

What the Victorian Age knew

Piero Scaruffi

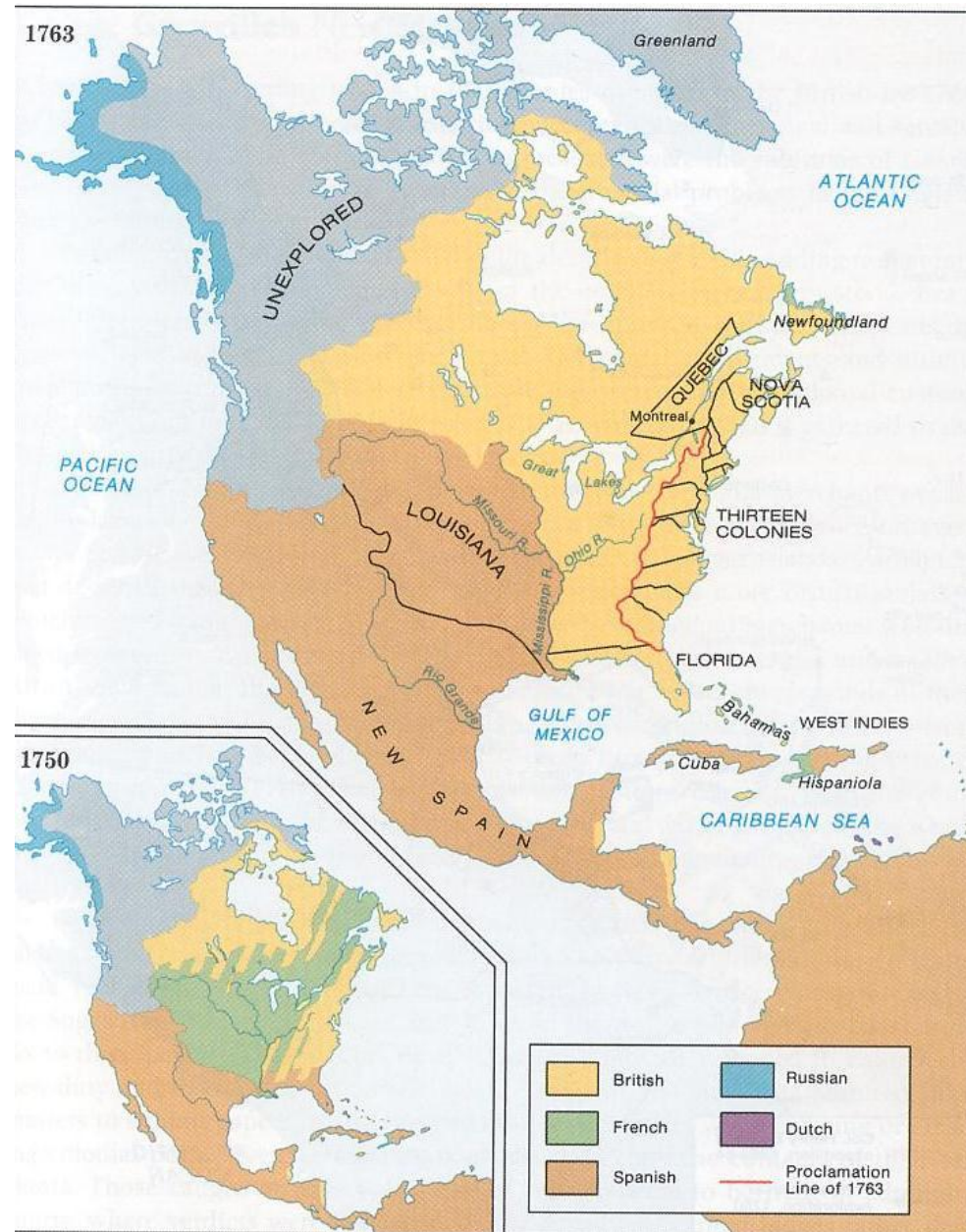
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Part II. The USA

