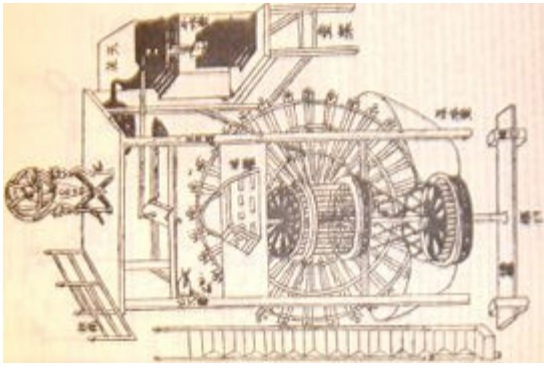


**Thursday April 10<sup>th</sup>**

**Why not China?**

# Why Britain and then Europe, but not China?

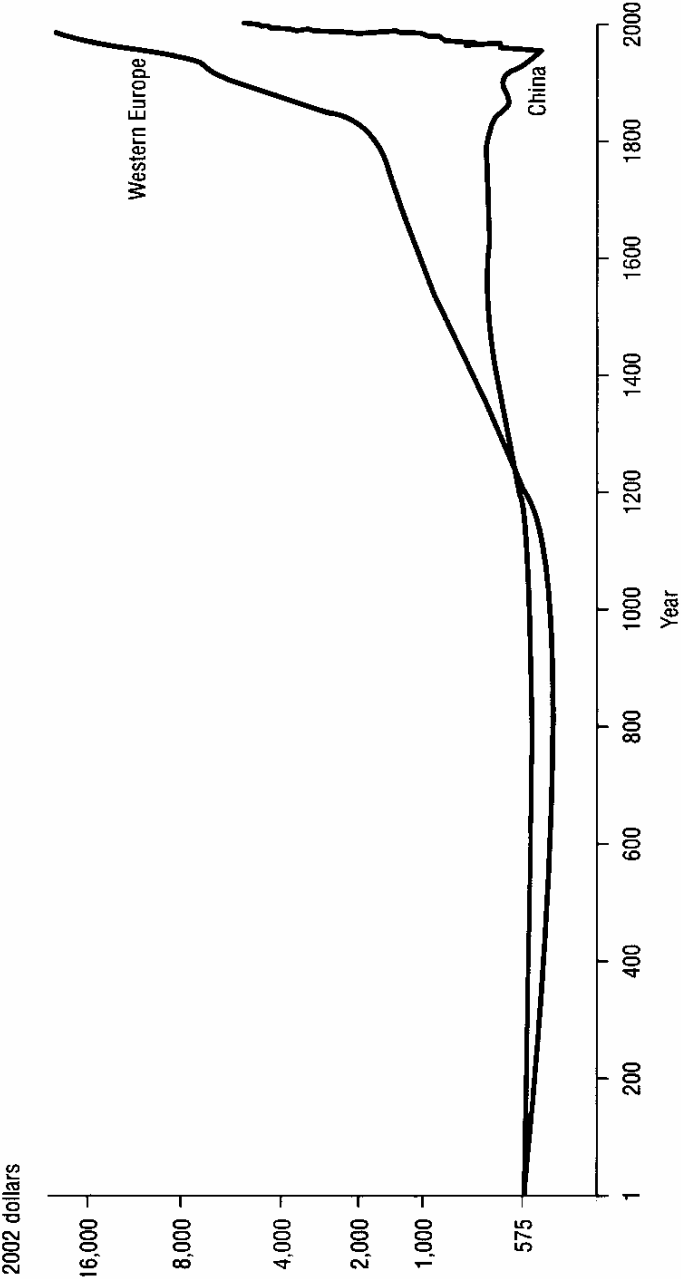
- (Or not Japan, or India, as we will ask later.)
  - China was technologically advanced.
  - It had competitive product markets.
  - It had active markets in land and labor.
  - It would seem to have been at least as plausible a candidate for industrialization as England.
- Then why, instead, did industrialization begin on a cold, windblown island of only 6 million people off the Northwest coast of the European continent, and reach China only more than a century later?



