

A History of Knowledge

Oldest Knowledge

What the Sumerians knew

What the Babylonians knew

What the Hittites knew

What the Persians knew

What the Egyptians knew

What the Indians knew

What the Chinese knew

What the Greeks knew

What the Phoenicians knew

What the Romans knew

What the Barbarians knew

What the Jews knew

What the Christians knew

Tang & Sung China

What the Japanese knew

What the Muslims knew

The Middle Ages

Ming & Manchu China

The Renaissance

The Industrial Age

The Victorian Age

The Modern World

What the Industrial Age knew

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Treat a man as he is, and he will remain what he is. Treat a man the way he can be and ought to be, and he will become as he can be and should be."

(Goethe)

Philosophy has only interpreted the world. The real challenge is to change it.

(Epigraphe on Karl Marx tomb)

"It will take a thousand years for the frontier to reach the Pacific"

(Thomas Jefferson in the 1780s)

"It is reasonable to expect that, with the favorable effects of time, and of European arts and sciences, [the USA] will become the most formidable power in the world."

(the Venetian ambassador to Paris, 1783)

Like all religions, Reason presents itself as the solution to the problems it has created

(John Ralston Saul, 1992)

What the Industrial Age knew

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Europe 1700



<http://www.euratlas.com/>

The Industrial Age

1750: There are about 300 states in Germany

1756: Britain and Prussia declare war against France, Austria and Russia ("Seven Years' War")

1760: Abd Wahhab allies with Muhammad Ibn Saud and founds the Saudi state in Arabia, founded on a pure form of Islam

1770: James Cook lands in Australia and claims it for Britain

1776: the American colonies ratify the Declaration of Independence

1789: a popular uprising in Paris starts the French Revolution

1790: the French Academy invents the "metric" system

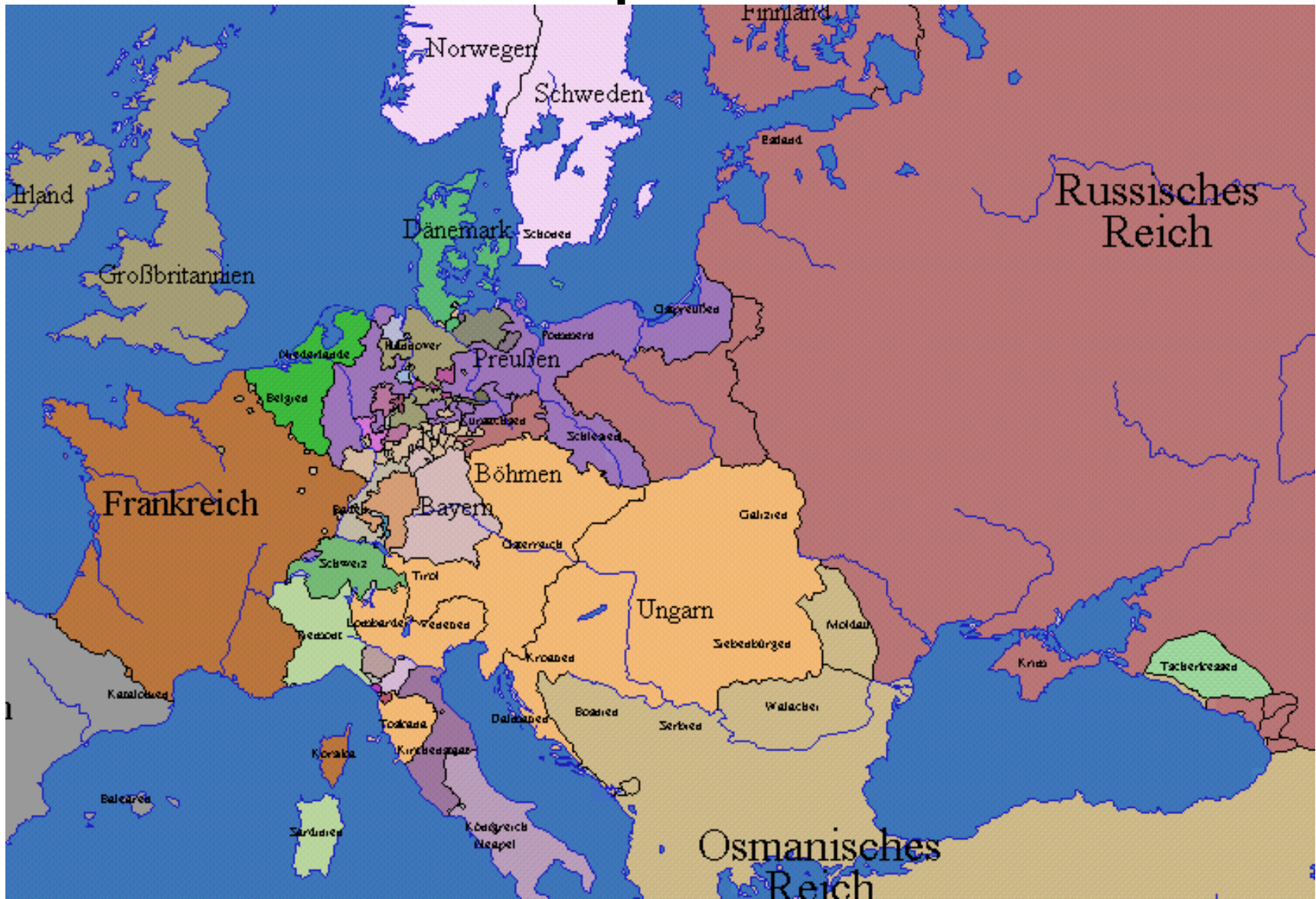
1700-1860: 15 million Africans are sold to the Americas (40 million die)

1795: Poland-Lithuania is divided between Russia and Prussia

1797-1815: Napoleonic wars

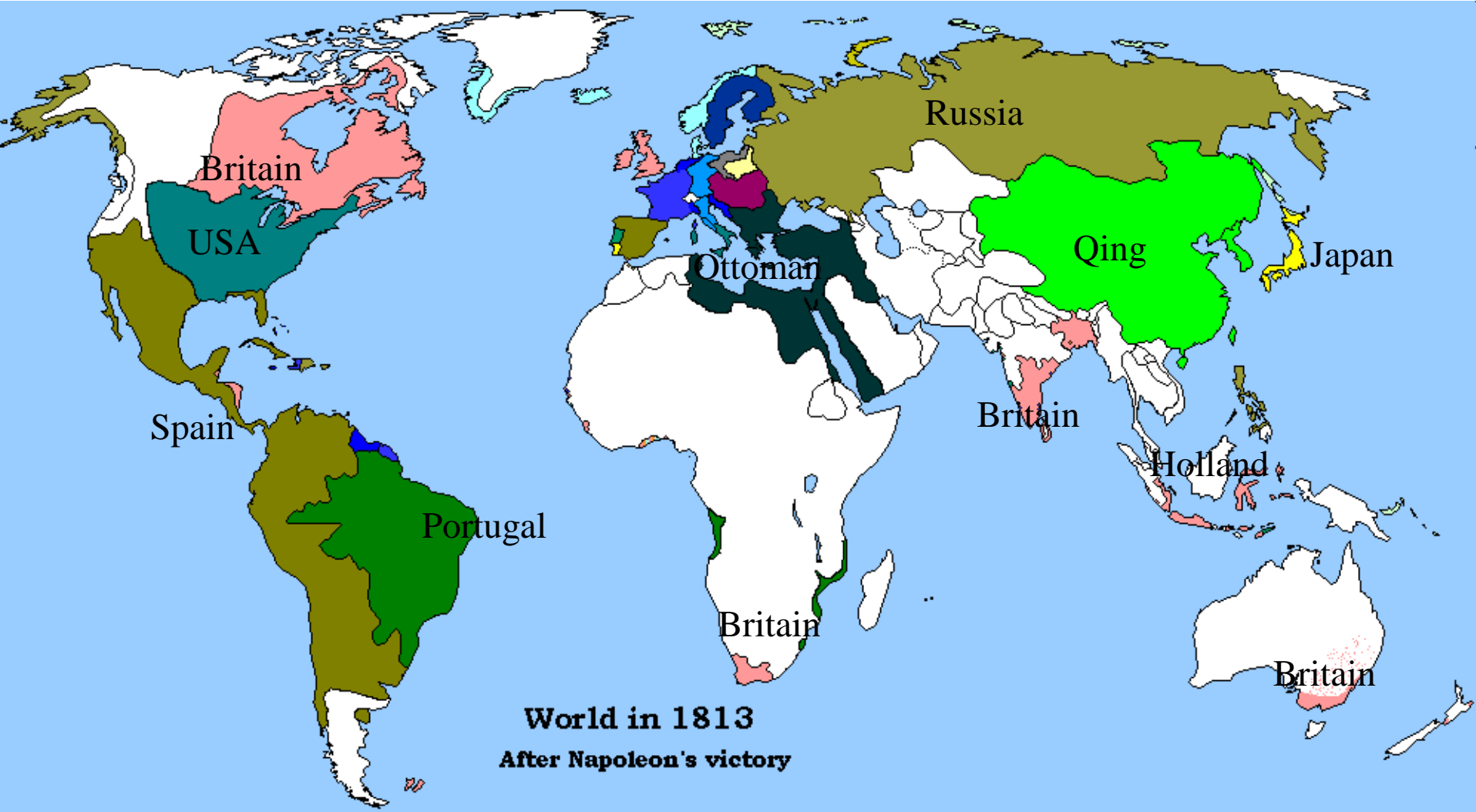
1800: 2.5% of the world's population lives in cities

Europe 1815

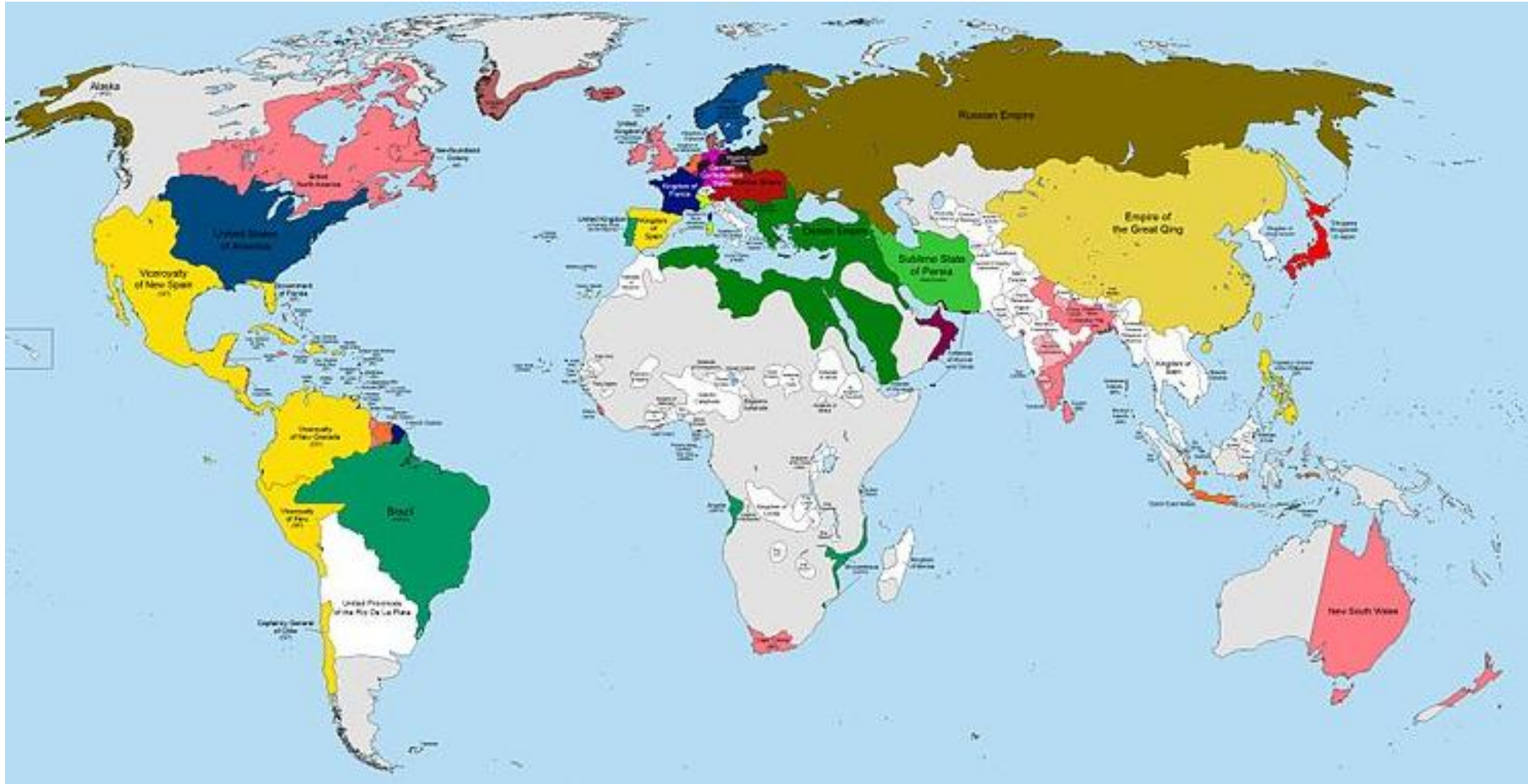


<http://www.uni-potsdam.de/u/slavistik/diverses/maps/1815.htm>

World 1813



World 1815



The Industrial Age

1812-24: Independence movement in Hispanic America

1830: The world's population is 1 billion

1839: Opium war (China vs Britain)

1847: France invades Algeria

1848: Republican (“liberal”) movements in Europe

1848: gold is discovered in California, whose population is 6,000

1851: the USA has 20,067,720 free persons and 2,077,034 slaves

1858: collapse of the Mogul empire in India

1859: Edwin Drake strikes oil in Pennsylvania

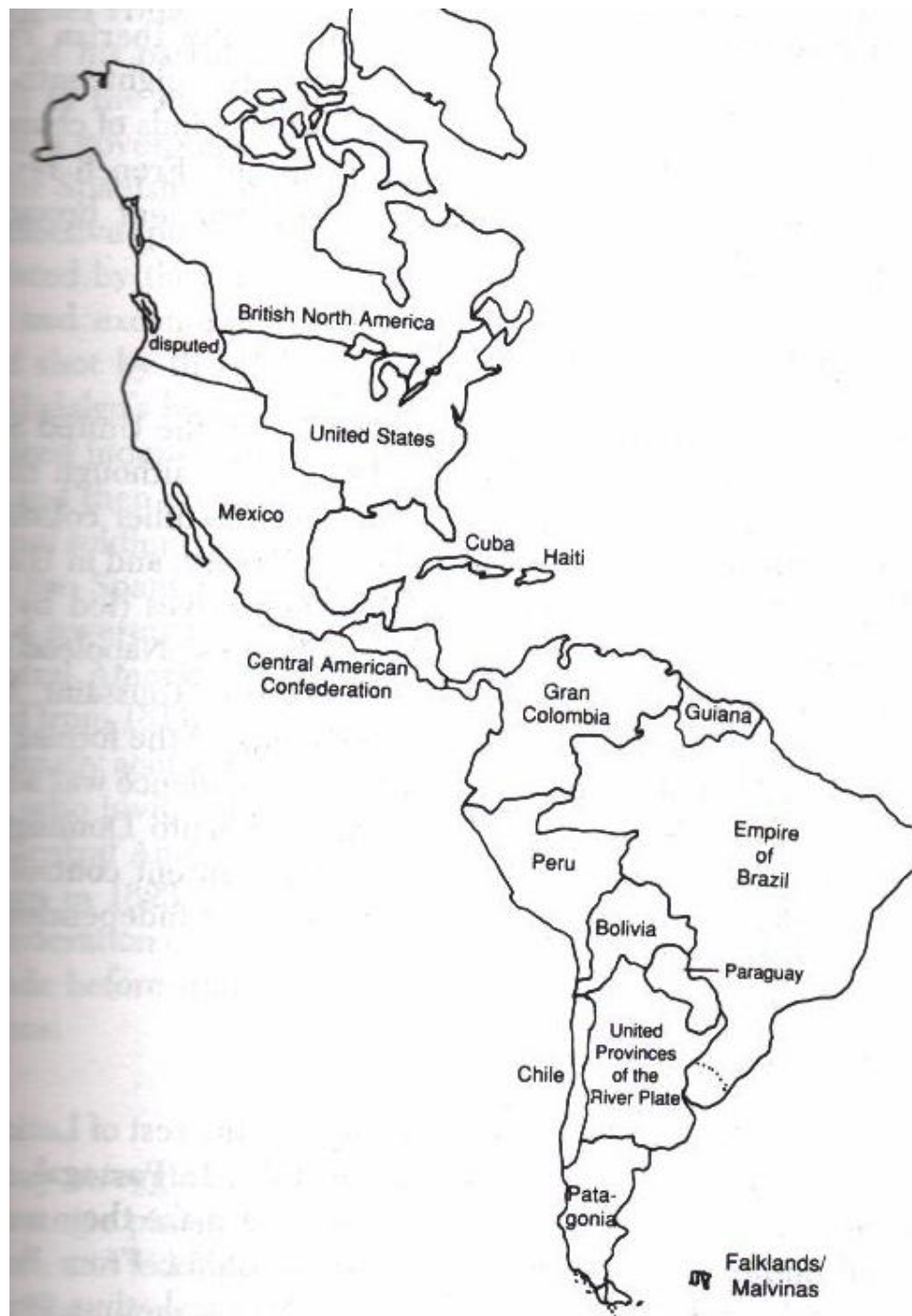
1861: Garibaldi unites Italy

1861-65: American civil war

1864: Karl Marx creates the First International in London, a coalition of socialist parties from all over the world

1871: Bismark unites Germany

1826



Austro-Hungarian empire (1850)



The Multi-national European Wars

- 1756-1763: Seven Years' war: Prussia and Britain win against France, Austria, Russia, Saxony, Sweden and Spain
- 1768-74: Russia defeats the Ottomans
- 1792-1815 Napoleonic wars: Austria, England, Russia, Spain, Sweden, Prussia win against France
- 1787-92: Russia and Austria defeat the Ottomans
- 1806-12: Russia defeats the Ottomans
- 1828-29: Russia, France and England defeat the Ottomans
- 1853-56: Ottomans, England and France defeat Russia

The Multi-national European Wars

- Seven Years' war
 - Causes:
 - Growth of the British navy (that aims at matching France's)
 - Growth of the Prussian army (that aims at matching Austria's)
 - Consequences
 - Protestant Prussia becomes a power
 - Protestant Britain becomes an empire
 - Decline of Catholic France and Catholic Spain
 - British monopoly of the Atlantic slave trade
 - To pay for the cost of the war, Britain precipitates the American Revolution

The Multi-national European Wars

- Britain
 - George I (1714-27) and George II (1727-60), born in Germany
 - Prime minister: Robert Walpole (Whig, 1721-42)
 - George III (1760-1820), born in England
 - Prime minister: Frederick North (Tory, 1770-82)
 - William Pitt: 1783-1801
 - Seven-years war
 - Expansion in America and India
 - Henry Addington: 1783-1804
 - Robert Jenkinson: 1812-27
 - George IV (1820-30)
 - William IV (1830-37)

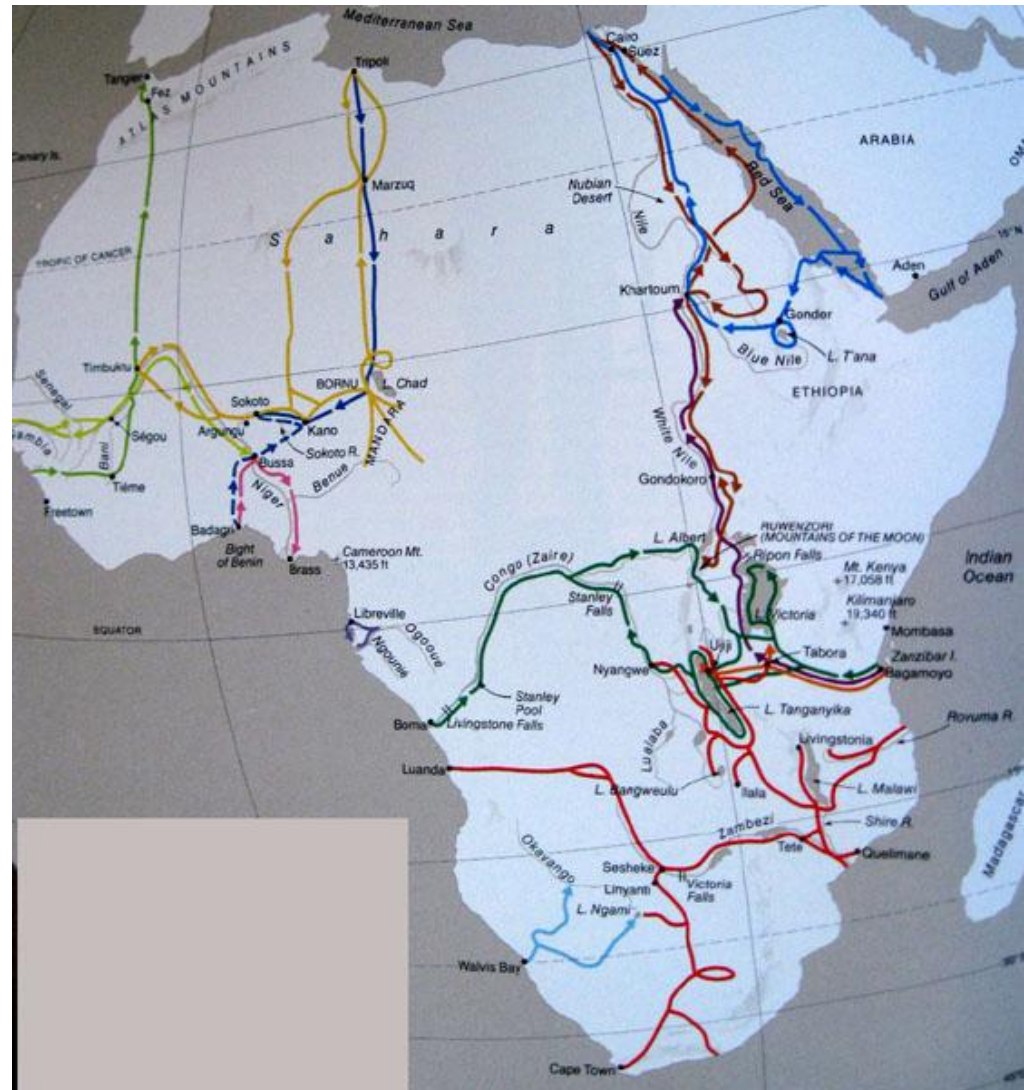
The Multi-national European Wars

- Britain
 - The “enclosure acts” (1700-1800) transfer land from poor farmers to rich landowners
 - “Corn laws” and “navigation acts” protect British markets from foreign competition