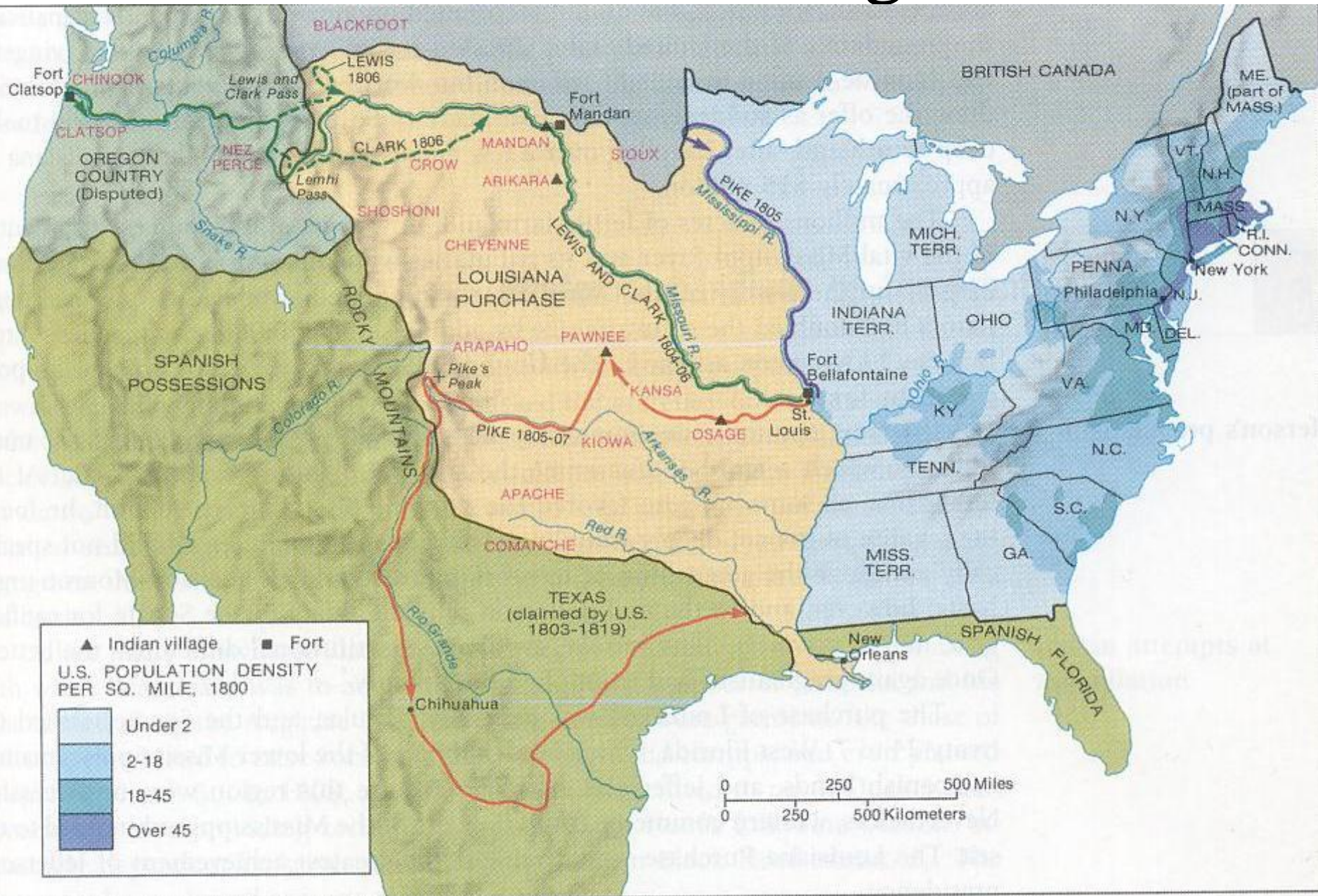
What the Victorian Age knew

- **USA**

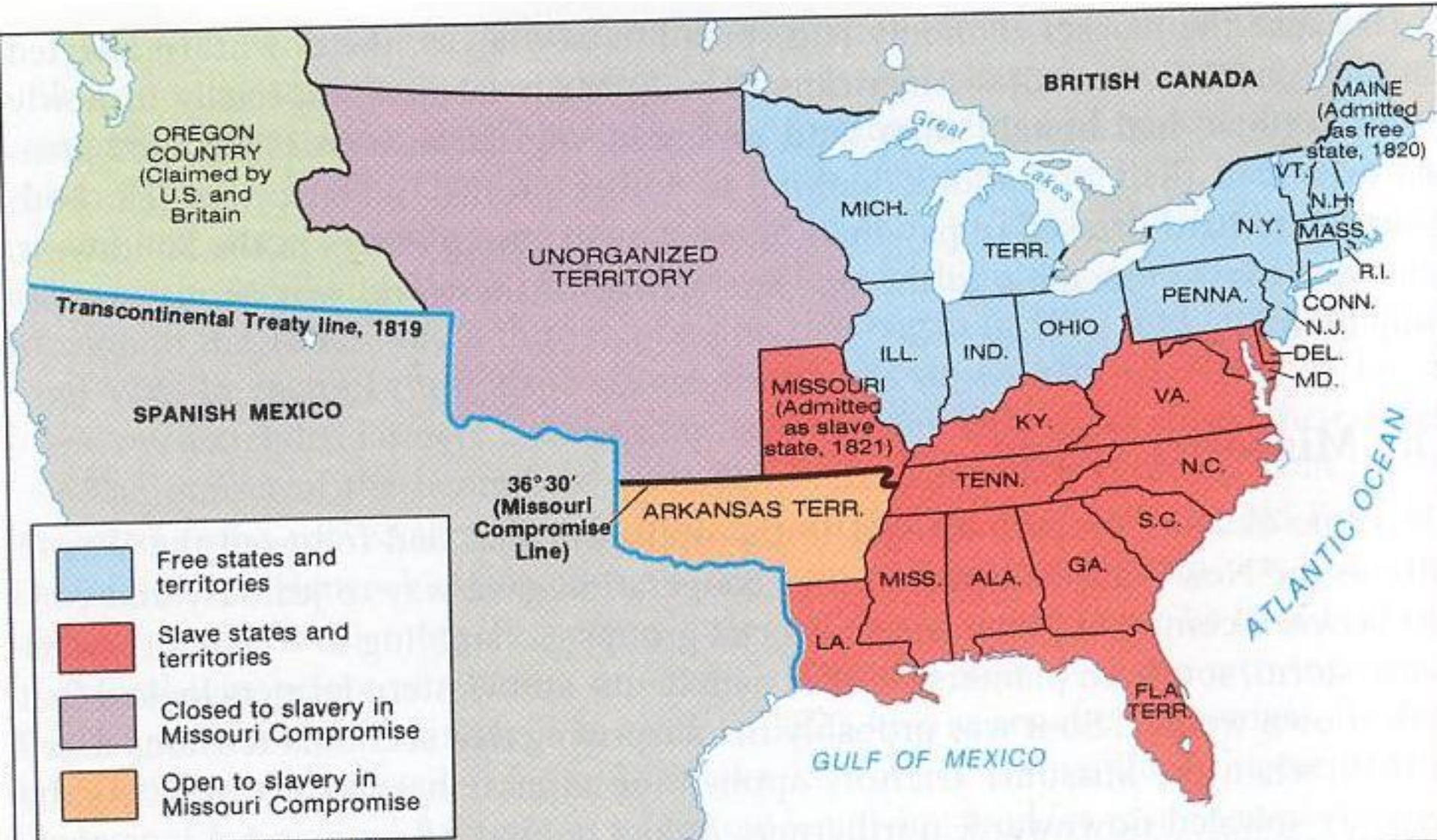


(From “A People And A Nation”,
Houghton Mifflin,
1998)

What the Victorian Age knew

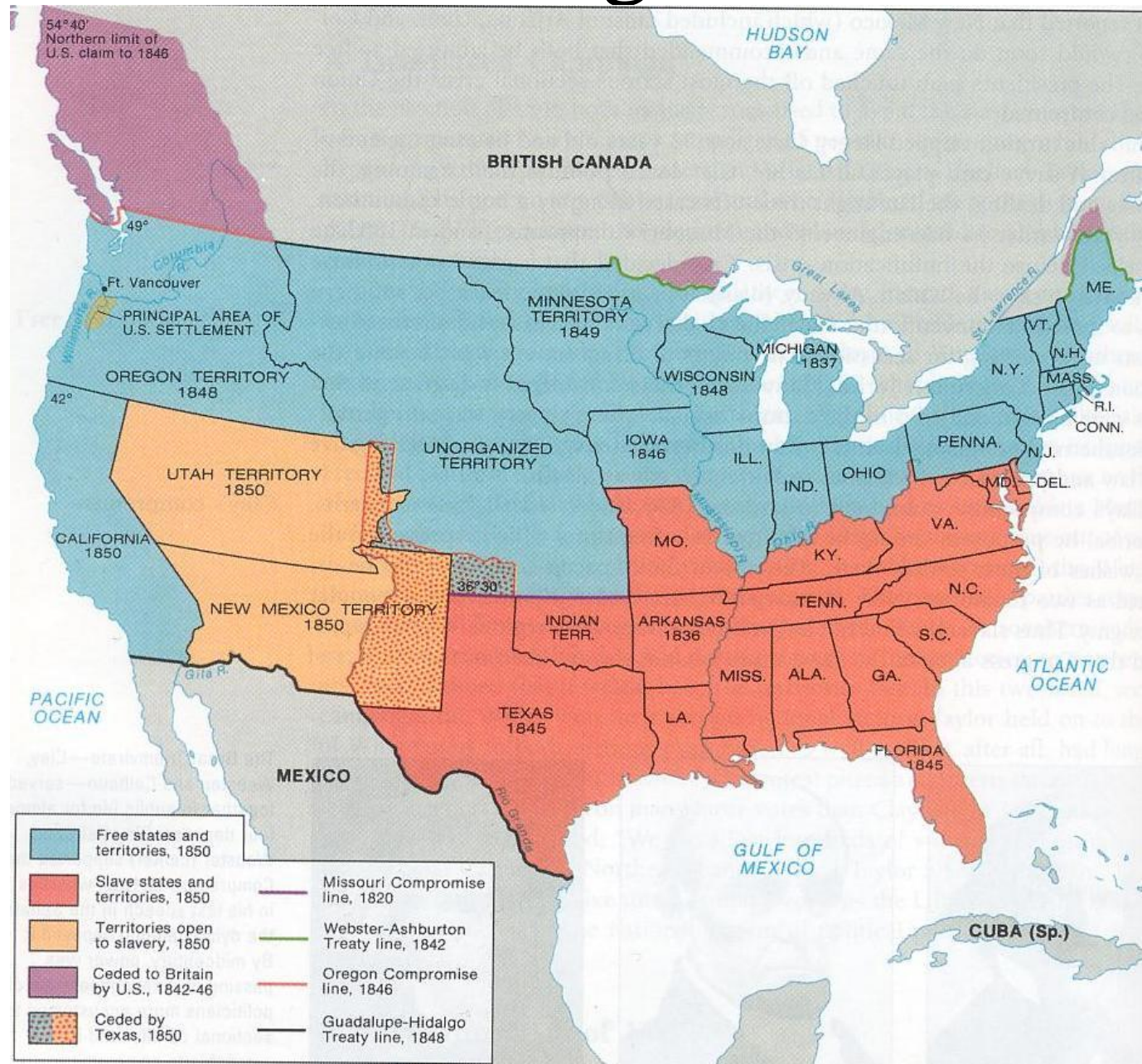


What the Victorian Age knew



What the Victorian Age knew

- USA 1850



What the Victorian Age knew

- USA
 - A populist democracy
 - Strong anti-aristocratic bias
 - Social vacuum created by the absence of feudalism is filled by a new and varied middle class
 - Education, technology and initiative matter more than family heritage
 - Relentless industrialization
 - Relentless expansion
 - Utopian/biblical overtones

What the Victorian Age knew

- USA: Andrew Jackson (1829-37)
 - 1830: Indian Removal Act - 100,000 Indians east of the Mississippi to Oklahoma (Indian Territory) along the Trail of Tears
 - Tobacco not as profitable anymore
 - High demand for cotton
 - The Indians of the east (Cherokees, Seminoles, etc) are an impediment to expanding cotton plantations (clearing the land for planting cotton)
 - Transforming the tobacco economy into a cotton economy requires their lands

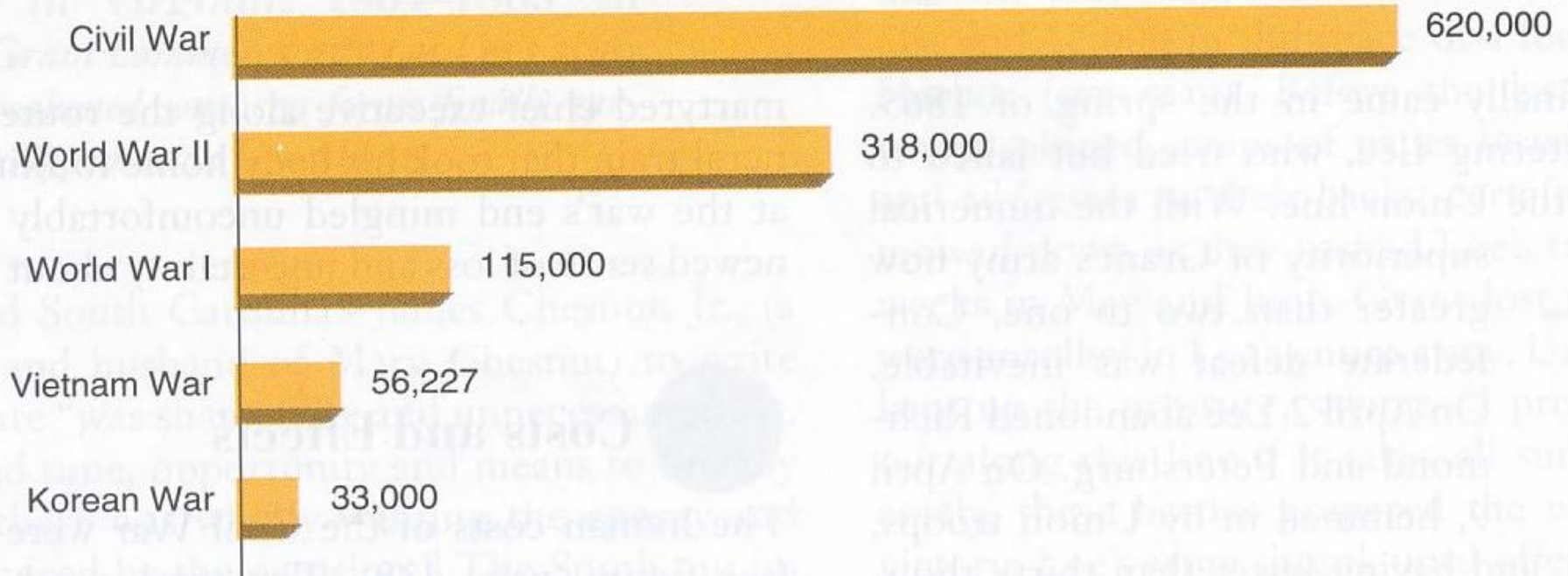
What the Victorian Age knew

- USA: Andrew Jackson (1829-37)
 - Boom of cotton requires a boom of African slaves
 - 1860: The South produces 85% of the world's cotton, which indirectly accounts for most of the US economy

