] Hauser, "The Diffusion of Cotton Processing and Trade in The Kinai Region in Tokugawa Japan", pp. 639-640.
[214] Ibid., p. 642.
[215] Pearse, Arno. *The Cotton Industry of Japan, China, and India and its Effect on Lancashire",* p. 634.

into yarn and cloth.[216] The raw material thus passed through numerous hands before being processed and turned into cotton yarns or cloth. The opening of Japanese ports after the arrival of Commodore Perry in 1854 led to major changes, both politically as well as economically. Having been shocked out of feudal isolation, the Meiji politicians soon realized that the best method of resisting foreign encroachment was rapid industrialization and the adoption of modern armaments.[217] There was significant technology transfer, which can be seen quite clearly in the evolution of cotton production; the first set of modern spinning machinery was sent to Japan in 1866[218] and the cotton-spinning industry of the Meiji era was the first in Japan to develop extensive factory production.[219] However, this is not to say that factories did not exist in Japan prior to this time. Workplaces employing up to one hundred people could be found in several of the textile trades as well as in sake-brewing and wax manufacture already in the late Tokugawa period; these tended to be small and relatively unimportant in the greater picture of economic life but nonetheless, organized, centralized production was not unknown.[220]

The production of cotton in Japan, as in Britain, is considered a leading industry in the road towards industrialization. According to leading scholar Gary Saxonhouse, "…Japan's cotton-spinning industry…stands alone as Japan's first truly successful assimilation of modern manufacturing techniques developed elsewhere".[221] Saxonhouse attributes much of the growth and success of both the Japanese cotton industry as well as the greater Japanese economy generally to the skillful adaptation of foreign technologies and the proper application of these technological transfers. Much of the growth of the cotton industry also rested upon the backs of the labor force which was utilized in the increasingly large factories that began to spring up in the Meiji period. From 1891 until 1935 the work force was comprised largely of teenage girls from the most underdeveloped parts of Japan, usually the young daughters of impoverished farmers and fisherman.[222] The application of a cheap and inexperienced labor force allowed Japan to compete with foreign powers, and by 1897 cotton-thread exports were more than twice

[216] Smith, *The Agrarian Origins of Modern Japan*, p. 77.
[217] Tsurumi, *Factory Girls*, p. 9.
[218] Saxonhouse, "A Tale of Japanese Technological Diffusion in the Meiji Period," p. 150.
[219] Tsurumi, *Factory Girls*, p. 9.
[220] Allen, *A Short Economic History of Modern Japan, 1867-1937*, p. 18.
[221] Saxonhouse, "Productivity Change and Labor Absorption in Japanese Cotton Spinning 1891-1935," p. 196.
[222] Ibid., p. 216.

the amount of cotton thread imported.[223] The cotton and textile industries were a leading industry in terms of technology transfer and ability to compete with western powers in the wake of the sudden, forced foreign interaction of the 1850s and 1860s.

It has become clear that Japan certainly had a highly specialized system of cotton production prior to the introduction of foreign technologies and practices. There is even some evidence of a nascent factory system, with reports of small factories existing both in textiles and sake-brewing already in the Tokugawa period. While it is hard to convincingly argue a counter-factual, it is at least plausible that Japan might have developed a more wide-spread and efficient factory system of its own without the intervention of foreign powers. In any case, Japan certainly already had a stable foundation upon which industrialization could build. Regardless of whether Japan might have eventually developed her own factory system and industrialization (though it seems unlikely this would have happened without at least some increase in foreign trade and competition, whether forced or voluntary), what is relevant here is that Japan did have a cotton industry and was able to industrialize without the benefit of ghost acreage and an expansive empire from which to import raw materials. Indeed, though Japanese industrialization is often credited to the intervention of westerners, it is undoubtedly the case that Britain also industrialized through contact and competition with foreign powers; Britain industrialized on her own just as little as Japan did. And, even in her industrial phase and transition into modernity, Japan did not abruptly abandon the old and fully adopt the new but rather maintained many old political as well as economic practices.[224] In fact, Japan remained largely agricultural during this period. According to E. Patricia Tsurumi, in the 1880s before the Japanese industrial revolution was fully launched, 78 to 80 percent of those gainfully employed worked in agricultural occupations; by 1902 this number was still as high as 67 percent.[225] Though the transition to industrialization and modernity was surely accelerated with the arrival on foreign powers on Japanese shores in the mid-nineteenth century, it was not the abrupt and total change that it is often characterized as but rather the expedited culmination of processes which had their roots in pre-Meiji times.

[223] Tsurumi, *Factory Girls*, p. 4.
[224] Allen, *A Short Economic History of Modern Japan, 1867-1937*, p. 20.
[225] Tsurumi, *Factory Girls*, p. 3.

Although Japan produced cotton at home through a specialized and efficient labor force without the benefit of ghost acreage in the same sense as Britain, Japan did also have colonial aspirations. To what extent was the colonial expansion of Japan necessary or important to her development? The argument postulated by Pomeranz asserts that the British colonies and the expansion of the land-resource base they provided were a crucial element in preventing Britain from following the land-intensive involutionary route of China. The implication, then, is that the colonies were some sort of pre-condition for industrialization; or perhaps not colonies per say, but a successful expansion of the land-base which was most effectively done by acquisitioning scarcely-populated foreign lands and developing them to meet the needs of the home country. Of course, the fact that Britain had colonies in the first place cannot be considered an accident, nor can colonies alone be considered sufficient for industrialization (as exemplified by the Spanish and the Portuguese, who had some of the resource-richest colonies yet failed to capitalize on them in the way that Britain did). In any case, colonies figure heavily into Pomeranz's explanation for British industrialization. In the context of Japan, then, it will be instructive to evaluate more closely the importance and necessity of Japanese imperialism in allowing for or sustaining Japanese industrialization.

6. THE JAPANESE COLONIES

Although the Meiji Restoration in 1868 is often used as a convenient starting point for modern Japan, it was not until the late 1880s and 1890s that the basic structure and ideology of Japan's industrial order was in place.[226] Originally, with the arrival of foreigners on Japanese shores, Japan had been a part of the informal empire that the West had established in East Asia through treaty ports and unequal agreements.[227] It is a distinctive as well as noteworthy element of Japanese imperialism that she managed to escape the informal western empire of which she was originally a part and to establish her own colonies and imperial empire in Asia. [228]

The expansion of Japan, in terms of extending her land-base, came at her own peripheries toward the northern and southern ends of the realm. Starting even before the fall of the Tokugawa regime, as Japanese leaders became familiar with western conceptions of sovereignty and jurisdiction, there was a push to claim political authority over the Ryukyu islands to the south (previously the Ryukyu Kingdom) and Hokkaido in the north.[229] The settlement of scarcely-populated Hokkaido and government programs to promote both settlement and land reclamation began almost immediately after the Meiji Restoration with the re-settlement of ex-samurais and others to lands traditionally inhabited by the Ainu people; beset by poverty and disease, the Ainu population hovered around 18,000 while the Japanese population increased from 60,000 in 1850 to 1.8 million in 1913.[230] The formal annexation of the Ryukyu island chain came a bit later, in 1879, but these islands, despite nominal independence, had long been under the effective governance of Satsuma[231] and had also seen some earlier influxes of Japanese settlers.[232] These early expansions were mostly labor migrations to peripheral areas that to some extent may have already been considered "Japanese", or at least within the Japanese sphere of influence. This type of expansion may be equated with the growth of the Chinese realm, which

[226] Totman, *A History of Japan*, p. 318.
[227] Beasley, *Japanese Imperialism 1894-1945*, p. 14.
[228] Ibid.
[229] Totman, *A History of Japan*, p. 328.
[230] Ibid.
[231] Satsuma was the feudal domain situated at the southernmost part of Kyushu which had long asserted claims on the Ryukyu Kingdom based upon tributary payments. Though Ryukyu nominally was still an independent kingdom, it was effectively ruled by Satsuma, and thereby Japan, from at least the time of the Satsuma invasion of the island kingdom in 1609. For more please refer to Josef Kreiner ed., *Ryukyu in World History* or George H. Kerr, *Okinawa: The History of an Island People*.
[232] Kerr, *Okinawa*, p. 63.

has been characterized as the movement of Chinese people into empty parts of China, and therefore fundamentally different from the type of colonization practiced by European powers.[233] It is argued that in moving into more peripheral regions in China, Chinese villages merely replicated themselves in smaller, fractal form[234] whereas British overseas colonies were integrated in an entirely different way into the home economy.

According to Conrad Totman, it was in the 1890s that "…Japan began to manifest an industrial society's dependence on external sources of raw material—metals, raw cotton, and food initially, other goods later—and began to flush out its basic strategies for global resource acquisition and future development".[235] Totman goes on to say that Japan adopted the preferred method of the day for market access and essential resources: gunboat diplomacy and empire building.[236] Was empire building really necessary though? We have already seen in the case of cotton that by 1897 Japan was exporting twice the amount it was importing; in this case it seems that Totman's characterization of external demand for resources is inaccurate. To what measure, though, did Japan rely on its colonial acquisitions for other resources or as a ready market for manufactured goods?

Japanese imperial activities can be said to have really begun with her policy in Korea in the last decade of the nineteenth century and the subsequent declaration of war against China in August 1894, thus commencing the first Sino-Japanese war.[237] Though Korea would not be officially annexed by Japan until 1910, this was merely the culmination of nearly two decades of Japanese policy and intervention in the Korean peninsula. The emergence of Japan from a relatively closed feudalistic society coincided closely with the consolidation of western powers into modern states characterized by centralization of state authority, mass incorporation into the economy and polity, and a broadened concept of defense to include not only domestic defense but also defense of strategic national interests abroad.[238] Though such conceptions of a modern nation-state were relatively new also in the west, it has been argued that Japan awoke to a world-

[233] Pomeranz, *The Great Divergence*, p. 83.
[234] Wong, *China Transformed*, p. 121.
[235] Totman, *A History of Japan*, p. 318.
[236] Ibid., p. 319.
[237] Beasley, *Japanese Imperialism 1894-1945*, p. 48.
[238] Jansen, *The Cambridge History of Japan, Vol. 5*, pp. 721-725.

order in which it was somehow believed that all successful modern powers must expand overseas.[239] While this aspect of Japanese imperialism will be explored in further detail later, the main question of concern is to what degree colonies and imperialism were essential to Japanese industrialization within the framework of the argument Pomeranz lays out for the importance of colonies in fueling British industrialization.

