

Announcements

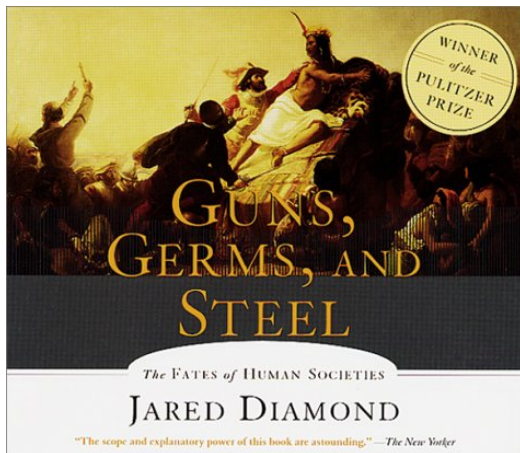
- Next thing to be thinking about is the second referee report, due March 30th at 5pm
- The referee report is on “Intergenerational Occupational Mobility in Great Britain and the United States since 1850” by Long and Ferrie
- After that is the empirical project, due April 20th

- We'll be starting on geography-based explanations of the Industrial Revolution today and covering social evolution later next week
- The relevant required readings for the next few lectures are:
 - Diamond (2004), "Economics: The Wealth of Nations", *Nature*
 - Clark (2008), *A Farewell to Alms*, Chapter 13 excerpt

Institutions as an Explanation

- So Nunn's work gives us insight into why a bad shock to institutions may have persistence
- These social dimensions of the effects of slavery can make it difficult for good government institutions to take hold and be effective
- These issues were compounded by the political boundaries drawn by colonial powers
- One takeaway from Nunn: dropping in good institutions may not be sufficient
- One question remaining from Nunn and AJR: why were Europeans able to alter African institutions?
- Why wasn't it Africa colonizing Europe?

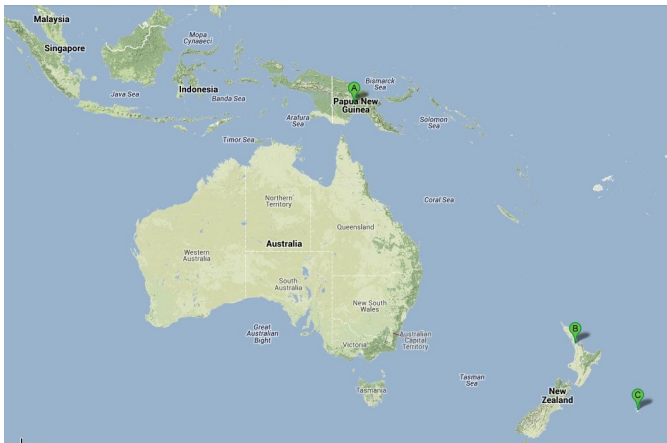
Jared Diamond and the Geography of Development



Jared Diamond and the Geography of Development

- Diamond isn't seeking to explain a narrow window of change like the Industrial Revolution
- He sees differences in development evolving over long periods of time.
- The differences have their roots in the geography and ecology of where societies began.
- The (proximate) factors allowing one culture to become dominant over another are guns, germs and steel.
- All three of these factors actually have their roots in geographical differences.

Polynesia as a (Natural) Natural Experiment



Polynesia as a (Natural) Natural Experiment

- Around 1200 BC, people from near New Guinea reach the Polynesian Islands and start to colonize every little island.
- By 500 AD, most islands are colonized.
- Why does this provide a natural experiment?
- Everyone descended from the same group but the environments of the islands varied tremendously.
- We can see what effect environment had on the evolution of societies.

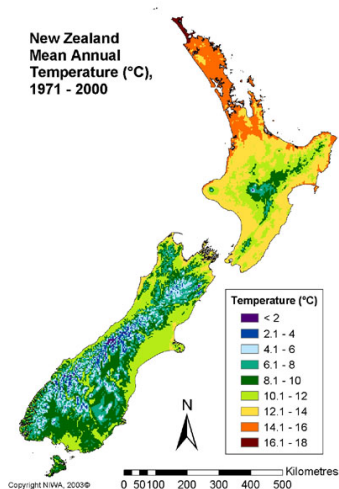
The Polynesian Islands



The Maori

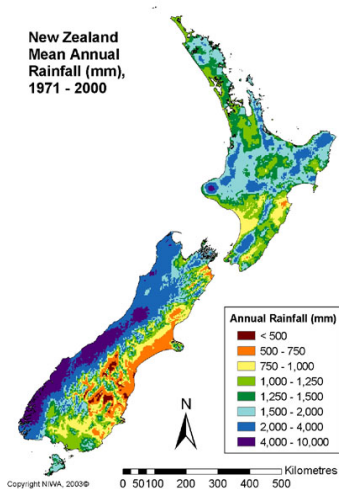
- The Maori lived in the northern part of New Zealand.
- Northern New Zealand was the warmer part of New Zealand.
- Largest land area in the Polynesian islands.
- Land and climate could support Polynesian agriculture.
- Population of the Maori exceeded 100,000.

New Zealand



Virginia's annual mean temperature is 14.9 degrees Celsius

New Zealand



Virginia's mean annual rainfall is 1100 mm.

New Zealand



The Maori vs The Moriori

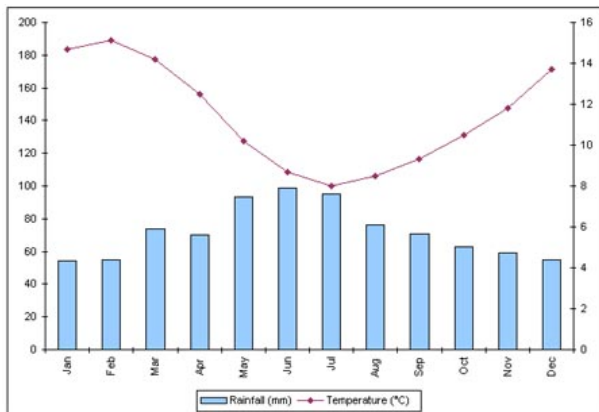
The Moriori

- The Moriori came from the Maori and were possibly Maori farmers.
- They settled the Chatham Islands.
- The Chathams had a cold climate.
- Tropical crops could not grow.
- The Moriori were hunter-gatherers, hunting seals, shellfish, nesting seabirds and fish.
- Catching these animals could be done by hand or club.
- The Chathams had a total population of around 2,000.