What the Industrial Age knew

- Exploration of Africa

- Bruce 1768-1773
- Park 1795-1806
- Clapperton, Denham, and Oudney 1821-25
- Clapperton and Lander 1825-27
- Caillié 1827-28
- R. and J. Lander 1830
- Livingstone 1841-1873
- Barth 1850-55
- Andersson 1853-59
- Burton and Speke 1857-59
- Speke and Grant 1860-63
- S. and F. Baker 1861-65
- Stanley 1871-1889
- Kingsley 1895



What the Industrial Age Knew

- Latin American independence



Henry Tanner, 1846



Antony Finley, 1826

What the Industrial Age Knew

- Latin America independence/ Haiti
 - 1790: The French colony of Haiti, whose population is 90% black slaves, produces half of the world's coffee besides sugar, cotton, tobacco, cocoa and indigo
 - 1791: Black slaves led by Toussaint L'Ouverture rebel
 - Collapse of the coffee economy
 - 1793: Haitian refugees spread yellow fever in Philadelphia
 - 1793-98: British intervention to avoid domino effect (rebellions in its own colonies)

What the Industrial Age Knew

- Latin America independence/ Haiti
 - 1802-03: Napoleon's troops invade Haiti but are massacred by yellow fever
 - 1803: Without Haiti, France doesn't need the port of New Orleans, and so it sells Louisiana to the USA
 - 1804: Haiti declares independence from France, the second colony after the USA to become independent in America

What the Industrial Age Knew

- Latin America independence/ Haiti
 - No European or American country recognizes Haiti
 - A decades-long boycott turns rich Haiti into the poorest country of the Americas
 - After losing Haiti, France launches the sugar beet industry (Franz Carl Achard in 1802 opens the first factory for producing beet sugar)
 - The rebellion ignites the abolitionist movement and in 1807 Britain bans the slave trade
 - Cuba benefits from the blockade of Haiti

What the Industrial Age Knew

- Spanish America/ Before independence
 - Spain discourages technology and industry
 - Spain wants the colonies to be a market for Spanish goods, not a manufacturing competitors
 - Mood of the Counter-Reformation does not encourage science and technology
 - Emergence of Buenos Aires for export of leather (long considered a liability because on the Atlantic and therefore difficult to defend from pirates and smugglers)

What the Industrial Age Knew

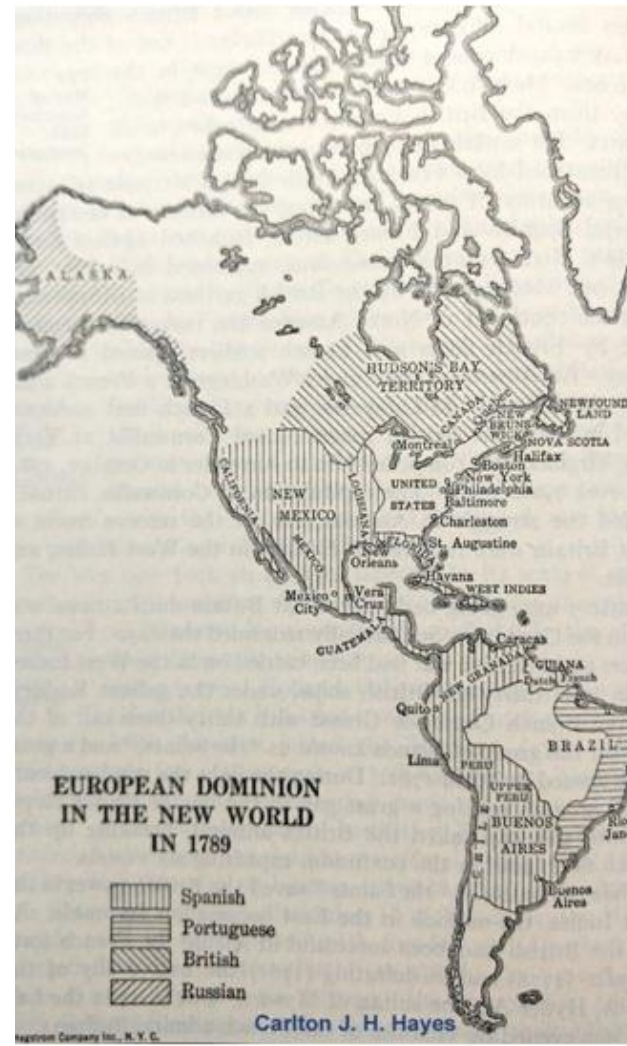
- Spanish America/ Before independence
 - Emergence of Venezuela for export of coffee and cacao
 - Emergence of Cuba for export of sugar (second after Jamaica and Brazil in 1792)
 - Agricultural exports boom due to population boom and industrialization in Europe
 - For the first time regions that don't have precious metals can get rich too
 - 1797: British naval victory over Spain cuts off Spain from American colonies

What the Industrial Age Knew

- Spanish America/ Before independence
 - Low standard of living because of Spain's economic troubles and local mismanagement
 - Excessive taxation
 - Power struggle between Spanish-born class and the American-born Criollos
 - Indifference of Indios, mestizos, slaves
 - Collapse of Spanish power during the Napoleonic occupation
 - USA independence (1776)
 - French Revolution (1789)
 - Popular expulsion of the British from Buenos Aires (1807) cements confidence

What the Industrial Age Knew

- Spanish America/ Before independence
 - America in 1789



What the Industrial Age Knew

- Spanish America/ Independence
 - USA and Britain protect new Latin American republics against the Holy Alliance (Spain, France, Prussia, Austria, Russia)
 - Distances, lack of communication and sparse population favor caudillos, who install brutal dictatorships
 - Latin American independence is enabled by trouble back home for the monarchies of Spain and Portugal (Napoleon, republican revolutions)
 - Inspired by Constitution of Cadiz in Spain (1812)

What the Industrial Age Knew

- Spanish America/ Independence
 - 1810: The cities declare war on Spain
 - Later: The provinces (that want regional gaucho/llanero autocracies) declare war on the cities (that want liberal democracies)

What the Industrial Age Knew

- Spanish America's Independence
 - Caudillos
 - Paraguay: Francia (1811-40) folk caudillo, pseudo-communist society
 - Argentina: Rosas (1829-52) gaucho revolution of the countryside for regional autonomy (federalists) against the urban "unitarians"
 - Chile: Portales (1829-37)
 - Venezuela: Paez (1830-63) llaneros revolution of the countryside
 - Mexico: Santa Anna (1833-55, son of Spanish immigrants from rural Veracruz)
 - Bolivia: Santa Cruz (1829-39, an indio)
 - Ecuador: Flores (1830-45) theocracy
 - Peru: Castilla (1845-63, a mestizo)
 - Guatemala: Rafael Carrera (1839-65) folk caudillo

What the Industrial Age Knew

- Spanish America's Independence
 - Most stable constitutions
 - Chile 1833-1925
 - Uruguay 1830-1918
 - Mexico 1857-1917
 - Brazil (monarchy) 1824-89

What the Industrial Age Knew

- Spanish America's Independence
 - Liberals vs Conservatives
 - Conservatives: wealthy landowners and city dwellers, clerical, unitarians, economic privileges
 - Liberals: middle class of the provinces, anticlerical, federalists, economic equality
 - Military controls the treasury of the state
 - Caudillos often favored by liberals-conservatives antagonism
 - Liberal policies increase the wealth gap (fair competition for land and business favors the rich)

What the Industrial Age Knew

- Latin American independence
 - Brazil until 1808
 - Brazil lacks the native civilizations of Spanish America (Incas, Aztecs, etc) that have already created cities and infrastructure and accumulated wealth (gold, silver)
 - Brazil's Indios are still “naked savages”
 - Portugal's strategic interests lie in West Africa (slaves and gold) and the Far East (spices, silk) not in the hostile landscape of Brazil
 - No governor and no capital until 1549
 - Sugar in Pernambuco

What the Industrial Age Knew

- Latin American independence
 - Brazil until 1808
 - Indios are enslaved but too uncivilized to be useful and protected by Jesuits
 - Dutch in Pernambuco till 1654 disrupt sugar plantations and export techniques to the Caribbeans
 - The Union with Spain allows Brazil to expand 2500 kms west (Pedro Teixeira, 1639)
 - Interior of Brazil mostly explored by bairderantes (Tupi-speaking mixed-race Sao Paulo natives leading slave expeditions)

What the Industrial Age Knew

- Latin American independence
 - Brazil until 1808
 - Banderantes turn to precious metals (Mina Gerais, Mato Grosso) after Portugal begins mass importation of African slaves (mid 17th c) and Jesuit campaign against Indio slavery (Antonio Vieira, 1653)
 - Gold and Diamond Rush of Brazil (1700-60)
 - Rise to political power of whites born in Brazil

What the Industrial Age Knew

- Latin American independence
 - Brazil until 1808
 - Brazil (on the Atlantic coast) is more easily reached from Europe and Africa than Spanish America
 - Therefore no need to build locally, easy to import from Europe
 - Precious metals pay for imported manufacture
 - No need for domestic trade routes

What the Industrial Age Knew

- Latin American independence
 - Brazil until 1808
 - Cheap to import slaves from Africa
 - Brazil becomes a land of white and black people as few Indios survive (as opposed to Spanish America's mix of white and Indios)
 - Mining shifts the economic and political center of mass south (Rio de Janeiro gets a high court in 1752)
 - Expulsion of Jesuits (1759), who run most of the higher education, causes education crisis
 - No printing press until 1808

What the Industrial Age Knew

- Latin American independence
 - Brazil until 1808
 - Agricultural boom of late 18th c
 - 1791: Slave revolt in Saint-Domingue (Haiti) boosts Brazil's sugar industry
 - 1792: Brazil provides 30% of cotton used by Britain
 - Tobacco in Bahia
 - Coffee from Pernambuco, Bahia, Rio, Minas Gerais exported all over Europe
 - 1796: Gold only accounts for 17% of Brazil's exports to Portugal compared with 51% of agricultural exports

What the Industrial Age Knew

- Latin American independence
 - Brazil until 1808
 - Sugar and gold civilizations have created a poor and backward society
 - No university
 - Only two printing presses
 - No cultural life
 - No integration between the various cities, and no colonization of the interior
 - Largest city: Rio with 30,000 inhabitants (1/3 of Lima, 1/4 of Mexico City)
 - Most of the population is black slaves (2M out of 3.5M)

What the Industrial Age Knew

- Latin American independence
 - Brazil
 - 1808: Napoleon invades Portugal, the Portuguese king Dom Joao VI flees to Brazil under the protection of Britain: Brazil becomes de facto a British protectorate until World War I (when the USA replaces Britain)
 - Britain controls the Atlantic
 - British monopoly of trade with Brazil
 - British capital investments in Brazil
 - Standard of living increases thanks to British goods and British investment
 - But Britain does not need Brazil's exports (1812: Britain exports more goods to Brazil than to all of Asia combined)

What the Industrial Age Knew

- Latin American independence
 - Brazil
 - No trauma of an independence war
 - Exports: sugar, coffee, cotton
 - No steamship nor railway until the 1850s

What the Industrial Age Knew

- Latin American independence
 - 1828



What the Industrial Age Knew

- Latin American independence
 - Age of the civil wars
 - Liberals (USA constitution) vs conservatives
 - Cities vs countryside
 - Military vs parties
 - Federalists vs unitarians
 - Mestizos vs indios
 - Oligarchy (landowners, miners, merchants, industrialists) vs masses

What the Industrial Age Knew

- Latin American independence
 - Economics
 - Industrial Europe (Britain, Germany, France) requires natural resources and food
 - Latin America's export boom fueled by European and US demand (exports grow 1000% between 1850 and 1914)
 - Industrial Europe funds mining and transportation with its own capital
 - Much land available
 - Cheap labor
 - Ironically, Spain and Portugal fade away as trading partners

What the Industrial Age Knew

- Latin American independence
 - Economics/1850-1913
 - Electrification creates demand for copper (Peru, Mexico, Chile)
 - Canned foods create demand for tin (Bolivia)
 - Agricultural revolution requires nitrates (Chile)
 - Electrification and bicycles (and later cars) create demand for rubber (Brazil, Peru)
 - Soft drinks create demand for mate (Paraguay), cacao (Ecuador, Dominican) and coffee (Brazil, Venezuela, Colombia, Central America)
 - Bananas (Caribbeans)
 - Grains (Argentina)
 - Refrigerated ships enable exports of meat (Argentina)

What the Industrial Age Knew

- Latin American independence
 - Economics/1850-1913
 - Main importers of Latin American goods by 1913
 - USA 29.7% (mostly Brazil, Mexico and Central America)
 - Britain 20.7% (mostly Argentina, Chile, Peru, Bolivia)
 - Owners of Latin American debt
 - Britain 67.8%
 - USA 23.8%

What the Industrial Age Knew

- Latin American independence
 - Mexico
 - Plus
 - Richest and most populous part of the Latin American states
 - Bloodless revolution
 - Slavery insignificant
 - Minus
 - 90% illiterate in 1880
 - Gold and silver drive the economy (they constitute 85% of the exports in 1870)
 - Military coups, civil wars, foreign intervention

What the Industrial Age Knew

- Latin American independence
 - Argentina
 - Cattle and sheep products
 - Grains
 - Conflict between Buenos Aires and the countryside (landowners and merchants)
 - Massive immigration from Europe

What the Industrial Age Knew

- **Latin American independence**
 - **Chile**
 - **Poor colony, small population**
 - **Whites and indios are mixed, very few blacks**
 - **Little military intervention after 1829**
 - **Catholic Church as state religion**
 - **Pragmatic politics**
 - **Copper, silver, nitrates**
 - **By 1879 good administration makes Chile a regional power (War of the Pacific, a war of conquest for rich mines)**

What the Industrial Age Knew

- Latin American independence
 - Peru
 - Mostly exporting silver and guano
 - Large indio population
 - Politics controlled by the army
 - During the independence wars the criollos of Peru were the only ones still loyal to Spain, reluctant revolutionaries

What the Industrial Age Knew

- Latin American independence/ 1850-60
 - Mexico produces half of the world's silver
 - Chile is the world's main exporter of copper
 - Peru is the world's main exporter of guano
 - Land and labor are cheap
 - Exports to Europe are more valuable than imports of manufacture goods
 - The price of manufactured goods decreases because of mass production
 - Positive trade balance with Europe
 - No motivation to industrialize
 - Latin America turns from being a political colony of Spain/Portugal to being an economic colony of industrialized countries (mainly Britain)

What the Industrial Age Knew

- Latin American independence
 - First major civilian governments
 - Colombia: José Ignacio de Márquez (1837)
 - Chile: Manuel Montt (1851)
 - Mexico: Benito Juárez (1858)
 - Argentina: Domingo Faustino Sarmiento (1868)
 - Peru: Manuel Pardo (1872)
 - Brazil: José de Moraes Barros (1894)
 - Ecuador: Jose Eloy Alfaro (1895)
 - Uruguay: Josi Battle y Ordonez (1903)
 - Venezuela: Romulo Gallegos (1947)
 - Bolivia: Hernan Siles (1956)
 - Paraguay: Juan Carlos Wasmosy (1993)

What the Industrial Age knew

- Latin America
 - Catholic Church impedes innovation
 - Mining, agriculture and livestock but no industrialization
 - Surplus traded for foreign manufactures
 - Little investment to create a domestic market

What the Industrial Age knew

- Latin America
 - Foreigners provide the main funding for the infrastructure (eg, railway) and build the main plants (eg, food processing)
 - Foreigners are increasingly blamed for the ills of Latin America (widespread anti-imperialism)
 - Buenos Aires: a horseshoe is more expensive than a horse
 - Immigration largely controlled by governments (only Catholics welcome, only farmers and artisans welcome)

What the Industrial Age knew

- British Empire
 - 1713: Britain and France sign a peace treaty ("Treaty of Utrecht") that hands most of Canada to Britain
 - 1733: James Oglethorpe founds Georgia south of Carolina
 - 1751: Britain captures the town of Arcot from the French and becomes the leading colonial power in India
 - 1757: The British East India company defeats France and gains access to Bengal (battle of Plassey)
 - 1763: Britain acquires the French possessions of Canada and India at the end of the Seven Year's War
 - 1763: British India = Calcutta/Kolkata + Madras/Chennai + Bombay/Mumbai + smaller towns
 - 1770: James Cook claims Australia for Britain
 - 1783: Britain recognizes the independence of the USA
 - 1787: Britain founds Sierra Leone in Africa
 - 1788: The first British settlement in Australia (convicts)
 - 1796: Holland surrenders Malacca and Sri Lanka to Britain

What the Industrial Age knew

- British Empire
 - 1798: Richard Wellesley becomes governor of India and begins a rapid military expansion
 - 1799: Britain conquers Mysore
 - 1803: Britain conquers Delhi from the Marathas and controls most of India
 - 1814: Britain purchases the Cape Colony from Holland
 - 1821: Sierra Leone, Gambia and the Gold Coast are combined to form British West Africa
 - 1826: Malacca, Penang and Singapore join in a British colony
 - 1836: South Australia becomes a province of the British Empire
 - 1840: The divided Maori tribes of New Zealand accept to be annexed by Britain

What the Industrial Age knew

- British Empire
 - Most valuable colonies: India and West Indies (provide commodities that cannot be made in Britain)
 - Note: the British Empire never tried to conquer Europe although at one point it was the wealthiest and most powerful country in the world

What the Industrial Age knew

- British Empire
 - Exporter of people and capital
 - Colonies as useful overflow for exploding population (between 1600 and 1950 about 20 million Britons emigrated)
 - Capital available from the slave trade (peaked in 18th century)
 - Military power sustained by capacity to tax (2/3 times the % of GNP paid in taxes by France) and borrow (between 1750 and 1820, debt servicing in peacetime amounted to almost 50% of all government expenses)

What the Industrial Age knew

- British Empire
 - Self-appointed mission to redeem the world, being the first “democratic” country (Magna Carta) and a Christian country
 - A liberal empire, pretending to enslave in the name of freedom
 - The seeds of its demise were planted by the original colonists: explorers, adventurers, traders, hunters, preachers, criminals (they all cherish freedom above all else)

What the Industrial Age knew

- British Empire/ 1763
 - Seven Years War: France surrenders Canada, Dominica, Grenada, and eastern Louisiana (all territory east of the Mississippi River) to Britain, Spain surrenders western Louisiana to France and Florida to Britain

What the Industrial Age knew

- British Empire/ 1763
 - 1763: To end an Indian rebellion, Britain bans colonial settlements west of the Appalachians, mostly lands acquired from France ("Royal proclamation"), first formal acknowledgement of Indian land rights and self-determination
 - Resentment among veterans of the French and Indian War
 - Resentment among Virginia's land speculators like George Washington who cannot profit from the new lands
 - Britain wants colonists to populate the newly acquired north and south regions (Quebec and Florida), not western ones
 - Britain doesn't want colonists to farm in the west for fear of a competitive commercial agriculture
 - First major ideological break between the colonists and the mother country

What the Industrial Age knew

- British Empire/ 1776
 - Independence War of the American colonies (1776) unmasks the hypocrisy of British ideology
 - Decline and Fall of the Roman Empire by Edward Gibbon (1776) inspires thoughts about the British empire after its first major setback
 - The Wealth of Nations by Adam Smith (1776) proves that the empire does not make economic sense and weakens its theoretical foundations

