Cliodynamics: the Journal of Theoretical and Mathematical History

Labeling and Analyzing Historical Phenomena: Some Preliminary Challenges

Kenneth Pomeranz
University of California at Irvine

A serious obstacle to the search for a more scientific history is that humans label themselves and their actions. These labels can be extremely sticky and often obscure the categories which might be most useful for seeking regularities. Another, related, problem is a focus on dramatic events that seem to be relatively rare and are commonly recognized as landmarks, e.g. political and industrial revolutions. Having formed several of these major events into a class, scientifically-minded historians have then often searched for a very small set of discrete variables that could predict the occurrence or non-occurrence of these very special events. By contrast, I would argue that we are likely to be better off by looking at more general processes that may include but are not limited to these dramatic events, and looking for clusters of variables which interact with each other; the hoped-for result would usually be not to explain the categorical presence or absence of some process (e.g., "economic development") but to group many cases into families, seeking to explain both within-group and between-group variation by means of systematic comparison.

Naming Historical Events and Processes: Problems of Familiarity

Historians often say that because they study processes in which the participants are consciously trying to affect the results, they cannot be expected to come up with generalizations comparable to those found by people studying, say, microbes or electrons. But human volition need not be a fatal obstacle to the search for a more scientific history; it does not rule out the possibility that there are regularities to be found in these human responses, at various levels of aggregation.

A bigger problem, I would argue, is that humans label themselves and their actions; these labels can be extremely sticky and often obscure the categories which might be most useful for seeking regularities. Moreover, people interested in a more scientific history cohabit with both professionals and amateurs whose efforts (often in reaction to the emic labels of participants) strongly skew the set of topics in which we are interested and the units we

Corresponding author's e-mail: klpomera@uci.edu

Citation: Pomeranz, Kenneth. 2011. Labeling and Analyzing Historical Phenomena: Some Preliminary Challenges. *Cliodynamics* 2: 121–145.

choose for looking at them away from those that might be most promising for developing generalizations.

We already have a few generalizations that are true about the behavior of all human groups as opposed to all other species, whether or not these take us very far in analyzing history: e.g., all known groups of *Homo sapiens* have made some use of fire, and no other species does. There are also many things that are true of all human groups and of only some other species – and we are reasonably sure, are true to a much greater degree among humans. (The use of language is an obvious example.) There is also a huge range of trends that are discernible in human history over very long periods – though the very fact that they are trends indicates that they have not always characterized all human groups, and they characterize some times and places much more than others. (Increases over the last few centuries in average life expectancy, in carbon dioxide emissions, and in the extent of inter-dependence with humans whom we do not personally know are just a few of many examples.)

It is not clear that grouping humans by their membership in contemporary national states is especially useful for studying most of these particular regularities or trends. Yet those groupings serve other purposes that matter to huge numbers of humans; thus they continue to dominate historians' training, topics of research, and framing of narratives for public consumption (whether in the classroom or elsewhere).[1] Those other purposes vary enormously in their moral justifiability, and in their capacity to inspire valuable reflection of other kinds (e.g., artistic and ethical[2]), but that is not the point here; what matters for present purposes is that they are all related to the fact that contemporary people are much more likely to label themselves and others as "Germans" or "Brazilians" – or by somewhat larger or smaller groupings that are linked to these, such as "African-American" or "European" – than as "resident of a tropical/temperate zone society," "resident of an industrial/agricultural/'post-industrial'[3] society," etc.[4] Other regularities

[1] This is not to deny of course, that national states, or their closest analogues in earlier times, such as empires, are precisely the right units for looking at other parts of history, which might also prove to exhibit regular patterns.

[2] For an argument by a distinguished contemporary historian that historian should be thought of primarily as an aesthetic exercise, see Hunt [1], p. 21. The notion that history should above all provide models for thinking through ethical problems exists in many traditions, but was perhaps strongest in Chinese historical writing before ca. 1895, and especially before ca. 1600. For a variety of examples (with an introductory overview by the editors), see Beasley and Pulleyblank [2].

[3] This is an awful term, since those of us who live in societies where industry makes up a declining share of economic output are still completely dependent on industrial processes for the basics of our lives – but it is the term in common use.

[4] One common emic term that may seem analytical in the way these latter terms are is "modern," but in fact the term has such a variety of meanings that it is usually much

based on the past – e.g., "resident of an area that until recently depended on rainfall agriculture and primarily grew tubers," "resident of an area that has practiced irrigated rice agriculture for centuries," "resident of a traditional rainfall-dominated wheat-growing area" are even less likely to be an important part of people's consciousness, though it would not be hard to come up with plausible hypotheses about how they might have crucial enduring influences.[5] And it is hardly surprising that historical inquiry aimed primarily at understanding one's own situation and choices often starts by projecting back into time apparently self-evident units that people today take to be crucial to their identities, such as nations, religions, and ethnicities. Inquiry into the

---

more a way of saying "people like us" than anything else. In particular, since the term often slides back and forth between referring to societies with a particular set of technologies, societies that claim to have certain norms (which may be loosely linked to those technologies) or simply societies that are contemporaneous with societies having those characteristics, it does not have the analytic value that I would argue these other terms often have unless it is defined much more carefully for a specific use.

[5]Francesca Bray [3] is one interesting attempt to lay out the distinctive ecology and labor requirements of rice paddies, and some possible (though not invariant) implications for population density, property systems, and society more generally. Kaoru Sugihara [4] and I [5, 47] are two among many scholars who have followed in this tradition in analyzing differences between East Asia and Europe, looking at implications for capital accumulation, the organization of rural industry, principal-agent relationships (which in turn affect property rights and division of labor), etc. More recently, in trying to compare long term development patterns in the Yangzi Delta and Ganges/Brahmaputra delta, I have been struck by how much two wet rice societies can diverge on all these points, based (I think) on initial differences in the behavior of the rivers, the density of the human population (which may be partly an effect of the differences in hydrology and geology) and the consequent human adaptations to regular flooding. Meanwhile, James Scott [6], pp 207-8, has developed a very different – but I think ultimately quite compatible – set of oppositions between wet rice and tubers, based in large part on how conducive they are to the building/avoidance of powerful state structures. Wet rice, he argues, stands at one end of a continuum among domesticated crops for the degree of fixed investment it rewards (and thus the degree to which its growers may be reluctant to flee), the extent to which it is best grown in accessible lowlands, the population densities it will support (and the degree to which it rewards increased inputs of labor per acre) and the relatively narrow time window within which it must be harvested (thus making it relatively easy for landlords or tax collectors to seize a large chunk of the crop). Many tubers and root crops, by contrast, will grow in less accessible highlands, can be grown with relatively little labor if one accepts low yields per acre, and will keep well in the ground for very long periods, making it possible to avoid a sharply delineated harvest/surplus extraction season. He does not mean this to be a deterministic scheme – one can, with enough labor, grow wet rice on steep terraced hillsides, or achieve remarkable yields per acre with labor-intensive potato cultivation, for instance – but the affinity of a particular agro-ecology for long-term, large-scale patterns in various realms of life is nonetheless significant.

history of others is then often structured by analogy. If "American history" is the key to understanding my place in the world – as the nineteenth century founders of professional history departments, always dominated by historians of the home country (and often composed of state employees), insisted that it was[6] – then the key to understanding intriguing or threatening others must also be national histories, be they Japanese, Russian, or Egyptian. Plenty of enlightening work has been and continues to be done using those categories – but it is not necessarily the work with the best chance of taking us to a synthetic view of the larger-scale social changes at issue here.