The Chatham Islands



The Chatham Islands



The Maori vs The Moriori

- So what happened between the Maori and Moriori?
- The two societies lost contact for several hundred years.
- Eventually, the Maori find out about the Moriori.
- In 1835, the Maori show up and enslaved or killed just about all of the Moriori.
- Diamond's question is how did two societies that came from the same society just a few hundred years earlier become so different?
- This is one of our big unanswered questions from our institutions stories.
- Diamond's answer lies in geography.

What can we learn from Polynesia?

- Polynesian islands differed in climate, geological type, marine resources, area, terrain fragmentation, and isolation.
- All of these environmental factors shaped Polynesian societies and economies.
- Different possibilities for food production led to differences in population size and density.
- These differences in population size and density led to differences in political structures, technology, and interaction with other societies.
- All of these differences led to very different paths of development for the different Polynesian societies.

Generalizing from the Polynesian Natural Experiment

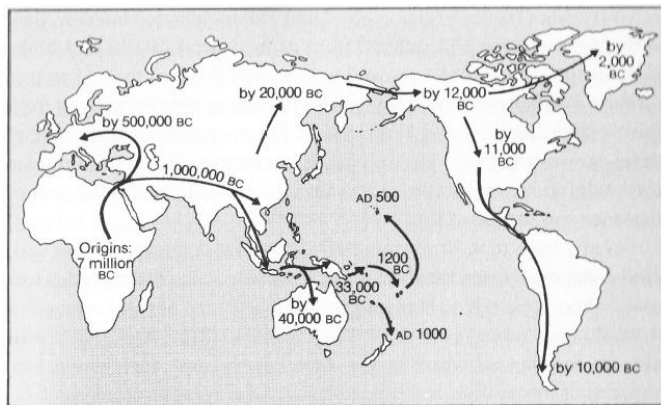
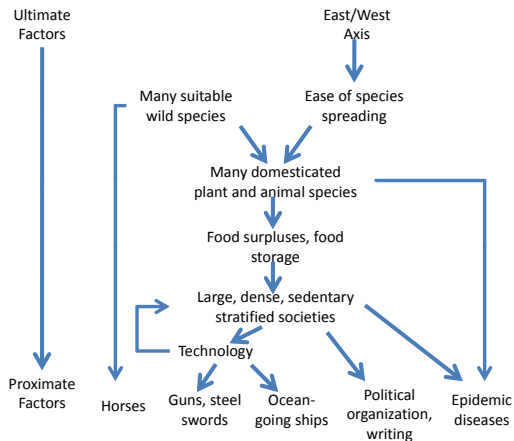


Figure 1.1. The spread of humans around the world.

Generalizing from the Polynesian Natural Experiment



Parts of Diamond's Argument We Will Cover

- The importance of developing agriculture
- The importance of domesticated animals
- The diffusion of plants and animals
- The importance of germs
- The development of technology
- Social structure and geography

The Domestication of Plants

- Farming is critical to development in Diamond's story.
- So who starts farming and how?
- Factors leading people to switch from hunting and gathering to farming:
 - decline in availability of wild foods
 - increase in range of domesticable wild plants
 - improvements in food technology
 - population pressure
- So places with more domesticable plants and animals, more population pressure and more exposure to agricultural practices and technologies of others will improve food production faster than others

The Domestication of Plants



- Wheat and barley are domesticated in the fertile crescent around 8,000 BC
- They were edible, gave high yields, could be easily and quickly grown and could be stored
- Start creating a role for trade, seasonality of labor, specialization of labor

The Domestication of Plants

Nutrition Facts			
Durum wheat ▾			
Amount Per 1 cup (192 g) ▾			
Calories 651			
			% Daily Value*
Total Fat 4.7 g			7%
Saturated fat 0.9 g			4%
Polyunsaturated fat 1.9 g			
Monounsaturated fat 0.7 g			
Cholesterol 0 mg			0%
Sodium 4 mg			0%
Potassium 828 mg			23%
Total Carbohydrate 137 g			45%
Protein 26 g			52%
Vitamin A	0%	Vitamin C	0%
Calcium	6%	Iron	37%
Vitamin D	0%	Vitamin B-6	40%
Vitamin B-12	0%	Magnesium	69%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.			

The Domestication of Plants



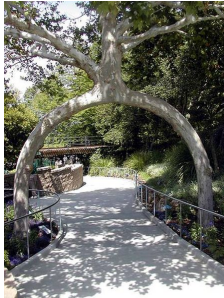
- Fruit and nut trees are domesticated around 4,000 BC
- They could only be grown by societies already committed to settled village life (think capital investment, property rights)
- They could be grown from cuttings (tech transfer)

The Domestication of Plants



- A later stage of plant domestication involved fruit trees that required grafting rather than using seed or cuttings
- Examples include apples, pears, plums and cherries
- Think of this as more advanced plant technology

Quick Aside on Technological Change and Economic Growth



Alex Erlandson and his Tree Circus

The Domestication of Plants



Spotted Dead Nettle



Spring Beauty



St John's Wort



Stinging Nettle



Sunflower



Supplejack Vine



Sweet Rocket



Sweetfern



Tea Plant



Teasel



Toothwort



Trout Lily



Valerian



Vervain Mallow



Wild Bee Balm



Wild Grape Vine

At the same time as these difficult fruit trees other wild plants became domesticated after appearing as weeds. These crops include rye, oats, turnips, beets, leeks and lettuce.

Who Domesticated Plants?

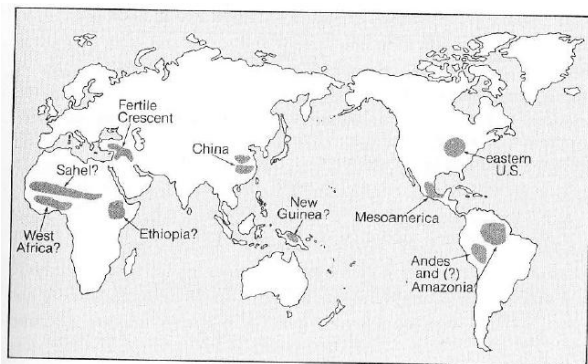


Figure 5.1. Centers of origin of food production. A question mark indicates some uncertainty whether the rise of food production at that center was really uninfluenced by the spread of food production from other centers, or (in the case of New Guinea) what the earliest crops were.

Why doesn't this match up with the most developed economies?

- If food production is the key to building a dominant society, why aren't African and South American countries the economic superpowers?
- It is because it's not so much where domesticated crops started, but how specific crops could spread.
- Fertile Crescent crops were better nutritionally and geography favored the spread of Fertile Crescent crops.