What the Victorian Age knew

- **USA Civil War (1861-65)**

Total Civil War Deaths Compared to U.S. Deaths in Other Wars



What the Victorian Age knew

- USA Civil War (1861-65)
 - USA until 1830
 - Industrialization of the Northeast is fueled by Southern plantations
 - The specialized Southern economy needs to import food from the Northeast and the West
 - The Southern economy needs to import manufactured goods from the Northeast
 - Mississippi steamboat trade increases dependence of the South on trade with the Northeast and West
 - Alliance between Northeast industry and Southern plantations

What the Victorian Age knew

- USA Civil War (1861-65)
 - The Union becomes a sophisticated industrial economy
 - Massive industrialization of the North (no manufacturer was listed on Wall Street before 1865)
 - Industrial empires
 - 1860: 50,000 kms of railroad (largest network in the world)
 - 1883: Cleveland Abbe's four standard time zones to help railroads schedule trains
 - 1900: 300,000 kms of railroads

What the Victorian Age knew

- USA Civil War (1861-65)
 - USA in the 1850s
 - Three nations in one
 - Cotton-growing slave plantations of the South
 - Food-producing family farms/ranches of the West
 - Industrialized Northeast

What the Victorian Age knew

- USA Civil War (1861-65)
 - USA after 1830s
 - Booming industrial Northeast requires more food
 - The prices of Western food increase creating a bonanza
 - Waves of Western immigration in search of easy money (1816-18, 1832-36, 1846-47, 1850-56)
 - The West trades more with the booming Northeast than with the South
 - The transportation revolution increases trade between West and Northeast

What the Victorian Age knew

- USA Civil War (1861-65)
 - USA after 1830s
 - Western family farmers perceive the Southern slave plantations as potential competitors
 - Conflict between Western farming system and Southern plantation system
 - Alliance between Northeast industry and Western farmers

What the Victorian Age knew

- USA Civil War (1861-65)
 - Confederates: South Carolina, Mississippi, Florida, Alabama, Georgia, Louisiana, Texas, Virginia, Arkansas, Tennessee, North Carolina
 - Lincoln's first reason: preserve the Union
 - A later reason: abolition of slavery (also to be able to draft blacks in the Union army)
 - The Union wins
 - Firearms production in 1861: 32 times more in the Union than in the Confederacy

What the Victorian Age knew

- USA Civil War (1861-65)
 - The Union becomes a sophisticated financial system
 - Union bonds to pay for the war change the way people “save” (bonds instead of money under the mattress)
 - First income tax in the Union
 - The Union prints paper money (“greenback”) although taxes still collected in gold
 - Boom of Wall Street (war as an investment into a number of industries) that becomes the second largest securities market after London

What the Victorian Age knew

- USA Civil War (1861-65)
 - Boom of steel
 - 1855: In England, Henry Bessemer invents the Bessemer converter for mass-producing steel (boom of steel during the Civil War)
 - 1872: Andrew Carnegie adopts the Bessemer converter in Pittsburgh, coal capital of the USA
 - Constant innovation to lower production costs
 - 1897: The USA produces seven million tons of steel, more than Britain and Germany combined
 - 1901: John Pierpont Morgan absorbs Carnegie and founds U.S. Steel, the largest corporation in the world
 - Steel enables a new generation of buildings (e.g., skyscrapers)

What the Victorian Age knew

- USA Civil War (1861-65)
 - Age of steel
 - Melting point of copper: 1083 C
 - Melting point of iron: 1535 C
 - Importance of charcoal: about 100 kg charcoal are needed to smelt 5 kg of copper
 - In the 17th c charcoal replaced with coal and coke

What the Victorian Age knew

- USA Civil War (1861-65)
 - Age of steel
 - Pig iron: iron ore + coke + limestone (high carbon content, very brittle)
 - Wrought iron (low carbon content, labor intensive, expensive, malleable, strong): beams, bridges, ships, rails
 - Cast iron (high carbon content, melting point of 1130 C, cheap, brittle): columns, cannons, decoration
 - Steel (narrow range of carbon content)
 - » Used in ancient times for swords
 - » Demise of wrought iron

What the Victorian Age knew

- USA Civil War (1861-65)
 - Age of steel
 - 1883: New York's Brooklyn Bridge, the world's longest suspension bridge and the first to use steel cables

What the Victorian Age knew

- USA Civil War (1861-65)
 - Boom of oil
 - 1862: John Rockefeller's Standard Oil to refine oil
 - Mission: low-cost producer of oil (Samuel Andrews's process for the refinement of crude petroleum)
 - Boom of gold
 - 1896: Klondike (Alaska)

What the Victorian Age knew

- USA Civil War (1861-65)
 - Boom of rubber
 - 1823: Charles Macintosh uses rubber to make waterproof clothing
 - 1839: Vulcanization (cooking and treating latex) discovered by Charles Goodyear
 - 1879: Rubber “rush” in the Amazon forest (Brazil, Colombia and Peru)
 - 1888: John Dunlop invents tyres
 - 1891: Edouard Michelin’s removable bicycle tyres

What the Victorian Age knew

- USA Civil War (1861-65)
 - Collapse of imports (USA manufacturers produce higher % of consumed goods)
 - 1865: manufactured goods account for 22.78% of USA exports
 - 1900: 31.65%
 - Transforms trade with Europe: instead of exporting raw materials and importing finished goods, the USA exports both
 - Southern economy based on agriculture, northern economy based on manufacturing and services

What the Victorian Age knew

- USA Civil War (1861-65)
 - The South as a third-world country
 - Freed slaves have no land, capital or skills, thus migrate North as cheap labor: they become the South's main export
 - Southern landowners compete with Northern manufacturers for black labor
 - Racial tensions in the South discourages Northern investment (until the 1990s)

What the Victorian Age knew

- USA Civil War (1861-65)
 - Second navy in the world after Britain

What the Victorian Age knew

- USA
 - Civil War (1861-65)
 - Industrialized north vs agricultural south
 - Weapons of mass destruction
 - William Sherman's "scorched earth" tactic
 - The railway changes the logistics of war (ammunition and food can be delivered in great amounts in short time)

What the Victorian Age knew

- USA
 - Civil War (1861-65)
 - Mark Twain blames the Civil War “in great measure” Walter Scott’s novels that are full of “the silliness and emptinesses, sham grandeurs, sham gauds, and sham chivalries of a brainless and worthless long-vanished society”

What the Victorian Age knew

- USA
 - Until 1890: a nation not just of immigrants but of settlers
 - After 1890: a nation of immigrants (with less and less settler heritage)

What the Victorian Age knew

Northern Europe Wave (1840–1889)		14,314,000	100
	Germany	4,282,000	30
	Ireland***	3,209,000	22
	United Kingdom	2,586,000	18
	Norway-Sweden	883,000	6
	Europe, total	12,757,000	89
Region totals	North/West Europe	11,700,000	82
	South/East Europe	1,058,000	7
	Canada	1,034,000	7
	Latin America	101,000	1
	South/East Asia	293,000	2
	Africa/Middle East	5,000	<0.5
	Other/Not specified	124,000	1

Notes: Population figures rounded to the nearest thousand. Data for 1965–2011 include legal and permanent residents. ***Includes Hong Kong.

Southern/Eastern Europe Wave (1890–1919)		18,244,000	100
	Italy	3,764,000	21
	Austria-Hungary	3,690,000	20
	Russia & Poland	3,166,000	17
	United Kingdom	1,170,000	6
	Germany	1,082,000	6
	Ireland***	917,000	5
	Europe, total	16,134,000	88
Region totals	North/West Europe	4,757,000	26
	South/East Europe	11,377,000	62
	Canada	835,000	5
	Latin America	551,000	3
	South/East Asia	315,000	2

What the Victorian Age knew

- USA
 - A bicoastal economy
 - East-West trade
 - Atlantic trade
 - Pacific trade
 - Self-sufficient
 - Free trade within a continent that belongs to the same nation (no borders, no tariffs)
 - An empty continent
 - State-funded expansion

What the Victorian Age knew

- USA
 - Extermination of Native Americans, mostly by epidemics (7 million in 1492, 1 million in 1600)
 - Homestead Bill (1863): granting 0.6 square kms of public land to anyone willing to develop it for five years
 - Alaska (1867), ends of the continental expansion

What the Victorian Age knew

- USA
 - Most literate country in the world
 - 440,000 patents for new inventions between 1860 and 1890
 - 1860s: USA universities abandon the British system and adopt the German system (emphasis on research, PhD, etc)
 - Consumer-oriented economy (“Get the prices down to the buying power”, Henry Ford)
 - 1872: First mail-order catalog (1887: Sears’ catalog)

What the Victorian Age knew

- USA
 - Ordinary person at the center of society, economy, etc
 - Technological innovation for the ordinary person, not the aristocracy
 - Death of the aristocracy
 - Motivation for humans can come from
 - discipline and order enforced by dictator
 - exploiting human nature (Darwinian competition)
 - Freedom is more efficient than order

What the Victorian Age knew

- USA
 - Just like in Britain, the inventor is mostly an everyman (not an academic or noble)
 - Northern USA: Mechanization of agriculture, food processing and transportation (dearth of skilled workers)
 - 1860s: invention is a normal state of mind (everyone can invent anywhere anyhow)
 - The USA is not the most industrialized country in the world (123,000 power looms vs Britain's 750,000) but it has the highest ration of inventions per capita
 - The USA is largely a rural population (85%)