The same is true, I would argue, of a large body of historical scholarship – especially important since the "cultural turn" of the 1980s – that takes as its central task probing the artificiality of categories taken for granted by historical actors at certain moments (and sometimes by many historians as well): work that examines how societies labeled certain people as "black," or certain groups as "tribes," or certain kinds of work as "feminine," with little or no objective basis, and how anomalies were made unthreatening to those categories. Clearly work like this – or about highly subjective shifts in the relative value attached to oral and written testimony, or the moral status of small children – can be very important to anyone seeking to understand how people viewed their world or to make sense of their patterns of behavior. But if we do only this kind of work, it is hard to see how we would ever have much to say about some of the most basic changes in human society (e.g., large changes in life expectancy, energy consumption, or in the status of women) or set any boundaries on the possible variations in social arrangements, ideas or patterns of change. For those projects, carefully chosen etic categories are indispensible.

The human groupings most often taken as the subjects of history are not the only relevant units that can be problematic; units that mark off the events/behaviors to be analyzed can also cause difficulties. Here one common problem is a focus on dramatic events that seem to be relatively rare (though on closer examination they may be less so than we think) and are commonly recognized as landmarks: a relative handful of political and industrial revolutions or the outbreaks of major wars come to mind. Having formed several of these major events into a class, scientifically-minded historians have then often searched for a very small set of discrete variables that could predict the occurrence or non-occurrence of these very special events. By contrast, I would argue that we are likely to be better off by looking at more general processes that may include but are not limited to these dramatic events, and looking for clusters of variables which interact with each other; the hoped-for result would usually be not to explain the categorical presence or absence of

[6] See for instance Duara [7] and Tanaka [8].

some process (e.g., "economic development") but to group many cases into families, seeking to explain both within-group and between-group variation by means of systematic comparison. One short and one lengthy example follow.

First, consider the case of "revolutions." These were once a popular object of comparative analysis (Brinton[9], Moore[10], Skocpol[11], Goldstone [12], et al.), but the results have not been terribly encouraging, in part because there is no consensus on which cases of collective violence leading to a change in government and significant social conflict" (CVCGSC) qualify as "revolutions." The N for the first category is fairly large (instances have occurred in Tunisia and Egypt during just the last 10 days), while the N for "revolutions" is very small, at least according to some historians; and the reasons for categorizing some episodes of CVCGSC as revolutions while excluding others often have more to do with the political uses of historical narratives than with criteria that would be promising for a scientific analysis. Again, my point is not that doing history based on emic categories and political, moral, or dramatic purposes is bad; but it is unlikely to be the most promising route towards identifying important regularities.[7]

---

[7] It is not easy to define what makes for an "important regularity"; I hope it will become clearer as the paper progresses. But for now, let me suggest two ways of thinking about it. First we want observations that seem likely to have implications for a number of social issues in the societies where we find them. It might well be true that many societies have symbolic color schemes in which red and green are opposed to each other, and united only on special occasions, (such as Christmas in the modern West) [13], 182, 198-203; and this regularity may well tell us something about the way the human visual apparatus works. But its presence or absence in a given society is unlikely to tell us much about whether that society has high literacy rates, lots of inter-personal violence, coerced labor, a long average life expectancy, a static or fluid occupational structure, or peaceful relations with its neighbors. Second, we want the regularity to be at a level of specificity/generality so that it is not initially obvious either that it will or will not be found in many societies. If, for instance, we define the religious group that led a series of uprisings in mid and late imperial China in the narrowest possible terms (as "the White Lotus society") the observation that we do not find it in other parts of the world is relatively trivial; if, at the other extreme, we simply describe it as "a group of dissenters" it is no surprise at all that we find such groups in just about all times and places. It is when we define it at an intermediate level of specificity ("a millenarian group with many adherents that was usually quiescent, but could become rebellious when it thought the times demanded it) that the question of whether groups fitting this category appeared in other times and places, and how they behaved, become interesting and capable of illuminating other aspects of the host societies. Both of these criteria, but especially the first, are connected to my preference for examining clusters of variables rather than looking for the presence or absence of a single phenomenon of overriding importance. The second is also connected to David Krakauer's observations about how defining our units properly may help us escape, or at least mitigate the N=1 problem.

In his 2007 SFI Bulletin article, David Krakauer suggests one way around this problem. He makes the point that the "$n = 1$" problem in historical analysis may be partly the result of choosing units that are too big. There has been only one French Revolution, but there were 20 meetings of the Estates General, 15 confiscations of church property, etc.; some of the latter events may be easier to compare, both to each other and to similar events in other times and places.[8] This kind of decomposition could certainly be useful, but there may also be other strategies to create comparable units without always going down in size; and for various reasons, I think it best not to bet exclusively on analyzing any one scale of historical phenomena.

Charles Tilly long ago suggested one alternative, recommending an initial division between two general types of "revolutions" [14]. One type begins with some cause of instability in a capital, which may be rather narrow or technical (e.g., the fiscal problems of the French state in 1788–89, the dispute between Madero and Diaz over presidential succession in Mexico in 1910, or the assassination of Gaitan in Bogota in 1948 – the latter leading to violence which is rarely thought of as a revolution, but lasted over a decade, fundamentally altered society, and was, in quantitative terms, one of the 3 largest military conflicts in the history of the Western Hemisphere). This instability at the center temporarily paralyzes or divides the state, allowing the expression of deeper social conflicts which none of the contending elites in the capital initially favored raising. The other type begins with insurgencies among people far from the main centers of power, which benefit at first from being based in inaccessible places, tend to start by mobilizing non-elites, and which generally seize the capital as one of the final acts in the taking of power (e.g., China in both 1368 and 1949, Cuba in 1959).

This kind of grouping, which relies on identifying different ways in which the parts of events can be related to each other, seems a useful way of beginning to create classes of objects we could investigate for both regularities and within-group variations. It is certainly more promising than accepting more everyday categories that depend on one key feature (often chosen by the movement or its opponents at the time) that is said to define the basic significance of the whole event: e.g. "bourgeois," "proletarian," "peasant," "democratic," "radical," etc. (Indeed, much of the turn away from large-scale comparison in recent decades is the result of perfectly justifiable discontent with the ways in which classic social theory often tried to derive prediction

[8] Ranajit Guha [15] makes a similar move for rather different reasons in his famous *Elementary Aspects of Peasant Insurgency in India*, insisting that rather than focusing on why a nationwide peasant revolution did not occur in India we look at the dynamics of the hundreds of small peasant uprisings that did occur, and at their cumulative effects.

from one single defining feature of a group or situation: Marx's strictures on the inevitable nature of "peasant" political behavior[9] is just one example.)