Although a detailed analysis of all the historical processes and alliances leading up to Japanese dominance in Asia is beyond the scope and scale of this study, a short, explanatory detour into the causes and consequences of Japanese policy in Korea may help to illustrate the role that colonies played within the larger picture of Japanese industrialization. In attempting to expand her sphere of influence Japan declared war against China in 1894 over the question of influence in Korea and under the conviction that assertiveness was essential to fending off western rivalries.[240] Both China and Japan had some historical claims over Korea through their respective tributary systems, but Chinese claims and influence over Korea were officially removed with a surprising Japanese victory over China in the Sino-Japanese war.[241] The aftermath of this victory firmly established Japanese pre-eminence in Asia. In the treaty of Shimonoseki signed in 1895, Japan received Chinese acknowledgement of Korean independence, was ceded the territory of Formosa (Taiwan), and the Liaotung Peninsula, was paid a cash indemnity of 200 million taels (about 300 million yen), was granted the opening of four treaty ports, and lastly, was granted most-favored-nation status[242]; Japan was later forced to return the Liaotung Peninsula to China after the intervention of Russia, Germany and France but Japan had nonetheless won a major victory and transitioned from a country subjected to unequal treaties to one successfully enacting such treaties.

In the wake of China's defeat against Japan, China's military weakness had been fully exposed and this then began an era of concessions and alliances which eventually led Japan into direct conflict with Russia. War was declared in 1904 and the subsequent Japanese victory returned the Liaotung Peninsula to Japan as well as granting railroad rights in Manchuria and,

[239] Jansen, *The Cambridge History of Japan, Vol. 5*, p. 727.
[240] Barnhart, *Japan and the World Since 1868*, pp. 15-16.
[241] Howe, *The Origins of Japanese Trade Supremacy*, p. 337.
[242] Jansen, *The Cambridge History of Japan, Vol. 5*, p. 767.

most importantly, forcing Russia to recognize Japan's claims in Korea.[243] With the defeat of both China and Russia in a decade's time, Japan had positioned herself as not only the major power in Asia but also an important global player. It had succeeded in defeating a European power and had in the process managed to join the great imperialistic game that seemed to characterize the external behavior of modern states in the late nineteenth and early twentieth centuries.[244]

What did these military victories and admission into the club of imperialists mean for Japanese industrialization and economic development though? While military victory surely bolstered national sentiment and conceptions of a national identity, the colonies that Japan acquired were wildly different from those established by the British in the Americas. Can these colonies be considered crucial, then, as an expansion of the land base or as suppliers of raw materials, in the way that Pomeranz argues that the British colonies were crucial in British industrialization? Or were the Japanese colonies crucial to industrialization in some other way? Or can we conclude that Japanese imperialism, though certainly significant to the historical development of Asia, was not a vital or necessary step in Japanese industrialization?

The Japanese colonies in East Asia were from the outset different from the colonies that were established by western European powers in the Americas. The Japanese colonies were much closer in geographical terms to Japan than was the case with Europe and the Americas, meaning that disease was much less of a factor for the indigenous population. In fact, climate and disease were more of a problem for the colonizers than the colonized in the early years of the Japanese presence in Taiwan.[245] Additionally, Japan colonized neighboring states with whom they shared some racial and cultural traits which meant that they could more realistically imagine a full integration of colonies into a greater Japan; this proximity also had the result that Japan, as well as many Japanese, played a more direct role in colonial rule than was typically the case in the European colonies.[246] However, in contrast to the British colonies in North America and the Caribbean, the Japanese colonies had established political and societal structures which had to be

[243] Jansen, *The Making of Modern Japan*, p. 440.
[244] Jansen, *The Cambridge History of Japan, Vol. 5*, p. 765.
[245] Yip, *Disease, Colonialism, and the State*, p. 50. There were many diseases on the island that were unknown in Japan. Amongst these, malaria posed one of the greatest threats and many of the Japanese colonizers succumbed to this and other diseases in the early years of colonization.
[246] Kohli, "Where Do High Growth Political Economies Come From?," p. 1272.

transformed. In the British American colonies whatever indigenous structure existed was quickly wiped out through the arrival of Europeans and the diseases that accompanied them, which then also necessitated the procurement of a non-native work force. [247] The Japanese, on the other hand, began their imperial experiment in populated regions that already had an internal political and structural dynamic before becoming part of an expanding Japanese empire.

For the purposes of this paper, only the Japanese colonies of Taiwan and Korea will be considered. With the end of the Russo-Japanese war, Japan also regained the Liaotung Peninsula (called Kwantung by the Japanese) as well as South Manchurian Railroad rights in Manchuria.[248] Japan's forays into Manchuria would prove to be significant in the history of Japanese imperial policy. However, Manchuria would not become truly important until after the First World War and therefore falls outside the parameters of this study; moreover, Japan's primary interest in Manchuria was as a strategic and commercial asset which differed significantly from her interest in Taiwan and Korea as agricultural appendages of Japan.[249] As such, the focus here will be exclusively on Japanese activities in Taiwan and Korea. This is not to discount the importance of Manchuria as a colonial asset but, as will later be made clear, by the time Manchuria became a focal point of imperial logic Japan was already well on her way to becoming a fully industrialized and modernized society.

Although the Sino-Japanese war was fought largely over claims to Korea, one of the spoils of the war as outlined in the Treaty of Shimonoseki was the island of Formosa (Taiwan), and it was there that Japan developed and defined her imperial policy. To be sure, Korea also moved definitively into the Japanese sphere of influence after the Sino-Japanese War, but was only officially annexed at the end of the first decade of the twentieth century. Rather, it was Taiwan which would become Japan's most successful colony and the governing of which was considered "…a crucial experiment by which [Japan] would not only join the ranks of the Western imperial powers, but would surpass them through the development of a superior form of colonial relationship".[250] Taiwan was effectively Japan's first colony and establishing authority

[247] Morgan, *Slavery and the British Empire*, p. 4-5.
[248] Jansen, *The Making of Modern Japan*, p. 440.
[249] Myers and Peattie, *The Japanese colonial empire, 1895-1945*, p. 350.
[250] Howe, *The Origins of Japanese Trade Supremacy*, p. 343.

there was imperative for the success of the greater Japanese imperial experiment.[251]

By the time Taiwan came under Japanese control in 1895, the island had already experienced various episodes of colonial subjugation. Being a part of the Chinese tributary system meant that Taiwan had a long history of loose political connection with China but was only fully incorporated into the Qing Empire in the late seventeenth century.[252] Prior to this, due to convenient geographical location along the Southeast Asian trade routes, Taiwan was of interest to the newly arrived Europeans and came under Dutch rule from 1624 until 1662.[253] The population of the island was comprised primarily of the indigenous aboriginal peoples and Chinese immigrants who came to Taiwan in the eighteenth century when the Qing rulers of China lifted the previously imposed immigration ban and pursued instead a policy of pro-colonization.[254] However, having been under Qing control prior to being ceded to Japan, China's main concerns for Taiwan were to keep it out of the hands of foreigners, to preclude anti-Qing sentiments from arising there, and to prevent the island from becoming too great an economic drain on the empire; even these minimum criteria were supposedly not met though, and despite garrisoning the island with approximately 10,000 troops to prevent uprisings, it has been argued by Asian politics and security expert Denny Roy that Qing China never exercised effective control over the island.[255] It was in this state of on-going conflict and ineffective control that Taiwan was handed over to Japan in the last years of the nineteenth century.

A latecomer to the imperialist game with essentially no experience in overseas expansion and in possession of a fruit of war that by many accounts was still a semi-savage island, Japan's venture into the business of colonialism did not initially appear to be off to a very promising start.[256] Indeed, perhaps due to inexperience coupled with a non-monetized subsistence-based colony, early Japanese colonial policy in Taiwan was somewhat aimless and chaotic.[257] To be sure, colonialism could be costly and troublesome and gaining Taiwan as a prize of war meant

[251] Beasley, *Japanese Imperialism 1894-1945*, p. 143.
[252] Howe, *The Origins of Japanese Trade Supremacy*, p. 341.
[253] Wu, "Economic History of Taiwan," p. 297. For a more comprehensive history of Taiwan both before and during the colonial period, see *Taiwan: A New History* by Murray Rubenstein.
[254] Ibid., p. 298.
[255] Roy, *Taiwan*, pp. 19-20.
[256] Kublin, "The Evolution of Japanese Colonialism," pp. 67-68.
[257] Chang and Myers, "Japanese Colonial Development Policy in Taiwan, 1895-1906," pp. 433-434.

that Japan, whose own modernization was still on very tentative ground, had to devise a policy regarding the administration of this new acquisition. After a bit of a haphazard start, a colonial policy was established in which it was clear that the colony represented an investment which was meant to be a source of profit for the mother country and was expected to provide the return of both principle and interest in as short a time as possible.[258]

Taiwan would prove to be quite rich in resources with an abundance of fish and timber as well as a climate suitable for cultivating rice, sugar, tea, vegetables and fruit; it is unlikely however that Japan would have known the true economic potential of the island before deciding to colonize it.[259] In any case, Japan quickly began to view her colonies in the same light as European colonial powers did: as a source of goods and raw materials that were scarce at home.[260] In this sense, the colonial aims of the Japanese and British empires appear to have been similar. As detailed earlier, in chapter 5, the British colonies were used for the production of sugar and cotton which alleviated the land restraint at home and provided the English population with assured access to these goods. Considering the population pressure and scarcity of resources at home, as well as the benefit of European colonial examples, it should come as no surprise that the Japanese would soon come to see their colonies in agriculturally and economically profitable terms.