# Angus Maddison's heroic quantitative estimates underscore the paradox

**Chart 1**

**GDP per Capita: China and Western Europe, 1–1998 A.D.**



SOURCES: Maddison, Angus (2001), *The World Economy: A Millennial Perspective*, Organization for Economic Cooperation and Development, p. 42; authors' calculations.

- It is important to acknowledge at the outset that economic historians have not come up with totally satisfying answering to this question.
- And it is the less-than-satisfying state of the scholarly literature that leads Clark to his particular answer.

- I will suggest this morning that maybe, just maybe we can identify a more conventional answer.
- That answer will emphasize Europe’s more favorable geography.
  - This is also an explanation emphasized by David Landes, whose work you will read.
  - And it is emphasized by modern development economists like Jeffrey Sachs when explaining African underdevelopment.
    - (And we have already encountered the importance of geography earlier in this course, when discussing the role of ruggedness in discouraging the slave trade and exercising long-lived effects on African economic growth.)

# Our point of departure is the paradox:

- The Chinese economy was relatively advanced and sophisticated, compared to Britain and Europe generally, in the first half of the second millennium and, arguably, as late as 1750.
- And yet it was Europe, not China, that industrialized in the 19<sup>th</sup> century.

# Chinese agriculture was sophisticated

- Traditional Chinese society, like traditional European society, was of course overwhelmingly rural, with over 90% of the population living in the countryside.
- Agricultural technology was sophisticated by European standards:
  - Chinese farmers made extensive use of irrigation,
  - They used urban-generated organic fertilizer much more extensively than European farmers, as we have seen,
  - They imported early-ripening rice types from Southeast Asia.

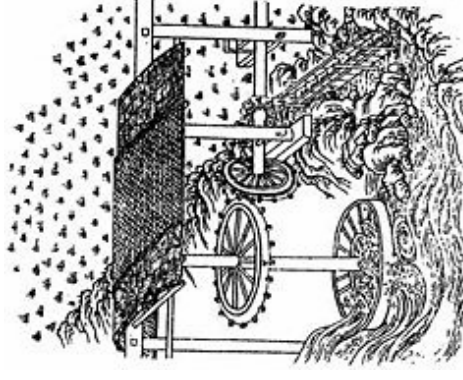
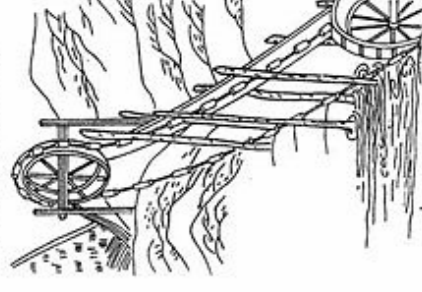