What the Industrial Age knew

- British Empire/ 1781
 - After the loss of the American colonies:
 - The USA plays a bigger (not smaller) role in Britain's industrial revolution (eg, most of the war cotton)
 - Boom of transatlantic traffic: within two decades Britain is supplying 4/5th of the USA's imports and buying half of its exports
 - France is left bankrupt by its support for the colonies and loses wars against Britain (1793-1815) that greatly expand the British Empire
 - 1816: 43 British colonies (up from 23 in 1792)
 - The abolitionist movement gets more powerful

What the Industrial Age knew

- British Empire
 - Population in 1701:
 - France 19 million vs England 6 million
 - Population in 1801:
 - France 27 million vs Britain 16.3 million (of which 10 in England, 1.8 in Scotland, the rest in Ireland)
 - And nonetheless....
 - 1702-1713: Britain defeats France in the War of the Spanish Succession
 - 1756-1763: Britain defeats France in the Seven Years' war
 - 1795-1815: Britain defeats France in the Napoleonic wars

What the Industrial Age knew

- British Empire
 - After Trafalgar (1805) Britain dominates all the seas
 - 1814: Britain acquires the Cape (route to India, Australia and the Far East)

What the Industrial Age knew

- British Empire/ India
 - 18th century: East India Company is a purely commercial enterprise with factories in Mumbai, Chennai and Kolkata
 - 1757: Battle of Plassey (Bengal) defeats a local prince armed by France (1000 British soldiers against 50,000 Indian soldiers)
 - 1784: Britain imposes parliamentary control on the East Indian Company
 - 1799: Conquest of Mysore
 - 1803: Mahratha wars (conquest of Delhi and Agra)

What the Industrial Age knew

- British Empire/ India
 - 1800: Trade accounts for lower revenues than land taxes
 - 1815: East India Company owns the most powerful army in the subcontinent and controls entire regions
 - East Indian Company becomes an Asian power (military intervention in Arabia, Malacca and Java)
 - British government had no plan for the conquest of India: it just happened
 - Extension of parliamentary control over India takes place only after the fact
 - Aristocracy takes over the administration of India

What the Industrial Age knew

- British Empire/ India
 - Strategy of expansion by coercion and treaty
 - American dominion rested on settlement, India rests on military power
 - Administration riddled with corruption
 - Soldiers get rich with war booty, administration gets rich with taxation
 - Opulence of “white” India vs poverty of “brown” India
 - Indians are denied economic advantage and political advancement
 - Indians accept to serve in British army (Britain even plans to invade Spanish South America using Indian troops)

What the Industrial Age knew

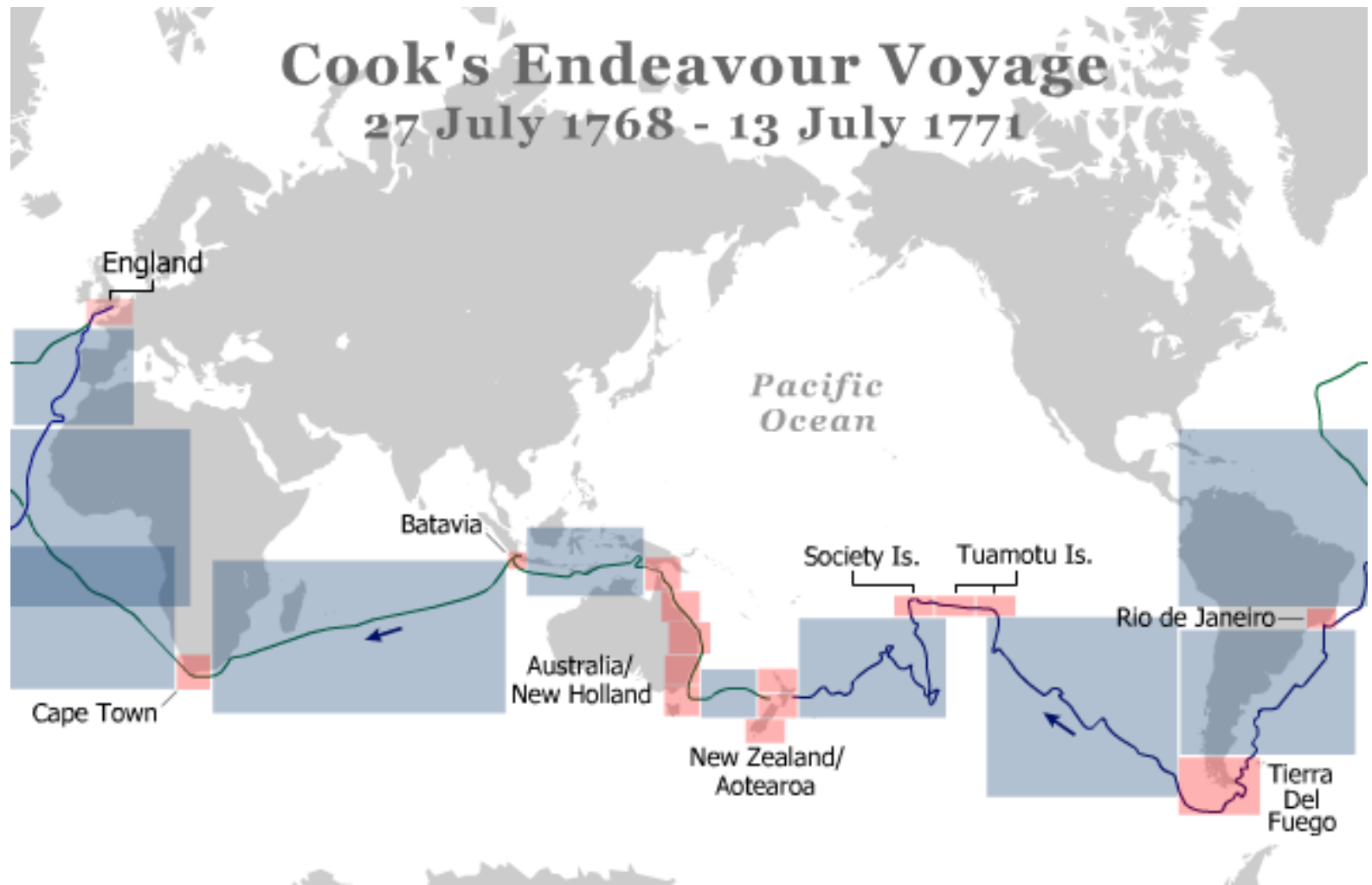
- British Empire/ Australia
 - Pacific exploration enabled by
 - “Nautical Almanac” (1765)
 - Accurate maritime chronometers
 - Medicine that reduced epidemics on ships
 - James Cook (1768-79) voyages of discovery
 - A product of Enlightenment (enhance human knowledge), not imperialism
 - Ethnography and Geography

What the Industrial Age knew

- British Empire/ Australia
 - Colonization of Australia
 - Guards and convicts (1788): America is no longer available as a penal colony
 - Relatively few free settlers
 - 1800: Full control of the Pacific Ocean by the British navy
 - Britain is more interested in conquering the sea (detering the French and restraining the Dutch) than in conquering the land
 - 1821: Australia and New Zealand have a population of 38,000

What the Industrial Age knew

- British Empire/ Australia
 - James Cook (1768-79) voyages of discovery



What the Industrial Age knew

- British Empire/ Australia
 - 1850: The population of Australia is 430,000
 - 1851: Gold is discovered
 - 1871: The population of Australia is 1.7 million

What the Industrial Age knew

- British Empire/ Britain
 - Britain is not a democracy: it is a corrupt oligarchy of aristocrats who pass laws to enrich themselves
 - George III (1760-1820) and Walter Pitt Jr (1783-1806) attempt democratic reforms but...
 - ... the 1789 revolution in France makes democracy unpopular in Britain

What the Industrial Age knew

- British Empire/ 1860
 - Britain has 2% of the world's population
 - Britain produces almost 20% of the world's manufacturing output
 - 53% of the world's iron
 - 50% of the world's coal and lignite
 - consumes 50% of the world's cotton
 - consumes six times more (fuel-based) energy than France

What the Industrial Age knew

- British Empire/ 1860
 - An incoherent empire
 - Mumbai is a royal dowry
 - Freetown is owned by British philanthropists
 - Hong Kong is on lease from China
 - Cyprus is held on license
 - Dutch law applies to Guyana, Cape Town and Ceylon/Sri Lanka
 - Sudan is an Anglo-Egyptian protectorate
 - Australia, Canada and New Zealand are de facto independent

What the Industrial Age knew

- British Empire/ 1860
 - An incoherent empire
 - Chartered companies rule India, Borneo, Nigeria and Rhodesia/Zimbabwe
 - India contains 560 princely states
 - East Africa and the Gold Coast/Ghana are protectorates
 - Tristan da Cunha is administered by missionaries
 - Sarawak is administered by hereditary white rajas
 - Ascension is administered by a navy captain

What the Industrial Age knew

- British Empire/ 1860
 - Queen Victoria is the icon of the empire, respected even by the colonies
 - Superior military technology (eg very accurate rifles that can fire six shots a minute, I.e. kill a lot of people)
 - Belief that technology would save the British Empire from the fate of the Roman Empire

What the Industrial Age knew

- British Empire/ Africa
 - Explorers:
 - David Livingstone: Angola to Mozambique (1856)
 - Richard Burton and John Speke: Lake Tanganyika (1858)
 - John Speke: Lake Victoria (1858)
 - Samuel Baker: Lake Albert (1864)
 - Henry Stanley: River Congo (1874)
 - Britain's main interest: to contain French expansion
 - Kimberley (diamonds) and Transvaal (gold)

What the Industrial Age knew

- British Empire/ 1875
 - Britain purchases the Suez Canal
 - Wheat from the Punjab
 - Cotton from the Deccan
 - Indigo from Bihar
 - Rice from Burma
 - Tea from Sri Lanka
 - Dates from Mesopotamia
 - Tin from Malaysia
 - Sugar from Fiji
 - Meat from Australia
 - Britain produces almost a third of the world's manufactured goods

What the Industrial Age knew

- British Empire
 - Global communications
 - steamships
 - railroads
 - telegraph
 - undersea cable (Dover-Calais 1851, North America 1866, Australia 1871)
 - they unified colonies as "nations"
 - they fostered global trade
 - they created a worldwide logistical system

What the Industrial Age knew

- British Empire
 - Science (invention)
 - Industry (manufacture)
 - Trade (commerce)

What the Industrial Age knew

- British Empire/ Science
 - British science passed by France (1789-1820s) and Germany (1792-1820s)
 - Meetings of the British Association for the Advancement of Science (1831) modeled after the German Gesellschaft Deutscher Naturforscher und Ärzte
 - Lots of specialized societies (Geology, Chemistry, etc) that are run like meritocracies

What the Industrial Age knew

- British Empire
 - Trade
 - As it industrializes, Britain has to import food, notably wheat from Ireland and America
 - Britain pays with manufactured goods (that don't require huge land) for food (that requires huge land), thereby off sourcing to other places the requirement to make a lot of land available to agriculture

What the Industrial Age knew

- British Empire
 - Trade
 - Ireland depends on potatoes
 - 1845: an American disease destroys the entire potato crop, causing famine
 - One million people die of starvation and another million emigrate
 - 1846: The famine forces the English government to abolish the Corn Laws that limit imports of food and make imported food more expensive
 - At the same time the USA has a surplus of wheat on the East Coast due to the railway that is bringing it from the Great Plains
 - Britain becomes dependent on American wheat

What the Industrial Age knew

- British Empire
 - Trade
 - 1833: Britain outlaws slavery
 - 1846: Britain converts to free trade
 - Britain fights piracy everywhere
 - Britain evangelizes the world about free trade
 - Coercion to introduce free trade where not welcome (China)
 - Britain owns about 50% of the world's industrial production, so it is the main beneficiary of free trade
 - Piracy and slavery have now become obstacles to free trade
 - Britain enforces “legitimate trade” in all seas

What the Industrial Age knew

- British Empire
 - Trade
 - Main British exports: capital, cotton, textiles, railway tracks, steam engines
 - British capital fuels economic development abroad
 - Peace benefits British commerce
 - Rivalry with France but no major war
 - Cold war with Russia (ideological enemy and only threat to India)
 - Crimean war (1854-56) removes Russia as a power from the Mediterranean and from the Middle East

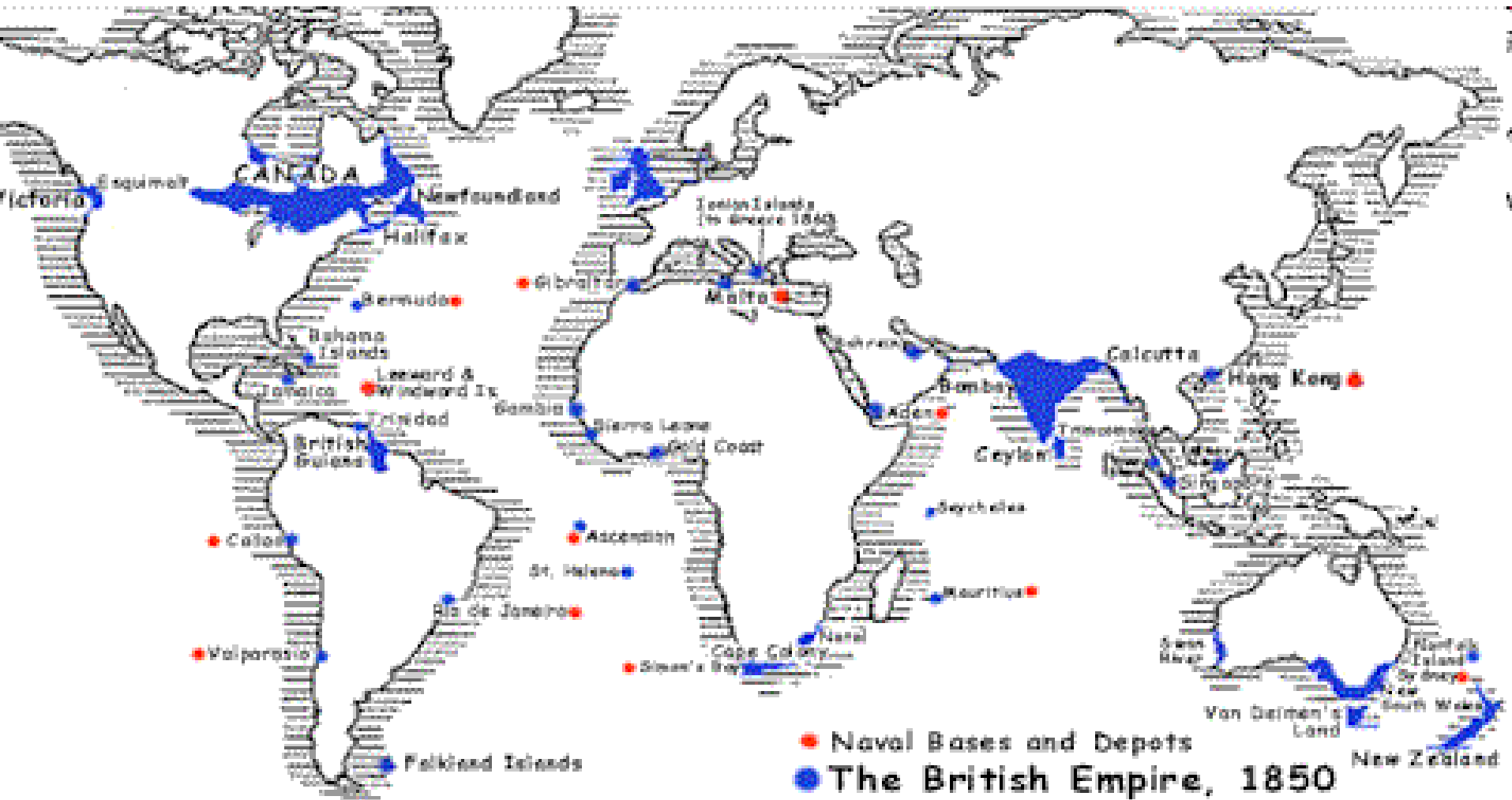
What the Industrial Age knew

- British Empire
 - Enforces free trade
 - The world's banker
 - Global economic and legal system
 - Collapsed because of costs of maintaining its own legality
 - The foundations had been economic and its downfall was economic
 - 1914: British tonnage is 21 million, almost half of the world (49 million), while the USA only has 5.4

What the Industrial Age knew

- The Triangular Trade
 - 1773: Britain establishes a monopoly on the sale of Indian opium
 - 1790s: Britain transforms opium from luxury good to bulk commodity
 - 1800s: Opium sales make up 6 to 15% of British India's tax revenues
 - Indian opium --> China
 - Chinese tea --> England
 - British textiles --> India
 - 1830s: Opium represents 40% of India's exports
 - 1839: Opium war between Britain and China

British Empire



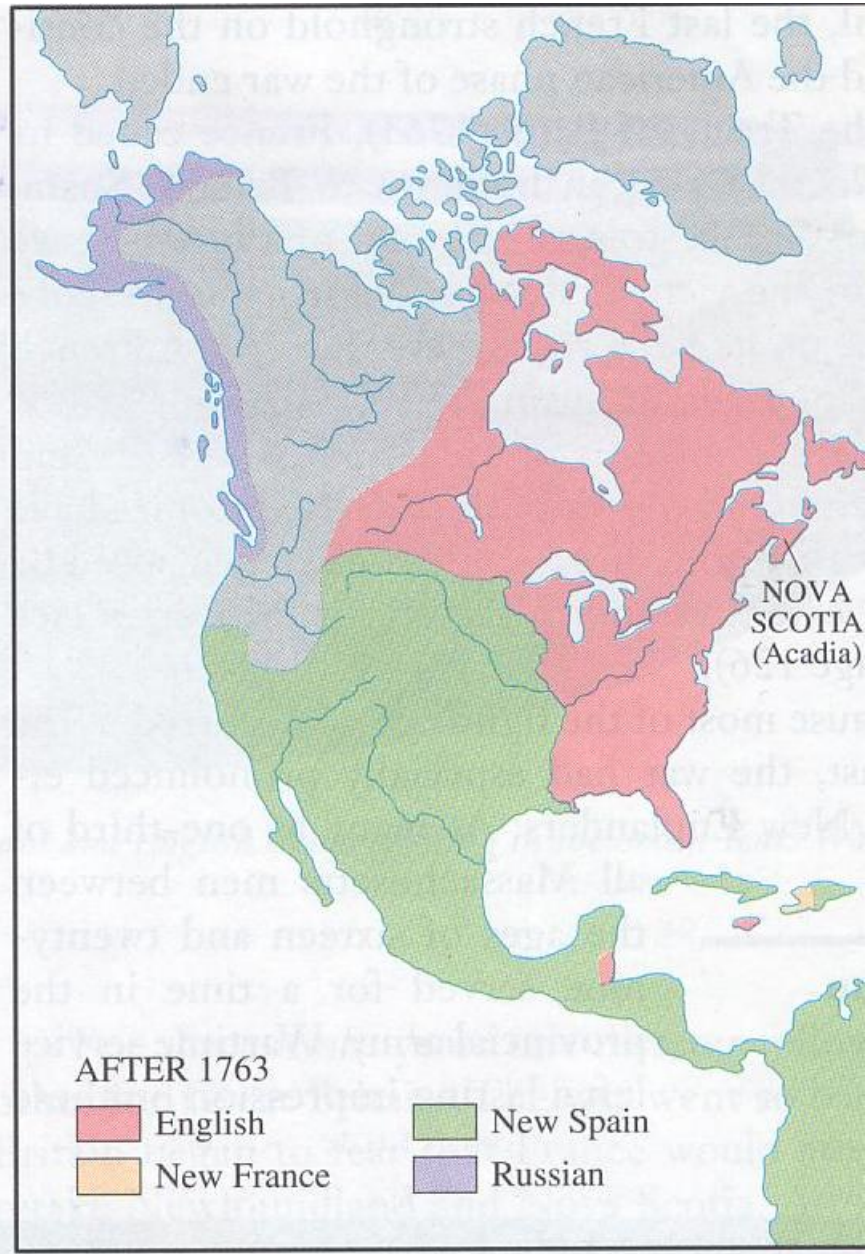
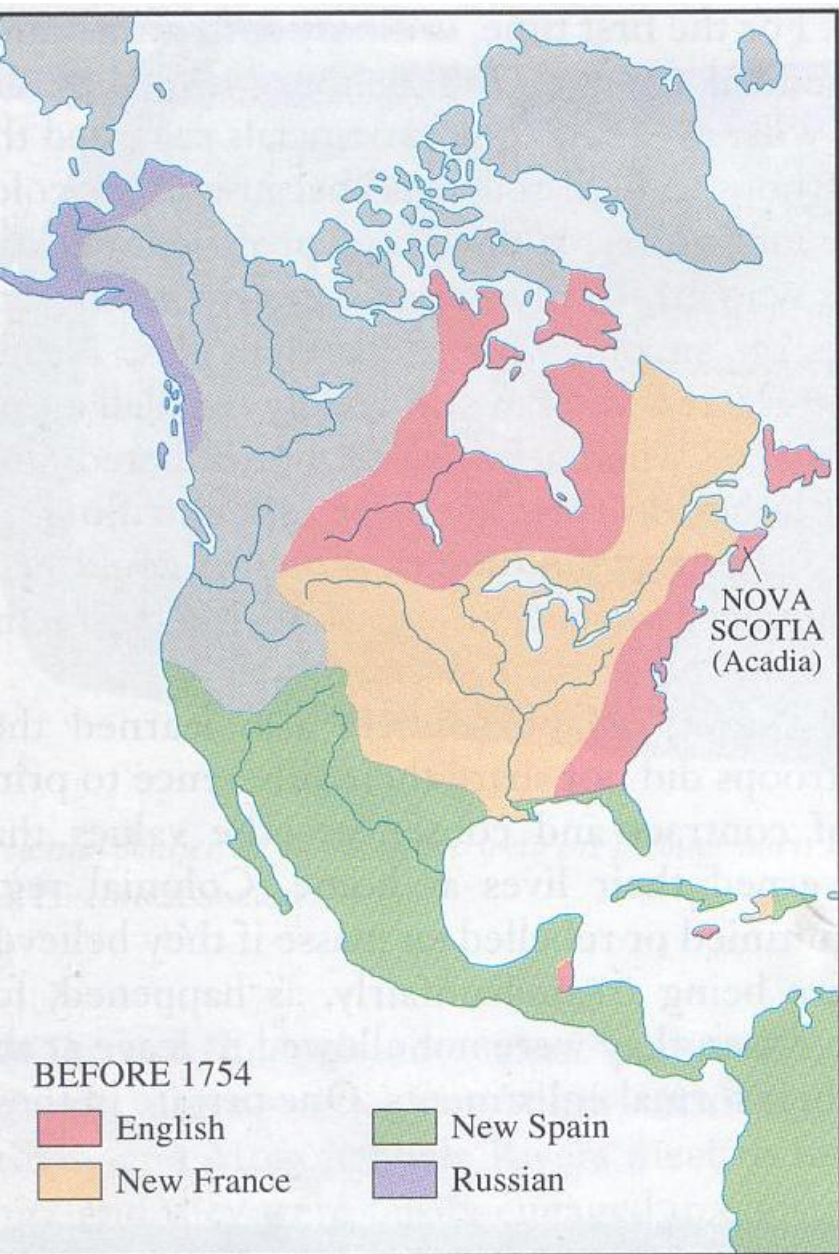
What the Industrial Age knew