However, it is a significant practical (if not conceptual) obstacle that categories such as "democratic," or "bourgeois" are at least superficially legible to historians' various constituencies in a way that a distinction between "center-out" and "periphery-in" revolutions is not; and for both good and bad reasons, most historians are wary of losing the public relevance that comes from addressing units and processes that people recognize as related to their own lives. It is also worth noting that in investigating these sub-categories of CVCGSC, we might find some important regularities across all cases, as well as explanations of the variability among the many cases of this general class of phenomena: while this within-group variability should be of a smaller order of magnitude than the differences between examples of this group and examples of other general categories (e.g., "peaceful transfers of power through elections" or "military coups with no significant participation by civilians"), it may nonetheless be the more interesting phenomenon. Focusing on this within-group variability would represent a shift away from the central ambition of many older theories of revolution, which were centrally concerned with defining the necessary and sufficient conditions which distinguished "revolutionary situations" from all other kinds of contentious politics – often with the further goal of making revolutions predictable.[10] That older project, if realizable, would have a straightforward kind of utility that recommends it strongly to some people.

Toward a Typology of Socio-Economic Development Paths: An Example

In the same spirit in which I offered the distinction between "center-out" and "periphery-in" CVCGSC, I would argue that we can go a long way towards creating comparable cases of "economic development" by separating cases in which agricultural commercialization and early industrialization were accompanied by a large percentage of cultivators losing secure access to land (or having never had such rights) from cases where cultivators' access to land remained secure, or became even more so. The advantage of choosing this variable is that its differing values have powerful implications for urbanization, the location of industry (which in turn probably influences the likelihood of certain kinds of innovation), migration patterns, and so on – which I will turn

---

[9] E.g., *The Eighteenth Brumaire of Louis Napoleon*, pp.123-4 [16]. For accounts of just how varied peasant behavior in precisely that case actually was see e.g., Merriman [17], Agulhon [18] and Margadant [19]. .

[10] For a brief essay arguing for a turn in just the direction I am suggesting here, see Tilly [20].

to momentarily. How widespread this kind of dispossession is seems to be linked in turn to a cluster of variables: an area's ecology and population density, its main crop and the specific labor requirements thereof, and the relationships between landed elites and the state. Consequently, the inquiry is not likely to identify a single cause of the development pattern in each case, or give rise to invariant laws; but I hope it will at least show that this cluster of variables (which are not fully independent of each other) create a limited range of likely outcomes. In other words, this project is also focused on explaining variability within a general phenomenon, rather than with making future occurrences of a singular kind of event predictable. And, paralleling the case with theories of revolution, such a focus represents a break (already well underway) with older attempts at specifying invariant necessary and sufficient conditions for a "take-off into sustained growth" that (like revolutions in politics) is seen as categorically different from any other instance of economic change.[11]

I have been trying to begin such a typological inquiry in some recent work that compares long-term development in China's Yangzi Delta (and to a lesser extent, other East Asian wet-rice regions) with those in Northwestern Europe on the one hand and the Ganges/Brahmaputra Delta on the other [21]. For reasons of length, I will tell only the Chinese version of the story below. The European narrative is more familiar, and some salient points will be mentioned in passing; the South Asian story provides some interesting comparisons, but would take too long to develop here.[12]

---

[11] The term "take-off into sustained growth" comes from Rostow [22], The Stages of Growth, but much other work also posits that each society makes a one-time, clearly identifiable break out of a Malthusian world and into a world of essentially limitless growth. See, e.g. R.M. Hartwell's observation that "economic growth is binary: all or nothing, one or zero," discussed in Jones [23]. For historically-based critiques, see Crafts [24], Goldstone [25], and Pomeranz [26]. The idea that a single variable – usually the creation of a proper system of property rights – explains the occurrence or non-occurrence of such a breakthrough is also still very much with us: see e.g. North and Weingast[27]; Acemoglu et. al. [28].

[12] Two points about the Bengal delta do seem worth making here, however. First, even in areas of Bengal that grew paddy rice, cultivators did not gain the same strong rights to particular pieces of land that they typically gained in both China and Japan. This suggests that though wet rice yields respond dramatically to very careful cultivation – making it imperative that the cultivator have strong incentives to maximize yields (as they do under fixed rents and to some extent under share rents, but not if they are slaves or earn a per hour wage) if the landowner wishes to avoid very high monitoring costs – this does not necessarily result in any particular system of property rights. Second, that at least two factors that are themselves probably linked may help explain this difference. First, the Bengal Delta was much less densely populated than the wet-rice parts of Japan and China, until the twentieth century; this meant that maximizing

It is convenient that in this case there is a significant overlap between units defined by the variables I am focusing on and more familiar units, since the area strongly influenced by large-scale agricultural commercialization with minimal erosion of secure small scale cultivation rights roughly corresponds to China, while the places where commercialization went along with the strongest shift in land rights towards undivided power for the owner and extremely weak rights to land for non-owner cultivators, roughly corresponds to modern Great Britain and the Netherlands. This is not just coincidental, of course: national or imperial level legal systems and state policy had some significant role in these outcomes. But nor does it show that political units are necessarily the right ones after all; in many ways, I would argue, the facts that were decisive for the "Chinese" case characterized only a few regions, with nation-wide patterns emerging through the interaction of those regions.

Five facts that were in place by roughly 1500 – when there was a significant increase in commercial activity, coinciding with the disappearance of most of the remaining bound labor in agriculture – combined to decisively shape Chinese economic development over the next few centuries:

(1) First, peasant property was relatively widely distributed, at least compared to most other commercialized agrarian societies; and while many of the more commercialized parts of the country had higher tenancy rates, they also had systems in which many tenants managed to gain relatively secure cultivation rights (which themselves eventually became a form of heritable and tradable property). One consequence of this was a very sharp difference in both social and economic status between tenants and agricultural wage laborers (though both might seem "propertyless" in Western eyes). The limited data we have suggests that even a rural laborer who found year-round work (which many did not) earned only 35-40% as much as a tenant with an average size plot in the Yangzi Delta of the 1750s; almost 200 years later, when we begin to have far more systematic survey data, the same ratio appears to hold. (The same is true for coastal Fujian, which also had high tenancy rates.)[13] This difference is

---

per acre yields was less important, and that cultivators, still having relatively nearby frontiers to move to, had less incentive to try to attach themselves permanently to a particular plot. Second, the Ganges/Brahmaputra is a much more difficult river to control than the Yangzi; the Delta of the latter has barely changed in the last 800 years while that of the former has expanded and shifted by hundreds of miles. Consequently, there was less incentive for elites to try to invest in a particular piece of land, secure it from floods, and try to secure the best possible cultivator for it by offering secure rights to that piece of land; instead the best deals tended to be offered on a short-term basis to attract cultivators to new pieces of land that had just become cultivable due to shifts in the annual flood. Under the circumstances, both cultivation rights and rights to extract surplus were often attached, not to a specific plot, but to a certain amount of land within the area inhabited by a particular group.

[13] Calculations in Kenneth Pomeranz [31].

also significant in that it reconciles estimates of relatively equal living standards for ordinary people in the Yangzi Delta and England ca. 1750 [29] with evidence that a large gap in real wages had emerged by this time [30].