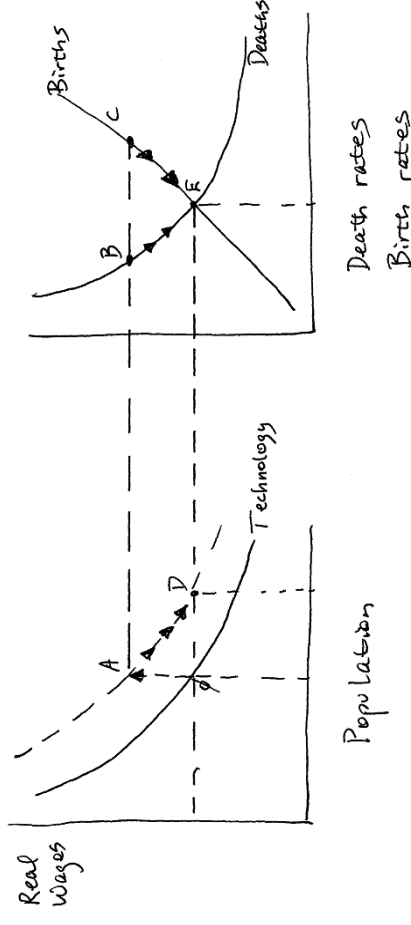
图 4-85 水转翻车  
（引自《明》宋应星《天工开物》）



- Chinese farmers also had the advantage of rich soils (richer than in Europe) in and around the country's alluvial river basins.
- Individuals worked closely together on intensively cultivated land, on the basis of not just sophisticated technology but also a cohesive social organization.

# China's agricultural technology was not just advanced but dynamic, which points up the paradox

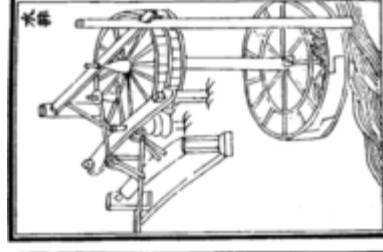
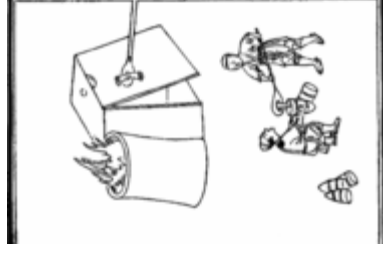
- As Clark observes, higher population densities than in Europe suggest that China's agricultural technology was more advanced than Europe's.
- Moreover, rural population increased significantly between 1400 and 1800, which suggests – again, according to the Malthusian model, that China's agricultural technology was continuing to progress.
- This is also what our familiar Malthusian model implies....





# Chinese industry was similarly sophisticated

- China had iron chain bridges long before Europe.
- It had drills that could reach depths of 2,000 feet 500 years before the West.
- The Chinese used bellows in iron workers (to provide a continuous flow of air over the molten iron and enhance refining) centuries before Europe.
- They began using coke in blast furnaces in the 11th century, 500 years before Europe (picture at right).
- They developed rudimentary spinning and weaving machines long before the British.



- Mokyr, in his “Why Europe and not China” article, similarly argues that basic knowledge of scientific principles, China was at least as advanced as Europe until, say, 1400.
- As late as 1400, China was ahead of Europe in iron-making, textiles, power, printing and shipbuilding.
- By 1500 or so China had all the “basics” needed to develop a working steam engine.
- The Chinese understood atmospheric pressure, they understood water condensation, and they had craftsmen capable of constructing advanced pumps (as at right).
- The 15th century Chinese notable Cheng Ho had took 30,000 men on 70 ships on eight voyages across the Indian Ocean, as far as Zanzibar, where the Portuguese sent no more than a handful of ships scarcely 900 miles never far out of sight of the African coast.
- Evidently, then, technology was not the problem.



# And it is not as if China lacked markets

- There was a thick network of markets in the countryside.
- Different areas were tied together by a well-developed system of water transport.
- Where there was a canal-building boom in England in the 1810s and 1820s, China had built an extensive system of canals, particularly around the Pearl and Yangtze River deltas, much earlier, helping to integrate the country's local markets. (Example at right dates back to 6<sup>th</sup> century AD.)
- Clark shows evidence that grain prices in different regions moved together as much in China as in Britain.
- So the Chinese economy was as commercialized as Europe's.
- Moreover, China's markets were competitive.
- There were numerous suppliers of essential commodities like coal, iron, textiles and tea.
- Entry by such suppliers was easy, exit frequent.