- **Exploration of North America**

- Cartier 1535-36
- de Soto 1539-1542
- Coronado 1540-42
- Champlain 1603-1615
- Hudson 1609
- Hudson 1610-11
- Jolliet and Marquette 1673
- Kelsey 1690-92
- Bering 1741
- Boone 1775
- Mackenzie 1789-1793
- Lewis and Clark 1804-05
- Clark's return
- Lewis's return
- Smith 1826-29
- Frémont 1842-47



(National Geographic: Into the Unknown)



(From "A People And A Nation", Houghton Mifflin, 1998)

What the Industrial Age knew

- USA revolution (1776)
 - Before the war
 - The successful colonies are the result of utopian settlements or pilgrim communities
 - Population explosion (population increases by a factor of ten in three generations)
 - Massive colonization by settlers of the region west of the Appalachians to the Ohio (from 1760)

What the Industrial Age knew

- USA revolution (1776)
 - Before the war
 - The 13 colonies of English-speaking North America are a patchwork of Protestant religion: Congregationalists in Massachusetts, Puritans in most of New England, Anglicans in Virginia, Baptists in Rhode Island, Quakers in Pennsylvania, Presbyterians in New Jersey, etc (and a few Catholics in Maryland)
 - The French-speaking colony of Canada is mostly Catholic

What the Industrial Age knew

- USA revolution (1776)
 - Before the war
 - Each colony has its own paper money
 - Each colony has its own political administration
 - The southern colonies (Georgia, Carolina, Virginia) are agricultural and run by aristocratic landowners
 - The northern colonies are ruled by middle-class merchants and farmers
 - There is little fusion of customs or economies among the colonies

What the Industrial Age knew

- USA revolution (1776)
 - Before the war
 - The landed hereditary aristocracy is either non-existent or not as powerful as in Britain
 - Most farmers are independent landowners, not tenants of an aristocratic landowner
 - Anybody can become an independent landowner because there is so much free land available to the west
 - The aristocracy of the south relies on slavery not tenant farmers

What the Industrial Age knew

- USA revolution (1776)
 - Before the war
 - The 13 colonies are viewed as poor and unprofitable by Britain (compared with India and West Indies)
 - Communications between Britain and the colonies are slow
 - Not worth the trouble for Britain to interfere in domestic issues of the colonies
 - The colonies become increasingly self-sufficient and self-ruled

What the Industrial Age knew

- USA revolution (1776)
 - Before the war
 - Duty of the colonies (navigation acts of 1651, 1660, 1663, 1672, 1696):
 - Produce commodities that cannot be found in Britain (eg tobacco in Virginia, indigo in Carolina)
 - Do not compete with British industries
 - All trade must be conducted on British ships (de facto bad of trade with other nations, even when economically convenient)
 - Sugar, tobacco, cotton, indigo, rice and furs can only be exported to Britain

What the Industrial Age knew

- USA revolution (1776)
 - Before the war
 - Duty of the colonies:
 - Pay British taxes for defense
 - Pay duties in Britain on import/export
 - The paradox of the Seven Years' War (1756–1763)
 - » After the war against France of 1763 Britain needs to increase taxes
 - » But after the victory over France of 1763 the only major enemy in North America is removed: defense against whom?

What the Industrial Age knew

- USA revolution (1776)
 - Causes of the war
 - 1764: Sugar act
 - 1765: Stamp act (first Congress of the colonies to protest the Stamp Act)
 - 1767: Charles Townshend's Acts (Boston massacre of 1770, Tea Party of 1773)

What the Industrial Age knew

- USA revolution (1776)
 - Causes of the war
 - 1774: Britain cedes to Canada the regions west of the Appalachian, thereby stopping expansion of the 13 colonies
 - 1774: Britain recognizes Catholicism in Canada
 - Taxation

What the Industrial Age knew

- USA revolution (1776)
 - Causes of the war
 - The British government granted the East India Company a monopoly on the tea trade from China
 - Tea becomes a necessity in the whole English-speaking world
 - The American colonies are forced to buy tea from England at a highly taxed price

What the Industrial Age knew

- USA revolution (1776)
 - Oct 1765: Nine colonies meet at the Stamp Act Congress in New York against a new British tax
 - Jan 1776: Thomas Paine's pamphlet "Common Sense" is published in Philadelphia calls for "final separation"
 - Jul 1776: The Continental Congress adopts the Declaration of Independence (written by Thomas Jefferson) that talks about "inalienable rights"

What the Industrial Age knew

- USA revolution (1776)
 - 1787: The Constitution
 - A House of Representatives
 - A Senate to represent the states
 - A President elected by an electoral college
 - A supreme court to interpret the constitution
 - 1789: First presidential election (George Washington)
 - 1791: The Bill of Rights, including freedom of the press, freedom of religion, etc
 - 1797: Washington voluntarily refuses to run for president again so he won't become like a king

What the Industrial Age knew

- USA revolution (1776)
 - 1778: France declares war on Britain
 - 1779: Spain declares war on Britain
 - 1780: Holland declares war on Britain
 - 1780: Russia, Sweden, Denmark form the “armed neutrality of the north” hostile to Britain
 - Prussia, Portugal, Austria join the “armed neutrality”
 - Britain is isolated

What the Industrial Age knew

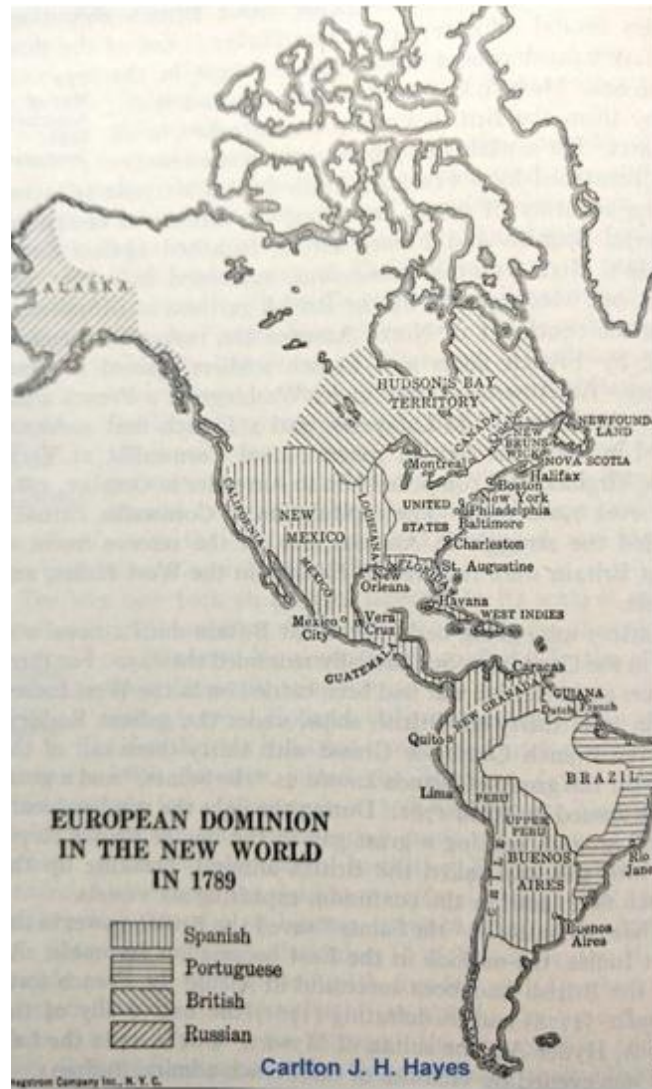
- USA revolution (1776)
 - A practical application of the Enlightenment
 - A very English principle: no taxation without representation
 - Not a revolution
 - An experiment never tried before in a major country: abolish both the monarchy and the aristocracy
 - Another experiment: the first country that treats religion like a personal matter

- 13 originals:**
- Massachusetts**
 - Rhode Island**
 - Connecticut**
 - New Hampshire**
 - New York**
 - Delaware**
 - New Jersey**
 - Pennsylvania**
 - Virginia**
 - Maryland**
 - North Carolina**
 - South Carolina**
 - Georgia**



USA Expansion

America in 1789



What the Industrial Age knew

- USA revolution
 - First revolutionaries to call themselves “revolutionary”
 - Not a return to old noble values but the founding of new noble values
 - Transition from cyclical to linear thinking about history
 - The future is better than the past

What the Industrial Age knew

- USA revolution
 - A country with no monarch, no aristocracy, no church, no tradition: the USA is therefore founded on laws
 - The first major blow at divine-right absolutist monarchy since Louis XIV and the first major blow at aristocracy since medieval time
 - Separation of church and state
 - All presidents, vicepresidents and secretaries of state will be lawyers for about 40 years (except Washington)

What the Industrial Age knew

- USA revolution
 - The other side of the Declaration of Independence
 - It asserts the equality of men but not of women
 - It upholds the principle of self-determination but treats Native Americans like terrorists
 - It upholds the principle of freedom but rules over the largest slavery enterprise in history
 - Liberty champion Thomas Jefferson is a slave owner

What the Industrial Age knew

- USA revolution
 - Dual manifestos of 1776
 - Thomas Jefferson's "Declaration of Independence": all men are created equal
 - Democracy (founded on equality)
 - Adam Smith's "Wealth of Nations": men cannot be equal
 - Capitalism (founded on inequality)
 - The USA: dysfunctional synergy between democracy and capitalism

What the Industrial Age knew

- USA revolution
 - Constitution
 - Deliberately undemocratic, not majoritarian (to protect minorities)
 - Representation in the senate is NOT proportional to population
 - The president is NOT elected by the people
 - Checks and balances create a “vetocracy”
 - No voting rights for women and slaves

What the Industrial Age knew

- USA revolution
 - Never a democracy
 - The president is not decided by the popular vote but by the electoral college
 - Two senators per state, regardless of population
 - Supreme Court judges are appointed randomly and their tenure is unlimited
 - Slaves are not allowed to vote until 1870
 - Women are not allowed to vote until 1920

What the Industrial Age knew

- USA revolution
 - Supreme Court
 - enforces slave laws
 - declares that even free blacks are not US citizens (Dred Scott v. Sandford, 1857)
 - reduces Native Americans from sovereign nations to wards of the state (Cherokee Nation v. Georgia, 1831)
 - legitimizes “Jim Crow” (Plessy v. Ferguson, 1896)
 - denies women the right to vote (Minor v. Happersett, 1875)

What the Industrial Age knew

- USA revolution
 - After the war:
 - USA destroyed, bankrupt and isolated
 - but full application of Adam Smith's theories
 - and rapid re-play of the British industrial revolution
 - Trade with Britain actually increases
 - Cycle of boom and bust
 - Booms driven by inventions (cotton gin, integrated cotton factory) and transportation (roads, canals, steamships, railway)
 - Busts caused by financial anarchy

What the Industrial Age knew

- USA revolution
 - 1690: Boston printer Benjamin Harris starts the Public Occurrences in Boston, the first newspaper of North America
 - 1704: John Campbell's "Boston Newsletter", the first newspaper of North America
 - 1719: Boston Gazette
 - 1721: James Franklin starts the New-England Courant and launches a campaign against smallpox inoculation (fake news)
 - 1731: Benjamin Franklin's "Apology for Printers"

What the Industrial Age knew

- USA revolution
 - 1791: The Bill of Rights, including freedom of the press
 - 1792: Post Office established with very low rates for newspaper delivery
 - 1828: The USA has 74 post offices per 100,000 people compared with 17 in Britain and 4 in France

What the Industrial Age knew

- Side effects of the US revolution
 - Britain has to stop shipping convicts to America and starts shipping them to Australia (January 1788)
 - Many loyalists move from the newly founded USA to Canada, therefore tilting the Canadian population towards the English side
 - Inspires the French revolution
 - Inspires the Haitian revolution



Integrated manufacturing at Middlesex Woolen Mills in Lowell (MA), 1830s

What the Industrial Age knew

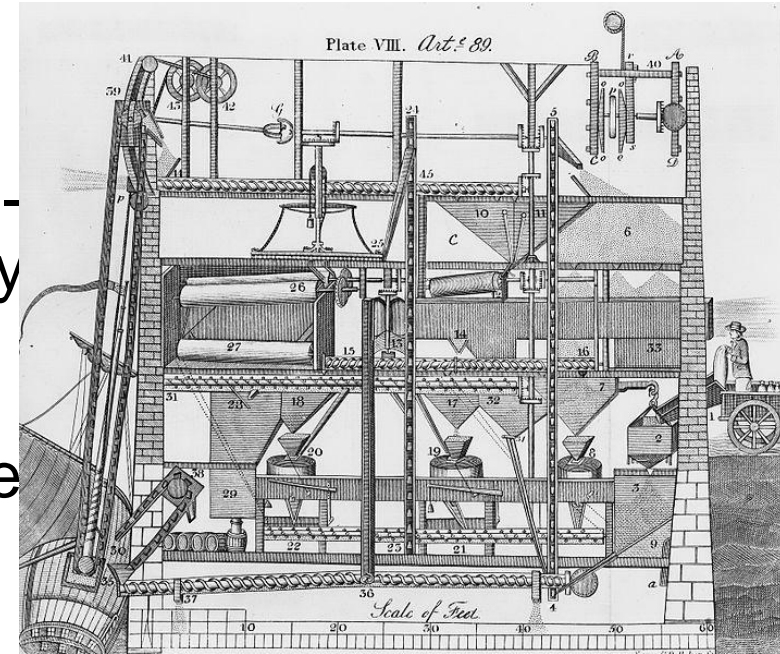
- USA revolution
 - US agriculture (vs European agriculture)
 - No need to dismantle an existing feudal system
 - Emphasis on capitalistic agriculture, i.e. agriculture for profit (Virginia tobacco plantations)
 - Availability of free land
 - Easier to own land for ordinary peasants

What the Industrial Age knew

- USA revolution
 - Boom of tobacco
 - South American tobacco planted in Virginia in 1612
 - 1630s: Overproduction
 - Mid-1650s: Mass imports of tobacco from Virginian plantation lowers the price of cigars in Europe and makes smoking a universal habit

What the Industrial Age knew

- USA revolution
 - Automation
 - Oliver Evans (Delaware, wheel-maker) builds the first assembly line (1784): a smooth and continuous flow of mechanized work that implements the whole flour milling process with no human intervention (belt conveyor, screw conveyor, bucket conveyor)
 - Cincinnati meatpacking plants of the 1850s (on the Ohio river)



What the Industrial Age knew

- USA revolution
 - Boom of cotton
 - Samuel Slater establishes an Arkwright-type cotton spinning factory manned by nine children in Pawtucket on the Blackstone River (1790)
 - The 1807 foreign trade embargo against Britain causes a boom in construction of cotton mills
 - Eli Whitney's cotton gin of 1793 helps the USA become the producer of 70% of the world's cotton by 1850

What the Industrial Age knew

- USA revolution
 - Boom of cotton
 - Mississippi, Alabama, Louisiana overtake South Carolina and Georgia as main cotton producers
 - The tobacco states of Virginia and Maryland sell their surplus to the southern cotton states
 - Cotton exported to Britain and France

What the Industrial Age knew

- USA revolution
 - Boom of cotton
 - 1813: Francis Lowell founds the Boston Manufacturing Co, the first textile factory to combine spinning and weaving, i.e. to turn cotton into cloth
 - 1823: Birth of Lowell's textile industry (Lowell the city named after Francis Lowell)
 - The workers are well-paid farm girls hosted in comfortable boarding houses (unlike the miserable conditions of British workers)
 - The cotton textile industry is the first factory-dominated kind of manufacturing
 - Chronic labor shortage

What the Industrial Age knew

- USA revolution
 - Boom of cotton
 - Cotton needs farmland
 - The cotton gin enables to clean more cotton, i.e. to plant more, which needs even more farmland
 - The US government expropriates land from Native Americans, acquires land in Georgia (1814), Alabama (1814), Tennessee (1775) and Florida (1819), and sells land on the cheap to white settlers
 - Massive wave of deforestation to clean land for cotton

What the Industrial Age knew

- USA revolution
 - Boom of cotton
 - Southern white elites grow rich by growing cotton
 - Northern white elites grow rich by erecting textile mills to process the cotton
 - Large-scale cultivation of cotton fuels the large-scale expansion of the industrial revolution
 - Integrated economy of slave-owning cotton planters (mostly in the southern states), millers (mostly in the northern states) and consumers (everywhere in the USA and outside the USA)

What the Industrial Age knew

- USA revolution
 - Boom of cotton
 - Plantation owners pioneer management techniques of the corporation (hierarchical organization, record-keeping and accounting, etc)
 - Productivity rapidly increases: the daily amount of cotton picked per enslaved worker in 1862 is 400% more than in 1801

What the Industrial Age knew

- USA revolution
 - Boom of cotton
 - Slave-produced sugar (from the Caribbean) and cotton (from the USA) accelerate worldwide commodity markets
 - Planters accumulate debt to finance their operations
 - The majority of credit for the slave economy comes from London
 - Boom of cotton production thanks to cheap land, labor and credit
 - The slave-economy creates a culture of financial speculation

What the Industrial Age knew

- USA revolution
 - Boom of cotton
 - 1831: The USA produces about half of the world's raw cotton
 - 1834: The value of cotton begins to drop due to overproduction
 - Panic of 1837
 - 1860: Cotton represents 3/5th of the USA's exports
 - The Mississippi Valley alone is home to more millionaires per capita than anywhere else in the USA
 - New Orleans has a denser concentration of banking capital than New York

What the Industrial Age knew

- USA revolution
 - Boom of iron
 - 1715: England goes to war against Sweden, its main supplier of iron
 - 1716: English Quaker blacksmith Thomas Rutter the first (bloomery) forge in Pennsylvania to supply iron to England
 - 1720: Rutter builds a charcoal-fueled blast furnace, Pennsylvania's first iron furnace, Colebrookdale Furnace
 - 1725: Thomas Potts becomes manager of Colebrookdale Furnace
 - John Potts expands his father's empire through marriages

What the Industrial Age knew

- USA revolution
 - Boom of iron
 - 1752: John Potts establishes the iron plantation of Pottsgrove and presides over the largest iron-making empire in North America

What the Industrial Age knew

- USA revolution
 - Iron Plantation
 - A self-sufficient community spreading for thousands of acres around the charcoal furnace for the mining, smelting and shipping operations
 - Located in rural areas near iron-ore deposits, forests for fuel, and rivers for water power
 - The ironmaster and his mansion, skilled workers from the British islands and their families, blacksmiths, shopkeepers, farmers and black slaves