The Spread of Domesticated Plants

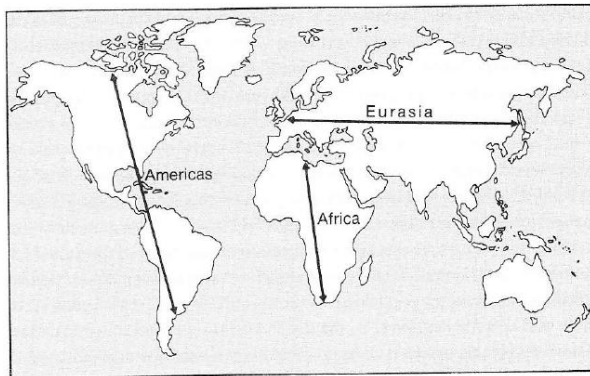


Figure 10.1. Major axes of the continents.

The Spread of Domesticated Plants

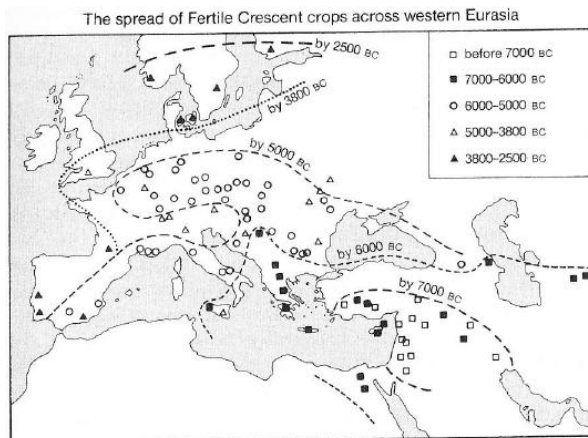


Figure 10.2. The symbols show early radiocarbon-dated sites where remains of Fertile Crescent crops have been found. □ = the Fertile Crescent itself (sites before 7000 B.C.). Note that dates become progressively later as one gets farther from the Fertile Crescent. This map is based on Map 20 of Zohary and Hopf's *Domestication of Plants in the Old World* but substitutes calibrated radiocarbon dates for their uncalibrated dates.

The Domestication of Animals

The Major Five

Domesticated animal	Location of wild ancestor
Sheep	West and Central Asia
Goat	West Asia
Cow	Eurasia and North Africa
Pig	Eurasia and North Africa
Horse	Russia

The Domestication of Animals

The Minor Nine

Domesticated animal	Location of wild ancestor
Arabian camel	Arabia
Bactrian camel	Central Asia
Llama and alpaca	Andes
Donkey	North Africa (maybe Southwest Asia)
Reindeer	Eurasia
Water buffalo	Southeast Asia
Yak	Himalayas
Bali cattle	Southeast Asia
Mithan	India

The Domestication of Animals

Mammalian Candidates for Domestication				
	Sub-Saharan			
	Eurasia	Africa	The Americas	Australia
Candidates	72	51	24	1
Domesticated species	13	0	1	0
Percentage of candidates domesticated	18%	0%	4%	0%

Candidate is defined as a species of terrestrial, herbivorous or omnivorous, wild mammal weighing over 100 pounds.

The Domestication of Animals



Why were domesticated animals a big advantage?

- Animals can be eaten for their meat
- Animals can provide milk products
- In the days before synthetic fertilizer, animals provide the fertilizer
- Animals provide land transportation (which remains important all the way up to the era of railroads)
- Animal power can be used for plowing
- Animals offer a big military advantage both through being assault vehicles and carriers of disease

Why were domesticated animals a big advantage?



Why were domesticated animals a big advantage?

Diseases and Domesticated Animals

Human disease	Animal with closely related pathogen
Measles	cattle
Tuberculosis	cattle
Smallpox	cattle
Flu	pigs and ducks
Pertussis	pigs and dogs
Falciparum malaria	birds

Geography, Food Production, and the Structure of Society

- Diamond sees intensified food production and societal complexity as promoting each other
- Intensified food production leads to:
 - seasonally pulsed inputs of labor
 - food surpluses that allow for economic specialization and social stratification
 - sedentary living and the ability to accumulate possessions and commit to projects with longer time horizons
- Complex, centralized societies are uniquely capable of:
 - organizing public works
 - long-distance trade
 - organizing activities of specialized workers

Technology and Geography

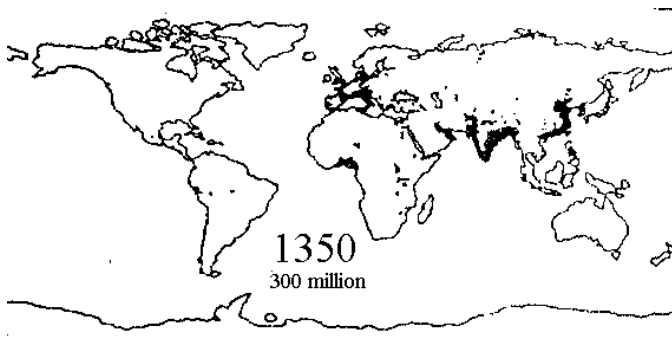
Human Populations of the Continents

Continent	1990 Population	Areas (square miles)	Population Density
Eurasia and North Africa	4,120,000,000	24,200,000	170
Eurasia	4,000,000,000	21,500,000	186
North Africa	120,000,000	2,700,000	44
North America and South America	736,000,000	16,400,000	45
Sub-Saharan Africa	535,000,000	9,100,000	59
Australia	18,000,000	3,000,000	6

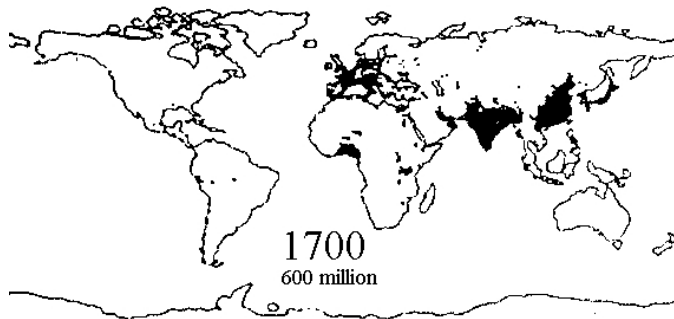
Why is Diamond's story a little unsatisfying?