What the Victorian Age knew

- USA
 - Adapting to the environment
 - 1836: The hamlet of Houston is founded in Texas as the temporary capital
 - 1836: The port of Galveston is founded in Texas on an island
 - First post office in Texas (1836)
 - First law firm west of the Mississippi (1846)
 - First railroad (1852), telegraph (1854), bank (1854), telephone (1878), electric light (1883) in Texas
 - Galveston: largest cotton port in the USA
 - Houston: commercial and railroad hub for overland shipment of cotton

What the Victorian Age knew

- USA
 - Adapting to the environment
 - 1900: Galveston's hurricane
 - 1908: The Ship Channel to Houston (inland city)
 - 1998: USA ports in tonnage: South Louisiana, Houston, New York, New Orleans
 - 2000: Houston is the seventh largest metropolitan area in the USA (5.2 million people)

What the Victorian Age knew

- USA
 - The industrial revolution in the USA
 - 1810: More than 80% of US labor force is employed in agriculture
 - 1840: more than 60% of US labor force is employed in agriculture
 - Industrial revolution driven by need to maximize the amount of land that can be cultivated by a single household

What the Victorian Age knew

- USA
 - The industrial revolution in the USA
 - Food is cheaper in the USA than in Europe throughout the century
 - Middle-class rural household can spend money on consumer goods instead of food
 - But that household typically is interested in goods that last a long time and are easy to repair, not in fashionable ones
 - The rural household drives the industry towards standardized, low-priced goods made of interchangeable parts (instead of Europe's high-quality craftsmanship)
 - Industry evolves towards specialized high-speed machine tools for manufacturing standardized components

What the Victorian Age knew

- USA
 - The industrial revolution in the USA
 - Crystal Palace Exhibition in London (1851): "the American system of manufacturing"
 - Use of specialized machines
 - Highly standardized
 - Interchangeable components
 - 1853: First major export sale of US machine tools (Enfield Arsenal contract awarded by the British government to Vermont-based Robbins & Lawrence)
 - 1900: Most machine tools used in Europe are made in the USA

What the Victorian Age knew

- USA
 - Natural resources drive industrialization
 - Lots of wood
 - Britain: by 1800 all blast furnaces use coke (better than charcoal)
 - USA: in 1840 almost all blast furnaces use charcoal (i.e., wood)
 - Lots of water
 - Britain: the steam engine spreads rapidly in the 19th century
 - 1849: James Francis' water turbine (that improves water power)
 - USA: in 1879 the waterwheel (water power) is still the most common source of power in New England (the USA's main industrial area)

What the Victorian Age knew

- USA
 - Not a coal economy
 - Lots of wood and water
 - Europe: the industrial revolution is fueled by coal mines
 - USA: in 1850 coal's contribution is still negligible
 - 1850s: industry spreads beyond New England in regions with less water power
 - 1840: George and Seldon Scranton's begin mining anthracite coal in Pennsylvania for their blast furnace

What the Victorian Age knew

- USA
 - A coal economy 1885-1935
 - 1870s: Coal used to make coke for steel
 - 1883: West Virginia's "coal rush" after railroads reach the region
 - 1884: Charles Parsons' steam turbine (that will open the age of cheap electricity and fast sea travel)
 - 1900: coal has become the #1 source of energy in the USA
 - 1900: The electric motor is still a rarity in the US industry

What the Victorian Age knew

- USA
 - A coal economy 1885-1935
 - 1900s: First large steam turbines
 - 1920s: Electric motors widely adopted in manufacturing
 - Coal's age in the USA lasts only between 1885 and 1935 (but later coal used to fuel electrical power plants)

What the Victorian Age knew

- USA
 - The boom of cattle
 - Cattle raised in public land, especially in Texas
 - 1867: The Kansas Pacific Railroad reaches Abilene, connecting the terminal of the west-east cattle trail to the meatpacking industry of Chicago
 - 1867: Joseph McCoy founds a cattle market in Abilene for Texan ranchers to ship cattle east
 - 1880s: Cattle boom
 - 1886: Beef prices collapse

What the Victorian Age knew

- USA
 - The boom of cattle
 - 1872: Northern Pacific Railroad reaches the Red River in North Dakota
 - European and Eastern investors fund large wheat farms ("Bonanza farms")
 - Massive mechanization of the Bonanza farms
 - Scientific management of agriculture to rival the industrial

What the Victorian Age knew

- USA
 - The Great Plains
 - 1880s: Nebraska's prairies parceled out to Old World homesteaders (German, Czech, Danish, Swedish pioneers)
 - The primary concern of the nation is to grow food for its population and carry it over long distances

What the Victorian Age knew

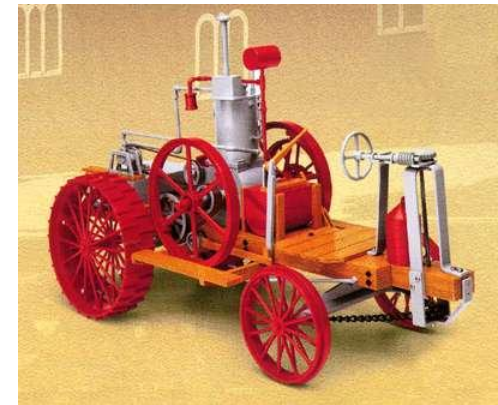
- USA
 - The Great Plains
 - Growing population of the East Coast and railroads increase demand for Texas cattle
 - Cowboys drive cattle to the main railroad hubs (Abilene, Dodge City, Cheyenne)
 - Trains take it to the meat industry of Chicago and St Louis
 - Cattle population of the Great Plains increases to reduce the long trek to the railway
 - Beef becomes a staple of the USA diet

What the Victorian Age knew

- USA
 - The Great Plains
 - Growing urban population doubles the demand for farming products
 - Machines allow families to farm large areas
 - Farmers settle in the Great Plains (six million farms by 1910)
 - European farmer: a member of a community (village)
 - USA farmer: isolated in the Great Plains
 - Mail-order houses and national postal system bring the products of the industrialized society to the isolated farmer

What the Victorian Age knew

- USA
 - Mechanization of agriculture
 - 1850s: reapers and harvesters spread in the Midwest
 - 1880: John Appleby's twine binder (Wisconsin)
 - 1892: John Froelich's gasoline-powered agricultural engine, a proto-tractor (Iowa)
 - 1903: Charles Hart's and Charles Parr's name their gasoline-powered vehicle "tractor" (Iowa)



What the Victorian Age knew

- USA
 - Exploration
 - 1867-72: Clarence King's 40th Parallel Survey
 - 1869: John Wesley Powell's three-month expedition down the Green and Colorado rivers (Powell becomes a national hero)
 - 1872-79: George Wheeler's survey west of the 100th meridian (including Death Valley)

What the Victorian Age knew

- USA
 - Transportation
 - 1828: First railroad (Baltimore-Ohio)
 - 1840: 4,500 kms of railroad track
 - 1860: 49,000 kms of railroad track (mostly in the North)
 - 1890: 320,000 kms
 - 1910: the USA has one third of all railroads in the world
 - Capital intensive (private investors)
 - 1860: There are 49,000 kms of railway in the USA
 - 1865: George Pullman builds a luxurious sleeping car (“Pioneer”) for railway travel

What the Victorian Age knew

- USA
 - Transportation
 - 1869: The Union and Central Pacific railroads create the first transcontinental railroad
 - Capital intensive (USA government)



What the Victorian Age knew

- USA
 - Transportation
 - Railroads create a new economy
 - Steel (steel rails replace iron rails from the 1880s)
 - Coal
 - Engineering (tunnels, bridges, grading)
 - Telegraph
 - Stations, depots, entire towns
 - Time replaces space (the distance “is” the time that the train takes to cover it)
 - 1883: Railroad companies standardize time (the four time zones of the USA)

What the Victorian Age knew

- USA
 - Transportation
 - Railroads create a new economy
 - European railroads mostly used to connect existing cities over existing routes
 - USA railroads created new cities or turned villages into regional centers (Kansas City, Los Angeles, Atlanta, Nashville, Seattle) and created new routes
 - The railroad in Europe transported passengers and goods
 - The railroad in the USA also opened new lands for exploration and exploitation

What the Victorian Age knew

- USA
 - Transportation
 - Railroads pioneer corporate management
 - Run by professional managers, not engineers
 - Coordination of complex operations
 - First large corporations to be publicly traded (because of high capital demand)
 - Railroads trigger a boom in financial markets (Wall Street)

What the Victorian Age knew

- USA

- Transportation

- 1800: It takes 5 days to travel from New York to Washington
 - 1827: the Concord stagecoach
 - Stagecoaches become less popular on the East Coast after the boom of steamships (1830s)
 - Stagecoaches still essential to travel west
 - Robberies: Reelfoot Williams (Illinoistown, 1852), Tom Bell (California, 1856), etc
 - "Indians": Apache attack in New Mexico (1861)
 - 1869: Transcontinental railroad



What the Victorian Age knew

- USA
 - Mail to the Pacific coast
 - Predominantly by sea until 1858: steamship to Panama, land carriage over the Isthmus of Panama, steamship to San Francisco
 - 1852: Henry Wells & William Fargo form Wells Fargo in New York to do business in California
 - James Birch's San Antonio-San Diego line 1857-58
 - 1858: government-sanctioned overland stage route for mail and parcels
 - Butterfield Overland Mail from Missouri to San Francisco 1858-60 (22-day trip), taken over by Wells Fargo
 - Pony Express from Missouri to Sacramento 1860-61 (10-day trip)