What the Industrial Age knew

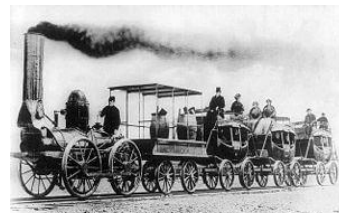
- USA revolution
 - 1824: The USA has become the second industrial power in the world with two million people employed in manufacturing
 - The industrial boom attracts European immigrants (300,000 in 1850 and 500,000 in 1854)

What the Industrial Age knew

- USA revolution
 - Transportation
 - 1790: First turnpike (Philadelphia-Lancaster)
 - Capital intensive (private investors)
 - 1803-1848: Turnpike from Maryland to Illinois (Congress funded)
 - *“Roads and canals, by multiplying and facilitating the communications and intercourse between distant regions and multitudes of men, are among the most important means of improvement”* (US president John Quincy Adams, 1825)

What the Industrial Age knew

- USA revolution
 - Transportation
 - 1830: The Baltimore and Ohio Railroad, the first common carrier railway
 - 1831: The Mohawk and Hudson Railroad, driven by a steam locomotive (deWitt Clinton)
 - 1833: The South Carolina Canal and Rail Road Company, longest railroad in the world (220 kms), driven by the first commercially-available steam locomotive in the USA (West Point Foundry in New York)
 - A group of Charleston merchant investors



What the Industrial Age knew

- USA revolution
 - Transportation
 - Largest cities of the colonies (1776): 1. Philadelphia (40,000), 2. New York (25,000), 3. Boston (15,000), 4. Charleston (12,000)
 - Main ports of the colonies: 1. Philadelphia, 2. Boston, 3. Charleston, 4. New York

What the Industrial Age knew

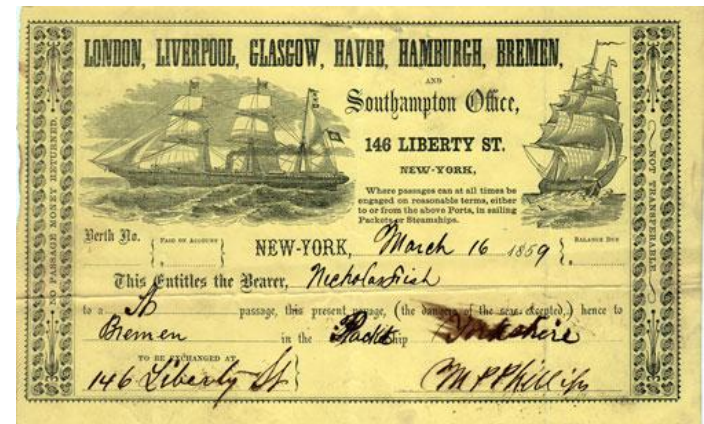
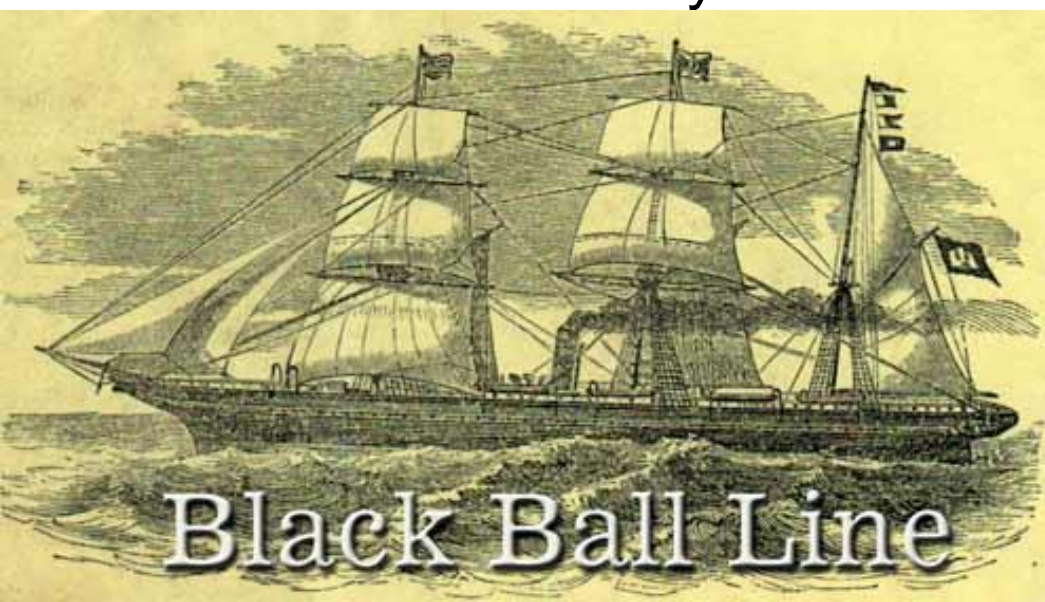
- USA revolution
 - Transportation
 - 1807: First steamboat (Robert Fulton's "Clermont", featuring Watt's engine, from New York to Albany in 32 hours)
 - Capital intensive (private investors)
 - 1815: Fulton's steamboat from Pittsburgh to New Orleans via Ohio and Mississippi rivers (two weeks down, four weeks back)

Fulton's steamboat "Clermont"
(Museum of Science, Chicago)



What the Industrial Age knew

- USA revolution
 - Transportation
 - 1817: First scheduled passenger ship from New York to Liverpool (Black Ball Line)
 - Capital intensive (private investors, a group of New York Quaker merchants headed by Jeremiah Thompson)



What the Industrial Age knew

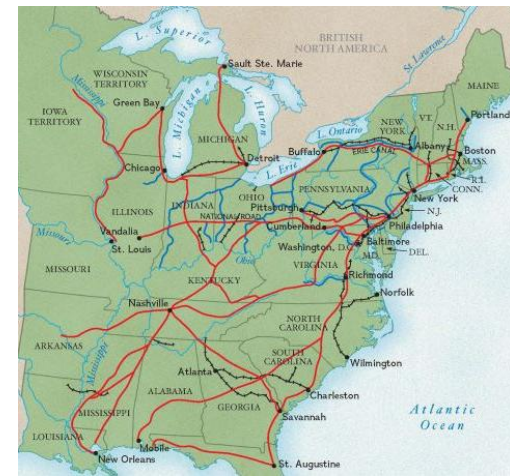
- USA revolution
 - Transportation
 - Long-distance commerce by ship is increasingly cost-efficient
 - In many cases it costs more to ship goods overland a short distance than to ship goods across the Atlantic to Europe

What the Industrial Age knew

- USA revolution
 - Transportation
 - 1825: Erie Canal (Trans-Appalachian water route from the Atlantic Ocean to the Great Lakes)
 - Capital intensive (New York state)
 - Slashes transportation costs by about 90%
 - Manhattan's population increases from 123,000 in 1820 to 814,000 in 1860
 - New York becomes the main port of the USA and its largest city
 - 1826: Pennsylvania builds a system of canals to link Philadelphia with Pittsburgh

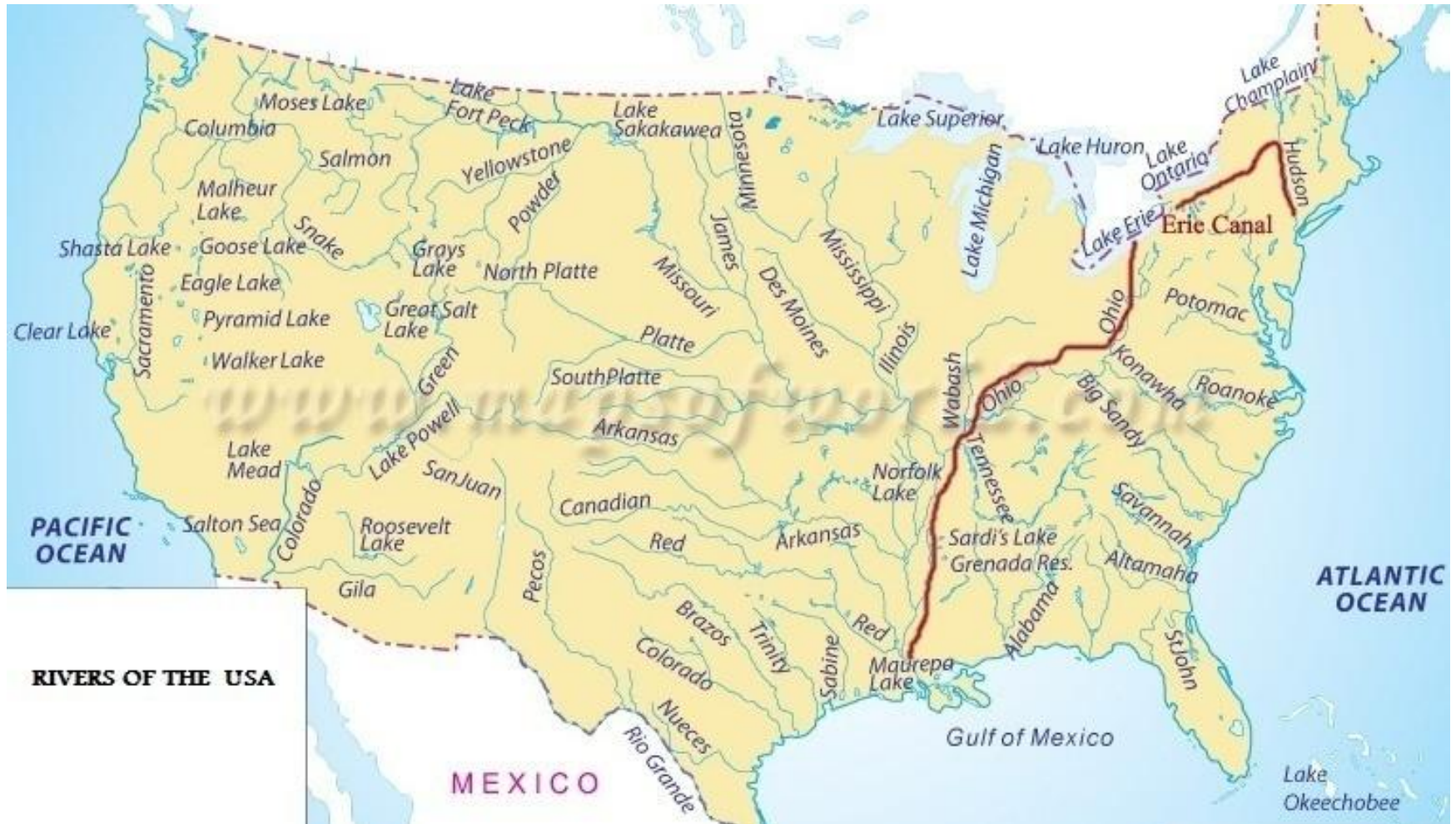
What the Industrial Age knew

- USA revolution
 - Transportation
 - 1848: The Illinois and Michigan Canal connects the Great Lakes to the Mississippi River and the Gulf of Mexico
 - 1849: About 5000 kms of canals have been built, mostly financed by local governments
 - One can travel through rivers and canals from New Orleans to New York via St Louis, Chicago, Detroit and Buffalo



What the Industrial Age knew

- **USA revolution**



What the Industrial Age knew

- USA revolution
 - Transportation
 - Competition among the main ports:
 - Erie Canal for New York
 - Pennsylvania's canals for Philadelphia
 - Baltimore and Ohio Railroad for Baltimore

What the Industrial Age knew

- USA revolution
 - Transportation
 - Railways and canals change the axis of the USA from vertical to horizontal
 - Railways and canals create new cities: Chicago had 350 inhabitants in 1833 and has become the second city of the nation in 1890 (Illinois-Michigan Canal of 1848 links with the Mississippi, ten railroads built between 1848 and 1856, grain and livestock markets, meatpacking industries, manufacture of railway cars, the railroads favor Chicago over Cincinnati)

What the Industrial Age knew

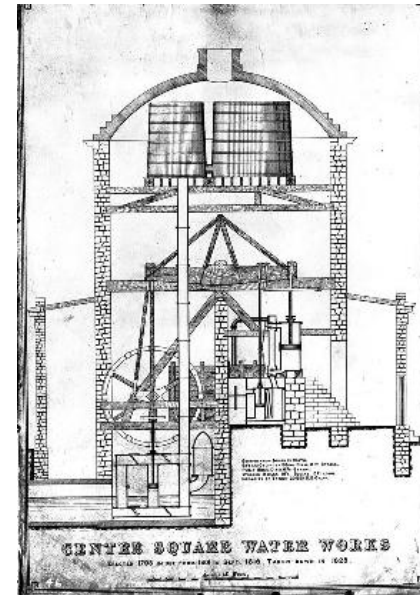
- USA revolution
 - Transportation
 - 1829: Cornelius Vanderbilt's first steamboat
 - Slashes operational costs and reduces fares to make them affordable to the masses
 - Capital intensive (private investors)
 - Competition from railways (that reach Chicago in the 1850s)
 - Fleet of steamships to transport 1849 gold diggers to California via Nicaragua

What the Industrial Age knew

- USA revolution
 - Government-assisted capitalism
 - Turnpike from Maryland to Illinois (1803-1848) funded by Congress
 - Erie Canal (1825) funded by New York State

What the Industrial Age knew

- USA revolution
 - Government-assisted capitalism
 - 1798: Boston's "Great Aqueduct"
 - 1793 and 1798: Yellow fever epidemics in Philadelphia
 - 1801: Philadelphia inaugurates its waterworks ("Center Square")
 - 1842: Croton Aqueduct from the Croton River to Manhattan



What the Industrial Age knew

- USA revolution
 - Boom of wood
 - Wood used to build houses and boats
 - Wood used as fuel for steamboats and railroads
 - Farmlands cleared of trees to be more productive

What the Industrial Age knew

- USA revolution
 - Boom of agriculture (mechanization of agriculture)
 - Vast areas to farm for a small population of colonists
 - Huge farms outside the village
 - Need for mechanical tools to help in farming the land
 - 1831: Cyrus McCormick's horse-drawn reaper (Virginia)
 - 1847: McCormick relocates to Chicago and starts the McCormick Harvesting Machine (later International Harvester Company)
 - 1837: John Deere's steel plow (Illinois)
 - Chicago's shipment of wheat increased from 80 bushels in 1839 to 2,000,000 in 1849
 - 1858: The Marsh Brothers' harvester rake (Illinois)

What the Industrial Age knew

- USA revolution
 - Boom of agriculture (mechanization of agriculture)
 - The percentage of agricultural workers steadily declines, while agricultural output steadily increases
 - Capital intensive (private investors)

What the Industrial Age knew



John Gast: American Progress (1875)

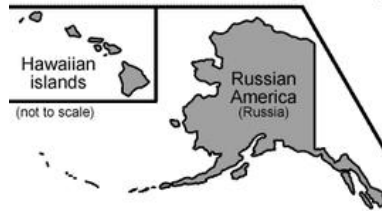
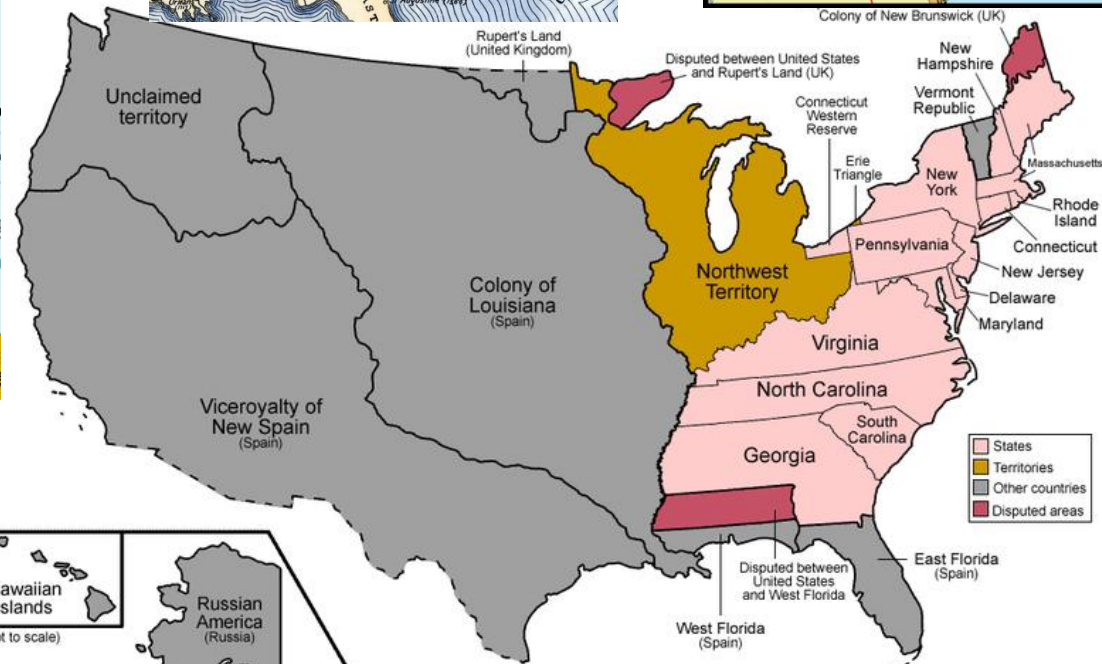
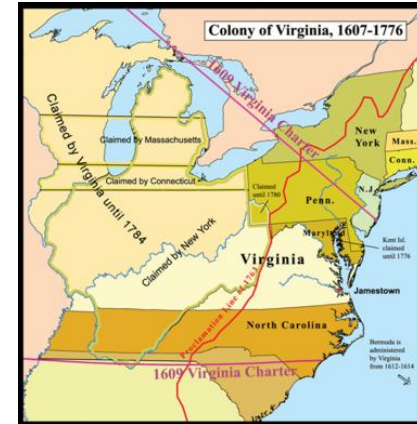
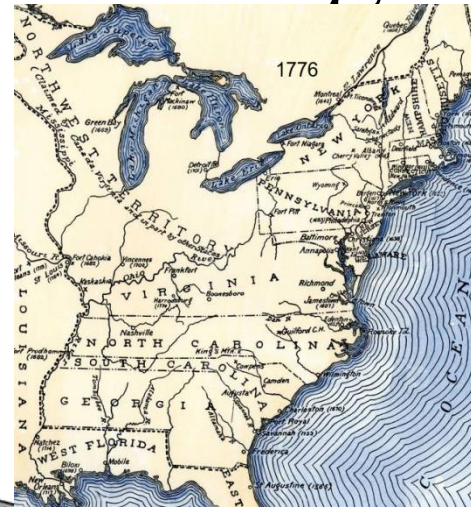
What the Industrial Age knew

- USA revolution
 - James Audubon: "Birds of America" (1827) in giant pages



What the Industrial Age knew

- USA expansion



States and Territories of the United States of America August 7 1789 to April 2 1790

What the Industrial Age knew

- USA expansion
 - Vermont 1791, Kentucky 1792, Tennessee 1796, Ohio 1803
 - 1803: Louisiana Purchase (pres. Jefferson) doubles the territory of the USA
 - Louisiana 1812, Indiana 1816, Mississippi 1817, Illinois 1818, Alabama 1819, Maine 1820, Missouri 1821
 - 1804-06: Meriwether Lewis and William Clark's expedition from St Louis to the Pacific Ocean
 - 1819: Florida from Spain
 - Arkansas 1836, Michigan 1837, Florida 1845
 - 1823: Monroe doctrine
 - 1845: Texas
 - Texas 1845, Iowa 1846, Wisconsin 1848