In Taiwan, sugar came to be the sector of greatest importance during the first period of Japanese control. Between 1896 and 1904 Japan annually spent more than 22 million yen to finance sugar imports, which accounted for more than 50% of her trade deficit in this period.[261] Although the Japanese per capita sugar consumption was only about one seventh of that found in Britain, the high import costs of the good were so serious that it was identified as one of the most important commodities for import substitution, which only became possible with the acquisition of a colony with a climate suitable for sugar cultivation.[262] Taiwan had just such a climate and sugar production came to be an agricultural priority on the island. An important component in the successful promotion of the colony as an agricultural and profitable investment was an

[258] Kublin, "The Evolution of Japanese Colonialism," pp. 77-78.
[259] Howe, *The Origins of Japanese Trade Supremacy*, pp. 341-343.
[260] Myers and Peattie, *The Japanese Colonial Empire, 1895-1945*, p. 347.
[261] Ibid., p. 348.
[262] Howe, *The Origins of Japanese Trade Supremacy*, p. 348.

extensive cadastral land survey which was carried out under considerable costs to the Japanese government but was pivotal in establishing a basis for agricultural taxation and providing information to select Japanese companies involved in exploiting the primary sector.[263] It was well known that during the Qing times, land taxation was extremely inefficient and land registered for taxation was significantly less than the cultivated area; the cadastral survey identified this untaxed land with the result that the taxed area quadrupled and uncultivated land suitable for cultivation was disclosed.[264]

In addition to the exhaustive land survey, the administration ordered a study of the land conditions to determine future industrial prospects. This study was carried out by Nitobe Inazo who reported that sugar production could be expanded fourfold if new seeds were used, water and fertilizer inputs increased, and additional modern mills were built.[265] These measures were implemented and the area of cultivation as well as the sugarcane output and the value of sugar exports increased dramatically. The area of cultivation increased from 16,029 hectares in 1902-1903 to a high of 86,753 hectares in 1910-1911 before falling to 73,981 hectares in 1913-1914. This corresponded with an increase in sugarcane output from 270,940.4 tons to a high of 1,870,070.2 tons before falling to 1,048,061 tons in 1913-1914 at respective export values of 4,231,000 yen increasing to 35,263,000 yen and then falling to 15,479,000 yen.[266] Since sugarcane had to be processed in order to be consumable, this cultivated cane had to be brought to the Japanese-owned sugar mills and the sugar famer had to accept whatever price the mill would pay; the owners of these mills were thus able to make large profits through keeping the price of raw materials artificially cheap.[267] The profitability and growth of the sugar industry was further enhanced by the protectionist policies adopted by the Japanese government which imposed high import duties on foreign sugar while allowing colonial sugar to go untaxed.[268] In this sense, Japan utilized her colony as a supplier of a raw material not available at home much in the same way the British exploited their sugar colonies in the Caribbean.

---

[263] Howe, *The Origins of Japanese Trade Supremacy*, p. 345.
[264] Wu, "Economic History of Taiwan," p. 303.
[265] Chang and Myers, "Japanese Colonial Development Policy in Taiwan, 1895-1906," p. 444.
[266] Ibid., p. 445. The highest value of sugar exports during the period 1902—1914 was actually in the year 1911-1912 at a value of 37,929,000 yen, presumably due to a change in price. The drop in area of cultivation and sugarcane output from 1910-1911 to 1913-1914 can be attributed to severe typhoons in August of 1911 which decreased the cultivation and sugar output in 1912-1913 and the sugar export earnings in 1913-1914.
[267] Roy, *Taiwan*, p. 40.
[268] Myers and Peattie, *The Japanese Colonial Empire, 1895-1945*, p. 348.

Japan's second important colony prior to World War I was Korea. Unlike the case with Taiwan, which was ceded without much forethought immediately after the end of the Sino-Japanese war in 1895, the annexation of Korea came about only in 1910 after a long process of increased Japanese influence on the peninsula.[269] This meant that by the time Korea officially became a Japanese possession, an imperial strategy had already been developed and could be transplanted without the hesitation and aimlessness of early policy in Taiwan. It was also the case that, even prior to annexation, by the time Japan gained decisive influence over the peninsula in the first few years of the twentieth century, the state of the long-ruling Choson dynasty was in disarray and decay.[270] In certain aspects, then, Korean colonization differed from the colonial experience in Taiwan but the imperial motives were largely the same: to control it politically and transform it economically for the home country's advantage through deliberate state intervention aimed at agricultural development and rapid industrial growth.[271]

Following a model pioneered in Taiwan, Korea was administered in such a way as to cater to the needs and interests of the Japanese motherland. By the beginning of the twentieth century Japan began to import food, presumably due to population pressure and lack of adequate resources at home.[272] In particular, Japan faced shortages of rice and turned to colonial rice imports to solve this problem. Though rice production was also promoted in Taiwan, many of Japan's rice imports began coming from Korea in the years after annexation. Although pre-colonial Korea had not been a major producer of rice, its development potential was considered much higher than Japan's and the production of rice for export to Japan was therefore encouraged.[273] Imports from Korea steadily rose in the years following annexation and by 1914 70 percent of Korean exports to Japan were foodstuffs, predominated largely by rice.[274] W.G. Beasley has argued that, together with Taiwan, Korea provided Japan with almost all its imports of food and therefore "…played a major part in sustaining Japan's modern economy by providing cheap food for a growing urban population".[275]

[269] Kublin, "The Evolution of Japanese Colonialism," p. 79.
[270] Kohli, "Where Do High Growth Political Economies Come From?," p. 1271.
[271] Ibid., p. 1272.
[272] Jansen, *The Making of Modern Japan*, p. 447.
[273] Kimura, "The Economics of Japanese Imperialism in Korea, 1910-1939," p. 559.
[274] Beasley, *Japanese Imperialism 1894-1945*, p. 131.
[275] Ibid.

Though the importation of rice from Korea followed a similar logic to the expansion of sugar imports from Taiwan, they had a markedly different effect on the home market in Japan. Since sugarcane is not grown in Japan, sugar was a non-competing good that augmented the caloric intake of the home population without displacing domestic producers. Rice, however, was a different story. Since the rice crop was the single largest source of income for Japanese farmers, imports of large quantities of rice were damaging to the domestic producers; colonial rice was particularly problematic since it was allowed to flow freely into the Japanese market without the strict government controls placed on foreign rice.[276] Indeed, according to an extensive study carried out by Yujiro Hayami and V.W. Ruttan, colonial rice policy does seem to have depressed the price and income of farmers while also contributing to social disorders in the agricultural sector. However, this seems to have become significant only after 1920 and Hayami and Ruttan's conclusion that colonial rice imports were responsible for Japanese agricultural stagnation applies only to the inter-war years; prior to this they concede that these imports contributed to industrial growth by keeping the industrial wage low and the return to capital high without causing a serious drain on foreign exchange.[277] In the period under consideration, therefore, it seems that agricultural imports made the industrialization project at home easier while also feeding a large population, though in 1915 Korean rice imports were equivalent to only 2.1 percent of the total amount of rice produced in Japan; this number would rise to 13 percent by 1935 but by this point Japan had undeniably taken off into modern economic growth.[278] This is not to say that these imports were not vital in feeding a growing population but the population at that point was growing *as a result* of industrialization thus precluding the argument that imports and colonial policy at this time could have been a cause of industrial development.

In addition to being a producer of agricultural products, there was also talk of Korea serving as a migration destination in order to ease the Japanese population pressure. In the early years of Japanese influence in Korea it was thought that the peninsula was relatively unpopulated and would be able to support many settlers.[279] Emigration was actively encouraged in order to mitigate overpopulation at home. However, in spite of this, the Japanese population in Korea

[276] Kimura, "The Economics of Japanese Imperialism in Korea, 1910-1939," p. 559.
[277] Hayami and Ruttan, "Korean Rice, Taiwan Rice, and Japanese Agricultural Stagnation," p. 563.
[278] Kimura, "The Economics of Japanese Imperialism in Korea, 1910-1939," p. 558.
[279] Jansen, *The Making of Modern Japan*, p. 447.

totaled only 650,000 in 1939, or less than 1 percent of the entire Japanese population.[280] From these figures it is clear that Korea did not support a large Japanese immigrant population and colonial emigration policy could not have done much to ease pressures at home. It is true, of course, that some segments of the population migrated to places outside the Japanese imperial sphere, with Hawaii and the United States attracting the largest numbers.[281] Though emigration as a whole surely had some effect at home, emigration within the larger imperial structure as a strategic means of easing population pressures at home appears to have been negligible. Amongst the reasons why so few people moved to Korea was the fact that the country was actually almost as densely populated as Japan and that untenanted fertile land was not easily available.[282] As such, it appears that while Korea as well as Taiwan could be utilized as agricultural producers and thus could provide some ghost acreage in terms of primary goods to the home market, they were not able to directly absorb large amounts of labor as a quick fix to Japanese population problems.

It is clear that Japan used her colonies for raw materials, particularly agricultural goods to feed her growing population at home. This echoes the role of islands such as Jamaica and Barbados as suppliers of sugar to England. Cotton and supplies of raw cotton from the American colonies also figured prominently into the British imperial model; cotton and textiles however played a relatively less important role in the exchange between Japan and her East Asian possessions.[283] In any case, it seems that the Japanese colonies did provide some sort of ghost acreage to the home economy, especially in rice and sugar. The question remains though, whether this can be convincingly compared with the ghost acreage cited for Britain. The Japanese colonies were to some extent seriously exploited with exports of Korean rice reportedly increasing more than production, leading to a drop in overall calorie consumption in Korea in order to feed the home population.[284] The supply of colonial rice was certainly important for

[280] Kimura, "The Economics of Japanese Imperialism in Korea, 1910-1939," p. 566.
[281] Jansen, *The Making of Modern Japan*, p. 447.
[282] Kimura, "The Economics of Japanese Imperialism in Korea, 1910-1939," p. 566.
[283] Korea was a market for Japanese textile manufactures, a market which was indeed almost monopolized by Japan after annexation. However, Mitsuhiko Kimura concludes that Japanese industry gained little by exporting to Korea and this was particularly true in cotton textiles. For more information, see Kimura Mitsuhiko, "The Economics of Japanese Imperialism in Korea, 1910-1939", In: *The Economic History Review*, Vol. 48, No. 3 (Aug. 1995), pp. 555-574.
[284] Kimura, "Standards of Living in Colonial Korea: Did the Masses Become Worse Off or Better Off Under Japanese Rule?," p. 639.

Japan, with Taiwan contributing 6 to 7 percent of the total Japanese rice supply in 1930[285]; accounting for the Korean rice supply would surely double this figure at the very least. These imports were surely significant and clearly helped to finance industrialization at home but were they really a necessary element for industrialization? It seems that the exploitation of the colonies developed in tandem with industrialization at home indicating that industrial development probably would have been slower without the benefit of the colonies, but it likely would have still occurred. The large-scale importation of goods seems to have really taken off around the 1920s, at which time Japan was already industrializing; this implies that rather than enabling the industrialization process to begin, the colonies instead were utilized to feed the increasing population that resulted from industrialization. As such, Korea and Taiwan appear to have functioned much more as a sustaining force than an enabling force in the process of Japanese industrialization.