(2) Second since urban unskilled wages did not exceed rural ones by very much – why should they, without strong guilds? – they also lagged far behind the earnings of secure tenants. This meant that even most tenants had little reason to try their luck in the city. (By the 1930s, mechanized industry had created some unskilled urban jobs that paid better than being a tenant, but even then not by a wide margin; and by the time the urban/rural gap began to grow rapidly in the 1950s, it was becoming hard to move to take advantage of it.) Instead it made more sense for most families to stay in the countryside; agricultural surpluses fed spinners, weavers, and other handicraft workers, just as they did elsewhere, but they were mostly embedded in families that also participated in agriculture. In the most productive and densely populated areas, the export of handicraft manufactures in return for primary products from elsewhere in China became crucial to the economy. The urbanization rate remained unusually low for a country with China's level of per capita income and productivity in agriculture (which determines the number of non-farmers who can be fed). Even the Yangzi Delta, which probably had a per capita income within 10% of England's circa 1750, and agricultural labor productivity within 10% of English levels as late as 1820 (along with much higher land productivity) was significantly less urban than England in 1750, and further still behind the Netherlands.[14]

(3) Third, even for those rural poor who did choose to migrate, heading for the cities made less sense than migrating towards the frontier, where average incomes were lower, but the chances of getting secure access to land – and thus obtaining something close to that average income – were reasonably high. This helps make sense of an otherwise puzzling fact: that for centuries, net migration in China was away from the regions with the highest per capita incomes. That in turn meant that migration did not contribute to reducing the economic inequalities among regions; if anything it tended to reinforce them. (For instance, Debin Ma and I have both estimated – using different methods – that per capita income in the Lower Yangzi was about 50% higher than the

[14] DeVries [32], gives figures of 16.7% urban for England and 30.5% for the Netherlands, counting only towns of 10,000 or more. For the lower Yangzi see Skinner [33]; Skinner [34] suggests an upward revision to about 9.3% based in both cases on a looser standard including all towns of 2,000 or more. Figures for the Delta alone, instead of the whole Lower Yangzi region would be significantly higher. Xue [21]and Li [36, p. 21; 53, p. 413] provide estimates of 20% or more for the early 19th century, but their definitions of "urban" places, like Skinner's, would include far more small towns than DeVries'. For the comparison of GDP per capita see Van Zanden [37, pp. 22-23], and the discussion in Pomeranz [21]. For agricultural productivity, see Allen [29].

empire-wide average in the mid-18th century, and the gap had widened by the early twentieth century.[15])

(4) China had an enduring shortage of marriageable women, due both to sex-selective infanticide and to a small group of elite men who had both wives and concubines. The imbalance has not been well-measured, and no doubt fluctuated over time, but a good guess is that in most late imperial generations, 10-15% of men could not marry or reproduce.[16] These were generally the poorest men, who were mostly those without secure cultivation rights; indeed the terms "bare sticks" and "rootless rascals," referring to men who lacked family and village ties, were sometimes used as if they were synonymous with "landless laborer" (see e.g., Zhang Peiguo [42]). Since most wage laborers did not form families – one reason they could survive on 30-40% of the not-so-princely earnings of a tenant farmer – the size of the proletariat did not grow, even though some people in each generation fell into this class, as one would expect in a competitive economy. It thus makes sense that 1930s surveys estimate that about 15% of farm work was done in exchange for wages – about the same as we think this percentage had been 200 years earlier.[17]

(5) State concerns about stability focused primarily on heading off rural uprisings; it was relatively rare for collective violence to begin in urban centers, at least after 1620 [46]. Efforts were particularly focused on relatively poor and ecologically vulnerable areas, particularly in the North and West, but were mostly paid for by taxes collected in the East and South, and above all in the Yangzi Delta. (The North and West were not only more vulnerable to environmental disaster, but closer to the steppe which was the traditional source of nomadic invasions. This was an additional reason why stabilizing them had priority.) Thus, for instance, the Yellow River in the North was controlled by the central government in the Qing, at great expense, while Yangzi River communities were expected to pay for their own flood control; subsidies for well-digging were at times available in the semi-arid North and Northwest; people resettling in certain specified frontier areas were subsidized, and so on. The result was a system of inter-locking regions that remained relatively stable for a few hundred years. The relatively prosperous areas were able to commercialize further (which inevitably produces both winners and losers) without accumulating a dispossessed class, in large part because of out-migration, birth control, and uneven sex ratios; they also enjoyed considerable de facto autonomy in local affairs as long as they did not

---

[15] Debin Ma [38], p. 6. See also Pomeranz [31].

[16] On sex-selective infanticide, see Lee and Wang [39], Lee and Campbell [40]; for an estimate of the rate of concubinage, see Liu [41], 129-30.

[17] Buck [43], 293. For the 18th century see Jing Su and Luo Lun [44] on the North and Li Wenzhi and JiangTaixin [45], 303, 310, on North China and the Lower Yangzi respectively.

rebel and paid their taxes. Meanwhile part of the relatively large surplus those regions continued to generate was taxed away to help stabilize areas that had (among other problems) less reliable water supplies and shorter growing seasons.

But in the nineteenth century, this system fell into crisis, for several reasons. On the one hand, large-scale migration and natural increase in interior regions fueled population growth, which greatly reduced the surpluses of primary products that these areas could sell to coastal regions; the expansion of local markets also led to the development of rural handicraft industries in the interior (often encouraged by local officials in conscious imitation of Lower Yangzi patterns), which reduced demand for imported manufactures. This worsened the terms of trade for "advanced" regions significantly: an average grade piece of cloth from the Yangzi Delta bought about half as much rice in 1840 as it had in 1750 (Pomeranz [47, pp. 323–326]). Meanwhile the Delta was relatively poorly positioned to move into other kinds of industrial production. On the one hand, the highly dispersed, rural-based nature of much of its industry meant it did not have the strong agglomeration effects that probably helped encourage technical innovation in some other areas.[18] Enterprises set in the countryside – where food, and thus labor, tend to be relatively cheap, and capital relatively expensive – are also that much less likely to favor capital-using, labor-saving, innovations [52]. The Delta was also particularly poorly positioned for the vital transition to much more energy-intensive kinds of production. It had never had much heavy industry, largely because it lacked metallic ores and above all, energy sources. Wood, coal peat, and even water power (due to flat terrain) were all scarce [47, pp. 63–64, 225–226; 53, pp. 272–342]; there were also significant obstacles to importing large amounts of energy [47, pp. 62–65]. Under the circumstances, the relative price of energy was exceptionally high along the China coast, making it unlikely that people would focus on finding ways to be more productive by using more of it. (One study finds that in 1704 real wages in Canton were almost at London levels, but charcoal was nonetheless almost 20 times as expensive relative to labor as it was in London.[19]) Moreover, the

[18] On population concentration and innovation see West [48] Northwest European handicrafts were more likely to be clustered in specialized districts and staffed by full-time workers fully detached from agriculture; these conditions encouraged information exchange, as did the journeyman system. See for instance Saito Osamu [49]; Markus Cerman and Sheilagh Ogilvie [50]; S.R. Epstein and Maarten Prak [51].

[19] Data from Allen [56], pp.6, 17. The unusually high real wage could be the result of the East India Company (the source of the data) paying above-average prices for the people who serviced their ships while in port; but since there are also some reasons to think that these records understate the in-kind component of wages, we should reserve

relative tractability of European rivers and their reliability throughout the year had encouraged the use of water power-driven equipment, and the development of industries and production techniques that could later be further developed with steam power. By contrast, China's major rivers complete most of their drop to the sea even before they enter China proper (90% in the case of the Yangzi) and then move quite slowly across the plains during most of the year; they also have a far greater variability in flow over the course of the year than European rivers, because they rely on the Himalayan snow melt and (in the south) monsoon rains [54, 55, p. 15]. Under the circumstances, water-driven equipment, though known, was not broadly applicable, and other, more labor-intensive industries and techniques predominated. For these and other reasons, rich areas could not create the sorts of large and sustained productivity increases they would have needed to offset the pressures resulting from changing relations with the interior.