- It places perhaps too much emphasis on conquest, one nation taking over another.
- In the absence of conquest, nearly everyone develops just at different rates.
- The implied solution to the Malthusian trap is population density leading to innovation.
- What are the relevant population density cutoffs?
- What can it say about growth promoting policies?
- It doesn't really explain why being conquered has long run effects.
- It gets some of the geography of industrialization right but it also gets some of it wrong.

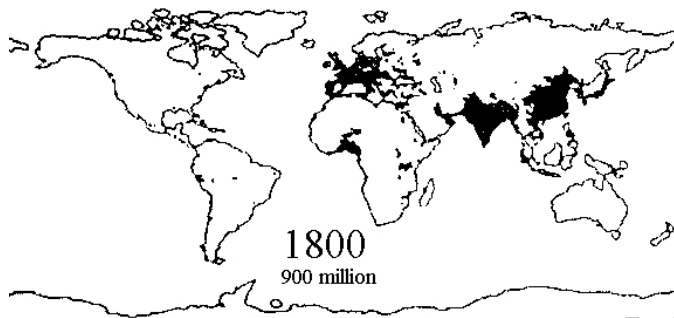
World Population, 1350



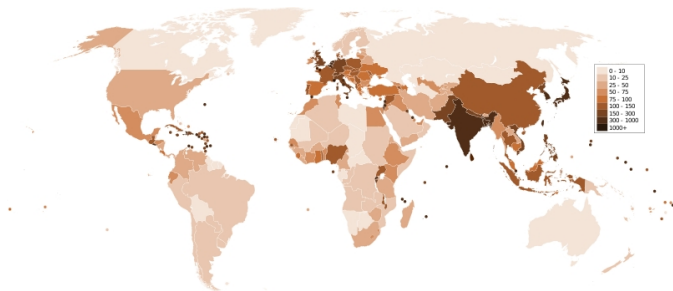
World Population, 1700



World Population, 1800



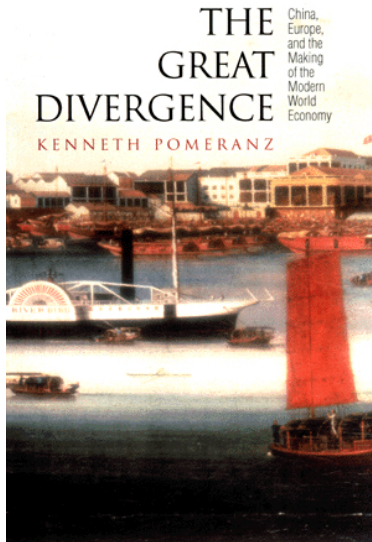
Population Density, 2006



Geography as an Explanation

- So Diamond views geography as central to the story
- He is thinking long, long term
- The east-west axis of Eurasia is central to his argument
- But this doesn't single out Europe let alone Britain as the center of the Industrial Revolution
- Geography may dictate Eurasia versus Africa or the Americas but it doesn't seem to explain why Britain and not China
- So do we have yet another necessary but not sufficient condition?

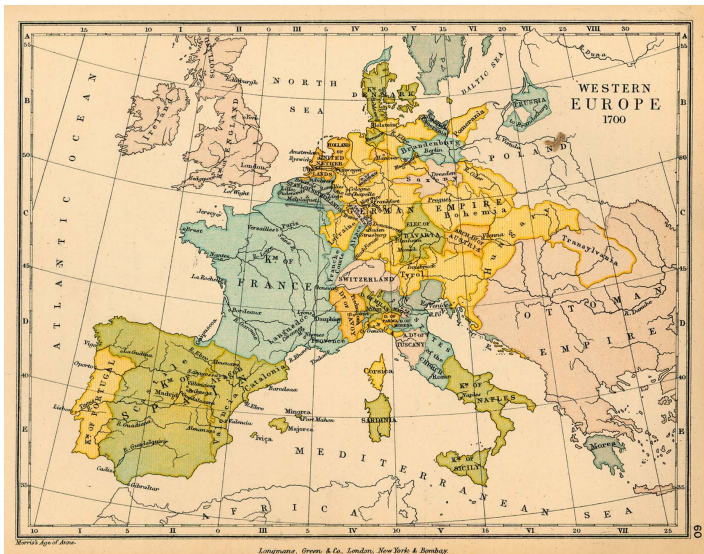
Enter Kenneth Pomeranz



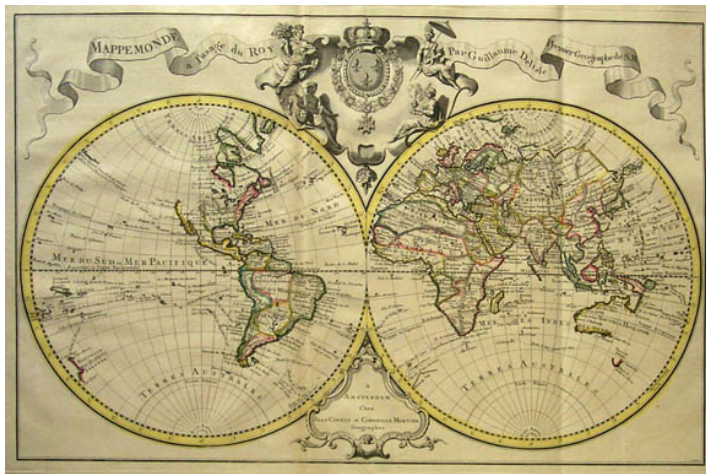
Enter Kenneth Pomeranz

- Pomeranz basically argues that we're doing our comparisons wrong
- We can't just say Europe developed and Asia didn't, continents are too heterogeneous to compare
- Focus on smaller units: for example England vs Yangtze Delta
- When choosing better comparisons, institutions, markets, technology, etc. don't seem to be that different
- The big difference was access to coal and access to New World

Making the Right Comparison



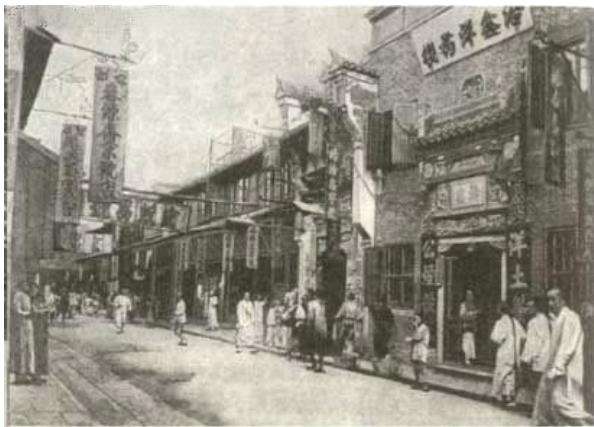
Making the Right Comparison



The Yangtze Delta



Shanghai



Did Europe Have More Agricultural, Transport and Livestock Capital?