What the Industrial Age knew

- **USA expansion**



USA territory doubles overnight

What the Industrial Age knew

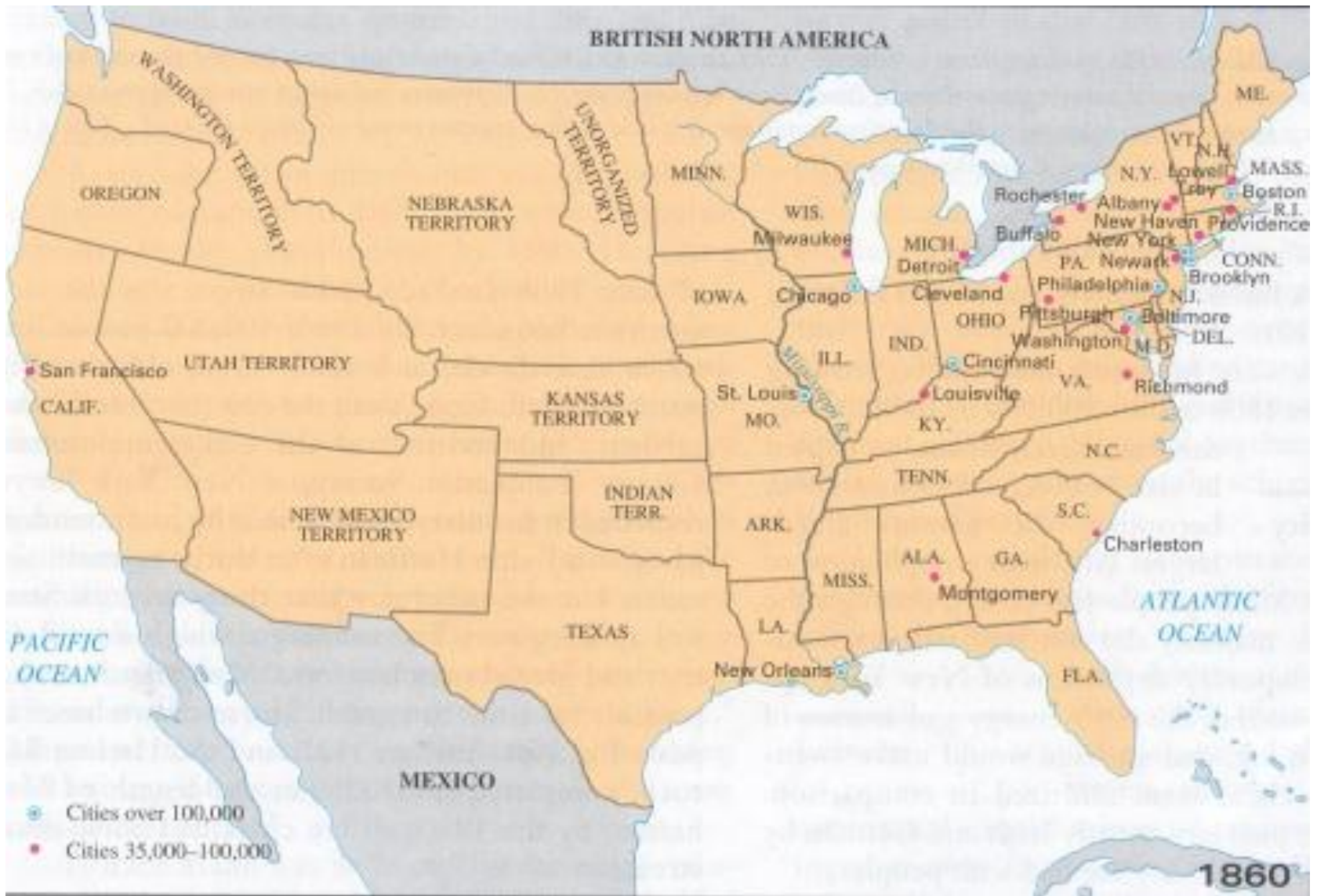
- USA expansion
 - 1848: Oregon territory
 - 1846-48: Mexican War (pres. Polk)
 - California 1850, Minnesota 1858, Oregon 1859, Kansas 1861, West Virginia 1863, Nevada 1864, Nebraska 1867,
 - Colorado 1876, North Dakota 1889, South Dakota 1889, Montana 1889, Washington 1889, Idaho 1890, Wyoming 1890, Utah 1896, Oklahoma 1907, New Mexico 1912, Arizona 1912, Alaska 1959, Hawaii 1959



(From "A People And A Nation", Houghton Mifflin, 1998)

USA Expansion





What the Industrial Age knew

- USA expansion
 - 1790: The population of trans-Appalachian West is 100,000
 - 1820: The population of the trans-Appalachian west is 2.2 million
 - 1821: 9 new western states have joined the Union
 - European churches disintegrate in the West into many independent denominations
 - Boston-based ABCFM (1810) organizes missionaries to the West

What the Industrial Age knew

- USA expansion
 - James Polk's vision (1845-48)
 - Annex Texas (independent), California (Mexican) and Oregon (jointly administered with Britain)
 - An army of fewer than 8000 men but fast lethal warships
 - The territory of the USA expands 60%

What the Industrial Age knew

- The West Coast
 - Early colonizers: Franciscan friars (Junipero Serra's "Sacred Expedition" of 1769-1823 to build 20 missions along the coast)
 - 1769: San Diego
 - 1781: Los Angeles (pop. 46)
 - 1804-06: Meriwether Lewis and William Clark's expedition from St Louis to the Pacific Ocean
 - Freight movement only possible via ships
 - First industry of California: fur trading
 - Fur trapper Jedediah Smith, first white man to cross the desert into California (1826), to cross the Sierra Nevada (1827) and to cross the South Pass of the Rocky Mountains into the Far West (1823)

What the Industrial Age knew

- The West Coast
 - 1821: Independence of Mexico (Mexico, California, Texas, Central America)
 - Population of California in 1848: 6-7000 plus Native Americans
 - 1841: Covered wagons cross the Oregon Trail
 - 1848: The journey from New York to California can be by sea via the Cape of Good Hope (six months), by sea via Panama (shorter but risk of malaria) or overland (also six months)

What the Industrial Age knew

- Fur Trading
 - During the 18th century fur becomes a commodity in Europe
 - Jay Treaty between Britain and the USA (1794) opens Canada and the Great Lakes to business
 - Astor's American Fur Company (1808), monopoly of the fur trade in the USA competing with the Hudson's Bay Company (British) for exports to Europe and China
 - John-Jacob Astor becomes the first multi-millionaire of the USA and one of the richest men in the world

What the Industrial Age knew

- Fur Trading
 - Astor Expedition (1810) from New York to the Columbia River via Cape Horn and Hawaii (6.5 months)
 - Columbia River trading post at Fort Astoria (1811), the first Anglosaxon community on the Pacific coast
 - 1840s: Decline of the fur trade due to change in European fashion and competition from Canada

What the Industrial Age knew

- USA
 - Trade with Asia
 - New England trades with China via ships
 - 1784-85: Robert Morris' "Empress of China" travels from New York to Canton and back in 15 months
 - 1800: The journey from the East Coast to Canton takes six months
 - Exports: ginseng, furs, cotton textiles, Turkish opium
 - Imports: tea, silk, porcelain
 - 1833: The first clipper ship (fast large armed sailing ship), Isaac McKim's "Ann McKim", is built in Baltimore

What the Industrial Age knew

- USA
 - Trade with Asia
 - 1840s: Tea, opium and gold prompt boom in clipper building
 - 1846: the clipper ship "Sea Witch" shortens the trip Boston-Canton to 79 days
 - 1840s: China is the third largest exporter to the USA after Britain and France
 - 1844: Opening of Chinese ports (Treaty of Wangxia, 1844)
 - 1854: Opening of Japanese ports (Commodore Perry expedition, 1854, via Cape of Good Hope and Hong Kong)

What the Industrial Age knew

- USA
 - Trade with Asia
 - Beneficiaries: New England whalers and traders
 - Beneficiary: Japan (exposed to technologies such as the telegraph, the steam engine, the revolver, the daguerreotype)
 - 1866-71: Failed mission in Korea
 - 1867: Acquisition of the Midway islands in the Pacific as coaling stations

What the Industrial Age knew

- USA expansion
 - The USA at war
 - Independence War 1775–83
 - Barbary Wars (North Africa) 1801-06
 - USA-Britain 1812-15
 - Monroe Doctrine 1823
 - China forced by US navy to grant trading rights 1844
 - Mexican War 1846-48 (California etc)
 - Japan forced by US navy to open up to foreign trade 1853-54
 - Civil War 1861-65
 - USA-Spain 1898 (Puerto Rico, Philippines)

What the Industrial Age knew

- USA expansion
 - Only major power to front both the Atlantic and Pacific ocean
 - A de-facto island (military security)
 - First republic in history to become a territorial empire

What the Industrial Age knew

- USA expansion
 - “Indian” wars
 - 1622: Opechancanough (Britain)
 - 1637: Pequot war (Britain)
 - 1655: Algonquian (Holland)
 - 1729: Natchez (France)
 - 1781: Miami (USA: Ohio)
 - 1814: Creek (USA: Alabama)
 - Andrew Jackson’s “Indian Removal Act” (1830)
 - 1832: Black Hawk (Illinois and Wisconsin)
 - 1835: Seminole (Florida)
 - 1860s: Arapaho, Cheyenne, Sioux (Great Plains)
 - 1880s: Apaches (Southwest)
 - 1890: Sioux (South Dakota: Massacre of Wounded Knee and end of the Indian wars)

What the Industrial Age knew

- USA expansion
 - “Indians”
 - Nomadic: Shoshone, Apache, Cheyenne, Dakota, Crow
 - Sedentary: Navajo, Zuni, Hopi
 - Matrilineal tribes: Navajo, Zuni
 - “Indian” wars
 - Whites sold guns and horses to the Indians, which Indians used to kill whites, which caused the Indian wars

What the Industrial Age knew

- USA expansion
 - Yellow Fever
 - Philadelphia in 1793
 - Boston, New York City and Philadelphia in 1798
 - Baltimore in 1800

What the Industrial Age knew

- Russian Empire (1762-1917)

RIVERS



What the Industrial Age knew

- Russian Empire
 - 1756-1763: Russia sides with France, Austria, Saxony, Sweden and Spain in the Seven Years' war against Prussia and Britain
 - 1768-74: Russia defeats the Ottomans
 - 1795-1815 Napoleonic wars: Austria, England, Russia, Spain, Sweden, Prussia win against France
 - 1787-92: Russia and Austria defeat the Ottomans
 - 1806-12: Russia defeats the Ottomans
 - 1828-29: Russia, France and England defeat the Ottomans

What the Industrial Age knew

- Russian Empire (1762-1917)

FORESTS



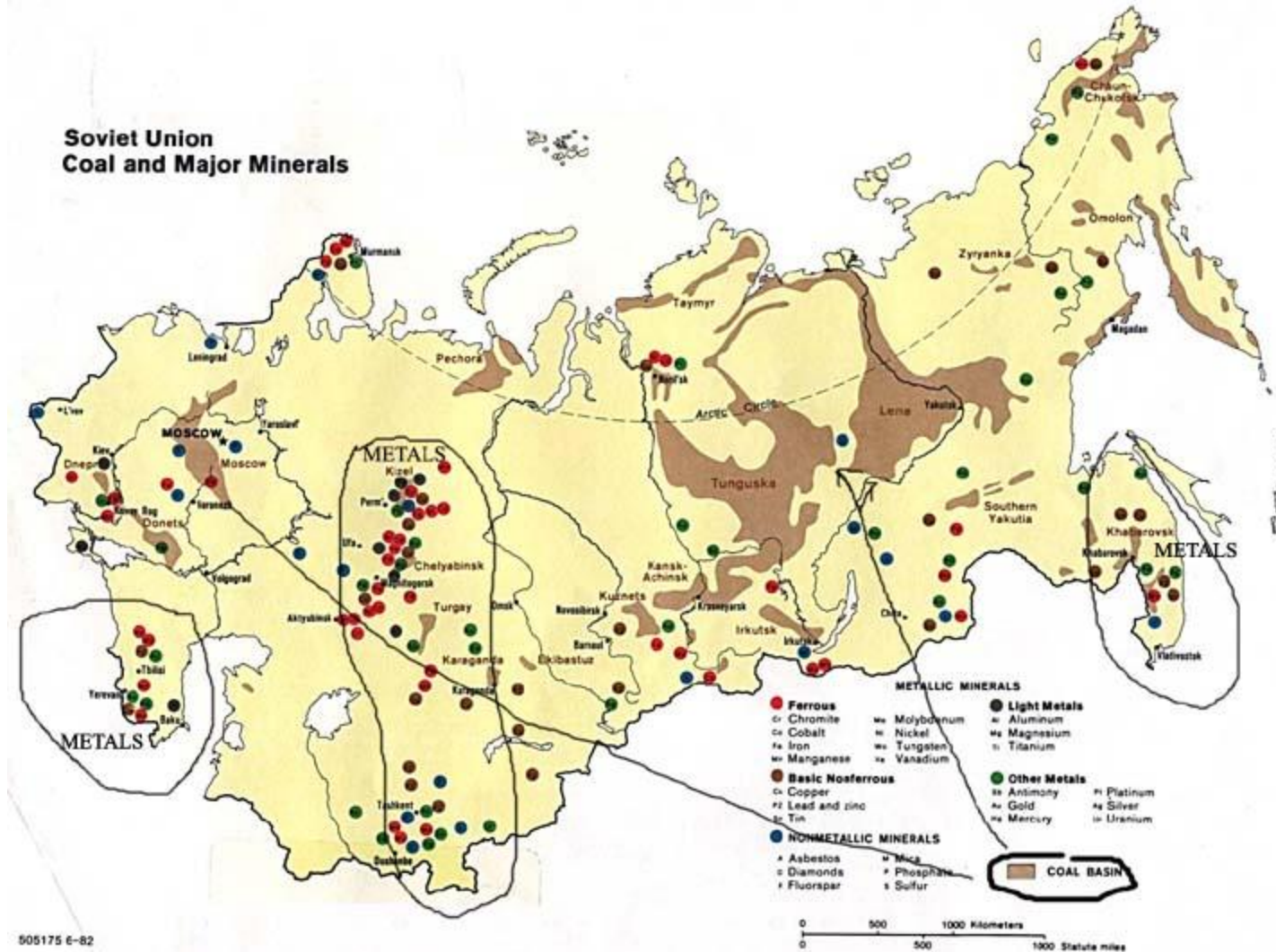
Some of the major classes displayed here are:

- | | | | |
|----------|------------------|-------|------------------------|
| Orange | Pine (Pinus) | Red | Cedar (Pinus Siberica) |
| Purple | Spruce (Picea) | Green | Oak (Quercus) |
| Dark Red | Larch (Larix) | Cyan | Birch (Betula) |
| Yellow | Cedar Elfin Wood | Blue | Water |
| | | Grey | Open Land |

What the Industrial Age knew

- Russian Empire (1762-1917)

IRON AND COAL



What the Industrial Age knew

- Russian Empire (1762-1917)
 - Ekaterina II/ Catherine the Great (1762-1796)
 - A princess of Protestant Prussia...
 - ...who had more than 20 lovers
 - Patronage of the arts
 - Personal collection of art, including much Chinese art (the future Hermitage Museum)
 - Studies the French philosophers, corresponds with Voltaire and Diderot
 - Antonio Rinaldi's "Chinese Palace" at Oranienbaum
 - Free Economic Society (St Petersburg, 1765)
 - Patron of the Russian opera

What the Industrial Age knew

- Russian Empire (1762-1917)
 - Ekaterina II/ Catherine the Great (1762-1796)
 - Two enemies: Poland and the Ottomans
 - Turkish wars (1768-92):
 - Russian obtains command of the Black Sea (its second “window to the west” after the Baltic)
 - 1774: Russia obtains control of Southern Ukraine, Northern Caucasus, and Crimea (first time that the Ottoman Empire loses Muslim subjects to a Christian power)
 - Protectorate over Christian churches in Istanbul, i.e. an excuse to meddle into Ottoman affairs

What the Industrial Age knew

- Russian Empire (1762-1917)
 - Ekaterina II/ Catherine the Great (1762-1796)
 - Partition of Poland-Lithuania among Prussia and Austria (1772, 1793, 1795)
 - Russia becomes a European power

What the Industrial Age knew

- Russian Empire (1762-1917)
 - Ekaterina II/ Catherine the Great (1762-1796)



Wedding gown of Ekaterina II
(Metropolitan Museum)

What the Industrial Age knew

- Russian Empire (1762-1917)
 - Ekaterina II/ Catherine the Great (1762-1796)
 - Westward expansion annexes regions with developed economy
 - Southward expansion annexes fertile agricultural lands (grain trade)
 - Russia becomes a leading European country for mining and metallurgy
 - Baltic expansion and Black Sea expansion fosters a boom of foreign trade via the Baltic ports (St Petersburg, Riga) and Black Sea ports (Odessa)
 - 50% of Russia's trade is with Britain

What the Industrial Age knew

- Russian Empire (1762-1917)
 - Ekaterina II/ Catherine the Great (1762-1796)
 - Russia has 36 million people, 96% living in the countryside and 53% being serfs
 - Decline of clergy (land expropriation)
 - Domination of the gentry (landlords/landowners)
 - 1762: Nobility is freed from the obligation to serve the czar and many noblemen are awarded country estates with thousands of serfs
 - 1789: Nikolai Sheremetev owns one million serfs
 - A landowner's manor is a miniature replica of the court

What the Industrial Age knew

- Russian Empire (1762-1917)
 - Ekaterina II/ Catherine the Great (1762-1796)



PARTITIONS OF POLAND

The Partitions of Poland

The map shows the collapse of Poland divided onto parts by its neighbours.

Each respective share of the Partitioning powers is marked with different colour.

	Russia	Prussia	Austria
1772			
1793			
1795			

TO RUSSIA

TO PRUSSIA

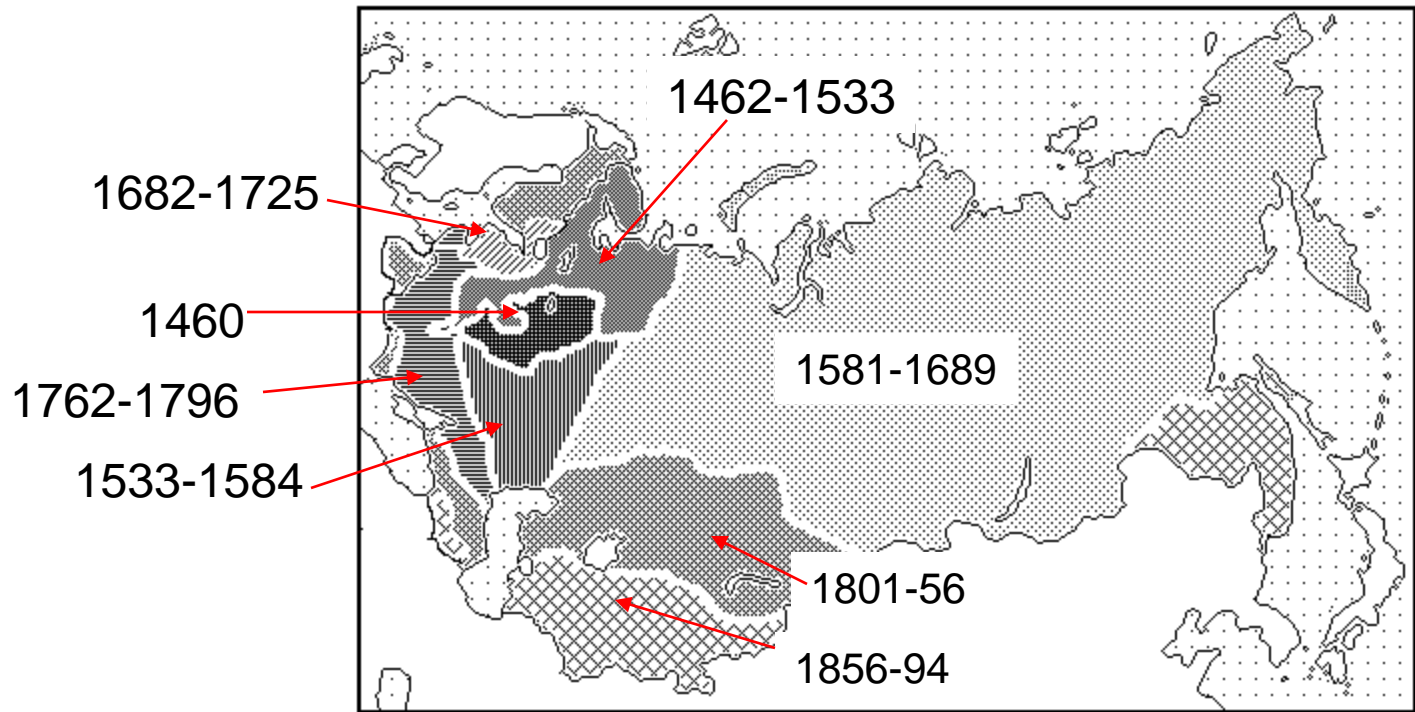
TO AUSTRIA












What the Industrial Age knew

- Russian Empire
 - Three wars with Sweden (1742, 1788, 1808)
 - Annexation of Finland in 1807, Baltic ports
 - Three wars with Poland (1772, 1793, 1795)
 - Annexation of Lithuania, eastern Ukraine, Belorussia
 - Two wars with Persia (1804, 1826)
 - Annexation of Georgia in 1810, Armenia in 1828, Caucasus
 - Endless wars with the Ottoman Empire (1736, 1768, 1787, 1806, 1828, 1853...)
 - Black Sea, Caucasus and Balkans
 - 67 million people in 1851

RUSSIAN EXPANSION, 1462-1894



-  Grand Principality of Moscow, ca. 1460.
-  Expansion Under Ivan III and Vasily III, 1462-1533. (Novgorod, Pskov, and Northern Regions).
-  Expansion Under Ivan IV, 1533-1584. (Smolensk, Khanates of Kazan and Astrakhan).
-  Siberian Expansion, 1581-1689.
-  Expansion Under Peter I, 1682-1725. (Estonia, Latvia, Ingria, St. Petersburg).
-  Expansion Under Peter's Successors, especially Catherine II, 1762-1796. (Rostov, Taman' Peninsula, Ukraine, Belorussia, Lithuania, the Crimea).
-  Expansion Under Alexander I and Nicholas I, 1801-1856. (Kazakhstan, Northern Caucasus, Finland, Congress Poland).
-  Expansion Under Alexander II and Alexander III, 1856-1894. (Amur River Basin, Southern Caucasus, Pacific Provinces, Central Asia).
-  Territories of Other Powers.