Meanwhile, this same population growth in interior regions created other important pressures. In particular, it exacerbated the ecological problems that had to be managed to stabilize many of these areas. Greatly increased highland settlement, accelerated by the diffusion of American crops that grew well at high altitudes, greatly increased deforestation and raised river beds; water tables decline in semi-arid regions; and people moved closer to the edges of lakes and rivers, increasing the severity of disasters when they did occur. This raised the price of ecological stabilization efforts just as the Delta and other rich regions were finding it harder to pay for them; Yellow River control alone consumed between 10 and 20% of all Qing expenditures for 1820–1850 [57, 58]. In a number of cases, increased highland settlement also led to clashes with indigenous populations or problems of social control that resulted in rebellions that were very expensive to suppress. Combined with certain other stresses of the time (particularly the rise of the opium trade and the arrival of Western gunboats) the system reached a crisis point. The height of Chinese emigrants (the only portion of the population for which we have height samples) started to fall with those born about 1840 [59]; and a series of enormous rebellions broke out beginning in 1851 (all of which, significantly, began in "hinterland" areas).

When those rebellions were finally suppressed, a new political economy, with different fault lines, had taken the place of the old. The Yangzi Delta and other coastal areas no longer subsidized ecological stabilization elsewhere to anything like the previous extent [57]; they also forged stronger ties with hinterlands overseas (especially in Southeast Asia) which served as new outlets for emigration and light manufactures, and new sources of primary products; they also imported new technologies. By the 1890s at the latest, they had

---

judgment. At any rate, this would not much affect the point being made here about the extremely high relative cost of fuel.

recovered from the mid-century crises and – though the data is not what we'd like it to be – at least the Lower Yangzi experienced sustained per capita growth thereafter until World War II [60, 38, 61]. By contrast, interior regions found no new trading partners, continued to grow in population, and lost the subsidies from advanced regions they had once received; with a few exceptions, they suffered from a worsening spiral of environmental, economic, and social decline that lasted until the 1949 revolution. Most indicators of average welfare stagnated or fell in these areas, and the number of disaster victims soared: Xia Mingfang estimates that 12 times as many Chinese starved from 1865-1937 as from 1644-1850, with almost all the deaths in the North and Northwest [62, pp. 78-79, 400-402].

Methodological Implications?

Assuming for argument's sake that this sketch is largely accurate empirically, how can we characterize it as an attempt at explanation in a scientific style? Clearly it is not a "natural experiment" of the sort Jared Diamond tries to create in Guns, Germs, and Steel [63]; not only is the case not fully independent of others around the world, but there is more than one thing that is different between them. This kind of exercise gives us no way of knowing what would happen if we imagined some coal easily accessible to the Lower Yangzi, but no changes in the property rights or family system. We might instead usefully see it as a story of how a cluster of "frozen accidents"[20] impart to a particular region "laws of motion" that hold for some limited range of time and space shaped by those "accidents." Deriving generalizations of this sort, which held for reasonably large areas of time and space, might allow us to explain diverse outcomes within one particular set of paths, and contrast them with a set of others shaped by different "accidents." That in itself would be a major achievement, though it would be something quite different from finding universal laws of history predictive of individual cases. (Perhaps one could make a loose analogy here to a quantum mechanical world of probabilities rather than one of certainties.[21]) But the parallel to natural science suggested by this terminology is inexact, and suggests various further problems.

The term "frozen accident" might raise problems for some historians, since it could suggest a deviation from "normal" development, often associated with Northwestern Europe. It would, however, be equally true (or untrue) to treat this path as "normal" and English development as the result of a cluster of different "frozen accidents": unusually weak tenant rights (even compared to the rest of Western Europe), a religion that forbade polygamy, easily managed

[20] For "frozen accidents," see Gell-Mann [64].

[21] For a physicist advocating quantum mechanics as opposed to Newtonianism as a model for social science, see Stephen G. Brush [65].

rivers (descending from relatively low mountains and fed by year-round precipitation), lots of coal in convenient places, two relatively nearby continents where many of the natives had no resistance to many European diseases, and so on. This point may at first seem unnecessary to natural scientists, or merely a response to an excessively "politically correct" ideological sensitivity. After all, with frozen accidents such as the preponderance of left-handed rather than right-handed amino acids on Earth, it seems fairly clear that either outcome would be equally "accidental" (pending some discovery that shows basic laws should lead us to expect one or the other). But in historical models it is harder – and more important – to maintain that neutrality about the possible values of these accidental variable.

In part this is because of a second problem with the analogy. While some background factors seem equivalent to frozen accidents from the viewpoint and timescale of human history – the location of coal deposits or the seasonality of rainfall in different areas, for instance – in other cases the analogy is much looser. That polygamy was legal in China and not in Europe, for instance, had been the case for many centuries at the time that the developments we want to explain begin, and was an externally given "accident" from the point of view of the economic dynamics we were interested in. But it was clearly not "frozen" in the same sense as the handedness of our amino acids, having been changed in the twentieth century. The differences in land rights, having been contested at various moments in both places, are even less truly "frozen"; treating them as exogenously given conditions is clearly artificial, though perhaps essential at an early stage of analysis. And since most (though not all) of the convergence in institutions that has taken place in recent centuries has consisted of Chinese institutions moving towards those of a more "successful" Europe, rather than vice versa, it is understandable that some would see the Chinese pattern as a deviation from a European pattern. Indeed the latter was generally treated as "normal" within classical social theory in at least two senses: first, in the sense that its persistence, having produced results that turned out be preferred at the end of some very long run, would need no explanation, and second, in the sense that it would therefore represent the pattern toward which others should be trying to converge.

But if we cannot treat some of these factors as "frozen," at least for purposes of a particular exercise, it is hard to see how we would escape from simply saying that everything is influenced by everything else. We might also find ourselves changing which outcome we considered "normal" with embarrassing frequency as our judgments of how "successful" different societies had been changed with contemporary events.[22] There seem, then, to

[22] This has happened several times just in the last few decades, as for instance, the "Confucian heritage" of Japan, Taiwan and Korea went from being considered a serious barrier to individualism, capitalism and development to being a major contributor to

be real advantages to treating certain accidents as if they were truly frozen (while relaxing that assumption in some other study), even though they aren't, and in pursuing what some of us have elsewhere called a strategy of "balanced comparison": treating two different conditions as each equally odd from the perspective of the other (like different-handed molecules), even if one seems to us to have clearly turned out to be the more successful configuration [47, 66., 67]. To reiterate, what we might hope to get from this is not predictive certainty, but the recognition of different families of development paths, which might help us grasp variability within and between groups.