What the Victorian Age knew

- USA
 - Tourism
 - 1869: The transcontinental railroad opens the West to tourism
 - 1871: Ralph Waldo Emerson travels from Concord to California in 11 days and spends 7 weeks in the West, visiting Yosemite and meeting John Muir

What the Victorian Age knew

- USA

- Transportation

- 1891-96: Otto Lilienthal, legendary glider in Germany
 - 1901: Alberto Santos-Dumont flies a dirigible (steerable balloon) around the Tour Eiffel
 - 1903: Orville Wright, son of an Ohio itinerant preacher and owner of a bicycle business, flies a plane for 260 meters
 - 1908: Wilbur Wright demonstrates the Wright flying machine in France
 - 1909: 15 factories in Paris are building Wright airplanes



What the Victorian Age knew

- USA
 - Transportation
 - New York in 1900

5th Avenue in New York in 1900



What the Victorian Age knew

- USA
 - National parks
 - Largely sponsored by the western railroads to boost tourism
 - Northern Pacific Railroad sponsors Yellowstone
 - Southern Pacific Railroad sponsors Yosemite and Sequoia
 - Santa Fe Railroad: Grand Canyon
 - Great Northern Railroad: Glacier

What the Victorian Age knew

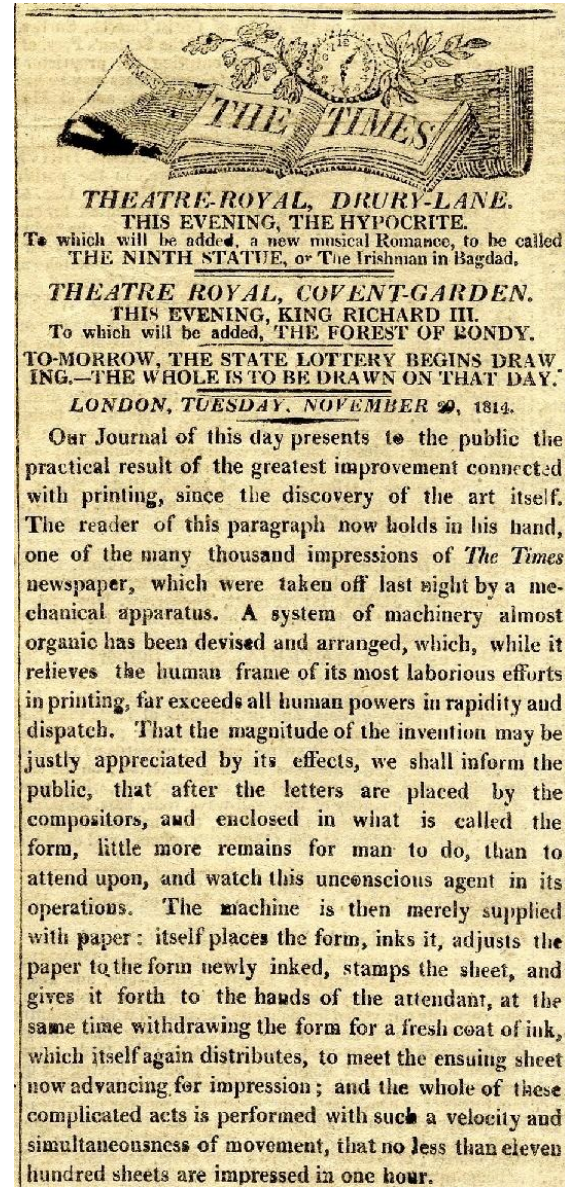
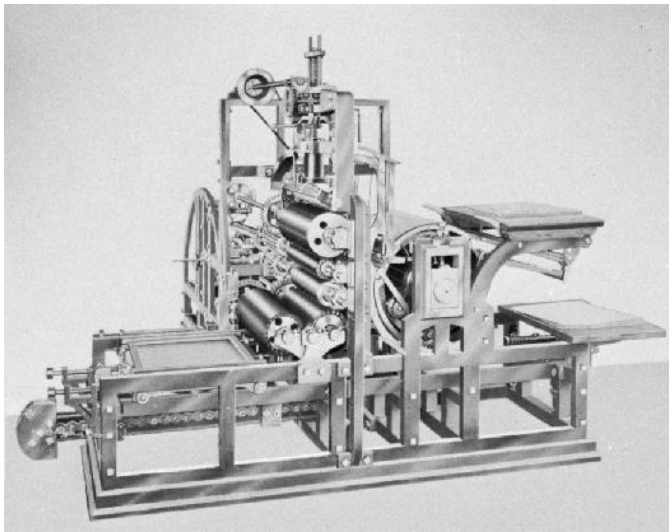
- USA revolution
 - 1833: Benjamin Day starts the New York Sun, the first “penny paper”, that mainly makes money out of advertising and is sold by hawkers in the streets (readers can buy individual copies instead of having to subscribe), with stories that ordinary people can identify with (crime, trials and fake news)
 - 1835: The Sun installs a steam press
 - 1838: The Sun is the #1 newspaper in the world (38,000 copies)

What the Victorian Age knew

- USA revolution
 - 1835: James Bennett's New York Herald
 - First mass-market daily newspaper: thousands of copies, low price (early adopter of the steam-powered rotary press)
 - Pages on business, weather, sports.
 - International correspondents (early adopter of the telegraph)
 - Advertising
 - Capital intensive (private investors)

What the Victorian Age knew

- USA revolution
 - The rotary press
 - 1814: Friedrich Koenig's steam-powered stop-cylinder printing machine at The Times of London (1,000 copies an hour)



THEATRE-ROYAL, DRURY-LANE.
THIS EVENING, THE HYPOCRITE.
To which will be added, a new musical Romance, to be called
THE NINTH STATUE, or The Irishman in Bagdad.

THEATRE ROYAL, COVENT-GARDEN.
THIS EVENING, KING RICHARD III.
To which will be added, **THE FOREST OF BONDY.**

TO-MORROW, THE STATE LOTTERY BEGINS DRAWING.—THE WHOLE IS TO BE DRAWN ON THAT DAY.

LONDON, TUESDAY, NOVEMBER 29, 1814.

Our Journal of this day presents to the public the practical result of the greatest improvement connected with printing, since the discovery of the art itself. The reader of this paragraph now holds in his hand, one of the many thousand impressions of *The Times* newspaper, which were taken off last night by a mechanical apparatus. A system of machinery almost organic has been devised and arranged, which, while it relieves the human frame of its most laborious efforts in printing, far exceeds all human powers in rapidity and dispatch. That the magnitude of the invention may be justly appreciated by its effects, we shall inform the public, that after the letters are placed by the compositors, and enclosed in what is called the form, little more remains for man to do, than to attend upon, and watch this unconscious agent in its operations. The machine is then merely supplied with paper: itself places the form, inks it, adjusts the paper to the form newly inked, stamps the sheet, and gives it forth to the hands of the attendant, at the same time withdrawing the form for a fresh coat of ink, which itself again distributes, to meet the ensuing sheet now advancing for impression; and the whole of these complicated acts is performed with such a velocity and simultaneity of movement, that no less than eleven hundred sheets are impressed in one hour.

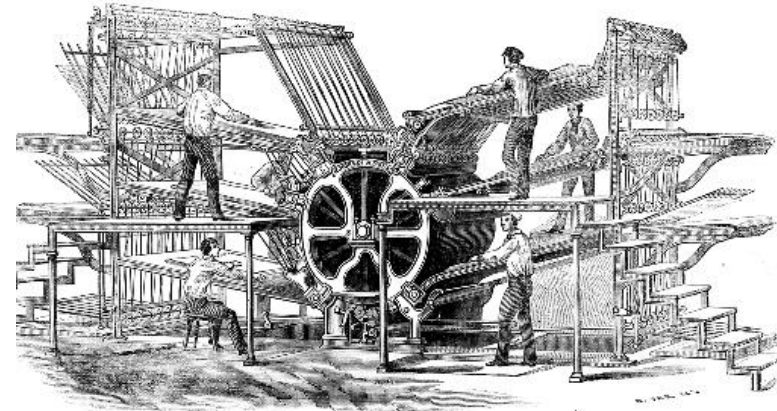
What the Victorian Age knew

- USA revolution
 - The rotary press
 - 1828: Augustus Applegath and Edward Cowper's four-cylinder press for the New York Times (4.000 copies an hour)