What the Industrial Age knew

- Russian Empire
 - Alexander I (1801-25)
 - The French revolution terrifies the Russian nobility
 - 1812: Napoleon invades Russia and is repelled mostly by Russian peasants not by the westernized nobility
 - Rediscovery of Russian traditions
 - Russian instead of French begins to make inroads as the official language of the cultural world
 - Russianization instead of Europeanization
 - 1825: Decembrists stage a (failed) coup against the czar

What the Industrial Age knew

- Russian Empire
 - Nikolay I (1825-55)
 - 1829: Russia defeats the Ottomans, gains control of Moldavia and Wallachia, and helps Serbia and Greece become independent (first step towards the dismemberment of the Ottoman Empire)
 - Arch-conservative, hostile to liberal ideas
 - Crushes Polish uprising
 - Russia as the natural leader of all Slavic peoples
 - Russia as the land of religious orthodoxy

What the Victorian Age knew

- Russia's expansion in Asia
 - 1552: Ivan conquers the Mongol khanate of Kazan
 - 1556: Ivan conquers the Mongol khanate of Astrakhan
 - 1581: Cossacks begin colonizing Siberia
 - 1639: the Cossacks reach the Pacific Ocean
 - 1718: Russia defeats the Khazak horde
 - 1741: Russian explorer Vitus Bering "discovers" Alaska
 - 1801: Russia annexes Georgia
 - 1808: Russia establishes the colony of Noviiy Rossiya in California
 - 1828: Russia captures Armenia and Azerbaijan from Iran

What the Victorian Age knew

- Russia's wheat
 - 1794: Russia founds Odessa in Ukraine (conquered from the Ottomans) as a port on the Black Sea to export wheat
 - The wheat trade is highly profitable
 - Odessa a cosmopolitan city
 - Odessa grows faster than any other major city in 19th-century Europe
 - Ukraine is the breadbasket of Europe

What the Victorian Age knew

- Russia's wheat
 - Russia's grain ships have to pass between two narrow straits, the Bosphorus and the Dardanelles, both controlled by the Ottomans
 - 1853: Russia provokes the Crimean War but loses
 - Ukrainian wheat is taken to Odessa on carts (first train station in 1865)

What the Victorian Age knew

- Nations
 - Russia
 - The largest country in the world, comprising
 - Finland (since 1809),
 - Poland (since 1815),
 - Ukraine (since 1654),
 - Armenia (since 1828),
 - Georgia (since 1813),
 - Azerbaijan
 - Central Asia

What the Victorian Age knew

- Nations
 - Russia



What the Industrial Age knew

- Before the French Revolution
 - Revolts against “old regimes”
 - Dutch revolution (aristocratic, independence, first republic)
 - English revolution (aristocratic, regime change, constitutional monarchy)
 - US revolution (bourgeois, independence, republic with separation of powers)

What the Industrial Age knew

- Before the French Revolution
 - 1770: Austro-French alliance via the wedding of the future Louis XVI with Marie-Antoinette of Austria (end of the age-old Bourbon-Habsburg rivalry)
 - 1774-81: Charles de Vergennes foreign minister, global strategy of engagement with the British Empire
 - France is the only power that has to support both a major continental army (to maintain dominance in continental Europe) and a major navy (to contain Britain worldwide)
 - Need to maintain the trade with the West Indies (sugar economy)

What the Industrial Age knew

- Before the French Revolution
 - 1778-83: France helps the USA against Britain
 - The financial cost is colossal
 - France loses any chance to regain the territories (Louisiana) lost to Britain in the Seven Years War
 - Britain remains the USA's main trade partner because pre-war trade patterns are rapidly reestablished
 - Admiral Pierre-André de Suffren wins naval battles off India (1782-83) that restore French pride
 - LaFayette hero of the two worlds

What the Industrial Age knew

- Before the French Revolution
 - Queen Marie-Antoinette described as a moral monster by the popular pamphlets



Essai Historique sur la Vie
de Marie-Antoinette

What the Industrial Age knew

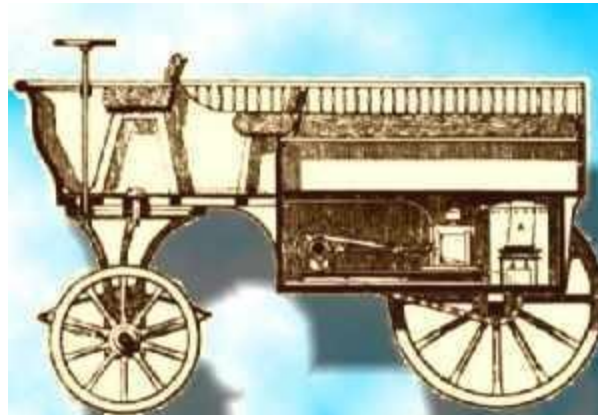
- Before the French Revolution
 - The Enlightenment: reason and progress
 - Indirectly: rebellion against religion (which is the opposite of reason) and against the old regime (which is the opposite of progress)

What the Industrial Age knew

- Before the French Revolution
 - Enlightened dictators who patronize science, art, technology, and promote commerce and industry
 - Friedrich II of Prussia (1740-86)
 - Josef II of Austria 1765-90)
 - Ekaterina II of Russia (1762-96)
 - Carlos III of Spain (1759-88)
 - Gustav III of Sweden (1771-92)
 - Jose I of Portugal (1750-77)

What the Industrial Age knew

- Before the French Revolution
 - Aristocratic and popular passion for science, novelty, inventions
 - Benjamin Franklin (1752): lightning rod and the idea that charged bodies cancel each other's charge
 - Nicolas Joseph Cugnot (1769): the first “automobile”
 - Montgolfier (1783): the age of the heroic inventor



What the Industrial Age knew

- Before the French Revolution
 - Joseph-Michel and Jacques-Étienne Montgolfier (1783)
 - Aeronauts: Jean-Francois Pilatre de Rozier and the Marquis Francois d'Arlandes become the first to fly

“Experience aerostatique
Versailles le 19 sept. 1783
(Etching, 1783)



Balloon for the first manned
flight of november 1783



What the Industrial Age knew

- Before the French Revolution
 - The “inventor” becomes a popular hero
 - Benjamin Franklin
 - Montgolfier brothers
 - The public of the inventor is now the masses not the elite
 - A spectacle that blurs the class divide

What the Industrial Age knew

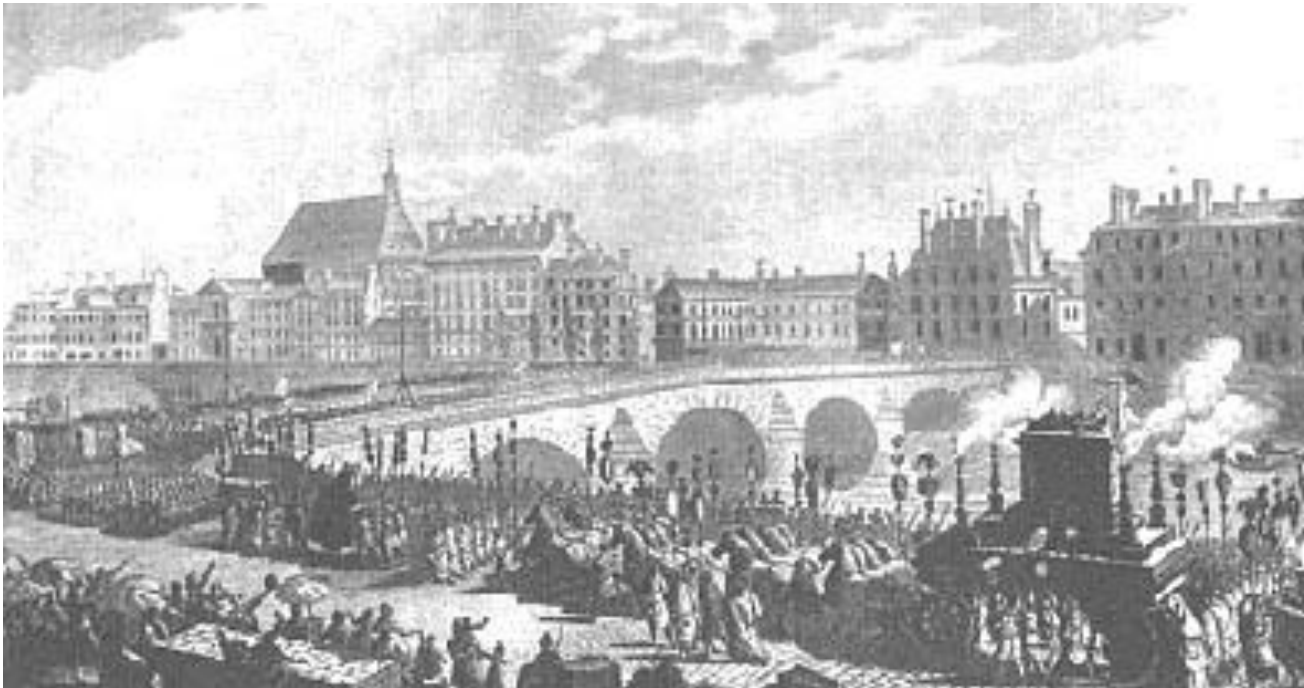
- Before the French Revolution
 - Theatre
 - Popular entertainment: pantomime, vaudeville and circus
 - Opera-Comique (1762) restores the Comedie Italienne as the main royal-sanctioned entertainment
 - Raucous boulevard theaters vs Comedie-Francaise and Opera
 - The Palais-Royal (1785) serves shows for both aristocrats and general public
 - Beaumarchais' farces appeal to both aristocracy and masses
 - A spectacle that blurs the class divide

What the Industrial Age knew

- Before the French Revolution
 - Public opinion
 - Simon Linguet’s “Journal de Politique et de Literature” (1775) and “Memoires sur la Bastille” (1783)
 - Libelles

What the Industrial Age knew

- Before the French Revolution
 - Public opinion
 - Voltaire's funeral



What the Industrial Age knew

- Before the French Revolution
 - The three estates (clerge, noblesse, tiers-etat)
 - First and second estate own a disproportionate share of the land
 - Only one estate pays taxes: the third estate



What the Industrial Age knew

- Before the French Revolution
 - Boom of domestic and international trade
 - Echoes of the British industrial revolution
 - Two Frances
 - Booming ports on the Atlantic and Mediterranean, booming textile industry in the Champagne, booming coal mines of the Pas-de-Calais, booming steel industry of the Lorraine, booming financial markets of Paris
 - Lethargic rural central France dominated by the clergy and the bureaucracy

What the Industrial Age knew

- Before the French Revolution
 - 1781-1787: Insurrection in the Netherlands
 - 1781: “Patriot” movement (pro-democracy)
 - 1787: Prussian invasion to restore order
 - France, its finances broke, cannot intervene and is humiliated at its doorstep
 - Dutch “Patriots” flee to Paris

What the Industrial Age knew

- Before the French Revolution
 - “La Journée des Tuiles” (Grenoble, 1788)
 - “Réveillon Riot” (Paris, April 1789)



Day of the Tiles

What the Industrial Age knew

- French Revolution (1789-94)
 - Freest countries in Europe: Britain, Holland
 - American revolution: feasibility study of the ideas of the Enlightenment
 - France's late-feudal model: absolute monarchy that makes deals with the aristocracy and the clergy
 - France's debt-ridden finances: unequal taxation (e.g., gabelle and corvee), exempting aristocracy and clergy, supports extravagant expenditures by the king (e.g., Versailles), military expenditures (e.g., Seven Years War) and support for friendly government (e.g., the USA)

What the Industrial Age knew

- French Revolution (1789-94)
 - France's debt-ridden finances
 - John Law's speculation (collapse of the Banque Générale in 1720)
 - Cardinal Fleury's wars (War of the Polish Election 1733-38 and War of the Austrian Succession 1740-48)
 - Seven Years' War (1756-63)
 - Extravagant lifestyle of queen Marie Antoinette (Austrian-born)
 - Support for the USA against Britain (1778-83)
 - 1788: France is broke and the king convenes the first Estates General since 1614

What the Industrial Age knew

- French Revolution (1789-94)
 - Frustrated citizens of France’s “ancient regime”:
 - Rising bourgeoisie
 - Seven Years War
 - Aggrieved peasants
 - Exploited wage-earners
 - Intellectuals (of all classes) influenced by Philosophes
 - Mobs angered by famine in the countryside and shortage of bread in Paris

What the Industrial Age knew

- French Revolution (1789-94)
 - New political discourse
 - Salons organized by women in Paris
 - The philosophes of Diderot's encyclopedia
 - Rise of the press
 - The monarchy lost control of what its subjects were reading
 - Penetration of British consumerist society
 - Creation of a "public sphere" outside the control of the state

What the Industrial Age knew

- French Revolution (1789-94)
 - Salons

French salon 1720
(Art Institute of Chicago)



What the Industrial Age knew

- French Revolution (1789-94)
 - Fiscal exemption of the aristocracy
 - Aristocratic monopoly over upper church offices
 - Policy of selling offices with tax-exempt status to fund warfare

What the Industrial Age knew

- French Pre-Revolution (1787)
 - 1787: The revolution is started by the aristocrats (second estate) not by the third estate (bourgeoisie, peasantry) to conspire against the tyranny of absolute government

Hubert Robert: The demolition of the Bastille on July 14, 1789 (Paris, Musée Carnavalet)



What the Industrial Age knew

- French Revolution (1789)
 - May 1789-Sep 1791:
 - May 1789: The Estates-General proclaim themselves the National Assembly
 - July 1789: Bastille
 - 1789-95: The government moves from Versailles to the “Paris Commune”
 - Peasant riots in the countryside (“Great Fear”)
 - August 1789: Abolition of the aristocracy (abolition of feudalism)
 - August 1789: “Proclamation of Rights”, modeled after the Virginia Declaration of Rights of 1776
 - October 1789: Women march on Versailles
 - November 1789: All Church property is confiscated

What the Industrial Age knew

- French Revolution (1789)
 - May 1789-Sep 1791:
 - 1791: The French constitution is the first constitution in Europe (Britain never had one)
 - Voting rights for male citizens
 - Separation of powers
 - Religious tolerance
 - The king remains in charge of the executive power, but no legislative power
 - Alliance between enlightened nobles (Mirabeau), enlightened clergymen (Sieyes, Talleyrand) and the Third Estate

What the Industrial Age knew

- French Revolution (1789)
 - July 1789: Bastille

Claude Cholat: “The Siege of the Bastille” (1789)



What the Industrial Age knew

- French Revolution (1789)
 - Oct 1791-Sep 1792: Legislative Assembly
 - Representing mainly the middle class
 - Emancipated from feudalism and empowered with land, the peasants become defenders of the status quo
 - The National Assembly asserts the union of France and increases the patriotic spirit
 - Feb 1793: Compulsory military draft
 - War (1792) against Austria and Prussia and (1793) Spain, England and Holland

What the Industrial Age knew

- French Revolution (1789)
 - Sep 1792: National Convention
 - End of monarchy
 - Massacre of royalists (about 1-2,000)
 - Jan 1793- Nov 1794: Robespierre's Terror
 - Aggressive attitude against the other powers
 - The other powers feel threatened by the revolution
 - Robespierre loses the support of the peasantry

What the Industrial Age knew

- French Revolution (1789)
 - Guillotine (first used in april 1792)



Journal d'Autre Monde, 1794

What the Industrial Age knew

- French Revolution (1789)
 - Exporting the revolution
 - France wins against the alliance of Austria, Prussia, Holland and Spain
 - Holland becomes the Batavian Republic (1795)
 - Helvetic Republic (1798)
 - Napoleon in Italy (1796-97)
 - Napoleon in Egypt (1798)

What the Industrial Age knew

- French Revolution (1789)
 - Aug 1795-Nov 1799: Directory
 - Partial restoration of civil rights
 - End of war
 - Dec 1799-May 1804: Consulate
 - Napoleon's coup: military dictatorship
 - May 1804-Jun 1815: Empire
 - Napoleon's imperial wars

What the Industrial Age knew

- French Revolution (1789-94)
 - Dismantling of feudalism: a casteless society
 - Losers: aristocracy (loses land to the peasants) and Church (loses most of its wealth but retains some power because people still believe in the Catholic dogma)
 - Beneficiaries: bourgeoisie (money buys the power) and peasantry (gets the land of the aristocracy)

What the Industrial Age knew

- French Revolution (1789-94)
 - The bourgeoisie started the revolution
 - The peasantry stopped it (after acquiring land)
 - The peasantry, now landowner, has no motivation to move to towns and factories (while Britain and Germany are undergoing the industrial revolution)

What the Industrial Age knew

- French Revolution (1789-94)
 - The schools migrate from the Church to the state, but the effect is a rapid decline of education
 - The revolution abolishes freedom of the press
 - The political discourse dominates in France while the literary and scientific discourses dominate in Britain
 - Anarchy and crime
 - Boom of pornographic literature
 - Rise of ordinary women

What the Industrial Age knew

- French Revolution (1789-94)
 - Old regime: inequality and privilege, social order based on caste
 - New regime: equality and liberty, wealth is more important than caste

What the Industrial Age knew

- French Revolution (1789-94)
 - Not a class war between bourgeoisie and aristocracy (85% of people executed were commoners)
 - The "nation" replaced "God" and "King" (birth of **nationalism**)

What the Industrial Age knew

- French Revolution (1789-94)
 - Birth of the idea of **redemption of human society through political means**
 - Transition from cyclical to linear thinking
 - The future is good, the past is bad
 - Modernity

What the Industrial Age knew

- French Revolution (1789-94)
 - Democracy but not liberalism (human rights, legal rights, individual freedom, etc)
 - The absolute power of the King is replaced by the absolute power of the National Assembly
 - An illiberal democracy

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - Restoration of order
 - Highly centralized administration (a revision of Richelieu's system of intendants)
 - French patriotism (the main motivation of the army)
 - Paris' population doubles during the Napoleonic years
 - Enlightened leader (French expedition of scholars to Egypt in 1798, the metric system 1800)
 - Vision of a federation of free European peoples

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - 1799: Coup
 - 1800: Bank of France
 - 1801: Concordat with the Pope
 - 1801: Austria and the Holy Roman Empire surrender all territories west of the Rhein (about 100 German states disappear)
 - 1803: Sells Louisiana to the USA
 - 1803: The “Mediatization” of the German diet assigns more than 100 small German states to larger states
 - 1803: War with Britain
 - 1804: Crowns himself emperor, whereas before there was only one emperor in Europe (the Habsburg)

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - 1805: Third coalition (Britain + Austria + Russia + Sweden and later Prussia)
 - 1805: After the defeat at Trafalgar, Britain dominates the seas, no matter how much Napoleon wins on land
 - 1805: Napoleon defeats Austria (Austerlitz)
 - 1806: Napoleon defeats and dismembers Prussia (Jena), southern German states form the Confederation of the Rhein (a French protectorate), the Holy Roman Empire is dissolved
 - 1806: Napoleone's brother appointed king of Spain
 - 1807: Napoleon defeats Russia
 - 1807: Invades Portugal
 - 1808: Napoleone's brother appointed king of Spain

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - 1809: Annexes the Papal state
 - 1810: Marries the daughter of the last Holy Roman emperor



What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - 1812: Napoleon invades Russia (a failure of logistics: only 25,000 of the 450,000 soldiers sent to Russia return to France, despite the fact that Russia has not won a single battle)
 - 1813: Spanish patriots expel France with help from Britain
 - 1813: Russia, Prussia, Austria (all funded by Britain) invade Napoleonic Germany
 - 1814: Napoleon surrenders

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - Code Napoleon:
 - Abolition of serfdom
 - Freedom of religion
 - National constitutions
 - Universal male suffrage
 - Parliament/ bill of rights
 - Free public schools
 - Academies for arts and sciences
 - But...
 - 1801: When the French colony of Haiti declares a constitution and abolishes slavery, France invades Haiti and arrests the rebel leader Toussaint L'Ouverture

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - but...
 - Cult of personality
 - War taxes
 - Compulsory military service
 - No freedom of press

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - The Napoleonic wars were the first world war: all the major powers were involved, with implications in other continents
 - Winners: Britain, Russia, Austria, Prussia and...
 - ... France (Talleyrand's diplomacy)
 - No loss of territory
 - No reparation
 - France remains a power
 - The real loser: Spain loses all the American colonies to independence movements

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - National spirit
 - Aspiration to unification by people who speak the same language but are fragmented into several states (Italy, Germany)
 - Aspiration to independence by people who speak the same language and are subjects of an empire that speaks a different language (Austro-Hungarian subjects, Italians)
 - Indirectly, patriotism defeats Napoleon (especially in Prussia and Spain)

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - National spirit
 - 1800: The “Carbonari” movement in Italy
 - 1804: Haiti declares independence from France, the second colony after the USA to become independent in America
 - 1808: Napoleon's occupation of Portugal and Spain triggers independence movements in their American colonies (Jose de San Martin)
 - 1814: “Hetaira Philike” movement in Greece
 - 1815: Serbia's independence

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - All lands conquered by Napoleon experience
 - abolition of feudalism/aristocracy
 - abolition of serfdom
 - recognition of equality of all citizens
 - educational reforms
 - individual liberties
 - suppression of the Inquisition
 - confiscation of church property
 - public works
 - Monarchies are restored but they are no longer absolutists