Concluding thoughts and caveats

As the multiple factors employed to frame my example suggest, it seems to me that one thing we would expect from a more scientific history is that it show us patterns that link phenomena in more than one realm of human activity – economic, social, environmental, political, cultural, etc. – at least across a certain range of settings. (The relationship between the size of a polity and its war-making capacity, for instance, is likely to look very different once we enter an era in which the variation in technological ability among societies in contact with each other expands, and once some societies develop institutions that allow their states to spend future revenues now.) After all, without the conviction that changes in many different aspects of life belong in the same story, history – like anthropology or sociology, though *perhaps* unlike economics or psychology – has little justification as a discipline. While claims of simple and deterministic links across these registers are currently very much out of favor, for mostly good reasons, it is hard to imagine how anyone could defend the proposition that there are no such connections. Even people who choose not to practice "economic and social history" still frequently use that phrase to link them together, while referring to "economic and musical history" would strike most people as odd. The intuitions expressed in those ways of speaking could turn out to be wrong, but they give some guidance as to where we should be looking.

It seems likely that most such relationships that we find will not be invariant. Sometimes the reasons for this will be very straightforward and uninteresting for theory-building, though they might be historically important nonetheless. For instance, there has been an association found in many case studies between the growth of wage labor opportunities and a lower average

---

successful "teamwork" and economic success, followed by at least a partial return to the older view in the aftermath of the bursting of the Japanese bubble economy in 1992, and the so-called "Asian financial crisis" of 1997-1998. It would not be surprising if this wheel turns yet again, especially if China continues to weather the Euro-American economic meltdown of 2008 better than most Western economies.

age at first marriage; this makes sense, since being able to earn money without owning any tools or land of one's own it makes it easier for adolescents to defy their parents' wishes and still have a way to eat [68-70]. But it is hardly surprising that this relationship did not obtain where the age at first marriage was already close to the age of puberty before lots of wage work was available.[23] The thornier problems emerge not when there is a simple intervening fact that blocks a relationship from working, as in the case above, but where there are a number of complicated feedback loops. That such relationships might be very complicated, however, doesn't mean we shouldn't try to unravel them, any more than it does in the case of biological evolution. So why is progress so slow?

One difficulty is that the "non-scientific" functions that historical narratives serve, to which I alluded at the beginning of this paper, may encourage us to focus on exceptional cases. Precisely because the reasons why the United States went to war with Mexico in 1846 seem easy to generalize across many cases – U.S. leaders chose a course that offered large potential gains, and relatively little risk of failure – there is not a massive demand, either within or outside the profession, for new research on this question. (At least as narrowly defined: research on American expansionism more generally is another matter.) The Japanese decision to go to war with the U.S. in 1941 attracts much more attention, because it is more interesting and challenging to try to figure out what factors blocked the operation of what would seem like a very powerful rule of behavior: "You are unlikely to go to war if you know that the chance of losing is high and the consequences of defeat very serious." A very strong interest in cases that seem exceptional, often to the point of asking about whether the participants were somehow abnormal, is not surprising. They may indeed make for better drama, and better examples from which to contemplate moral issues. It is particularly logical that scholars of high politics – where a single decision that seems as if it should have been improbable can have enormous ramifications for millions of people – often focus on just those events, and that people looking for immediate guidance on contemporary issues often feel the same way. But the same intellectual habit may be much less helpful when it leads us to abandon hypotheses in, say, historical demography, as soon as a few villages don't conform, or when it leads us to frame our research largely in terms of emic categories and the questions they

[23] In one such place, the Pearl River Delta in South China, greater availability of wage work actually raised the average age at first marriage, because it gave young women the wherewithal to resist arranged marriages that they were reluctant to enter. One could thus argue that a more generally stated relationship – "the availability of wage work increases the opportunities for young people to make their own marriage decisions" is further confirmed by this example, though the original statement of the relationship turns out to have been too narrowly stated [71].

suggest. In other words, we may need to think about decomposing the discipline along with some of its objects; we definitely need to think about relabeling many of those objects.

At the same time, it is precisely by combining categories, timescales, and so on which enable us to see patterns that were invisible to historical actors with an attempt to recapture some of the categories that they did see (and therefore tried to act on) that the historical analysis becomes most interesting, and makes its strongest claim for a unique kind of significance. Thus any "decomposition" of the kind I have been recommending can only be partial and provisional. One final contrast may clarify why.

In his presidential address to the American Economics Association, Milton Friedman once suggested that good social science *must* be counter-intuitive, because it aims to greatly simplify an enormously complex reality, constrained only by the need to be predictively accurate. (Not that that is easy.) At one point, he suggests that though expert billiards players do not operate by thoroughly learning Newtonian mechanics and then applying the relevant formulas, they behave *as if* they did; thus assuming that they do so generates good predictions; and thus assuming that they do so can be the basis of a good theory. By contrast, any attempt to discover what they actually do would be extremely difficult; and even if the inquiry was ultimately successful, a model based on the actual process would probably be too complicated to be useful in generating predictions [72].

Almost all historians (myself included) find this quite unsatisfactory as a model for our own discipline; and there are empirically-derived descriptions of human activities that seem to uncover the actual heuristics which actors apply, without realizing it themselves, to solve relatively complicated problems. To take an example close to Friedman's – though probably more complex – psychologists have recently produced a convincing account of how experienced baseball players get to the right place to catch fly balls. Not surprisingly this does not involve rapid physics calculations, but a fairly simple heuristic: once the ball reaches something close to its peak height, players move so as to maintain a fixed angle from the horizontal between themselves and the ball. They are not aware of doing this, but it explains both the final result and various steps along the way as seen on film (e.g. sudden accelerations, decelerations, and changes in direction), matches experimental results (e.g. the players were not better than ordinary people at predicting the final destination of simulated batted balls), and is straightforward enough that one can imagine people following it without being aware they are doing so [73]. This is still far short of a full account of relevant processes – it does not, for instance, tell us how some people come to be following this heuristic without consciously learning it, while others do not – and the process it models is presumably far simpler than political revolutions or economic growth. But it does suggest at least the possibility of providing an accurate account of *mechanisms*

underlying repeated instances of a complex, voluntary human action without relying on the actors' accounts.

Of course, even when we insist on tracing processes, rather than relying heavily on "as if" models, we also do not produce a one to one map of "how things actually happened." The question, then, is what degree of simplification we want, and why. The answers will vary, but one principle that would probably find broad assent is that the mechanisms invoked to explain how circumstances led to an event, and thus to new circumstances, must involve a plausible path by which they would consciously or unconsciously influence human intentions. Thus it makes sense to argue that rivers with wild seasonal fluctuations and heavy silt loads would inhibit the implementation of known technologies for water mills, even if we cannot find a single document in which somebody says "I'd build a water-powered mill here if only the current were more regular"; and it is a permissible simplification to "explain" a low rate of urbanization at least partly on the basis of wage rates having been lower than tenant earnings, even if most farmers probably did not explicitly frame the problem in those terms.

On the other hand, the observation that medieval English villagers may have had roughly the same scattering of plots that they would have had if they been consciously maximizing the number of standard deviations by which their average yield was above starvation – a calculation nobody at the time could have done [74] – is an interesting observation, but does not dispense with the need to look at custom, inheritance law, and social conflict to *explain* that fact. Since no individual could have made this calculation and individuals often had very little choice about what plots they worked, anyway, any forces that were somehow guiding the situation towards such an optimal result must have operated through shaping these social institutions. When we are dealing with humans, we will rarely be able to come up with plausible mechanisms without gaining some understanding of the categories through which people saw their world and thus formed intentions – even if the mechanism we then describe involves categories that remained implicit for most people. (The mechanism may also, of course, rest just as much on unintended consequences of their actions as on those they were aiming for, as long as we can show why, given what we know and the actors did not, the unintended consequences follow logically from their actions.) And at least to some extent understanding the emic categories of others usually involves some juxtaposition with our own, as when we uncover implicit categories by pointing both to distinctions other people made that we may not use and to some that we make (or at least formulate) and they did not. Thus, as Geoff Eley has suggested in a recent book, it is necessary to take seriously the analysis of historical subjects' mental maps in which "the new cultural history" has specialized, often with the goal of raising questions about our own conceptual categories; but rather than stopping there, historians needs to also deploy both emic and etic categories to

able to address the big questions that would make up a general "history of society" [75].