To a large degree, the Japanese quest for colonies followed a model pioneered by European powers. After a long period of relative isolation, Japan awoke to a world in which it seemed that modernity and industrial success were predicated upon an ability to acquire and effectively administer foreign possessions.[286] To some extent, Japanese imperialism merely followed what appeared to have been a successful formula for industrialization; this however, does not mean that colonization was imperative to industrial development. Although the imports of primary goods came to be of growing importance, emigration to the colonies remained insignificant, such that pressure on the land at home in Japan was not much alleviated by the colonies. Korea and Taiwan were certainly instrumental in expediting and sustaining Japanese industrial growth; however, merely having colonies was not enough. Factors such as institutions and the role of the state were presumably just as, if not more, important. The acquisition and effective utilization of colonies did not happen by chance. Pomeranz and other Californians often refer to the windfall of the colonies and the fortunate location of coal; while coal and colonies surely were important, both for Japan as well as for Britain, they alone do not seem to adequately explain Japanese industrialization. In the next chapter I will attempt to identify elements that are missing from the Californian explanation in regards to providing a comprehensive understanding of industrial development in Japan.

[285] Howe, *The Origins of Japanese Trade Supremacy*, p. 359.
[286] Jansen, *The Cambridge History of Japan, Vol. 5*, p. 727.

7. WHAT THE CALIFORNIANS MISSED

From the preceding analysis it has become clear that both coal and colonies did play some role in Japanese industrialization; however, it's more than a small stretch to make the claim that these made the ultimate difference. The existence of a pre-modern coal sector and a skilled labor force surely was pivotal in the speed and ease of adaption of new techniques and technology once the Japanese ports were opened, but to follow the Pomeranzian claim that colonies and coal could have been the deciding factor also in Japanese industrialization would be far-fetched. Coal, as we have seen, was mined in Japan and the coal sector was relatively developed for the pre-modern world in which it operated; however, coal was not developed on a large scale and, despite water problems similar to those found in English mines, did not produce the steam engine or other steam-related technology. Colonies, on the other hand, appear to have been more a consequence than a cause of industrialization, arising largely out of the European nationalist sentiment that Japan was attempting to emulate[287], and becoming really profitable only after take-off into modern economic growth had begun.

Up until this point there have been numerous mentions of Japan embarking on a course toward modern economic growth without any indication of what this really means. The term "take-off" is typically employed in reference to the Rostovian model in which W.W. Rostow outlines his stages of economic growth. These five stages include the traditional society, the pre-conditions for take-off, the take-off, the drive to maturity and lastly, the age of high mass consumption. The criticisms of this model as attempting a historical linear explanation of economic growth are not of concern here, though these and many other criticisms surely exist. What is of concern is the definition of an economic take-off into self-sustained growth and what this means for Japan. It is difficult to determine the importance of Japanese colonialism without first having some idea of what stage Japan was in. Take-off is called by Rostow "…the great watershed in the life of modern economies"[288] and is defined as:

> …the interval when the old blocks and resistances to steady growth are finally overcome. The forces making for economic progress, which yielded limited bursts and enclaves of modern activity, expand and come to dominate society. Growth becomes its normal condition.[289]

[287] Calman, *The Nature and Origins of Japanese imperialism*, pp. 318-319.
[288] Rostow, *The Stages of Economic Growth*, p. 7.
[289] Ibid.

According to his criteria for sustained economic growth, which will be explained in somewhat further though not exhaustive detail later, Rostow originally dated the Japanese take-off as having taken place sometime between 1878-1900,[290] but revised the date to 1885-1905 in a later publication.[291] The determination of these take-off dates is based on three main criteria, which Rostow outlines as follows: first, there must be a rise in the rate of productive investment from 5% or less to over 10% of national income; second, the development of one or more substantial manufacturing sectors, with a high rate of growth; and third, the quick emergence of a political, social, and institutional framework which exploits impulses to expansion in the modern sector and the potential external economy effects of the take-off which gives growth an on-going character.[292] Consequently, Japanese take-off appears to have occurred within the first few years of the twentieth century in accordance with this model, followed by the drive to technological maturity which occurred between 1905 and 1941.[293] The colonies and the agricultural policies instituted there were an important factor in sustaining the take-off and spurring the drive toward economic maturity, but there seem to be some underlying factors that receive short shrift from the Californians, yet which were essential for Japanese take-off.

The purpose here is not to give a conclusive explanation of Japanese industrialization or take-off requirements but rather to point out some factors that seem to be neglected in the California theory. Given the Californian assessment of the Malthusian restraints which held back Chinese industrialization, it is difficult within this framework to explain the Japanese case. Considering the population and land pressure faced by Japan, which appears to have been even worse than in China, Japan should theoretically also have been destined for a path of involution and stagnation. Certainly Japan managed to acquire some colonies which provided much-needed slack in the early twentieth century; however, this really only became relevant after the take-off was already underway and in any case Japan did not come into her colonies through sheer luck or dumb fortune. Japan had to win two wars against formidable opponents in order to establish her rule over Taiwan, Korea, and later Manchuria and parts of China. This indicates that there were some internal dynamics already prior to 1895 which put Japan on a path toward imperial success and sustained economic growth.

[290] Rostow, *The Stages of Economic Growth*, p. 38.
[291] Rostow, *The World Economy*, p. 425.
[292] Rostow, *The Stages of Economic Growth*, p. 39.
[293] Rostow, *The World Economy*, p. 425.

Though not entirely neglected, Pomeranz pays fairly little attention to the importance of institutions in his explanation of the great divergence. He does concede, however, that in the textile sector and in terms of the proletarian migration option "…European institutions may have been more conducive to migration that would (theoretically) create equilibria by moving people from labor-glutted areas to capital-rich ones".[294] A few sentences prior to this, though, Pomeranz also mentions the English Poor Laws as having had an inhibiting effect on the migration ability of large portions of the English population.[295] The key distinction here may be between Europe and England, terms which Pomeranz frequently fails to properly define and appears to use inter-changeably as it suits him. Regardless, Pomeranz misses the mark by confusingly implying that European institutions generally were more favorable toward labor mobility while specifically England had certain laws which inhibited this mobility more than in other parts of Europe. From this arises a seemingly insurmountable contradiction: England was indisputably the first country to industrialize so the argument of European institutions aiding labor mobility falls mute under the claim that the Poor Laws inhibited the same. However, while it is true that Poor Laws were technically limited to a person's parish of settlement, research by Peter Solar has shown that many English parishes, especially in industrial areas, granted relief even to people without legal entitlements and that continental relief, to the extent it existed, was circumscribed by far less flexible settlement laws.[296] Additionally, more important than the question of labor mobility in a strictly geographic sense is the fact that the English Poor Law was comprehensive, national, and decreased the risk of working for wages. The result of this was that people felt protected from destitution and less urgently felt the need to obtain access to land.[297] It seems that this aspect of the Poor Laws made for conditions in England that were quite distinct from elsewhere, not only globally but also within Europe and yet it does not garner even a mention in Pomeranz's explanation. Overall, Pomeranz takes an overwhelmingly demographic and ecological approach to the question of industrialization, affording very little mention of institutions, technology or the role of the state in driving economic expansion and growth.

In reality, successful industrialization was undoubtedly due to many factors coalescing in a certain way and at a certain time in history. Amongst these, there are some factors that don't

[294] Pomeranz, *The Great Divergence*, p. 85.
[295] Ibid., p. 84.
[296] Solar, "Poor Relief and English Economic Development before the Industrial Revolution," p. 7.
[297] Ibid., 9.

figure largely into the Californian analysis but deserve further attention. These include points such as institutions and property rights which are most prominently championed by Douglass North and Robert Thomas. In their institutionally-based analysis of European economic development, North and Thomas end their study in the eighteenth century with the claim that "by that time a structure of property rights had developed in the Netherlands and England which provided the inducements required to encourage innovation and the consequent industrialization. The industrial revolution was not the source of modern economic growth. It was the outcome of raising the private rate of return on developing new techniques and applying them to the production process".[298] This type of analysis is almost completely absent in Californian comparisons of the British and Chinese trajectories. Roy Bin Wong makes some mention of the lack of institutions in China after 1800 hindering economic growth, stating that "industrial capitalism in China possessed neither the institutional structures nor the capital to transform large parts of the country".[299] In a claim closely mirroring Pomeranz's line of reasoning, Bin Wong cites lack of institutional structures and financial institutions in China as a cause for the relatively late and contingent divergence between China and Western Europe. Shifting our focus to Japan, in what way might institutions have played a vital role in industrialization?

One fundamental institutional reform that pre-dated not only the Sino-Japanese war but also even the possibility, let alone the reality, of imperial conquests was the Land Tax Reform in 1873. The tax reform was intended to re-distribute the relative gross product of agriculture which previously had been split such that the ruling feudal class averaged around 37 percent while the remainder was divided between landowners and cultivators in a rough proportion of 4 to 6; the Land Tax Reform re-distributed this under a formula in which 34 percent of the gross product would go to the government as tax, 34 percent went to the owner, and the remaining 32 percent to the tenant.[300] This re-distribution had some important effects that laid some of the ground-work for the era of industrialization that soon followed. Some of the more significant of these were that, although the land tax rate at first appeared to be exorbitant, it was a fixed rate which eventually lost its severity both through a rise in prices and in the productivity of the rice crop, such that what began as a tax of 34 percent of the gross value of the crop had been reduced to 12

[298] North and Thomas, *The Rise of the Western World*, p. 157.
[299] Wong, *China Transformed*, p. 62.
[300] Tsuru, "The Take-Off in Japan, 1868-1900," p. 145.

percent by 1878.[301] Being a flat rate helped motivate the cultivators because an increase in productivity would lessen the relative tax burden, and the fact that this reform happened to coincide with a period of inflation further reduced the severity of the tax and increased the possibilities for profit.[302] Additionally, the land tax revenue could be used by the government as a basis for issuing bonds, including industrial bonds—this meant that the Meiji government was able to channel some of the surplus directly into productive investment and it allowed for deficit financing for creating new industries.[303] Although the land tax reform also had a wide-reaching negative impact on those peasants who could not pay the initially high tax, it did provide incentives to increase productivity since a guaranteed flat tax meant that extra profits from increased production accrued to the landowners rather than to the government. In line with research conducted by Sudipto Mundle, it can be seen that a system such as this, in which the surplus producer is able to appropriate the gains in productivity, is a viable agrarian basis for industrialization.[304] Additionally, the portion of the gross value that goes to the government establishes a revenue base for investment in industrial production.