# China also had an active land market

- The government held only maybe 5 per cent of land in the Qing period.
- Other land was “freely alienable” (it could be freely bought and sold).
  - There were some restrictions: tenants (and their heirs) had some rights and couldn’t be arbitrarily thrown off the land.
  - This made land hard to sell just like apartments in Berkeley are hard to sell when you can’t freely evict the tenants.
  - But there is also evident that tenants found their rights hard to enforce.
  - Remember how in pre-19th century England much land was held in common?
  - This land could not be bought and sold, since it belonged to the village.
  - Eventually this problem was solved by the enclosure movement (and by Parliamentary enclosure in particular, as we have seen).
  - But not for a long time.
- So it is hard to argue that Europe’s land markets were freer.

# Labor markets were also relatively free

- There was no aristocracy or casts defined by birth.
- Individuals frequently migrated in search of economic opportunity.
- Bound labor (where workers and their descendants were bound to the land and owed labor in kind to landlords) declined in the 14th and 15th century and essentially disappeared in the first 50 years of the Qing Dynasty (1644-1911).

- There were also other important elements of market infrastructure.
- For example, by the 18th century there were banks to accept deposits, make loans, transfer funds between regions, and discount accounts receivable for merchants.
- There was widespread use of paper money (one-third of the money circulation circa 1820 was paper, making this convenience as widespread as in Europe).
- Thus, it is hard to argue that China lacked private markets, market infrastructure and commercial economy comparable to Europe's.

# So why didn't China industrialize?

- According to Mokyr, although China had useful knowledge it somehow lacked the ability to build on it, quickly, decisively and cumulatively.
- This seems to be Clark's view: China and Japan would have "gotten there" (there being to the threshold of an industrial revolution) eventually, only it would have taken a few more centuries (without the jump-start of imported European technology).
- The weakness of Mokyr's argument is that he doesn't explain why China lacked this ability to build on prior breakthroughs quickly, decisively and cumulatively.
- The weakness of Clark's argument is that his mechanism works at the wrong periodicity and is backed by little evidence.

So why didn't China industrialize?



# So why didn't China industrialize?

- **First possible answer:** maybe the Chinese were more risk averse than the Europeans.
- Maybe low living standards (close to the margin of subsistence) and the constant threat of famine depressed saving and therefore limited investment.
- Clark argues that more intensive agriculture and a culture that put a higher premium on health and cleanliness actually meant lower living standards in Asia. People lived closer to the margin of subsistence, as the Malthusian model would suggest. And this made people more risk averse.
- Chinese living standards were also more volatile. There could be sudden collapse of output and incomes, and this discouraged risk taking by Chinese households, who put “safety first.”
- In China there was a drought or famine in at least one Chinese province in virtually every year between 1400 and 1900.
- It is argued that this led the masses to be risk averse.
- In turn this made saving and therefore financing capital accumulation more difficult.

- In contrast, Europe had a wider variety of geographies, topographies and soil types.
- It grew a wider variety of crops as a result (China depended very heavily on rice in the South and wheat in the North).
- Ireland similarly came to depend very heavily on potatoes rendering it similarly vulnerable to a great famine in the 1840s. But other parts of Europe had more varied climate, soils and topography. Hence these other parts of the Continent were less vulnerable to the spread of crop disease and harvest failure.
- There may have been less risk averse behavior as a result.

# So why didn't China industrialize?

- **Second possible answer: lack of coal.** Substituting coal for charcoal (a mineral-based energy economy for an organic energy economy) was central to the process of initiating modern economic growth in Britain.
- Previously, woodland that remained was critical for fuel (hence customary rights over woodland and waste).
- Each ton of coal mined freed up an acre of renewable forested land previously required for the provision of fuel for other purposes. If Europe lacked the coal, it would have bumped up against deforestation, slowing growth and depressing the returns on invention and innovativeness.
- The Crafts-Harley view of the Industrial Revolution we looked at earlier is consistent with this view: Crafts and Harley place all the innovativeness and efficiency gains in textiles, ironworking and transportation, you will recall.
- And it is hard to imagine their taking off in the absence of coal.
- By the mid 18th century Britain produced some 15 million tons of coal a year. Thus, it freed up 15 million acres for other uses. China did nothing analogous.