- Europe had more livestock per person
- Within Europe, more livestock meant greater agricultural productivity
- Livestock was less important under Asian agricultural practices
- So more animals in Europe did not mean they had a bigger advantage in agricultural capital stock
- Did it mean they had a bigger advantage in transportation capital stock?

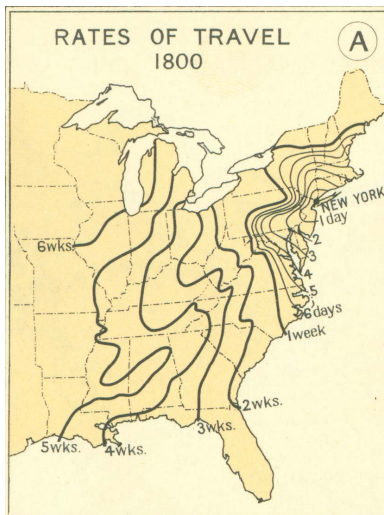
China's Grand Canal System



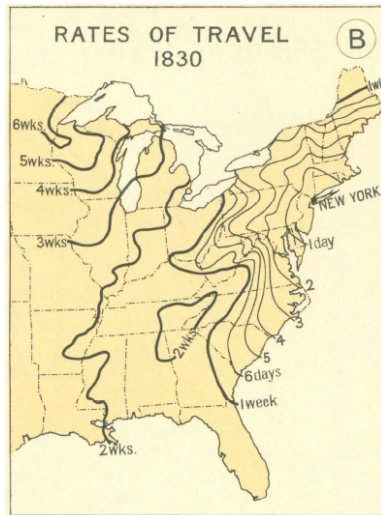
Transportation Costs, 1815

Mode of Transportation	Cost per Ton-Mile
Road	\$0.30
River, Upstream	\$0.06
River, Downstream	\$0.01
Ocean	<\$0.01

Animals, Boats and Transportation Capital Stock



Animals, Boats and Transportation Capital Stock



Did Europe have more growth-friendly demographic patterns?

Country	Period	Life Expectancy
England	1650	32
Germany	18th-19th centuries	35-40
England	18th century	32-34
France	1770-1790	28-30
Japan (men)	18th-19th centuries	35-41
Japan (women)	18th-19th centuries	45-55
China (wealthy)	mid-18th century	39
Manchuria (males)	1792-1867	36
Manchuria (females)	1792-1867	29

Did Europe have more growth-friendly demographic patterns?

- So life expectancies weren't drastically different between Asia and Europe
- What about birthrates?
- Europeans kept birthrates low by delayed marriage
- Chinese couples delayed pregnancy in marriage, shortening reproductive careers despite universal early marriage
- Evidence that fertility was limited in Japan not just to cope with hardship but also as accumulation and mobility strategies

Did Europe have better technology?

Invention	China	Europe/America
Silk	1300 BC	582 AD
Wheelbarrow	231 BC	1200 AD
Paper	105	1150
Water-powered mills	100	
Printed Book	868	1456
Compass	1050	1190
Explosives	1151	16th century
Crank-driven engine	1310	1757
Ship building:		
Fore-and-aft rig	3rd century	9th century
Watertight compartments	5th century	1790
Stern-post rudder	8th century	1180

Did Europe have better technology?

- Europe was better in some areas (pumps, canal locks, steam power)
- Asia, India and even Africa had technological advantages in many other important areas
- India and China had more advanced ways of dealing with deforestation and conservation of soil
- Indian and African iron was as good or better than English iron
- Chinese medicine was better than European medicine
- While Britain led in the efficiency of power-generating machines, China led in efficiency of stoves for cooking and heating

Did Europe have better technology?



Did Europe have better markets?

- Majority of land in China was freely alienable
- European farmland was harder to buy or sell than Chinese farmland
- Large portion of European land could not be freely sold
- Bound labor was unimportant in the Yangzi Valley by the 18th century, earlier in other areas of China
- Migration within Europe faced more legal barriers, language differences, and other obstacles than in China
- What about markets other than labor and land?

Capital markets in Europe and China

- There is some evidence that capital markets were more efficient in Europe (lower interest rates)
- But higher interest rates doesn't mean firms can't invest
- Most early industrial projects in Britain were financed by entrepreneurs or their family (not financial institutions)
- Top 2% of Chinese population received the same share of income and the elite in Britain
- Japanese data reveals that there was capital around - among peasants in the 1840's there was a savings rate of 20 percent (US rate as of January 2018 is 3.2 percent)
- Much of the early mechanization didn't require huge investment (railroads are a different story)

When did European merchants have an advantage in terms of markets?

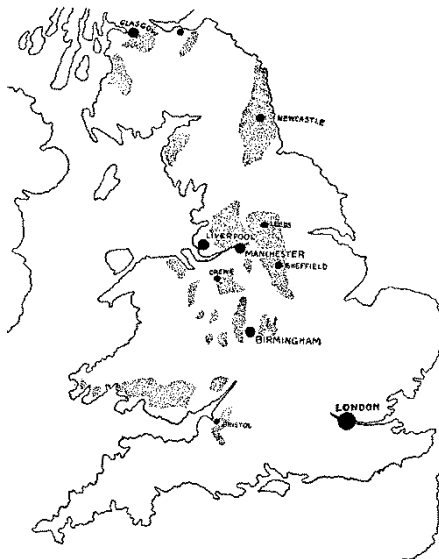
- When they weren't particularly free markets.
- Europeans did well when they could use force to create monopolies or near-monopolies (spice trade)
- Europeans benefited when wars and military force disrupted markets.
- In truly competitive markets, Europeans often fared worse than Asian merchants.
- Not exactly the classic free markets promote growth story (think how this changes our institutions stories)

Ecological Constraints

- Both Europe and Asia had to deal with Malthusian problems: if population goes up, you run into major problems with land being a fixed resource
- In modern times, synthetic fertilizer, synthetic fibers and cheap mineral energy solves this problem, but these things weren't around yet
- Europe was slightly less ecologically constrained than China (in part because Europeans were inefficient with using their land) but this was an advantage that would quickly disappear
- So why does Britain manage to escape these constraints while China does not?