Whereas the export sector is often heralded as leading economic growth, which in turn directs attention toward the importance of colonies, studies by Okawa and Rosovsky have shown that throughout the period of modern economic growth in Japan, domestic demand has always accounted for 75 to 80 percent of aggregate demand, leading them to conclude that it is not exports that led growth but conversely domestic economic growth which led exports.[305] This is substantiated also by Richard Grabowski who points out that "…successful export generally requires the mastery and adaptation of new technology. If such mastery and adaptation can be enhanced only by practical experience in applying and utilizing the technology, it will be domestic demand which is the key to long-run export success. In other words, production for the domestic market would be a necessary prerequisite before foreign markets could be successfully

[301] Tsuru, "The Take-Off in Japan, 1868-1900," p. 145.
[302] Sussman and Yafeh, "Institutions, Reforms, and Country Risk," p. 445. Japan experienced an inflationary period from 1877-1881, which was largely a result of the Satsuma Rebellion. This inflation was restrained during the 1880s by the Ministry of Finance under Matsutaka.
[303] Tsuru, "The Take-Off in Japan, 1868-1900," p. 147.
[304] Mundle, "The Agrarian Barrier to Industrial Growth," p. 67. For more on property rights and productivity, see Douglass North and Robert Thomas, *The Rise of the Western World*.
[305] Ōkawa and Rosovsky, *Japanese Economic Growth*, pp. 175-177.

penetrated".[306] Since the main market for manufactured goods in early industrialization was typically the agricultural sector, a successful agricultural revolution may be critical for successful import substitution industrialization.[307] The agricultural modifications instituted through the Land Tax Reform helped to establish the advanced agricultural base upon which industrialization could and would then thrive. The agricultural sector provided export earnings and import substitutes which then helped in acquiring machinery and raw materials from abroad.[308] Additionally, the land tax reform and incentives toward productivity increases would have kept relative food prices low such that a greater share of income could be devoted to the purchase of manufactured goods.[309] In this manner, the institutional reform established through the land tax provided funds for the government while also expanding the domestic market, which in turn would have driven export growth. Even if following this argument to its logical end places too much emphasis on the importance of agrarian reform, it at least correctly points out that such institutional underpinnings were at least as, and probably more, important than coal and colonies in establishing the foundations for successful industrialization in Japan.

Entangled with this argument is the availability of cheap labor to work in factories once the factory system came to be wide-spread. Although the tax burden fell significantly in the years following the tax reform, there were numerous small-sized landowners who could not survive the initial severity of the tax and were forced to sell their land and become tenant farmers; the average peasant also continued to live in near subsistence conditions.[310] This created a class of cheap laborers, often young women from impoverished rural families, who supplemented the family income by working in textile factories or engaging in some form of proto-industrialization.[311] As already seen in chapter 5, by-employment in the textile industry was widespread and, considering that cotton was a leading sector in the Japanese economy from around 1885 until 1905, the availability of cheap employment was surely important in profitability and the consequent ability of this sector to compete even in the domestic market

[306] Grabowski, "The Successful Developmental State," p. 417.
[307] Ibid.
[308] Dore, "Land Reform and Japan's Economic Development," p. 487.
[309] Grabowski, "The Successful Developmental State," p. 417.
[310] Tsuru, "The Take-Off in Japan, 1868-1900," p. 148.
[311] Ibid.

against imports from Britain and India.[312] Low wages then also helped to establish Japanese exports, which were aided by a policy of dumping and expansionist military policy towards the Asian continent.[313] Again, it is clear that the imperial expansion was an outgrowth of national policy (both for national strength and to promote the import/export sector) once the internal dynamics were already in place. Indeed, Meiji institutions played no small part in this.

It can also be argued that these agrarian reforms were not an abrupt change instituted under the new Meiji government and breaking entirely with the past. As already described in chapter 4, there had been a long process of agricultural evolution and improvements already in the Tokugawa period. The major political changes that took place during the Meiji Restoration naturally have their place in the historical context of Japanese development; however, the foundation upon which these institutional and political changes would be based was already being put in place in the Tokugawa period. In his insightful comparison of Japanese and Indian industrialization, Sudipto Mundle draws the conclusion that the industrial revolution in Britain, as in Japan, was the outcome of a long agrarian revolution; India, by contrast, attempted to implement a similar strategy of state-led industrialization as that found in Japan, but in the context of a much less developed agrarian structure which, for Mundle, accounts for the differing success rates.[314] Regardless of the ultimate validity of this claim, there undeniably was a long precedence of agricultural and land-productivity improvements tracing back to the Tokugawa period which surely played a role in the speed of Japan's transition from a pre-modern agricultural society to a society well on the path toward industrialization and mass consumption in the space of a tumultuous but impressive fifty years.

Also of note in Mundle's comparison of Japan and India is his characterization of their common strategy of industrialization as "state-led". Although the involvement of the Japanese state in actively pursuing industrialization is almost too obvious, the role of the state is a point not carefully considered within the California tradition and therefore requires some attention here. Naturally, Japanese and British industrialization occurred in two entirely different environments. Britain, as the first industrializer, did not have any examples to follow nor could she have

[312] Rostow, *The World Economy*, pp. 422-423.
[313] Tsuru, "The Take-Off in Japan, 1868-1900," p. 149.
[314] Mundle, "The Agrarian Barrier to Industrial Growth," pp. 71-76.

guessed the likely outcome of certain actions or policies. Japan, on the other hand, was able to look to the West for precedence and could model her industrial strategy after what appeared to have led to success for other countries in the past. Regardless of this temporal and situational difference, it is likely that the motives and internal dynamics of the state, even if less deliberate than in Japan, may also have been critical in the British divergence from China. This is a point not much acknowledged by the Californians, and the juxtaposition of strong state involvement in the Japanese industrialization will hopefully serve to illustrate that the role of the state needs to be considered in an analysis in the impetus for industrialization.

In the wake of the forced opening of Japanese ports and the subsequent Restoration, a great concern for the newly established Meiji government was creating a strong nation able to fend off the dangers of invasion by foreign powers. The policy of seclusion, the relative lack of resources, and overwhelming interest in China had provided a barrier to outside intervention in the past but it was well understood that without decisive action the tables could quickly turn.[315] As a result of this looming threat, Japan embarked on an impressive mission of state-building with the goal of not only pre-empting foreign invasion but to stand on equal terms with European powers.[316] In this sense it is clear that the Japanese motive for industrialization was quite different from the British motive in that Japan had a clear model to emulate while the British did not. However, it will do well to remember that Britain existed within a highly competitive state system in which mercantilism[317] was order of the day and an inability to compete meant perishing into the oblivion of history.[318] In Western Europe, as in Japan, survival meant successful competition and consequently the need for a strong state to institute competitive policies. Amongst these, we see in Britain a policy of mercantilism and warfare which in turn led to institutions of taxation and parliament which may not have directly caused industrialization, but the objectives of the state in shaping policy in a certain direction and not in another cannot be

[315] Norman and Woods, *Japan's Emergence as a Modern State*, p. 47.
[316] Tsuzuki, *The Pursuit of Power in Modern Japan, 1825-1995*, p. 100.
[317] Mercantilism first appeared in print as *systeme mercantile* in 1763 but only gained its world-wide reputation through Adam Smith and *The Wealth of Nations*. The precise meaning of the term is still subject to debate but it essentially refers to the strengthening of both the internal and external position of the state through military might and the required international liquidity to maintain such an army. The balance of payments was also a central concern for mercantilists such that protectionist policies were enacted to prevent outflow of bullion and to promote exports. For more on mercantilism, see *European Economic History: From Mercantilism to Maastricht and Beyond* by E. Damsgaard Hansen, or *Mercantilism: The Shaping of an Economic Language* by Lars Magnusson.
[318] Hansen, *European Economic History*, pp. 61-66.

discounted as irrelevant.

In the Japanese case, the stated objective of the Meiji government was to strengthen the nation and join the ranks of the western powers.[319] Thus, the state cannot be disregarded as an important driving force toward Japanese industrialization. During the early transition phase from the semi-feudal Tokugawa order to the modernizing Meiji period, Sydney Crawcour points to four major features that stand out. These are the adoption of modern economic growth as a national objective, institutional change, the creation of infrastructure, and the growth of the traditional economy, all of which he claims were responses to, or prompted by, contact with the West or followed Western models.[320] Indeed, it is true that most of the Meiji policies followed Western models. This, however, is not very surprising. Much more relevant is the fact that all of these features, to which I would add also military might, were carried out under the impetus of government-guided policy. The Meiji government also was able to influence private investments which then gave the state influence in key areas of development and it continued the emphasis on literacy and education already in place during Tokugawa times; this created a literate and educated labor force which would prove crucial for later industrialization.[321] The Japanese case thus clearly illustrates that the state can play a vital role in encouraging industrialization. Though the purpose here is merely to use Japan as a case study to illuminate points of consideration that are lacking in the Californian analysis and not to actually delve deeply into the British or Chinese cases, the implication is of course that the role of the British state differed in some critical ways from the state in China, thus accounting, at least in part, for the very different paths these two countries found themselves on by the nineteenth century.