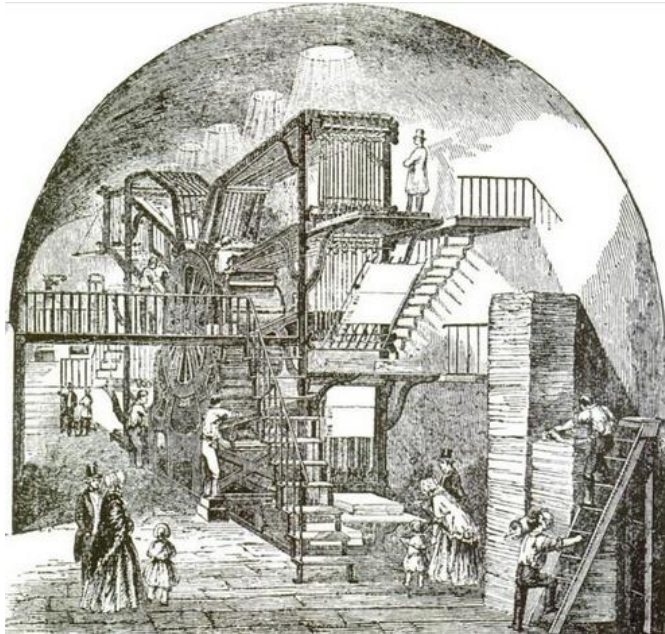


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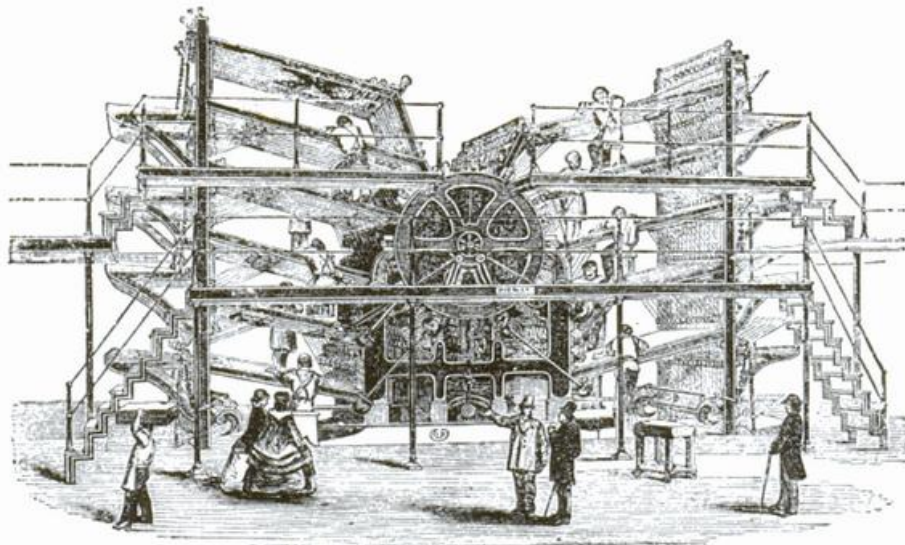
- USA revolution
 - The rotary press
 - 1847: Richard Hoe's horizontal rotary press (New York)



Hoe's six-feeder



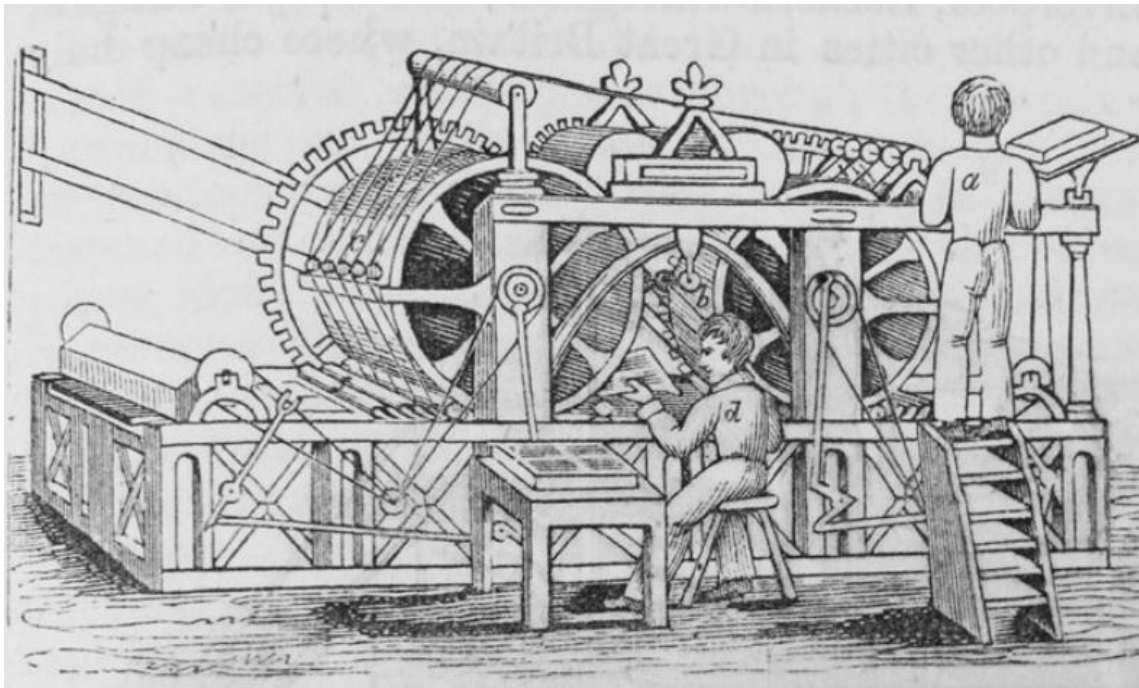
Hoe's rotary press printing the Baltimore Sun



Hoe's ten-feeder

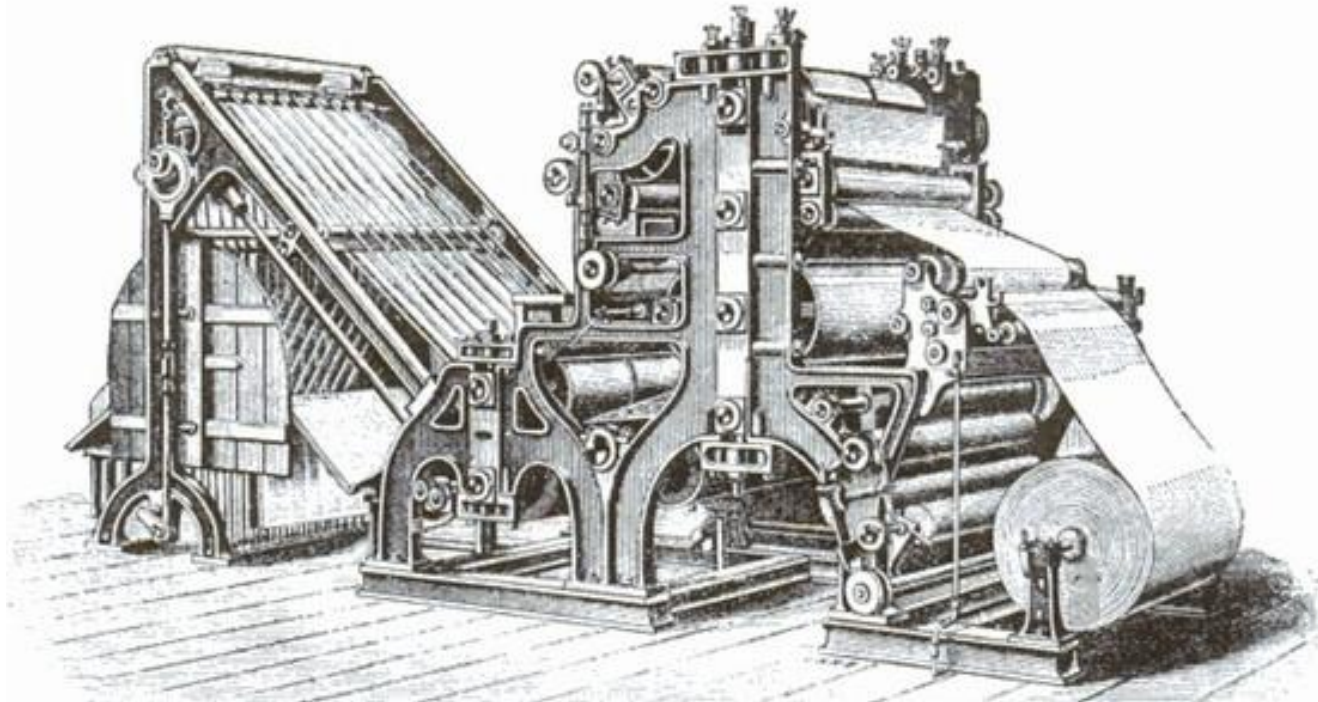
What the Victorian Age knew

- USA revolution
 - The rotary press
 - 1848: Augustus Applegath's vertical-drum rotary press (London)



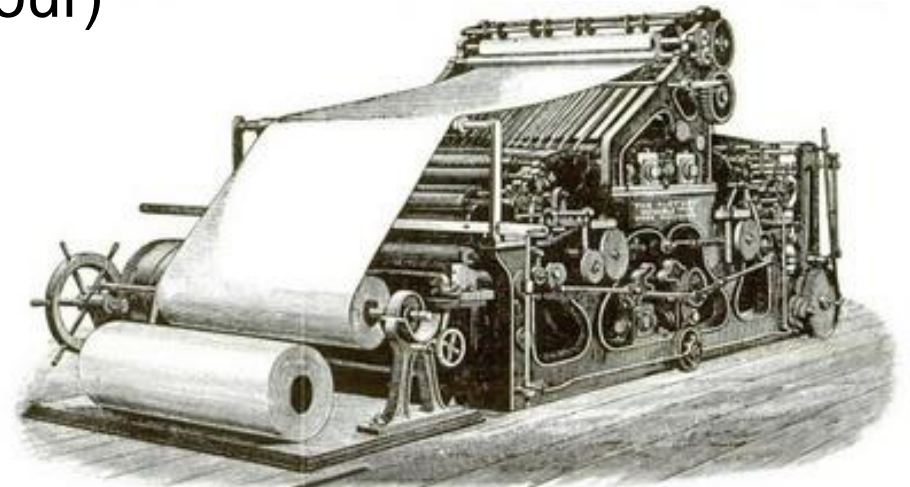
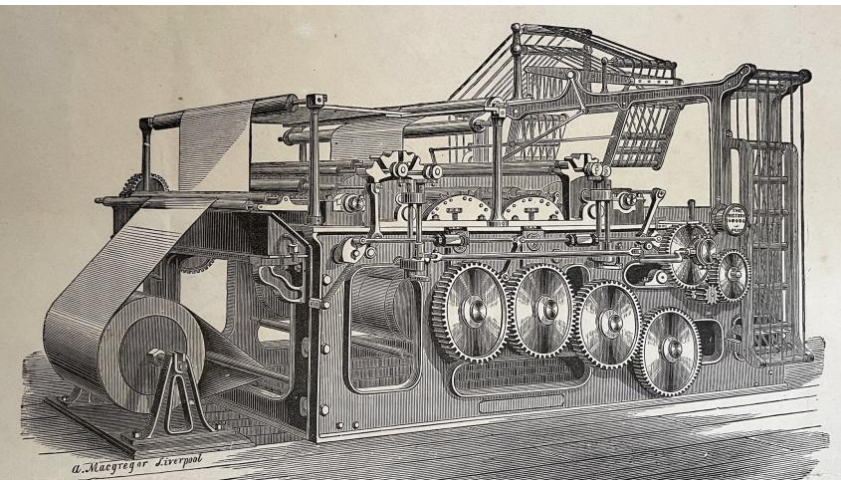
What the Victorian Age knew