In sum, an analysis that became completely divorced from our own society's everyday labels for social phenomena (if that were even possible) would probably cease to be recognizable as history, and would certainly lose much of its ability to speak to urgent human questions; but a history that stands at least a bit further from those everyday categories, as it probably must in order to see important regularities, seems to me both possible and desirable.

Acknowledgment
My thanks to Jeffrey Wasserstrom and Vinayak Chaturvedi for their comments on a draft of this essay and to all the participants in the Santa Fe Institute conference of March, 2008 for which the original version was prepared.

References

[1] Hunt, Lynn, "Introduction: History, Culture and Text," in Lynn Hunt, ed., *The New Cultural History* . Berkeley: University of California Press 1989.
[2] W.G. Beasley and E.G. Pulleyblank, eds, *Historians of China and Japan*. London: Oxford University Press, 1961.
[3] Bray, Francesca. *The Rice Economies*. Oxford, New York: Blackwell, 1986
[4] Sugihara, Kaoru. "The East Asian Path of Economic Development: A Long-term Perspective," in Giovanni Arrighi, Takeshi Hamashita, and Mark Selden, eds., *The Resurgence of East Asia: 500, 150 and 50 Year Perspectives* (London: Routledge, 2003), pp.78-123.
[5] Pomeranz, Kenneth. "Chinese Development in Long-run Perspective," *Proceedings of the American Philosophical Society* 152:1 (March, 2008), pp. 83-100.
[6] Scott, James C. *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia*. New Haven: Yale University Press, 2009.
[7] Duara, Prasenjit. *Rescuing History From the Nation: Questioning Narratives of Modern China*. Chicago: University of Chicago Press, 1995.
[8] Tanaka, Stefan. *Japan's Orient: Rendering Pasts into History*. Berkeley: University of California Press, 1993.
[9] Brinton, Crane. *The Anatomy of Revolution*. New York: Vintage, 1952.
[10] Moore, Barrington. *Social Origins of Dictatorship and Democracy: Lord and Peasant in the Making of the Modern World*. Boston: Beacon Press, 1967.

[11] Skocpol, Theda. *States and Social Revolutions: A Comparative Analysis of France, Russia, and China*. Cambridge: Cambridge University Press, 1979.
[12] Goldstone, Jack. *Revolution and Rebellion in the Early Modern World*. Berkeley: University of California Press, 1991.
[13] Sahlins, Marshall. *Culture and Practical Reason*. Chicago: University of Chicago Press, 1976.
[14] Tilly, Charles. . "Town and Country in Revolution." Working Paper #84, Center for Research on Social Organization, 1973.
[15] Guha, Ranajit. *Elementary Aspects of Peasant Insurgency in India*. Durhan, NC: Duke University Press, 1999.
[16] Marx, Karl. *The Eighteenth Brumaire of Louis Napoleon*. New York: International Publishers, 1963. (Original edition, 1852).
[17] Merriman, John. *The Agony of the Republic: The Repression of the Left in Revolutionary France, 1848 – 1851*. New Haven: Yale University Press, 1978.
[18] Agulhon, Maurice. *La République au village: Les populations du Var de la Révolution au IIe République*. 2nd Edition. Paris: Seuil, 1979.
[19] Margadant, Ted. *French Peasants in Revolt: The Insurrection of 1851*. Princeton, NJ: Princeton University Press, 1979.
[20] Tilly, Charles. "To Explain Political Processes," *American Journal of Sociology* 100:6 (May, 1995), pp. 1594-1610.
[21] Pomeranz, Kenneth. "Chinese Development in Long-run Perspective," *Proceedings of the American Philosophical Society* 152:1 (March, 2008), pp. 83-100.
[22] Rostow, W.W. *The Stages of Growth: A Non-Communist Manifesto*. Cambridge, MA: Cambridge University Press, 1960.
[23] Jones, Eric., "Patterns of Growth in History," *Capitalism in Context: Essays on Economic Development and Cultural Change in Honor of R. M. Hartwell,* ed. John A. James and Mark Thomas (Chicago: University of Chicago Press 1994), 15 attributing this view to R. M. Hartwell.
[24] Crafts, N.F.R. *British Economic Growth During the Industrial Revolution*. Oxford: Clarendon, 1985.
[25] Goldstone, Jack. "Efflorescences and Economic Growth in World History: Rethinking the 'Rise of the West' and the Industrial Revolution," *Journal of World History* 13:2 (2002), pp. 323-389. 2002
[26] Pomeranz, Kenneth. "Le machinisme induit-il une discontinuité historique ? Industrialisation, modernité précoce et formes du changement économique dans l'histoire globale," in Beaujard P., Berger L. and Norel P. (eds), Histoire globale, mondialisations, capitalisme (Paris: La découverte, 2009), 335 -373.
[27] North, Douglass, and Barry Weingast, "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth

Century England," *Journal of Economic History* 49:4 (December, 1989), pp. 803-832.

[28] Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2002. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution," *Quarterly Journal of Economics* 117:4 (November): 1231-1294.

[29] Allen, Robert. "Agricultural Productivity and Rural Incomes in England and the Yangtze Delta, ca. 1620-1820," *Economic History Review* 62:3 (August, 2009), pp. 525-550.

[30] Robert Allen, Jean-Pascal Bassino, Debin Ma, Christine Moll-Murata, and Jan LuitenVan Zanden, "Wages, Prices and Living Standards in China, Japan, and Europe, 1738-1925." http://www.nuff.ox.ac.uk/Users/Allen/unpublished/allen%20et%20all%202007i(7-dp).pdf.

[31] Pomeranz, Kenneth. "Standards of Living in Rural and Urban China: Preliminary Estimates for the Mid 18th and Early twentieth Centuries." Paper for Panel 77 of International Economic History Association Conference, Helsinki, 2006.

[32] DeVries, Jan *European Urbanization, 1500 – 1800* (London: Metheun 1984), 39.

[33] Skinner, G.William., "Regional Urbanization in Nineteeenth Century China," in G. William Skinner, ed., *The City in Late Imperial China* (Stanford University Press, 1977), 229 .

[34] Skinner, G.William., "Sichuan's Population in the 19th Century: Lessons From Disaggregated Data," *Late Imperial China* 8:1 (June, 1987) pp. 1-79.

[35] Xue Yong, "Agrarian Urbanization: Social and Economic Changes in Jiangnan from the Eight to the Nineteenth Century" (Yale University Ph. D. dissertation, 2006), pp. 432-470.

[36] Li Bozhong. *Agricultural Development in Jiangnan, 1620-1850*. New York: St. Martin's Press, 1998.