Technology also gets comparatively little mention from the Californians. The question of technology has already been touched upon in our analysis of Japanese agricultural improvements as well as having been faintly hinted at in our discussion of the different energy paths upon which different societies found themselves. It is not the existence of technology in itself that is really important though, but rather the factors that drive technological innovation. These factors are manifold, cutting across cultural and institutional lines with certain institutions and

[319] Howe, *The Origins of Japanese Trade Supremacy*, p. 90.
[320] Crawcour, "The Tokugawa Period and Japan's Preparation for Modern Economic Growth," p. 116.
[321] Ibid., pp. 121-122.

government policies enabling different cultures that are more or less open to invention and technological innovation. For W.W. Rostow, for example, the distinguishing characteristic of the industrial revolution was the systematic, regular, and progressive application of science and technology to the production of goods and services.[322] David Landes also devotes a chapter of his book to invention and innovation, citing Judeo-Christian traditions as well as the free market for reasons why inventions were cumulative and fast-spreading in Europe while in China they languished in a "…weird pattern of isolated initiatives and Sisyphean discontinuities".[323] Ultimately, these arguments come down to culture and the role of the state. Cultural explanations are completely avoided in Californian analyses. While Landes' Judeo-Christian argument doesn't make much sense in the Japanese context, Japan does seem to have been open and receptive to new technologies in a way that other cultures, such as perhaps China, were not. With the opening of the ports, Japan embraced the backlog of foreign technological advancements and embarked on a mission to adapt and improve upon these new techniques.[324] In this, Japan was presumably able to learn from China's mistakes and recognized that opening herself up to Western techniques and adapting them on her own terms was a far wiser course of action than resistance and withdrawal.

[322] Rostow, *How It All Began*, p. 2.
[323] Landes, *The Wealth and Poverty of Nations*, pp. 57-59.
[324] Macpherson, *The Economic Development of Japan, 1868-1941*, pp. 23-24.

8. CONCLUSION

The question of fundamental requirements essential for industrialization and the extent to which Japan fits into the western development pattern is a debate unlikely to be satisfactorily resolved anytime soon. This does not mean, however, that such scholarly pursuits are not worthwhile. Indeed it is the very complexity of the problem which makes it a compelling topic for on-going research and discussion. The success of certain parts of the world in breaking away from pre-modern stagnation into an era of sustained and continuing economic growth has led to the publication of many thousands of tomes, engaging some of the most brilliant minds of the past two and a half centuries. The California School of writers marks an important break within what was, and to some degree still is, a heavily euro-centric tradition of understanding industrialization. These writers have made significant strides in broadening the field of research and introducing new perspectives from which to understand the modern world. Due in large part to these writers, as well as to those writing within the framework of dependency theory or world-systems theory, it is no longer possible to explain the modern, industrialized world through Europe alone. Ultimately, it is true, any analysis of industrialization must confront the question of Europe and why it was there that industrialization began. However, to ignore the rest of the world is wholly inadequate and insufficient for those writing in the wake of the California School which so powerfully, and oftentimes very convincingly, positions China at the center of the debate while relegating Europe for the most part to the side-lines.

Although the Californians have undoubtedly had an enormous impact on the field of economic history, a reorientation towards Asia is not entirely unproblematic. China lies at the core of this re-conceptualized approach which deals only in a very insignificant and unsystematic way with the country of Japan. This, then, eventually brings us to the problem at the heart of this paper: if China was such a powerful force in Asia, why did Japan industrialize first? Can we understand Japanese industrialization within this context and if so, how? This paper has sought to provide a systematic analysis of the main elements that seem to have been deciding factors for writers within the Californian tradition.

Ecological factors figure most prominently into the works of Kenneth Pomeranz, Andre Gunder Frank, Roy Bin Wong, and other writers within this school of thought. In following this approach, the main units of analysis applied in this paper to Japan have also been ecological. The

dense population of the Japanese archipelago made it at least as likely a contender for Malthusian checks as China or Britain. In fact, Japan appears to have had a much greater population working on an area of significantly less arable land than either its Asian neighbor or its European counterpart, meaning that it should have been beset by greater involution and more intensive Malthusian pressures than either China or Britain. This would have made Japanese industrialization all the more surprising. Indeed, famine and pestilence offer some indication of positive Malthusian checks in Tokugawa Japan, but neither led to massive population drops. Rather, the archipelago maintained a stable population throughout much of the eighteenth and nineteenth centuries. This does not mean that Japan was not heavily populated or that there was no evidence of land exhaustion; indeed there was. However, fertility research suggests that the population was carefully controlled through family structure and practices such as abortion and infanticide—practices reportedly also prevalent in China. It is therefore difficult to determine to what extent the Japanese population, as opposed to the Chinese or British population, was truly kept in check by exogenous Malthusian forces and to what extent it was consciously controlled in order to prevent total resource exhaustion and collision with the Malthusian ceiling. It appears that although Japan was densely populated, it was not to the point of a drastically reduced standard of living or serious population decline. No such trade-off is evident. Au contraire, the Japanese standard of living in the pre-modern era seems to have been as high, and by some measures even higher, than standards of living in Western Europe. In this way, Japan very closely mirrors the Californian argument that China also maintained a large population at a high standard of living. Additionally, Japan's rice agriculture and reliance on labor over capital were also similar to conditions in China thus providing an inadequate explanation of industrial success and failure in the two respective countries.

Kenneth Pomeranz explains the divergence between Britain and China as having been a result of fortuitous coal deposits and a colonial windfall for Britain. This argument in itself largely overlooks the colossal investments required to not only obtain but more importantly to maintain colonies, thus placing in doubt how much of a windfall the British colonial empire really was. It becomes even more tenuous in light of the fact that China had advanced knowledge of mining and coal extraction already centuries earlier but failed to develop steam technology. Tokugawa Japan also had an endogenous coal-mining industry faced with many of the same drainage problems as Britain, but solved these problems in a markedly different manner. Merely

having coal and some extraction capabilities was evidently not enough to harness the power of kinetic energy and develop that all-important precursor to industrialization, the steam engine.

Applying the colonial ghost acreage argument to Japan also proves problematic. Japan did indeed have colonies, but these were nowhere near as vast or as unpopulated (or depopulated as the case may be) as the British colonies in the Americas. The British were able to incorporate their colonies into a comprehensive system of production that utilized the land and capacity of the Americas for supplying raw materials. This did not come cheap, either in terms of labor or in terms of capital investment. However, it did provide an escape from the land-base at home and the opportunity to direct colonial production toward the needs and demands of the home country. According to calculations by Pomeranz, the ghost acreage gained through the colonies was enormous and decisive, providing not only raw materials scarce at home but also later becoming a stable market for the absorption of British manufactures. Although Japan also joined the imperial game and used her colonies in Taiwan and Korea for agricultural production, it is difficult to argue that these colonies were critical to the successful industrialization of Japan.

The controversy over the necessity of Japanese imperialism in East Asia is an on-going debate. It is true that Manchuria was certainly important for Japanese foreign and military policy and largely shaped East Asian politics in the run-up to the Second World War. However, by the time Japan had gained a foothold in Manchuria, it had for all intents and purposes already reached and exceeded its take-off point into sustained economic growth. As such, Manchuria was more an out-growth of industrialization than a driving force. Taiwan and Korea, on the other hand, may be considered to have been more pertinent in providing momentum for the definitive break-away from Smithian growth. Taiwan in particular served as the model for Japanese imperialism, becoming an important producer of sugar for the home economy. Although only informally a part of the Japanese imperial sphere until 1910, Korea also became integrated into the colonial empire as a producer and net exporter of rice to the home market. Imports from both Taiwan and Korea surely were important for sustaining the Japanese take-off into modern economic growth, but it would be highly suspect to claim that they enabled take-off in the first place. Japan had won two wars against major powers in order to even acquire these possessions, and by the time they became really significant to the Japanese economy in the second and third decades of the twentieth century, Japan had almost certainly reached and gone beyond the point

of take-off.

Although coal and colonies do not appear to have been decisive for Japan, they are also not irrelevant. Japan had an endogenous coal industry upon which it could build once steam power became available after foreign intervention forced the opening of Japanese ports. As such, though neither one of these elements can be said to have been a direct cause of industrialization, they also cannot be discounted as playing no part in the process. The existing coal industry coupled with a skilled and able labor force may have provided a basic foundation upon which industrialization could build while raw food and material imports from the colonies surely sustained and expedited economic growth. However, other factors, which are largely marginalized by the Californians, likely played a more important role not just in Japanese industrialization but in industrialization as a whole.

Although it will have become fairly clear by this point that the units of analysis utilized by the California School are not entirely adequate in explaining the Japanese case, neither is it simple to make a clear and concise assessment of what is missing. The explanation of a lack is inherently fraught with complexities and difficulties in that it radically broadens the topic and requires a systematically logical appraisal of what elements are truly critical from amongst any plethora of potentially lacking features. The perilousness of such an exercise is fairly obvious—it can easily become messy and overwhelming. However, this alone does not mean that it shouldn't be attempted. Indeed, if we are to conclude that the California School does not entirely explain the case of Japan, then there must be some attempt to identify the missing ingredients. Though this could take many forms, in the end, the role of the state seems to be a point of fundamental importance that is not seriously addressed by the Californian writers.

Essentially all of the missing elements highlighted in chapter 7 can be boiled in some form or another down to the state and the degree to which certain policies were either encouraged or inhibited. Though it is not specifically addressed, the disruption of the Meiji Revolution is itself also an important factor in Japanese developed which has no equivalent counterpart in Chinese history. Many of the early industrialization processes were a continuation of Tokugawa conditions; however, the ability of the Japanese state to re-direct itself and embark on a purposeful and deliberate path towards industrialization was both instrumental and unique.

Although the conditions of the Meiji era have not been discussed in this work, a thorough understanding of how Japanese industrialization came about will inevitably lead to strength of the Meiji leadership, the stated policy of modernization, and the existence of a skilled bureaucracy to guide the process of transitioning and building upon the Tokugawa agrarian and social structures that were already in place as a solid development foundation.

Having defined some aspects that appear to be lacking when applying the California Theory to Japan, we come now to a crucial point of difference: that of being the first industrializer as opposed to merely catching up. Ultimately, the question boils down to whether Japan could have feasibly been the first or if the existence of some precedential model was critical to Japanese success. In the end, though there is some incongruity in the argument that China and the West only truly began to diverge after 1800, what the Californians are correct about is that industrialization was nowhere inevitable. However, even if not inevitable, I believe we can point to some areas of the world which were more likely to achieve and sustain a take-off into modern economic growth than others.

Understanding the various paths to industrialization requires an analytic distinction between being first and catching up. Japan seems to have had a fairly solid foundation for catch-up and was therefore a more likely candidate for early industrialization. The agrarian structure coupled with a bureaucratic, institutional and political apparatus capable of affecting change within a highly educated and homogenous populous provided a springboard to economic growth not available elsewhere. Actual industrialization, however, only followed on the heels of markets being opened to competition and the formation of the Meiji government which made modernization a national priority. Britain, on the other hand, industrialized without any clear precedence or stated modernization goal. Rather, a convergence of factors, which surely included colonial mercantilism as well as availability and utilization of coal deposits, allowed Britain to be the first country to reach the take-off phase.