# China, in contrast, lacked coal

- This limited the expansion of key power using industries like mechanized textiles, iron and steel.
- It led to deforestation as wood and charcoal were desperately sought after by an expanding population.
- Deforestation led to silting up of waterways, impeding commerce and facilitating the spread of water-borne disease.
- China thus experienced an ecological disaster. It ran up against ecological constraints on growth (consistent with the idea of a Malthusian trap) that prevented it from completing the transition to modern industrial growth.
- Whereas Europe (and especially Britain) escaped this trap by successfully substituting coal (and then inorganic power, courtesy of the coal-mining-inspired steam engine) for wood and charcoal.

- Actually, China possesses a good deal of coal in its northwest.
- So can this really be seen as a binding constraint?



- Scholars are aware of this; they are forced to resort to ad hoc explanations:
  - This location remote from China's industrial center was unfavorable, compared to the proximity of coal in the Lakes Region and Wales to Britain's industrial center.
  - Coal mining in China never recovered from a series of catastrophes in the period 1100- 1400: invasion by the Mongols, a series of floods.
  - Unlike England, where flooding was the problem for mining (and the steam engine was the solution), in China mines were arid and spontaneous combustion of coal exposed to the air was the problem (which did not admit of an easy technological solution).
- Convincing?
- Or is this an example of how social scientists can come up with an explanation for anything ex post?



- In addition, Clark notes some uncomfortable aspects of this argument (as you will have read):
  - For example, coal was abundant in Britain, but it was absent in other places that began industrializing in the early 19th century, like Switzerland and New England.
  - Shouldn't we worry about these counterexamples? Given Swiss and American experience, how can this factor be viewed as decisive?