- Switching to fossil fuels helps get around these ecological constraints
- England has lots of coal
- The problems with coal mining in England were different than the problems facing the Chinese
- Coal mining was intertwined with technological advance and the easing of ecological constraints

England's Coal Fields



British vs Chinese Mines



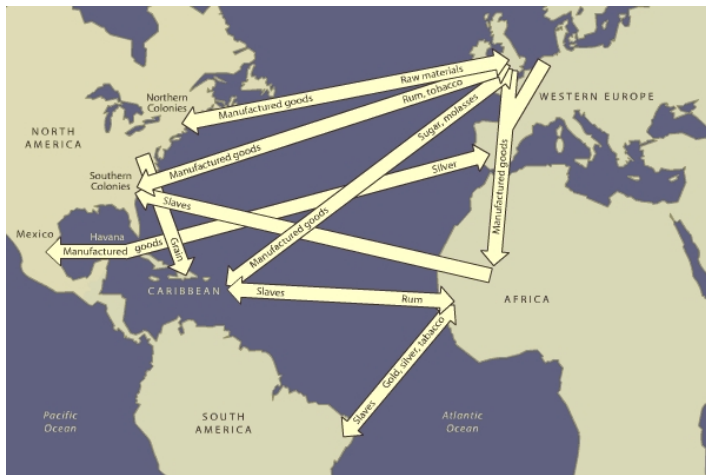
British vs Chinese Mines



Natural Resources from the New World

- Britain also has the advantage of importing natural resources from the New World
- Sugar, timber, cotton and other natural resources are all imported from the New World
- China did not have a similar influx of resources from the New World
- By Pomeranz's calculations, the land that it would have taken in Europe to replace these resources was enormous

The New World



Sugar and Ghost Acreage

Pomeranz's calculation of ghost acreage associated with sugar from the New World:

- 150,000 tons of sugar per year X 3.8 millions kcal per ton = 570,000 billion kcal from imported sugar
- Wheat (after milling into flour) produces 799,000 kcal per acre
- 570,000 million kcal from sugar / 799,000 kcal per acre of wheat = 713,000 acres to replace sugar calories
- 20 acres of wheat needs 4 oxen to plow, each oxen needs 1 acre of hay a year for food
- 713,000 acres of wheat + 713,000 acres of wheat x (4 acres of hay / 20 acres of wheat) = 856,000 acres of land total

856,000 Acres Saved with Sugar



Rhode Island: 775,680 acres

Cotton and Ghost Acreage

Pomeranz's calculation of ghost acreage associated with cotton from the New World:

- 100,000,000 pounds of cotton imported from New World in 1814, 263,000,000 pounds imported in 1830
- $100,000,000 \text{ pounds of cotton} \times 1 \text{ acre per } 500 \text{ pounds flax} = 200,000 \text{ acres to replace } 1815 \text{ imported cotton}$
- $263,000,000 \text{ pounds of cotton} \times 1 \text{ acre per } 500 \text{ pounds flax} = 526,000 \text{ acres to replace } 1830 \text{ imported cotton}$
- Ghost acreage doesn't seem too bad but flax was an inferior substitute for cotton

Cotton and Ghost Acreage

Pomeranz's calculation of ghost acreage associated with cotton from the New World:

- 100,000,000 pounds of cotton \times 500 acres per 8,445 pounds of wool = 5,920,000 acres to replace 1815 imported cotton
- 263,000,000 pounds of cotton \times 500 acres per 8,445 pounds of wool = 15,571,000 acres to replace 1830 imported cotton
- Adjusting to account for pound of cotton yielding 1.5 times as much yarn as pound of wool gives us 8,880,000 acres in 1815 and 23,356,500 acres in 1830

8,880,000 Acres Saved with Cotton



Netherlands: 10,260,000 acres

23,356,500 Acres Saved with Cotton

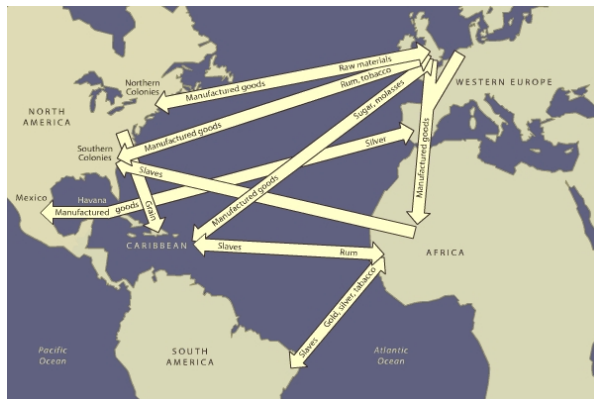


South Korea: 25,000,000 acres

How did England manage a revolution?

- So why did England have a revolution and not just postpone ecological disaster?
- Coal helps but it doesn't do away with all land constraints.
- Similarly, the New World helps but the New World is also finite.
- What it did was allow England to not shift workers back into agriculture.
- Trading with the New World allowed trade of manufactured goods (requiring little British land) for land-intensive food, fiber and timber at falling prices
- This wasn't possible with internal trade

The New World as a Trading Partner



How did England manage a revolution?

- Keeping British workers out of agriculture and in manufacturing allowed manufacturing to grow
- The New World and the right coal deposits may have helped Britain achieve a sort of critical mass in manufacturing
- Also think about how this relates to the points made by De Vries

What Was Happening in China

- China had the same population pressures going on as England
- China was also running up against an ecological constraint
- China had coal, but not in great locations and not demanding the same types of technological innovations
- China didn't have the equivalent of the New World for extra resources
- To cope with meeting demand for food, cloth, etc. China needs to use existing agricultural land more intensively
- This requires more labor, shifting labor out of manufacturing and back to agriculture

Questions About the Pomeranz Story

- Why did western European economies not stagnate after depleting the new resources?
- How crucial are slavery and military power to Pomeranz's story?
- Why were the relative economic gains by the Europeans persistent?
- What can Pomeranz say about changes in the rate of innovation, changes in demographics, etc?

Geography and the Industrial Revolution

- We've seen geography enter into nearly every explanation of development so far
- North and Thomas story depends in part on the depletion of natural resources
- Acemoglu, Johnson and Robinson feature geography in multiple ways:
 - Differences in environment → differences in disease → differences in institutions
 - The resource curse
- Diamond focused on endowments of plants and animals and the right kind of geographical axis
- Pomeranz addressed the location and nature of coal deposits as well as access to the natural resources of the New World

Geography and the Industrial Revolution

- The effects of geography are pretty hard to quantify
- How do we measure the extent of natural resource constraints?
- How do we disentangle all of the different things correlated with a tropical environment?
- How do we attribute economic growth today to initial ecological endowments and not the thousands of other things that impact a society over time?
- If geography remains relatively constant, offering no variation over time within a society, how can you identify a causal effect for that society?