It is my opinion that Japan could not have been the first industrial country. Without interaction and competition with global players, much of the impetus for industrialization would have been missing. Granted, Tokugawa Japan did conduct some trade with her Asian neighbors as well as with the Netherlands; this was rather minimal however, and certainly negligible when

compared with trade relations between other parts of the world. Japan had an endogenous coal industry which functioned adequately and which solved its problems in a sufficient manner, though not in a manner that harnessed kinetic energy and effectively changed the prevalent mode of production. It is improbable that this would have changed significantly without some exogenous shock or without reforms that would have made Japan resemble England more closely. Colonies also were a part of Japan's plan to emulate the West and could never have been established within the isolationist policy of the Tokugawa period. Of course, it is possible that Japan could have come out of isolation of her own volition and somehow managed to industrialize. However, such a counter-factual scenario would be extremely difficult to construct in a logical and meaningful manner. In any case, the analytical dichotomy between understanding the difference between the first industrializer and all other industrializers is fertile grounds for new and continuing research that may very well expand our understanding of industrialization in general and how Japan fits into this larger picture.

While Japan appears to have had the necessary groundwork for a successful catch-up in the late nineteenth century, China was another story altogether. Although the Californians are not wrong in pointing to China as an important player in the pre-modern economy, it seems that China was on the decline already well before the British appeared. The state appears to have been too weak to effectively keep the British out, even if they were largely barred from the interior and relegated to trading in the coastal ports--when it came to the point of military intervention, the Chinese were no match for the British.[325] The state of the coal industry, which had also massively declined from its height in the eleventh and twelfth centuries, is another indication of China's regressive trajectory relative to other regions in the world. Therefore, even after once the potential of steam power had been discovered and harnessed in Britain, its

[325] Military conflict came to a head over the issue of opium during the First Opium War from 1839—1842, which England handily won. However, this conflict came about more over the realization that millions of taels of silver were flowing out of China than over a direct concern about the effects of opium. Ultimately, the outrage over opium was a question of economics. The argument that China may have been severely weakened either socially or militarily by the British-controlled opium inflow into the country is fairly weak. Opium existed in China both prior to and following the British presence, with production peaking at the beginning of the twentieth century, long after the British had moved on to other pursuits. Opium did have a large financial impact on China and certainly led to internal discord; however, the fact that the Chinese could not keep the British out in first place nor effectively control the import of opium indicate that this was a consequence rather than a symptom of Chinese decline. For more, see *Opium, Empire, and the Global Political Economy* by Karl Trocki or Wong, Roy Bing, "Opium and Modern Chinese State-Making", In: Brook, Timothy and Wakabayashi, Bob Tadashi (eds.), *Opium Regimes: China, Britain, and Japan, 1839-1852*.

introduction into China did not result in a successful technology transfer and a subsequent catch-up phase. China lacked the institutions and the fundamental political structure to make this kind of transition in the way that Japan did. Ultimately it seems then that although industrialization was nowhere inevitable or foreseeable, some place in Western Europe was much more likely to achieve this break-through than China, which for all her ability to sustain an incredibly large population at a high standard of living had a fairly weak state and seems to have been moving away from technological innovation. Japan also would have been an unlikely candidate for first industrialization lacking some of the necessary pre-conditions for take-off without policy geared directly at achieving this goal; however, Japan did have a strong state as well as the technological and institutional foundations for successful technology and best practice transfers which made her a viable candidate for take-off and catch-up, a feat achieved within the first few decades of the twentieth century.

BIBLIOGRAPHY

Allen, G. C. *A Short Economic History of Modern Japan, 1867-1937*. Routledge, 2003.

Aston, T. H., and C. H. E. Philpin. *The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe*. Cambridge University Press, 1987.

Bailey, Ronald. "The Other Side of Slavery: Black Labor, Cotton, and Textile Industrialization in Great Britain and the United States." *Agricultural History* 68, no. 2 (Spring 1994): 35-50.

Barnhart, Michael A. *Japan and the World Since 1868*. 3rd ed. A Hodder Arnold Publication, 1995.

Beasley, W. G. *Japanese Imperialism 1894-1945*. Oxford University Press, USA, 1991.

Benaerts, Pierre. *Les Origines de la Grande Industrie Allemande*. F.H. Turot, 1933.

Bentley, Jerry H. and Herbert F. Ziegler. *Traditions and Encounters: A Global Perspective on the Past*. Vol. 2, McGraw-Hill, 2003.

Blackburn, Robin. *The Making of New World Slavery: From the Baroque to the Modern 1492-1800*. Pbk. ed. Verso, 1998.

Borgstrom, Georg. *The Hungry Planet; The Modern World at the Edge of Famine*. New York,: Macmillan, 1965.

Borton, Hugh. *Peasant Uprisings in Japan of the Tokugawa Period*. Paragon Book Reprint Corp., 1968.

Braudel, Fernand. *The Perspective of the World: Civilization and Capitalism 15th-18th Century, Vol. 3*. First Edition. University of California Press, 1992.

Bray, Francesca. *The Rice Economies: Technology and Development in Asian Societies*. University of California Press, 1994.

Brook, Timothy, and Bob Tadashi Wakabayashi. *Opium Regimes: China, Britain, and Japan, 1839-1952*. University of California Press, 2000.

Calman, Donald. *The Nature and Origins of Japanese Imperialism: A Reinterpretation of the Great Crisis of 1873*. Routledge, 1992.

Catton, William R. *Overshoot: The Ecological Basis of Revolutionary Change*. University of Illinois Press, 1982.

Chang, Han-Yu, and Ramon H. Myers. "Japanese Colonial Development Policy in Taiwan, 1895-1906: A Case of Bureaucratic Entrepreneurship." *The Journal of Asian Studies* 22, no. 4 (August 1963): 433-449.

"CIA - The World Factbook -- Japan," n.d. https://www.cia.gov/library/publications/the-world-factbook/geos/ja.html.

Clark, Gregory. "Why Isn't the Whole World Developed? Lessons from the Cotton Mills." *The Journal of Economic History* 47, no. 01. The Journal of Economic History (1987): 141-173.

Cogliano, Francis D. *Revolutionary America, 1763-1815: A Political History*. Taylor & Francis, 2008.

Craig, Albert M. *Japan, A Comparative View*. Princeton University Press, 1979.

Crawcour, Sydney. "The Tokugawa Period and Japan's Preparation for Modern Economic Growth." *Journal of Japanese Studies* 1, no. 1 (Autumn 1974): 113-125.

Dore, R. P. "Land Reform and Japan's Economic Development." *The Developing Economies* 3, no. 4 (12, 1965): 487-496.

Durrant S. The Rise of the Chinese Empire: Frontier, Immigration, and Empire in Han China, 130BC--AC157". *The American Historical Review*. 113(3), 2008: 803-804.
Elvin, Mark. *Pattern of the Chinese Past*. Methuen Publishing Ltd, 1973.
Engerman, S.L., and Eugene D. Genovese, eds. *Race and Slavery in the Western Hemisphere: Quantitative Studies*. Princeton University Press, 1992.
Fairbank, John King, and Merle Goldman. *China: A New History*. Harvard University Press, 2006.
Frank, André Gunder. *ReOrient*. University of California Press, 1998.
Goldstone, Jack. *Why Europe? The Rise of the West in World History, 1500-1850*. McGraw-Hill, 2008.
Grabowski, R. "The Successful Developmental State: Where Does It Come From?." *World Development* 22, no. 3 (1994): 413–422.
Hanley, Susan B. *Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture*. Berkeley, Calif. [u.a.]: Univ. of California Press, 1997.
Hanley, Susan B, and Kozo Yamamura. *Economic and Demographic Change in Preindustrial Japan, 1600-1868*. Princeton University Press, 1977.
Hansen, E. Damsgaard. *European Economic History: From Mercantilism to Maastricht and Beyond*. Copenhagen Business School Press DK, 2002.
Hartwell, Robert. "A Cycle of Economic Change in Imperial China: Coal and Iron in Northeast China, 750-1350." *Journal of the Economic and Social History of the Orient* 10, no. 1 (July 1967): 102-159.
———. "Markets, Technology, and the Structure of Enterprise in the Development of the Eleventh-Century Chinese Iron and Steel Industry." *The Journal of Economic History* 26, no. 1 (March 1966): 29-58.
Hauser, William B. "The Diffusion of Cotton Processing and Trade in The Kinai Region in Tokugawa Japan." *The Journal of Asian Studies* 33, no. 4 (August 1974): 633-649.
Hayami, Akira, Osamu Saitō, and Ronald P. Toby. *The Economic History of Japan, 1600-1990: Emergence of Economic Society in Japan, 1600-1859*. Oxford University Press, 2004.
Hayami, Yujiro, and V. W. Ruttan. "Korean Rice, Taiwan Rice, and Japanese Agricultural Stagnation: An Economic Consequence of Colonialism." *The Quarterly Journal of Economics* 84, no. 4 (November 1970): 562-589.
Hobsbawm, E. J. *Industry and Empire: The Birth of the Industrial Revolution*. Upd Sub. New Press, The, 1999.
Honjo, Eijiro. *The Social and Economic History of Japan*. Russell & Russell, 1965.
Howe, Christopher. *The Origins of Japanese Trade Supremacy: Development and Technology in Asia from 1540 to the Pacific War*. 1st ed. University Of Chicago Press, 1999.
Huang, Philip. *The Peasant Economy and Social Change in North China*. Stanford University Press, 1985.
Inikori, J.E. "Market Structure and the Profits of the British African Trade in the Late Eighteenth Century." *The Journal of Economic History* 41, no. 4 (December 1981): 745-776.
Jannetta, Ann Bowman. *Epidemics and Mortality in Early Modern Japan*. Princeton Univ Pr, 1987.
Jansen, Marius B. *The Cambridge History of Japan, Vol. 5: The Nineteenth Century*. Cambridge University Press, 1989.
———. *The Making of Modern Japan*. Belknap Press of Harvard University Press, 2002.