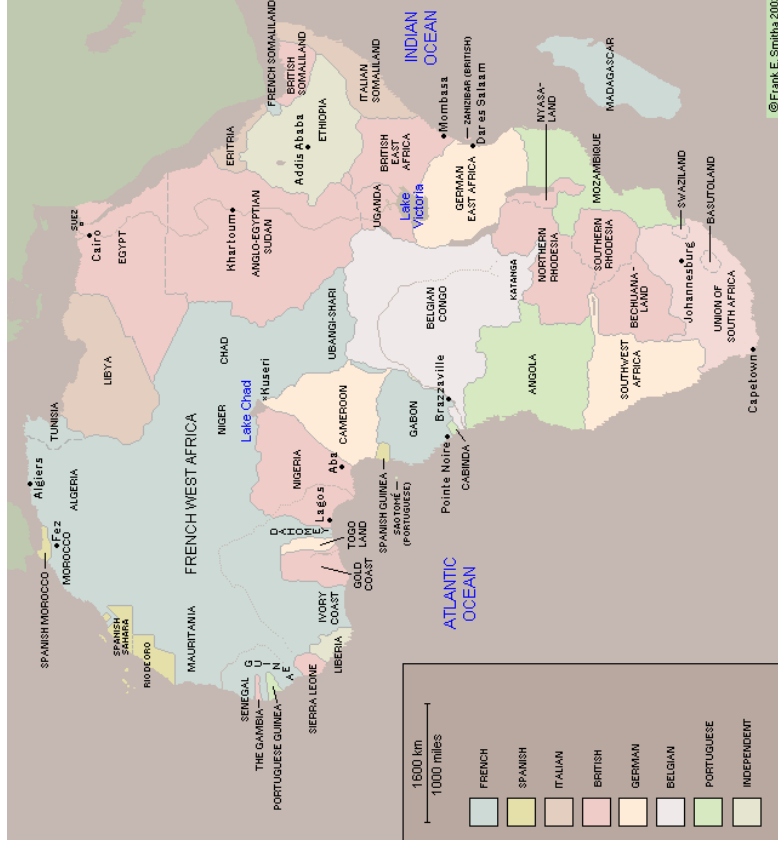


# So why didn't China industrialize?

- **Third possible answer: lack of colonies.** But recall also how most scholars are now skeptical of its importance.
  - Consider Britain. Until the 19<sup>th</sup> century, the colonies probably cost Britain more, in terms of military expenditures, to maintain than they delivered in economic benefits.
  - Even relatively late, the profits from the colonies were small relative to the resources plowed into industrial investment in Britain.
  - Inputs like cotton from the colonies indeed mattered for the growth of key industries like cotton textiles, but their availability mattered relatively little insofar as there were alternative sources that could be tapped at only slightly higher prices (Egypt, Brazil, Turkey).



- In addition, Clark notes some uncomfortable aspects of this argument (as you will have read):
  - Neither Belgium nor Germany had colonies until the end of the 19th century, yet their absence did not stymie their industrialization in the preceding period..
  - (They eventually got them in the Congo and West Africa, but this seems more like a consequence of industrialization – which created growing rivalry among the leading industrial powers and an imbalance of power with less developed regions – than an independent cause.)
    - (Actually, Belgium didn't seize the Congo – its King Leopold did as a personal fiefdom.)



# So why didn't China industrialize

- Fourth possible answer\*: weak institutions.
- (Clearly, this is the anti-Clark interpretation.)

\* Eric Jones: *The European Miracle: Environments, Economics and Geopolitics in the History of Europe and Asia* (Cambridge, 1982).

- This argument is that if there was an obstacle to China gathering the momentum needed to break out of the traditional economy and move to modern industrial growth, it was the underdevelopment of government institutions.
- To be sure, written contracts were ubiquitous.
- But these tended to be privately enforced, not by government-created courts.
- Merchants associations existed and were used to resolve contract disputes, but they were an imperfect substitute for rule of law imposed by government.
- And the government had a voracious appetite for revenues, often for conspicuous consumption, leading to arbitrary taxation.
  - Eric Jones, in a classic book, *The European Miracle*, argues that the key condition setting the stage for European industrialization was supplementing the private market in production with governmental provision of public goods.
  - In China, in contrast, courts were ineffective and arbitrary. Thus, the state's courts did not provide reliable contract enforcement, and the merchants associations that were the spontaneous private sector substitute were an imperfect replacement.
  - In China, in contrast, there was no civil/national guard. Any policing that occurred to keep law and order and protect property was provided by villages or their own.

- The modern US expert on the Chinese economy, Barry Naughton of UC San Diego, observes that cotton fabric was woven in  $\frac{3}{4}$  of Chinese counties, but that there were no large textile mills.
- He suggests that this preference for very small enterprise was rooted in the need to prevent wealth from being too obvious to rapacious officials desperate to tax something.
- And this in turn discouraged investment in new industrial technology relying on centralized power and taking advantage of the economies of the factory system.

- Naughton points to a decline in the effectiveness of the Qing dynasty toward the end of the 18th century (right at the critical period, in other words).
- There is indeed evidence the Imperial Government was undercapitalized and underdeveloped:
- There was only 1 government worker for every 32,000 people in China in 1800, compared to 1 for every 600 in Britain.
- The government was continuously battling the effects of inadequate revenues and manpower.
- Poor (and declining) maintenance of large-scale irrigation and canal networks is evidence of this trend.
- Agricultural productivity therefore declined relative to population.
- There was less to save; investment became even harder.
- The population became more vulnerable to droughts, floods and famines.
- Some scholars argue that this led to a vicious spiral.
- As agricultural output declined, desperate villagers encroached on wetlands and forests.
- The result was additional deforestation, further silting up of waterways, and more problems for a government with very limited revenues and administrative capacity to solve.