[37] Van Zanden, Jan Luiten, "Estimating Early Modern Economic Growth" (Working Paper, International Institute of Social History, University of Utrecht, 2004. Available at http://www.iisg.nl/research/jvz-estimating.pdf, accessed December 17, 2007), pp. 22-23.

[38] Ma, Debin. "Modern Economic Growth in the Lower Yangzi in 1911-1937: A Quantitative, Historical, and Institutional Analysis." Discussion paper 2004-06-002, p. 6. Foundation for Advanced Studies on International Development, Tokyo, 2004.

[39] Lee, James. and Wang Feng, *One Quarter of Humanity: Malthusian Mythologies and Chinese Realities*. Cambridge, MA: Harvard University Press, 1999.

[40] Lee, James, and Cameron. Campbell, *Fate and Fortune in Rural China: Social Organization and Population Behavior in Liaoning, 1774-1873*. Cambridge: Cambridge University Press, 1997.

[41] Liu Ts'ui-jung, "Demographic Constraint and Family Stucture in Traditional Chinese Lineages," in Stevan Harrell, ed.,*Chinese Historical Microdemography* (Berkeley: University of California Press, 1995), pp. 121-140.

[42] Zhang Peiguo, *Jindai Jiangnan xiangcun diquan de lishi renleixue yanjiu*. (Historical Anthropology of Land Rights in Modern Jiangnan Villages.) Shanghai: shanghai renmin chubanshe, 2002.

[43] Buck, John.L. *Land Utilization in China*. Shanghai: Commercial Press,1937; reprint edition, New York,: Paragon, 1964.

[44] Jing Su and Luo Lun, *Qing dai Shandong jingying dizhu jingnji yanjiu* (revised edition of 1958 text). (Economic Research on Managerial Landlords in Qing Dynasty Shandong.) Jinan: Qilu shushe, 1986.

[45] Li Wenzhi and Jiang Taixin,. *Zhongguo dizhu zhidu jingji lun*. (An Economic Discourse on China's Landlord System.) Beijing: Shehui kexue chubanshe, 2005

[46] Yang, C.K. "Some Preliminary Statistical Patterns of Mass Actions in Nineteenth-Century China." In *Conflict and Control in Late Imperial China,* eds. Frederic Wakeman and Carolyn Grant, pp. 186-187. Berkeley, CA: University of California Press, 1975.

[47] Pomeranz, Kenneth. *The Great Divergence: China, Europe, and the Making of the Modern World Economy*. Princeton, NJ: Princeton University Press, 2000.

[48] West, Geoffrey. *Can there be a Quantitative Theory for the History of Life and Society*? Cliodynamics Vol. 2, Iss. 1. 2011

[49] Osamu, Saito. *Puroto-Kōgyōka no jidai: Seiō to Nihon no hikakushi*. (The Age of Proto-Industrialization: A Comparative History of Western Europe and Japan.) Tokyo: Nihon Hyōronsha, 1985.

[50] Cerman, Markus, and Sheilagh Ogilvie, eds. *Euroepan Proto-Industrialization*. Cambridge; Cambridge University Press, 1996.

[51] Epstein, S.R., and Maarten Prak, eds., *Guilds, Innovation, and the European Economy, 1400-1800*. Cambridge, MA: Cambridge University Press, 2008.

[52] Rosenthal, Jean Laurent, and R. Bin Wong. *Before and Beyond Divergence*. Cambridge: Harvard University Press, forthcoming, 2011.

[53] Li Bozhong, *Jiangnan de zaoqi gongyehua*. (The Early Industrialization of The Yangzi Delta Region.) Beijing: shehui kexue wenxian chubanshe, 2000.

[54] Terje Tvedt, "Why England and not China and India? Water Systems and the History of the Industrial Revolution," *Journal of Global History* 5:1 (March, 2010), pp. 29-50.
[55] Van Slyke, Lyman. *Yangtze: Nature, History, and the River* (Reading, MA: Addison-Wesley, 1988), p. 15
[56] Allen, Robert C. "Mr. Lockyer Meets the Index Number Problem: The Standard of Living in Canton and London in 1704,. Available at http://www. iisg.nl/hpw/papers/allen.pdf, accessed December 7, 2008.
[57] Pomeranz, Kenneth. *The Making of a Hinterland: State, Society, and Economy, in Inland North China, 1853 – 1937.* Berkeley: University of California Press 1993.
[58] Dodgen, Randall. *Controlling the Dragon: Confucian Engineers and the Yellow River in Late Imperial China.* Honolulu: University of Hawaii Press, 2001.
[59] Morgan, Stephen, "Economic Growth and the Biological Standard of Living in China 1880-1930," *Economic and Human Biology* 2:2 (2004), pp. 197-218.
[60] Rawski, Thomas G. *Economic Growth in Prewar China.* Berkeley: University of California Press, 1989.
[61] Ma Junya. 2002. *Hunhe yu fazhan: Jiangnan diqu chuantong shehui jingji de xiandai yanbian (1900-1950).* (Mixture and Development: The Modern Evolution of Traditional Society and Economy in the Jiangnan District, 1900-1950.) Beijing: Shehui kexue wenxian chubanshe,
[62] Xia Mingfang, Minguo shiqi ziran hai yu xiangcun shehui. (Natural Disasters and Village Society in the Republican Era) Beijing: Zhonghua shuju, 2000.
[63] Diamond, Jared. *Guns, Germs and Steel: The Fates of Human Societies.* New York: W.W. Norton, 1997
[64] Gell-Mann, Murray. *Regularities in Human Affairs.* Cliodynamics Vol. 2, Iss. 1. 2011
[65] Brush, Stephen G. "Are the Soft Sciences Too Hard?" *Contentions* 4(2) (1995): 3-12.
[66] Wong, R.B. *China Transformed: Historical Change and the Limits of European Experience.* Ithaca: Cornell University Press, 1997
[67] Austin, Gareth. 2007. "Reciprocal Comparison and African History: Tackling Conceptual Eurocentrism in the Study of Africa's Economic Past,' *African Studies Review* 50:3 (December), 1-28.
[68] Levine, David. *Family Formation in an Age of Nascent Capitalism.* New York: Academic Press, 1977.
[69] Kriedte, Peter, Medick, Hans., and Schlumbohm,Jürgen. *Industrialization Before Industrialization.* Cambridge: Cambridge University Press, 1981.

[70] Mendels, Frankin F. "Proto-industrialization: the First Phase of Industrialization," 32:1 (1972), pp. 241-261
[71] Stockard, Janice. *Daughters of the Canton Delta: Marriage Patterns and Economic Strategies in South China, 1860-1930*. Stanford: Stanford University Press, 1989.
[72] Friedman, Milton, "The Methodology of Positive Economics" in Friedman, *Essays in Positive Economics*. Chicago: University of Chicago Press, 1953.
[73] Berg, Nathan and Gerd Gigerenzer, "As-If Behavioral Economics: Neoclassical Economics in Disguise?" *History of Economic Ideas* 18 (2010), 133-165.
[74] McCloskey, Donald. "English Open Fields as Behavior Towards Risk," in P. Uselding, ed., *Research in Economic History* Vol. 1 (Greenwich, CT: JAI Press, 1976), pp. 124-170.
[75] Eley, Geoff. *The Crooked Line*: *From Cultural History to the History of Society*. Ann Arbor, MI: University of Michigan Press, 2005.