Jones, Eric. *The European Miracle: Environments, Economies and Geopolitics in the History of Europe and Asia*. 3rd ed. Cambridge University Press, 2003.
——— *Growth Recurring*. University of Michigan Press, 2000.
Kasuga, Yutaka. *Transfer and Development of Coal-Mine Technology in Hokkaido*. United Nations University, Tokyo, 1982.
Kerr, George. *Okinawa: The History of an Island People*. Revised. Tuttle Publishing, 2000.
Kimura, Mitsuhiko. "Standards of Living in Colonial Korea: Did the Masses Become Worse Off or Better Off Under Japanese Rule?." *The Journal of Economic History* 53, no. 3 (September 1993): 629-652.
———. "The Economics of Japanese Imperialism in Korea, 1910-1939." *The Economic History Review* 48, no. 3. New Series (August 1995): 555-574.
Kohli, Atul. "Where Do High Growth Political Economies Come From? The Japanese Lineage of Korea's "Developmental State"." *World Development* 22, no. 9 (September 1994): 1269-1293.
Kreiner, Josef (ed). *Ryukyu and World History*. Bonn: Bier'sche Verlagsanstalt, 2001.
Kublin, Hyman. "The Evolution of Japanese Colonialism." *Comparative Studies in Society and History* 2, no. 01 (1959): 67-84.
Landes, David S. *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor*. W. W. Norton & Company, 1999.
Macpherson, W. J. *The Economic Development of Japan, 1868-1941*. Cambridge University Press, 1995.
Marx, Karl And Friedrich Engels, Karl Marx, and Friedrich Engels. *The Communist Manifesto*. Wildside Press LLC, 2008.
Mathias, Peter. *The First Industrial Nation: The Economic History of Britain 1700-1914*. London: Methuen Publishing Ltd, 1969.
Mc Neill, William. *The Rise of the West: A History of Human Community*. University of Chicago Press, 1968.
Mintz, Sidney Wilfred. *Sweetness and Power: The Place of Sugar in Modern History*. Penguin Books, 1986.
Morgan, Kenneth. *Slavery and the British Empire: from Africa to America*. Oxford University Press US, 2007.
Mundle, Sudipto. "The Agrarian Barrier to Industrial Growth." *Journal of Development Studies* 22, no. 1 (1985): 49–80.
Murakushi, Nisaburo. "Coal Mining." *The Developing Economies* 17, no. 4 (1979): 461–483.
———. *Technology and Labour in Japanese Coal Mining*. United Nations University, Tokyo, 1980.
Myers, Ramon H., and Mark R. Peattie. *The Japanese Colonial Empire, 1895-1945*. Princeton University Press, 1987.
Nakane, Chie, Shinzaburō Ōishi, and Conrad Totman. *Tokugawa Japan: The Social and Economic Antecedents of Modern Japan*. University of Tokyo Press, 1991.
Norman, E. Herbert, and Lawrence Timothy Woods. *Japan's Emergence as a Modern State: Political and Economic Problems of the Meiji Period*. International Secretariat Institution of Pacific Relations Publishing Office, 1940.
North, Douglass C., and Robert Paul Thomas. *The Rise of the Western World: A New Economic History*. Cambridge University Press, 1976.
Ōkawa, Kazushi, and Henry Rosovsky. *Japanese Economic Growth: Trend Acceleration in the Twentieth Century*. Stanford University Press, 1973.

O'Rourke, Kevin H. and Jeffrey G. Williamson. "When Did Globalization Begin?". *European Review of Economic History*. 6 (2002): 23-50.
Pearse, Arno. "The Cotton Industry of Japan, China, and India and its Effects on Lancashire". *The Journal of International Affairs*. Vol. 11, No.5 (Sept. 1932): 633-657.
Pomeranz, Kenneth. *The Great Divergence*. Princeton University Press, 2001.
Potter, J. "The British Timber Duties, 1815-60." *Economica* 22, no. 86. New Series (May 1955): 122-136.
Rostow, Walt Whitman. *How It All Began: Origins of the Modern Economy*. Taylor & Francis, 1975.
———. *The Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge University Press, 1990.
———. *The World Economy: History & Prospect*. University of Texas Press, 1978.
Roy, Denny. *Taiwan: A Political History*. Cornell University Press, 2003.
Rubenstein, Murray. *Taiwan: A New History*. Cornell University Press, 2003.
Sanderson, Stephen K. *Social Transformations: A General Theory of Historical Development*. Rowman & Littlefield Publishers, 1999.
Saxonhouse, Gary. "A Tale of Japanese Technological Diffusion in the Meiji Period." *The Journal of Economic History* 34, no. 1 (March 1974): 149-165.
———. "Productivity Change and Labor Absorption in Japanese Cotton Spinning 1891-1935*." *The Quarterly Journal of Economics* 91, no. 2 (May 1977): 195-219.
Shlomowitz, Ralph. "Plantations and Smallholdings: Comparative Perspectives from the World Cotton and Sugar Cane Economies, 1865-1939." *Agricultural History* 58, no. 1 (January 1984): 1-16.
Smith, Adam. *An Inquiry into the Nature and Causes of the Wealth of Nations*. Plain Label Books, 1986 (reprint).
Smith, Thomas Carlyle. *The Agrarian Origins of Modern Japan*. Stanford University Press, 1959.
Smitka, Michael, ed. *The Japanese Economy in the Tokugawa Era, 1600-1868* . Garland, 1998.
Solar, Peter M. "Poor Relief and English Economic Development before the Industrial Revolution." *The Economic History Review* 48, no. 1. New Series (February 1995): 1-22.
Solow, B. L. "Caribbean Slavery and British Growth." *Journal of Development Economics* 17 (1985): 1–2.
Sugihara, Kaoru. *Japan, China, and the Growth of the Asian International Economy, 1850-1949*. Oxford University Press, 2005.
Sussman, Nathan, and Yishay Yafeh. "Institutions, Reforms, and Country Risk: Lessons From Japanese Government Debt in the Meiji Era." *The Journal of Economic History* 60, no. 02 (2000): 442-467.
Taeuber, Irene Barnes. *The Population of Japan*. Princeton University Press, 1958.
Thomas, Robert Paul. "The Sugar Colonies of the Old Empire: Profit or Loss for Great Britain?." *The Economic History Review* 21, no. 1. New Series (April 1968): 30-45.
Totman, Conrad D. *A History of Japan*. Wiley-Blackwell, 2000.
———. *Early Modern Japan*. University of California Press, 1995.
———. *Pre-Industrial Korea and Japan in Environmental Perspective*. Brill Academic Publishers, 2004.
Trocki, Carl A. *Opium, Empire and the Global Political Economy: A Study of the Asian Opium Trade, 1750-1950*. Routledge, 1999.

Tsuru, Shigeto. “The Take-Off in Japan, 1868-1900.” In *The Economics of Take-Off Into Sustained Growth: Proceedings of a Conference Held by the International Economic Association*, edited by Walt Whitman Rostow. Macmillan, 1963.
Tsurumi, E. Patricia. *Factory Girls: Women in the Thread Mills of Meiji Japan*. Princeton University Press, 1992.
Tsuzuki, Chūshichi. *The Pursuit of Power in Modern Japan, 1825-1995*. Oxford University Press, 2000.
Vlastos, Stephen. *Peasant Protests and Uprisings in Tokugawa Japan*. University of California Press, 1990.
Vries, Peer. "The California School and Beyond: How to Study the Great Divergence". *History Compass*. Vol. 8, Issue 7, (July 2010): 731-751.
Weber, Max, and Talcott Parsons. *The Protestant Ethic and the Spirit of Capitalism*. Courier Dover Publications, 2003.
Williams, Eric. *Capitalism and Slavery*. Read Books, 2008.
Wong, R. Bin. *China Transformed: Historical Change and the Limits of European Experience*. Cornell University Press, 2000.
Wrigley, Edward Anthony. “The Supply of Raw Materials in the Industrial Revolution.” *The Economic History Review* 15, no. 1. New Series (1962): 1-16.
Wrigley, Edward Anthony, and R. S. Schofield. *The Population History of England, 1541-1871*. Cambridge University Press, 1981.
Wu, Tsong-Min. “Economic history of Taiwan: a Survey.” *Australian Economic History Review* 44, no. 3. Australian Economic History Review (2004): 294-306.
Yoshida Togo. 吉田東伍前期論考・随筆選 (Yoshida Togo zenki ronko zuihitsu sen), Kokusai Nihon bunka kenkyu senta, 2003.
Yamamura, Kôzô. *The Economic Emergence of Modern Japan*. Cambridge University Press, 1997.
Yasuba, Yasukichi. “Standard of Living in Japan Before Industrialization: From What Level did Japan Begin? A Comment.” *The Journal of Economic History* 46, no. 1 (March 1986): 217-224.
Yip, Ka-Che. *Disease, Colonialism, and the State: Malaria in Modern East Asian History*. Hong Kong University Press, 2009.

Carmen Gruber

grubes@gmail.com

Persönliche Daten:

Geburtsdatum:	25.Oktober 1983
Geburtsort:	Voitsberg, Steiermark, Österreich
Staatsangehörigekeit:	Österreich, USA
Familienstand:	ledig

Schulbildung und Studium

2008-2010	Universität Wien Globalgeschichte und Global Studies MA
2001-2005	University of Michigan, Ann Arbor Triple Major: BA Economics, BA Asian Studies BA German (akademischer Grad mit Prüfung im Spezialfach)

Berufpraktische Erfahrungen

8/2005—8/2008	Japan Exchange and Teaching Program (JET) Assistant Language Teacher (ALT) Shiga Board of Education Englischlehrerin (Moriyama, Shiga, Japan)
4/2003—7/2005	Surveys of Consumers Institute for Social Research Büroassistentin
9/2002—3/2003	Universitätsbibliothek Bucherhaltung Abteil Teilzeitbeschäftigung

Praktika

6/2002—8/2002	Wirtschaftslehre Praktikum RCG Münsterland GmbH Münster, Deutschland Neue Medien und Brenn u. Kraftstoffe Abteilungen

Sonstige Fähigkeiten

Sprachkenntnisse:	Deutsch (Muttersprache, fließend) Englisch (zweite Muttersprache) Japanisch (fortgeschritten) Spanisch (Grundkenntnisse)
EDV-Kenntnisse:	MS Word, Excel, Powerpoint for Windows, SAS