- The argument, then is that this thin veneer of public support for economic activity sufficed for a traditional agricultural economy.
- It even supported a small but vibrant manufacturing sector.
- But it did not create a platform for the transition to modern economic growth.
  - European states, in contrast, provided more support for modern economic growth:
    - Courts provided reliable enforcement of contracts and property rights.
    - Public support was provided for the rationalization of landownership and traditional property rights.
    - Arbitrary taxation was limited (recall North & Weingast's argument about the Glorious Revolution).
    - Public revenues were systematically devoted to the national defense and to improving roads & infrastructure, not simply to conspicuous consumption by the Crown.
    - Schools and technical academies were established for training scientists and technicians; prizes were offered for scientific and practical breakthroughs.

# The question, of course, being why

- What explains this contrast in state capacity between Europe and China?

# One answer runs as follows:

- European regimes did better because they had to, since their most valued citizens had an exit option.
- The rulers of Europe's relatively small states learned that they had to supply services and adjudication in order to attract and retain their best-paying, most productive constituents.
  - Skilled workers and entrepreneurs had always been willing to migrate, despite government efforts to make them stay put.
  - Recall our earlier discussion of how Flemish textile workers brought their technology to Britain, and British textile machinery makers later took their knowledge to the Continent.
  - Already in the 16th century German miners with specialized knowledge were traveling to the mines of Cornwall and the Lake District for work.
  - The glassmakers of Murano threatened to leave if they did not get support from the government of the city-state of Venice.
- Thus, European states had to figure out how to be more effective, and to support the growth of commercial activity more effectively, or lose out to their neighbors.
- And losing out to their neighbors might have political and military consequences.



- A related argument is that European states not only competed but the fact that there were so many of them meant that there was a useful biodiversity.
- Given there different structures, some might survive difficult circumstances that brought down the others.

- China's very different geography meant centralized government and little regime competition.
- (Few mountain valleys and natural barriers to slow centralization and protect Andorra-like kingdoms in Asia – Tibet being the exception that proves the rule, until recently.)
- Given a single centralized government, government decisions may for trivial reasons must have profound effects.
  - Recall how China had long outstripped Europe in terms of seafaring.
  - But in the early 17th century the Ming Dynasty banned all trade by sea.
  - The reason was the rise of Japanese piracy off China's shores; banning trade by sea was a simple response, but one that shot the economy in the foot.
  - It had profound negative effects by shutting off China from the rest of the world precisely when economic development was accelerating in Europe.
  - But, unlike Europe, when one government did this in China, it was the one and only government. There was no safety valve or alternative channel for trade.

- More generally, the Qing Dynasty continuously had to contend with (and divert its resources toward coping with) invasions from abroad.
- In the 19<sup>th</sup> and early 20<sup>th</sup> centuries, foreign incursions disrupted the economy (Western invasions in response to Boxer Rebellion, Japanese invasion of Manchuria, etc.). China lost 2 wars with Japan, was invaded three times by Britain and France and once by Russia and the U.S.
- This reflects China's geography, as argued earlier.
- Britain's status as an island was an advantage in this respect.
- That Europe was protected by the Alps and other natural barriers may have had similar effect.
- It is perhaps revealing that the parts of Europe least protected in this way (the Balkans, which were contested by the Ottomans) and Eastern Europe (contested by the Russians) were late to industrialize.

# Conclusion

- We don't really have a satisfactory answer to the question of "Why not China?"
- But maybe we have the elements.
- Maybe a more diverse geography meant less risk of universal harvest failure in Europe and hence less risk averse behavior.
- Maybe differences in geography also resulted in continuous incursions from outside that disrupted the development of the economy, by limiting the ability of government to provide the public goods needed for a more advanced economy.
- Maybe that geography also led to centralized government that didn't have to raise efficiency and avoid arbitrary taxation in order to retain its skilled workers and valued citizens.
- Maybe the imbalance of economic power with the West then accentuated this problem once industrialization began there.
- 
- Maybe. Ultimately, these conjectures are less than entirely satisfactory.
- And that is why Clark is driven to his even more speculative alternative.