Announcements

- The second referee report is due March 30th at 5pm (on “Intergenerational Occupational Mobility in Great Britain and the United States since 1850”)
- The empirical project is due April 20th at 5pm

Final Set of Readings

- Clark (2008) “A Farewell to Alms” Chapter 13
- Bleakley (2007) “Disease and Development: Evidence from Hookworm Eradication in the American South”
- Goldin and Katz (1998) “The Origins of Technology-skill Complementarity”
- Long and Ferrie (2013) “Intergenerational Occupational Mobility in Great Britain and the United States since 1850”

Estimating the Impact of Geography

- To think about how to look at the role of geography empirically, we're looking at two very different papers:
- “Trade, Institutions, and Ethnic Tolerance: Evidence from South Asia” by Saumitra Jha (APSR, 2013)
- “Portage and Path Dependence” by Hoyt Bleakley and Jeffrey Lin (QJE, 2012)

Trade, Institutions and Ethnic Tolerance

- Jha is interested in the relationships between trade, institutions and ethnic tolerance
- Consider the words of Baron de Montesquieu (1748):

“Commerce is a cure for the most destructive prejudices; for it is almost a general rule that wherever the ways of man are gentle there is commerce; and the wherever there is commerce, there the ways of men are gentle.”
- In contradiction to this quote is the experience of ethnic Chinese in Indonesia, South Asians in East Africa, and Jews in Europe
- Jha’s main question: what conditions for trade lead to ethnic tolerance?

Trade, Institutions and Ethnic Tolerance

- Nonlocals and locals should produce complementary goods or services
- If they produced substitute goods, strong locals would force weak nonlocals out of town (ethnic violence)
- The nonlocals' contributions should be hard to cheaply replicate
- The nonlocals' resources should be hard to violently seize
- There need to be mechanisms that redistribute surplus between groups to reduce incentive to violently expropriate
- How do Muslim traders satisfy these conditions?

Trade, Institutions and Ethnic Tolerance

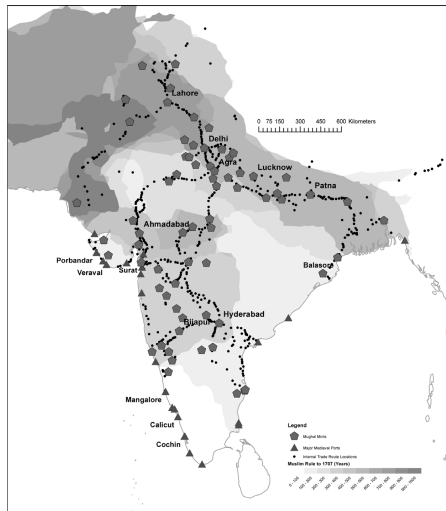
- There were Islam-specific advantages to trade across the Indian Ocean
 - Pilgrimages to Mecca coordinated the development of the world's largest textile market during the Hajj
- Muslim advantages in oceanic trade were hard to steal or replicate
 - Trade networks enjoy increasing returns to scale
 - Oceanic trade can't be split into short segments and replicated by a local
- There was a natural, decentralized mechanism for the redistribution of surplus to locals
 - It was easy for any Muslim to enter into the Indian Ocean trade (unlike kin-based trade networks)
 - Intra-Muslim competition would drive prices down for locals

Trade, Institutions and Ethnic Tolerance

- Jha draws on a wide range of data to test his theories (historical texts on trade patterns, geographic data, datasets on ethnic violence, surveys on modern attitudes, etc.)
- I want to focus on a couple of pieces of geographical data
- The basic thing that Jha needs to test is whether areas that gave rise to the right kinds of trade end up having lower levels of ethnic violence
- A key thing to look at would be areas that are medieval ports

Trade, Institutions and Ethnic Tolerance

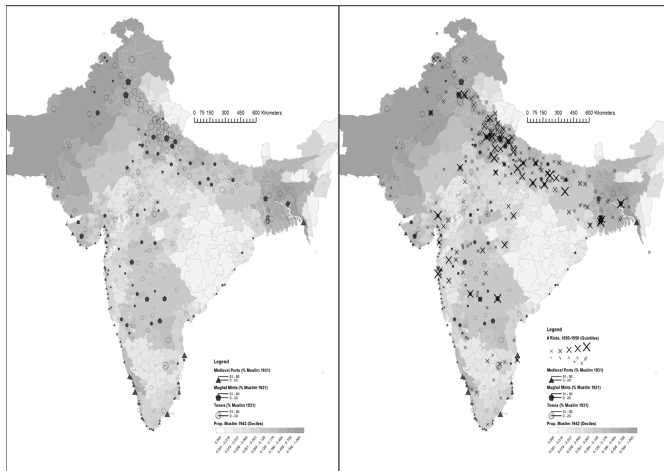
FIGURE 1. Major Medieval Ports and Political Patronage Centres, ca. 8th century- 1707



Note: Muslims traded to ports across both coasts in the medieval period, spanning places that enjoyed long periods of Muslim political control (shaded darker) and areas where such control was fleeting (lightly shaded). Many towns were also founded as centres of Muslim political control and patronage in the medieval period, with mints established to monetize wealth.

Trade, Institutions and Ethnic Tolerance

FIGURE 2. Medieval Legacies: Religious Composition and Hindu-Muslim Riots



(a) Religious Composition, 1931

(b) Hindu-Muslim Riots, 1850-1950

Note: The pattern of modern religious demography mimics patterns of Muslim rule, medieval trade, and political patronage. Medieval ports and major Muslim patronage centers (such as those that housed mints) continued to have greater Muslim populations relative to nearby areas in 1931. Medieval ports, however, experience fewer religious riots relative to towns nearby.

Trade, Institutions and Ethnic Tolerance

- But there are a couple of problems of endogeneity that will get in the way of causal inference
- First, why were particular ports chosen?
- The unobserved characteristics that lead to a particular port being chosen may also be correlated with ethnic tolerance or economic outcomes
- Second, what if there are other unobserved variables correlated with international trade?
- In this case, it may not be trade itself leading to tolerance but something correlated with trade driving results

- The first issue in Jha's words:

A [potential] concern...is that Muslim traders may have chosen to trade at geographically similar ports for unobservable reasons, such as having a local population with a proclivity for peace independently of trade.