- USA revolution
 - The rotary press
 - 1868: “Walter” rotary press at The Times of London (12,000 copies per hour)



What the Victorian Age knew

- USA revolution
 - The rotary press
 - 1863: William Bullock of Philadelphia invents the web press
 - Duncan & Wilson of Liverpool makes the “Victory”, the first web press that also incorporates a paper folding mechanism (9,000 complete, folding 8-page newspapers per hour)



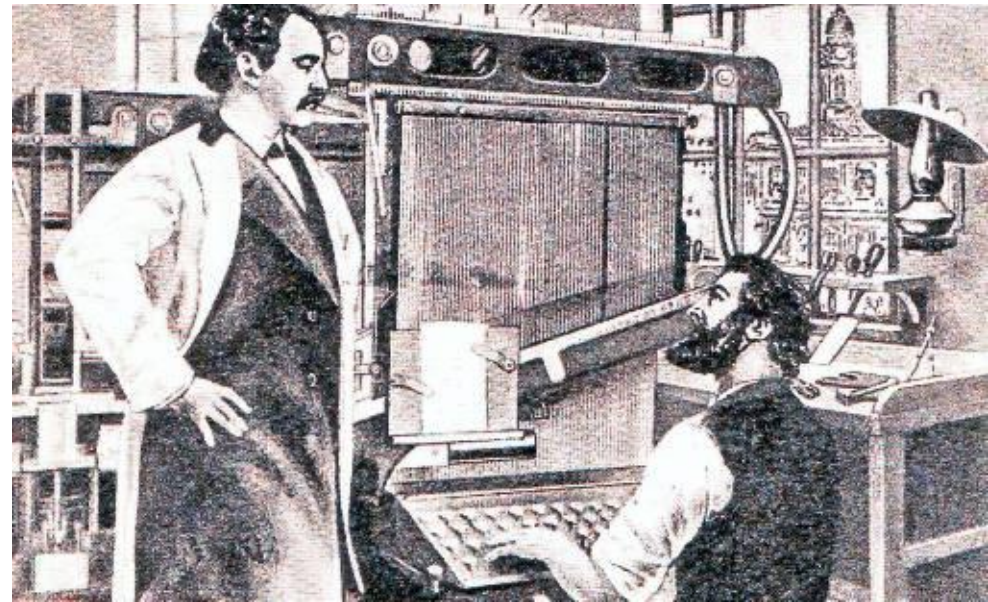
The “Victory” Printing and Folding Machine Manufacturing Company, Limited, Liverpool.

What the Victorian Age knew

- USA revolution
 - Newspapers
 - The penny paper intensifies competition for last-minute news from other cities
 - 1838: The New York Herald has correspondents in six European cities
 - Birth of the profession of the reporter (previously, newspapers had mostly rephrased documents)
 - 1834: The Sun employs four reporters
 - 1854: The New York Tribune (1841) employs 14 reporters
 - Advertisers become more important than readers (readership is used to attract advertising)

What the Victorian Age knew

- The industrialization of printing
 - New York newspapers offer a rich reward for mechanizing the composition process (1880)
 - Ottmar Mergenthaler (German clockmaker): the linotype machine to compose type at the New York Tribune (1886), i.e. the first "keyboard"



What the Victorian Age knew

- The industrialization of printing
 - Louis Prang (German printer in Boston): mass-market color lithography (adverts, Christmas cards, artistic cards to collect in “scrap” albums, etc)



The Christmas card in 1873

What the Victorian Age knew

- USA
 - Periodicals
 - 1841: Horace Greeley's New-York Tribune
 - 1851: The New York Times (also a penny paper)
 - 1852: Frank Leslie's Illustrated Newspaper (illustrated with wood engravings, not photographs)
 - 1857: Harper & Bros' Harper's Weekly (also with wood engravings)



Harper's Weekly, 1874

What the Victorian Age knew

- USA
 - Periodicals
 - 1894: Frank Musey's *The Argosy*, the first monthly "pulp" magazine

What the Victorian Age knew

- USA
 - Paper
 - The most abundant source of inexpensive cellulose is trees
 - 1844: Friedrich Keller (Germany) and Charles Fenerty (Canada) independently invent the wood pulp process for papermaking
 - 1850s: First wood papermaking mills in Germany (Heinrich Voelter and Johann Voith)

What the Victorian Age knew

- USA
 - Paper
 - 1867: First wood pulp paper in the USA is made by Smith Paper Mill (Lee, Massachusetts)
 - 1869: Albrecht Pagenstecher's Hudson River Pulp & Paper Company
 - Trees replace cloth and flax as the primary sources for paper making
 - Paper becomes cheaper

What the Victorian Age knew

- USA
 - Communication
 - 1815: The Battle of New Orleans between the British and US army takes place 15 days after the war has ended because news of the peace treaty has not yet reached the USA
 - Problem: how to send messages instantaneously

What the Victorian Age knew

- USA
 - Communication
 - 1837: Samuel Morse, a New York painter, uses electricity to send an “instant” message
 - 1837: Financial crisis in the USA (“Panic”) makes it difficult to raise capital
 - 1837: Morse’s assistant Alfred Vail invents a code of dots and dashes
 - 1838: Morse demonstrates his telegraph to the president of the USA
 - 1843: US Congress approves funding for Morse’s first telegraph line

What the Victorian Age knew

- USA
 - Communication
 - 1844: Washington-Baltimore telegraph line
 - Simpler than the Cooke-Wheatstone telegraph (that requires five wires instead of one, although it doesn't require memorizing a code)
 - Uses electricity to broadcast information
 - Vali/Morse code: a binary code, short and long bursts of electricity (dots and dashes)
 - Enabling tech: battery and electromagnet
 - Shared the route of the railroads

What the Victorian Age knew

- USA
 - Communication
 - 1844: Samuel Morse's telegraph
 - Cut the time to send a message from months to minutes
 - Made Wall Street “the” stock market of the nation (no more need for others)
 - Capital intensive (USA government)
 - (Trivia: Morse ran twice for mayor of New York on an anti-immigrant and anti-Catholic platform)
 - (Trivia: Morse was a painter, Vail a machinist)

What the Victorian Age knew

Trivia:

Morse ran twice for mayor of New York on an anti-immigrant and anti-Catholic platform)

Morse turned to the telegraph after being rejected as a painter for the Rotunda of the Capitol in Washington (1836)

James Fenimore Cooper was a good friend of Morse (Morse was a member of Cooper's Bread and Cheese Club and Cooper's daughter took painting lessons from Morse)

Morse was already 46 when he invented the telegraph

Morse was a painter, Vail a machinist (more likely to have built the actual telegraph)

What the Victorian Age knew

- USA
 - Communication
 - 1846: First commercial telegraph line in the USA (Philadelphia-New York, but the telegram has to be physically carried across the Hudson river by ferry)
 - 1846: The telegraph sends news of the Mexican war in real time (it used to take weeks to get news by ship: Britain learned of the revolution in the USA more than a month after it had started)
 - 1846: The first female telegrapher (Sarah Bagley)

What the Victorian Age knew

- USA
 - Communication
 - Dec 1848: President James Polk's announcement that gold has been found in California generates an instant "gold rush" throughout the country and in the world
 - Note: only telegraph operators can communicate with each other, the individual doesn't have a "personal telegraph"
 - 1850: 20,000 kms of telegraph lines operated by 20 companies
 - The telegraph introduces a faster pace of life

What the Victorian Age knew

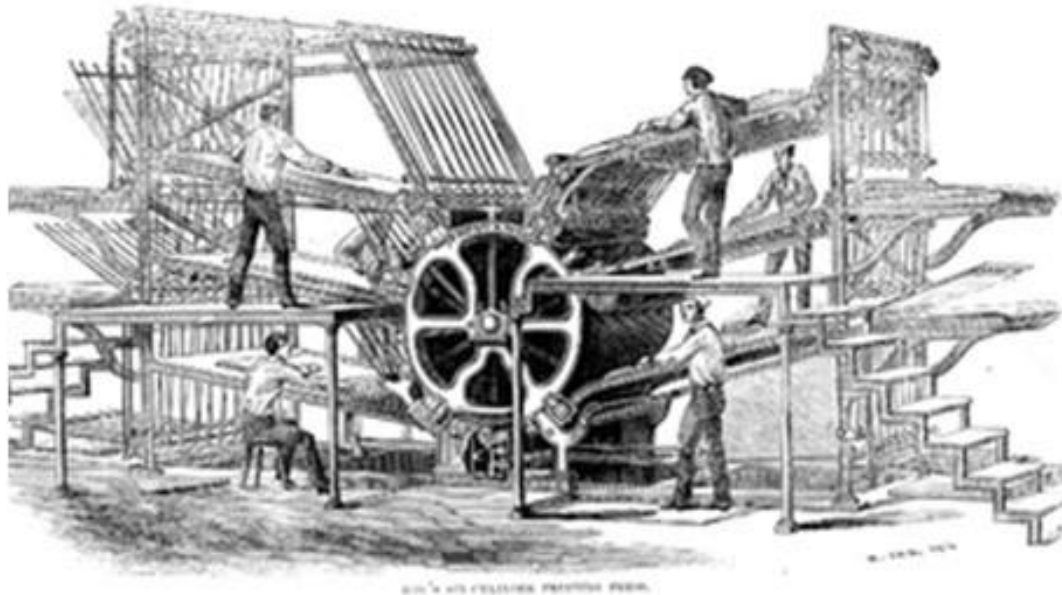
- USA
 - Communication
 - Limitation of the telegraph: only one line, which means only one message at a time
 - 1874: Edison invents a four-line telegraph and sells it to Western Union (four messages at a time)
 - Telegraph offices mandate short messages
 - 1903: Most telegraph messages are 10 words or shorter