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - Exceptions
 - Britain
 - The parliament remains an aristocratic oligarchy
 - The aristocracy remains in power
 - Corn laws and enclosure acts even achieve the exact opposite of the French revolution: the aristocracy gets richer at the expense of the peasants
 - Britain even suppresses the independence movement in Ireland (1800)

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - Exceptions
 - Britain
 - Reason: the British system created a successful empire and a successful economy
 - All the successes against Napoleon result in commercial advantages for the British middle class
 - Acquisition of islands in the Mediterraneans (Malta, Ionian islands), the Caribbeans (Trinidad, St Lucia, plus Guyana), south Asia (Ceylon), Africa (Mauritius, plus South Africa) that increase British control over international trade

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - Exceptions
 - Britain
 - Rise of the industrial capitalist who benefits from the British system
 - The British are more interested in making money than in humanitarian principles

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - Exceptions
 - Russia
 - The only European country where the absolutist monarchy survives
 - The only country where serfdom survives
 - The aristocracy remains in power
 - Most Russians are illiterate

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - Consequences
 - The powers of Europe aim for perpetual peace
 - Alexander I of Russia proposes a “Holy Alliance” (1815)
 - However Britain supports revolutionary movements (e.g., Latin American independence movements, Spain 1820, Italy 1821, Greece 1821, Belgium 1830) while the absolute monarchs of Russia, Austria and Prussia fear them

What the Industrial Age knew

- Napoleon's experiment (1795-1815)
 - Britain
 - Cripples the economic routes of the French empire
 - Assembles an anti-French alliance that provides warriors
 - And its territory is left untouched by war

What the Industrial Age knew

- Paris, city of science
 - Antoine Lavoisier’s “Elements of Chemistry” (1787): founding of chemistry
 - Joseph Louis Lagrange’s “Mecanique Analytique” (1788): mechanics reduced to calculus
 - The French Revolution (1789) undermines religion and Napoleon respects scientists
 - Ecole Polytechnique in Paris (1794) invents the science/engineering student
 - Academie de Sciences (refounded in 1794): salaried scholars
 - Georges Cuvier (1796): paleontology
 - Xavier Bichat’s “Treatise on Membranes” (1799): histology

What the Industrial Age knew

- Paris, city of science
 - The metric system (1799)
 - Sadi Carnot (1824): Second law of Thermodynamics
 - Pierre-Simon Laplace: "Traite` de Mecanique Celeste" (1825): The future is fully determined
 - Joseph Fourier (1827): Any periodic function can be represented as the sum of a series of sinusoidal and cosinusoidal waves
 - André-Marie Ampère (1827): Electrodynamics
 - Auguste Comte's "positivism" (1830)

What the Industrial Age knew

- After Napoleon
 - 1820: Becquey's plan for a network of canals

What the Industrial Age knew

- Congress of Vienna (1815)
 - Horror at the bloodshed of the French Revolution
 - Clemens von Metternich (1809-48)
 - “What the Europeans want is not liberty but peace”
 - Hatred of liberalism and fear of Russia
 - Restoration of monarchies
 - Restoration of frontiers of 1792
 - Revival of religion (Pius VII, rebirth of the Jesuits)
 - Holy Alliance of Austria, France and Russia to protect Europe from liberal movements and uprisings (eg abolition of the constitution and restoration of the Bourbons in Spain, 1823)

What the Industrial Age knew

- Congress of Vienna (1815)
 - Russia obtains Poland and Finland
 - Sweden obtains Norway from Denmark
 - Holland, Belgium and Luxembourg are united (but the union only lasts 15 years)
 - A German Confederation is created under Austria (reducing the number of the Holy Roman Empire states from 360 to 38) but without Prussia

What the Industrial Age knew

- Congress of Vienna (1815)
 - Prussia obtains half of Saxony, Swedish Pomerania and the Rhineland, becoming the biggest German state and extending its border to France
 - Prussia as the bulwark against France
 - Prussia obtains vast mineral resources for its industrial development
 - Prussia transformed from a half-slavic state into a German state
 - The most industrial state of Germany

What the Industrial Age knew

- Congress of Vienna (1815)
 - Austria obtains the richest part of Italy: Lombardy (Milano) and Venezia/Venice and control over Tuscany (Firenze/ Florence)
 - Southern Italy remains under Spain
 - Central Italy remains split into small states plus the Papal State
 - Only Piedmont/ Savoy is independent in Italy

What the Industrial Age knew

- Congress of Vienna (1815)



What the Industrial Age knew

- The German-speaking world before Napoleon
 - The Holy Roman Empire in theory still embraces all of the German-speaking world, except Switzerland
 - The emperor remains a Habsburg
 - In practice the “empire” is a loose alliance of 200-300 independent states, each an absolutist monarchy
 - The diet is simply a congress of diplomats
 - Some are Catholic, some are Protestant, and some Protestant ones are Lutheran and some are Calvinist

What the Industrial Age knew

- The German-speaking world
 - Second most important family in Germany: the Hohenzollerns
 - 1415: The emperor assigns them Brandenburg (Berlin)
 - Leader of the Protestant states, just like Austria is the leader of the Catholic states
 - 1618: Acquire East Prussia (a fief of Poland) through marriage



What the Industrial Age knew

- The German-speaking world
 - Hohenzollerns
 - 1640: Friedrich Wilhelm becomes duke of Brandenburg and Prussia (still a Polish fief)
 - 1657: Friedrich Wilhelm obtains Prussia from Poland in return for helping fight Sweden
 - 1672: Brandenburg allies with Spain and Holland against France and Sweden
 - 1679: Brandenburg defeats Sweden and becomes a rival for Baltic domination

What the Industrial Age knew

- The German-speaking world
 - Hohenzollerns
 - Friedrich Wilhelm builds a canal joining the Oder and the Elbe
 - Welcomes Huguenots who flee France after 1685 (revocation of the Edict of Nantes)
 - 1701: Friedrich I crowns himself “king” of Prussia
 - 1713: Friedrich Wilhelm I, second king of Prussia, recognized by all powers
 - Friedrich Wilhelm I creates a world-class army

What the Industrial Age knew

- The German-speaking world
 - Hohenzollerns
 - 1740: Friedrich II becomes third king of Prussia at the same time that Maria Theresa becomes ruler of the Habsburgs
 - 1741: Friedrich “the Great” (an enlightened king) reforms the Royal Academy hiring philosophers and scientists from all over Europe (eg Euler)
 - 1740-48 Prussia allies with France and Bavaria against Austria (War of the Austrian Succession) and annexes industrialized Silesia

What the Industrial Age knew

- The German-speaking world



What the Industrial Age knew

- The German-speaking world



What the Industrial Age knew

- The German-speaking world



What the Industrial Age knew

- German states
 - Bavaria
 - Saxony
 - Hanover



What the Industrial Age knew

- German states
 - Bavaria
 - Wittelsbach family
 - Leader of the Catholic League
 - But then enemy of the Habsburgs since the War of the Spanish Succession
 - Saxony
 - Wettin family
 - Most important protestant state after Brandenburg
 - Saxon dialect is the literary language of Germany
 - 1697-1763: Union of Saxony and Poland under a Saxon king

What the Industrial Age knew

- German states
 - Hanover
 - 1714: A Hanover ruler becomes English king George I
 - 1714-1837: Union of Hanover with England under the house of Hanover

What the Industrial Age knew

- Prussia
 - 1750: There are about 300 states in Germany
 - 1756: Britain and Prussia declare war against France, Austria, Sweden and Russia ("Seven Years' War")
 - 1763: Prussia wins the Seven Years' War and becomes Austria's peer in Germany
 - 1763: Prussia (Friedrich II) mandates universal education for children (Massachusetts: only in 1852, first in the Americas) (England: only in 1880!)
 - 1772: Prussia conquers West Prussia from Poland
 - 1795: Poland-Lithuania is divided between Russia and Prussia

What the Industrial Age knew

- Prussia
 - 1815: The Congress of Vienna restores order in Europe but that order depends on the German world being fragmented into dozens of small states
 - 1815: Prussia gains political control of industrial Rhineland
 - 1830s: The industrial revolution finally starts gathering pace in Prussia

What the Industrial Age knew

- Prussia
 - Education
 - Goal of education is the Bildung (self-growth to become a good human being)
 - Lessing: the goal of education has to be “moral becoming”
 - Herder: Bildung is a task, a project, and it has to be driven by the state to shape the nation (Volk)
 - Education becomes part of economics and politics
 - A secular version of Pietist theology
 - Bildung is a form of secular salvation

What the Industrial Age knew

- Prussia
 - Education
 - Inspired by Athens and Renaissance (the German nation is a federation of nations just like ancient Greece and Italy)
 - Johann Winckelmann: "The History of Art in Antiquity" (1764)
 - Friedrich Wolf: "Prolegomena to Homer" (1795)
 - Art is important for a nation, and the history of art is important for the history of a nation
 - Greek revival in universities

What the Industrial Age knew

- Prussia
 - Education
 - Weimar
 - Christoph Wieland founds the literary monthly “Der deutsche Merkur” (1773)
 - Tiny Weimar (6000 people) becomes the cultural capital of Germany

What the Industrial Age knew

- Prussia
 - Education
 - Wilhelm von Humboldt (1792)
 - Reform of education in Germany
 - Establishment of Technische Hochschulen and Gymnasien (classical school based on Greek civilization)
 - Abitur examination
 - Berlin Univ (1810): the first university founded on research
 - Depth of knowledge, not breadth
 - The PhD

What the Industrial Age knew

- Prussia
 - Education
 - First PhD program in science: Justus von Liebig at the University of Giessen in the 1820s
 - Before the PhD:
 - Engineers and doctors learn on the job
 - Science is a hobby
 - Research depends on patronage from nobility and gentry or the scientist is financially independent (Darwin)
 - Ecole Polytechnique in Paris (1794) invents the science/engineering student but Napoleon turns into a military school
 - Science lagging behind technology

What the Industrial Age knew

- Prussia
 - Education
 - After the PhD:
 - Formal courses in science and engineering taught by researchers
 - Competitive examinations
 - The model spreads to Britain and the USA
 - 1870: the better educated country (Germany) wins the war (against France)
 - Science overtakes technology
 - Scientific research is a male occupation

What the Industrial Age knew

- Prussia
 - Education
 - University education required for government positions
 - Easier for children of the poor to get an education than anywhere else in Europe (Winckelmann, Heyne, Fichte, Goethe came from poor families)
 - A professor has to teach knowledge but also produce knowledge
 - By 1850 almost all German universities have converted to research institutes

What the Industrial Age knew

- Prussia
 - Education
 - The intelligentsia comes from all social classes and is part of the regime (vs in France: the intelligentsia is alienated from the state; in Russia the intelligentsia consists of aristocrats; in Britain of wealthy individuals)
 - Rapid increase of literacy
 - Rapid increase of magazines and newspapers
 - Hegel imposed by the state on universities

What the Industrial Age knew

- Prussia
 - Education
 - French science is centered upon Paris, but Germany is not a state and does not have a center: science is distributed across many capitals (Berlin, Munich, Dresden, Weimar, Hamburg...)
 - 1822: the first Gesellschaft Deutscher Naturforscher und Ärzte that brings together scientists from all German states (Leipzig 1822, ..., Munich 1827, Berlin 1828 with 600 scientists, Heidelberg 1829, Vienna 1832, ...)

What the Industrial Age knew

- Prussia
 - Education
 - 1780s: Rise of the public concert (neither in a court nor in a church)
 - Increased sales of sheet music and instruments

What the Industrial Age knew

- Prussia
 - Enlightenment/ Aufklärung
 - Several decades later than in France/Britain
 - Stronger resistance against the mechanistic view of Newton
 - The “Terror” of Robespierre looks barbaric to Germans: they are different from the French, i.e. history and not universal values determines a nation’s character
 - The military disasters of 1792-1815 motivate adoption of enlightenment

What the Industrial Age knew

- Prussia
 - Enlightenment/ Aufklärung
 - Grimm brothers rediscover folk sagas as early German history
 - “Society for the Study of Early German History” (1819)
 - Leopold von Ranke makes German historiography the leader in Europe
 - German nationalism

What the Industrial Age knew

- Austria under Metternich
 - Economic stagnation
 - The old regime is an agricultural regime
 - Serfdom and illiterate peasants
 - Aristocratic landlords
 - No hints of Britain's industrial revolution
 - No hints of Prussia's educational revolution

What the Industrial Age knew

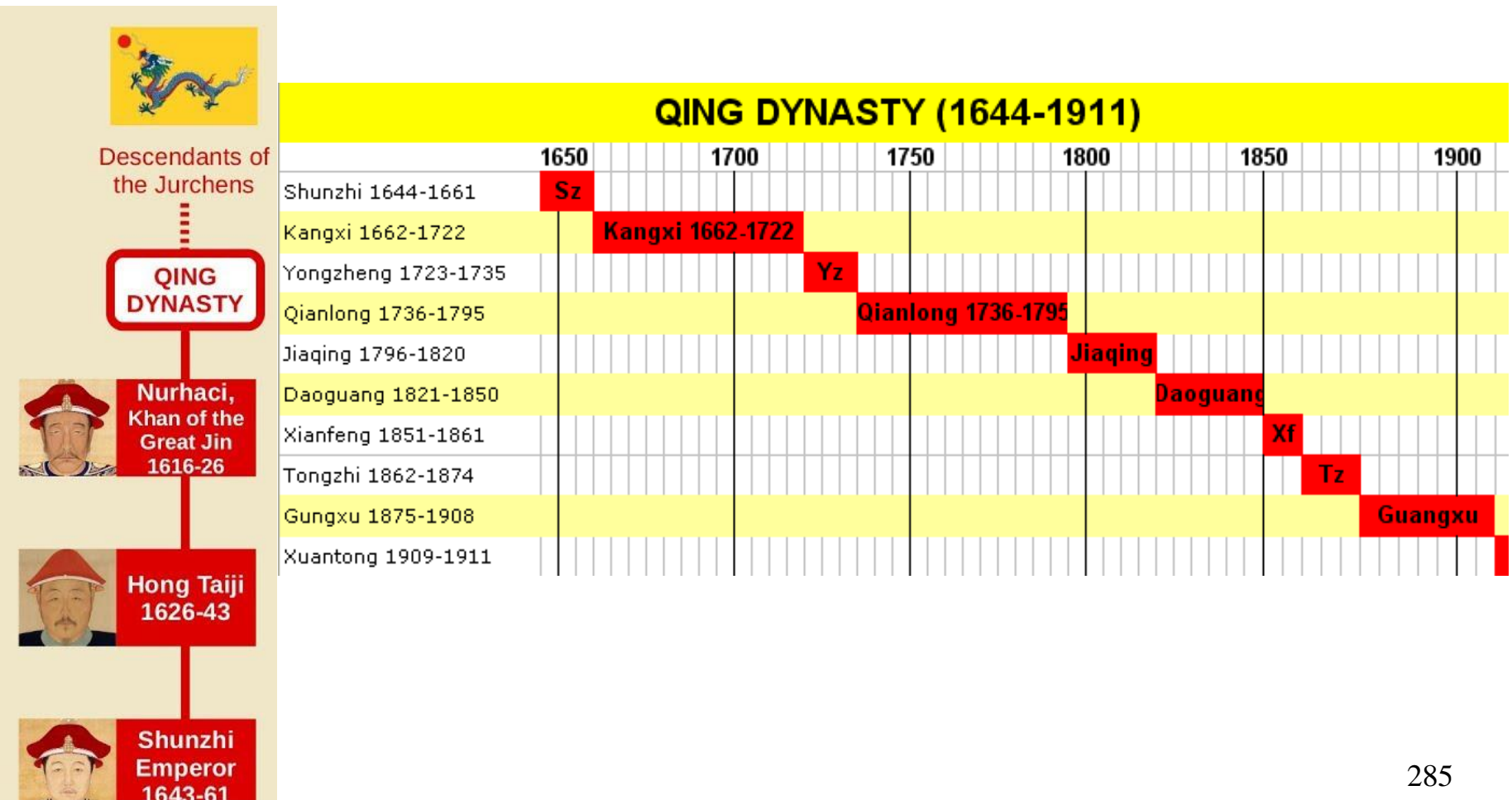
- Forces of liberalism
 - 1830: Coup in France (end of the Bourbons and end of divinely-inspired absolutist monarchy in France)
 - 1830: Belgium independence (from Holland)
 - 1831: Polish (failed) war of independence against Russia
 - 1832: Greece independence (from the Ottomans)
 - The industrial revolution causes Britain to become more liberal

What the Industrial Age knew

- Long periods of peace in Europe
 - 1816-1852
 - 1871-1913

What the Industrial Age knew

- China Qing (1644-1912): a new imperial power



What the Industrial Age knew

- China Qing (1644-1912): a new imperial power
 - 1635: The Manchus conquer the Chahar Mongols (Inner Mongolia)
 - 1683: the Qing annex Taiwan
 - 1691: The Qing obtain Qinghai
 - 1720: The Qing invade Tibet
 - 1757: China conquers the Dzungar khanate (Xinjiang)
 - 1765: War with Burma
 - 1787: the Qing quell a rebellion in Taiwan
 - 1788: War with Vietnam
 - 1790: War with the Gurkhas in Nepal

What the Industrial Age knew

- China Qing (1644-1912): a new imperial power
 - Qing invasions of the Dzungar Khanate and Mongolia



What the Industrial Age knew

- China Qing: a new imperial power



What the Industrial Age knew

- China Qing: a new imperial power



What the Industrial Age knew

- China Qing: a new imperial power
 - vs today's China



What the Industrial Age knew

- China Qing: a new trading empire
 - 1727: Russia and China sign the treaty of Kyakhta, defining their border and granting Russia a trading post in Kyakhta
 - 1728: France establishes a trading post in Canton
 - 1729: the Qing emperor issues a decree banning the sale of opium
 - 1760: all foreign trade is confined to Guangzhou
 - 1817: Britain exports 275 tons of opium to China

What the Industrial Age knew

- The Islamic world
 - See logos2

What the Industrial Age knew

- The first complete world census (1801)
 - China (295 million people)
 - India (131 million)
 - Russia (33 million)
 - France (27 million)
 - Ottoman Empire (21 million)
 - Germany? (14 million)
 - Spain (11 million)
 - Britain (10 million)
 - Ireland (5 million)
 - USA (5 million)

1750 population

France: 21.5 million

Austria: 18 million

Prussia: 6 million

Britain: 10.5 million

Spain: 9 million

Russia: 20 million

USA: 2 million

Europe's population in 1600: 70 million

Europe's population in 1800: 180 million

Europe's population in 1914: 460 million

1800 population

France: 28 million

German states+Austria: 23 million

Italian states: 19 million

Britain: 11 million + Ireland: 5 million

Spain: 11 million

Russia: 37 million

USA: 5 million

Paris population: 550,000; New York: 60,000

What the Industrial Age knew

- **Population growth in Europe**
 - 1600: 70 million
 - 1650: 100 million
 - 1750: 140 million
 - 1800: 187 million
 - 1850: 266 million
- **Population growth in Asia**
 - 1750: 400 million
 - 1850: 700 million
- **Decline in diseases (not an increase in birth rates but a decrease in death rates)**
- **Increased agricultural output**
- **End of little ice age (1560-1850)**

What the Industrial Age knew

- **Population growth in Europe**
 - **1800: less than ten cities above 100,000 people**
 - London 959,000
 - Paris 600,000
 - Wien/Vienna 247,000
 - Berlin 172,000
 - Hamburg 130,000
 - Roma 153,000
 - Milano 134,000
 - Barcelona 115,000

What the Industrial Age knew






- The world's largest cities in 1800
 - Beijing 1,100,000
 - London 861,000
 - Canton 800,000
 - Istanbul 570,000
 - Paris 547,000

GDP per capite 1820

Map & Graph: [Europe](#): [Economy](#): GDP per capita in 1820

↓ Scroll down for more information ↓

[Show map full screen](#)

	<u>Country</u>	<u>Description</u>	<u>Amount</u>
1.	United Kingdom	\$1756	
2.	Netherlands	\$1561	
3.	Austria	\$1295	
4.	Belgium	\$1291	
5.	Denmark	\$1225	
6.	France	\$1218	
7.	Sweden	\$1198	
8.	Germany	\$1112	
9.	Italy	\$1092	
10.	Spain	\$1063	
11.	Norway	\$1004	
12.	Ireland	\$954	
13.	Finland	\$759	
	Average	\$1,194.46	

Source: [Angus Maddison](#)

What the Industrial Age knew

- Shares of world manufacturing output
 - 1750: China 33%, France 4%, Britain 2%, USA 0.1%
 - 1800: China 33%, Britain 4.3%, France 4.2%, USA 0.8%
 - 1850: China 20%, Britain 20%, France 8%, USA 7%
 - 1875: Britain 23%, China 14%, USA 13%, France 8%
 - 1900: USA 23%, Britain 18%, France 7%, China 6%

What the Industrial Age knew
Piero Scaruffi
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