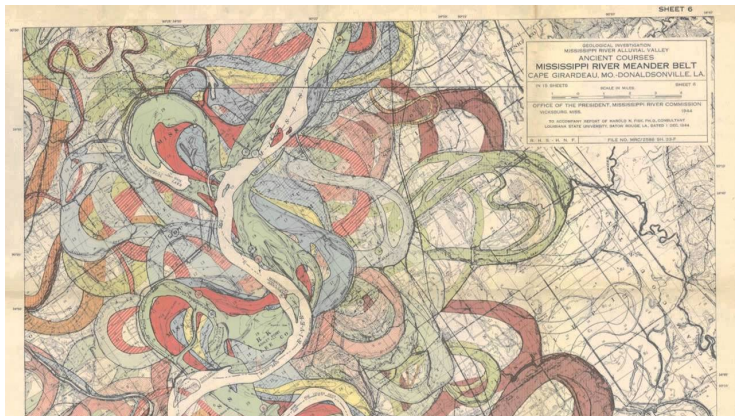
- Solution: don't look at which towns did become ports, look at which towns had the right geography to be a port

- Jha identifies medieval natural harbors through the following steps:
 - Use a 2001 atlas to identify water bodies within 10km of the modern Indian coastline
 - If those bodies intersected the coast in a the medieval period, they would have produced inlets or sheltered harbors
 - Towns within 10km of those water bodies are defined as potential harbors
- These potential harbors provide an instrument for the actual harbors

Trade, Institutions and Ethnic Tolerance

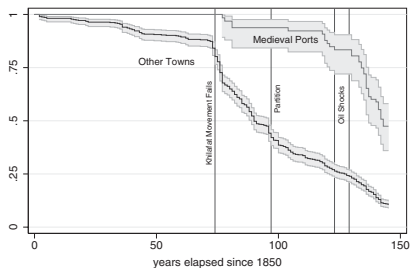
- The second issue is trickier unless there is an exogenous force shutting off trade to certain ports randomly
- Good news, there is
- Jha notes that coast itself has moved over time due to the effects of monsoon season
- Certain ports that were active harbors in medieval times have become inaccessible to shipping due to silting
- This gives Jha natural variation in the viability of trade within a town over time

Trade, Institutions and Ethnic Tolerance



Trade, Institutions and Ethnic Tolerance

FIGURE 3. Timing of the first failure of religious tolerance, 1850–1995



Note: This Kaplan-Meier curve compares the relative survival rate of towns without any religious rioting.

Trade, Institutions and Ethnic Tolerance

- Medieval ports were five times less prone to Hindu-Muslim riots between 1850 and 1960 (two centuries after Europeans disrupted Muslim overseas trade dominance)
- Medieval ports remained half as prone to Hindu-Muslim riots between 1950 and 1995
- These effects are present even if the port was silted over (so they are not driven by engaging in modern trade)
- These silting results bring us back to some of the persistence stories we covered when looking at institutions

Trade, Institutions and Ethnic Tolerance

- Jha's results aren't simply about the incidence of riots
- Medieval port residents today are more likely to be members of business groups and trade unions and join credit and savings groups
- There is greater trust in medieval port communities today than non-port communities
- Where does this evidence on trust come from?

Trade, Institutions and Ethnic Tolerance



Portage and Path Dependence

- One takeaway from Jha is that geography influenced medieval trade which in turn influenced institutions and modern outcomes
- Bleakley and Lin are exploring a similar pathway, thinking about how geography determined the center of economic activity
- They are interested in what happens when those geographical advantages disappear, much like Jha's use of silting
- Let's let Bleakley and Lin set things up in their own words:

Portage and Path Dependence

Why is economic activity distributed unevenly across space? Is the distribution of population determined uniquely by natural endowments, or does path dependence have a role even in the long run? Separating these two effects can be challenging, in part because the features that first brought people to an area (such as topography, resources, climate, etc.) are usually persistent, thus confounding attempts to attribute the spatial distribution of activity to path dependence.

Portage and Path Dependence



Portage and Path Dependence



Portage and Path Dependence



Portage and Path Dependence

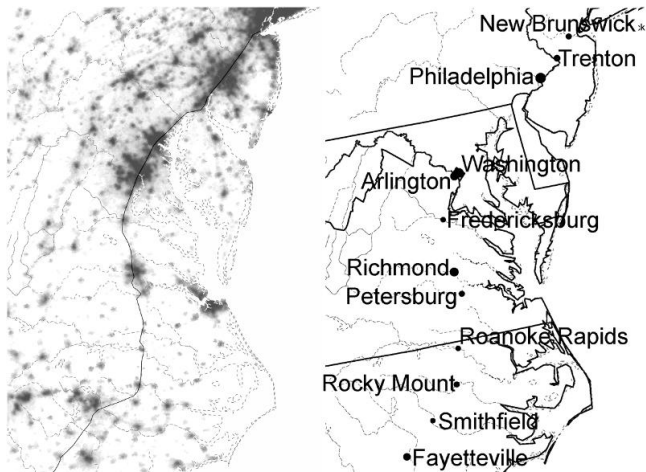
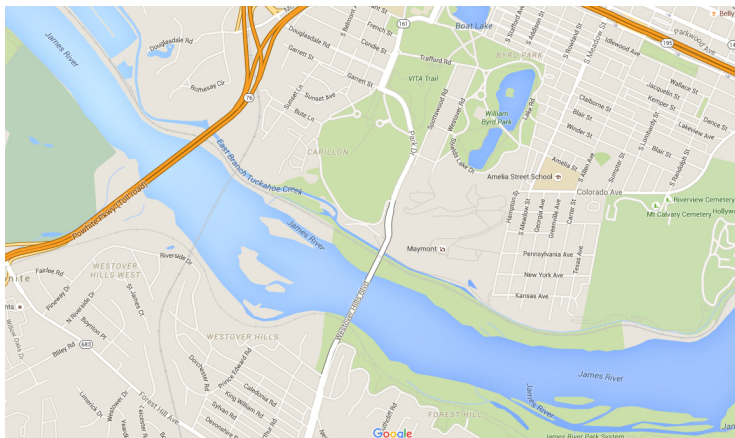


FIGURE IV
Fall-Line Cities from North Carolina to New Jersey

Portage and Path Dependence



Portage and Path Dependence

- Bleakley and Lin use the fall line as a source of a geographical advantage that disappeared
- So it gave cities their start but then ceased to help them once railroads came through
- What happens to cities when the fall line ceases to be relevant?
- Quick answer: Richmond is still standing
- They interpret these results as evidence of path dependence and increasing returns to scale in local economic activity
- Think about the relevance to our discussion of the work of Diamond and Pomeranz