What the Victorian Age knew

- USA
 - Communication
 - The telegraph shortens the letter to ten words
 - The telegraph doesn't transmit nonverbal cues that occur in face-to-face communication
 - The telegraph reduces empathy
 - The telegraph turns live events into data

What the Victorian Age knew

- USA
 - Communication
 - Richard Hoe's rotary cylinder press (USA, 1843): thousands of newspapers per hour
 - 1847: Philadelphia's "Public Ledger" installs Richard Hoe's rotary cylinder printing press



What the Victorian Age knew

- USA
 - Communication
 - 1843: The USA has 1634 newspapers
 - 1846: Five daily newspapers in New York City organize the Associated Press to share the costs of collecting and broadcasting news
 - 1870: Reuters (the British empire), Havas (the French empire), Wolff (Germany)

What the Victorian Age knew

- USA
 - Communication
 - 1851: Hiram Sibley founds the New York and Mississippi Valley Printing Telegraph Company in Rochester
 - 1854: The state of Maine creates the Atlantic and Pacific Telegraph Company (A&P) to build a telegraph system extending from the East Coast to the West Coast
 - 1855: Sibley's company merges with Ezra Cornell's New York & Western Union Telegraph Company and becomes Western Union

What the Victorian Age knew

- USA
 - Communication
 - 1861: Western Union opens the first transcontinental telegraph line, Washington to California, replacing the 10-day journey by horse of the Pony Express
 - 1866: Paper magnate Cyrus Field's Atlantic Telegraph Company completes the transatlantic telegraph line between Newfoundland and Ireland (80 times faster than the first 1858 cable), thereby reducing the communication time between America and Europe from days to minutes
 - Capital intensive (private investors)
 - 1869: A&P leases telegraph lines from the Union Pacific Railroad and the Central Pacific Railroad ⁸⁹

What the Victorian Age knew

- USA
 - Communication
 - 1870: Western Union introduces a standardized time service
 - 1871: Western Union introduces a money transfer service
 - 1873: Western Union acquires the International Ocean Telegraph Company
 - 1875: Jay Gould takes control of the Atlantic and Pacific Telegraph Company
 - 1881: Jay Gould takes control of Western Union

What the Victorian Age knew

- USA
 - Communication
 - 1900: Western Union operates more than 1.5 million kms of telegraph lines and two international undersea cables
 - 1914: Western Union introduces the first charge card for its customers
 - 1921: The first wirephoto (predecessor of the telefax) is sent by Western Union
 - 1923: Western Union deploys teletypewriters in its branches

What the Victorian Age knew

- USA
 - Communication
 - Proliferation of newspapers
 - Cheaper paper
 - Steam-powered printing presses
 - 1871: Richard Hoe's "web press" that can print on both sides for the New York Tribune (18,000 newspapers per hour)
 - 1886: Ottmar Mergenthaler invents the linotype for the New York Tribune
 - 1887: Tolbert Lanston's monotype
 - Faster transportation
 - Small-town post offices
 - Subsidized printed matter

What the Victorian Age knew

- USA
 - Newspapers
 - 1851: Henry Raymond founds the New York Daily Times
 - 1878: Joseph Pulitzer creates the St. Louis Post
 - 1883: Joseph Pulitzer takes over the New York World
 - 1887: William Randolph Hearst takes control of his father's San Francisco Examiner
 - 1889: Pulitzer sends reporter Elizabeth Cochrane, disguised under the name Nellie Bly, around the world in less than 80 days

What the Victorian Age knew

- USA
 - Newspapers
 - 1895: Hearst purchases the New York Journal
 - 1898: Hearst fabricates the motivation for the USA to declare war on Spain and conquer Cuba, Puerto Rico and the Philippines



"You furnish the pictures and I'll furnish the war." – William Randolph Hearst, January 25, 1898



What the Victorian Age knew

- USA
 - Newspapers
 - Rise of media groups that own multiple newspapers (Hearst, Pulitzer, Northcliffe in Britain)
 - Hearst ammasses 30 newspapers
 - Rising political influence of newspaper's owners
 - Boom of sensational fake news (Hearst's papers invent the premise to the war against Spain and incites violence against president McKinley who is assassinated in 1901)

What the Victorian Age knew

- The Press
 - Godefroy Engelmann invents color lithography (1837, France) and economical color printing spreads
 - 1841: Volney Palmer in Philadelphia opens the first advertising agency
 - 1840s: Rapid expansion of reading public + lower production costs due to steam-powered press + rising revenues from advertising = boom of magazines and newspapers

What the Victorian Age knew

- The Press
 - 1850: Harper Brothers in New York (founded 1817) is the largest publishing house in the world
 - 1850: Harper New Monthly Magazine is the first major pictorial magazine
 - 1867: Harper's Bazar for women

What the Victorian Age knew

- The Press
 - 1871: Thomas Nast's political cartoons in Harper's Weekly kill the political career of William Marcy Tweedy in New York (voters cannot read but they can see the pictures)
 - 1877: “The Nickel Library” (vogue of the nickel novel, mostly about the Civil War and the Far West)
 - 1881: Century Magazine
 - 1887: Scribner's Monthly
 - 1890: Charles Dana Gibson's posters create an ideal of female beauty ("Gisbon girls")

What the Victorian Age knew

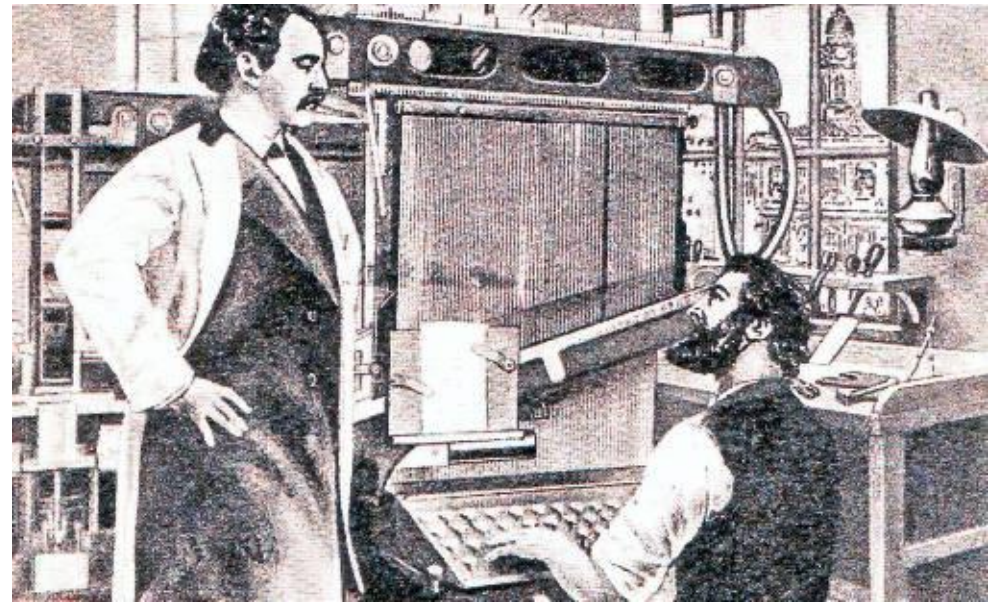
- Advertising
 - 1870s: Louis Prang mass produces “trade cards”
 - 1870s: Scribner’s and Harper’s print full-page ads
 - Advertising agencies (Ayers 1869, Walter Thompson 1878)
 - Color lithography first used by Luis Susini for labels of cigarette boxes (1850s)



Susini, 1867

What the Victorian Age knew

- The industrialization of printing
 - New York newspapers offer a rich reward for mechanizing the composition process (1880)
 - Ottmar Mergenthaler (German clockmaker): the linotype machine to compose type in Baltimore (1887), i.e. the first "keyboard"



What the Victorian Age knew

- The industrialization of printing
 - Louis Prang (German printer in Boston): mass-market color lithography (adverts, Christmas cards, artistic cards to collect in “scrap” albums, etc)



The Christmas card in 1873

What the Victorian Age knew

- USA
 - Communication
 - Mass literacy due to the lower prices of printing due to the steam-powered printing press
 - Literacy also for women, first step in women's liberation

What the Victorian Age knew

- Gold Rush (1849)
 - 1848: James Marshall's discovery of gold
 - 1848: The USA acquires California, New Mexico, Nevada, Arizona, Utah from Mexico (almost half of Mexico)
 - The opening of California is contemporary with the openings of China (Treaty of Wangxia, 1844) and Japan (Commodore Perry expedition, 1854)
 - 1849: After the president's speech, thousands of people rush to California looking for gold
 - Easy cheap technology of gold panning, potential of high returns
 - A multi-ethnic phenomenon, especially Chinese

What the Victorian Age knew

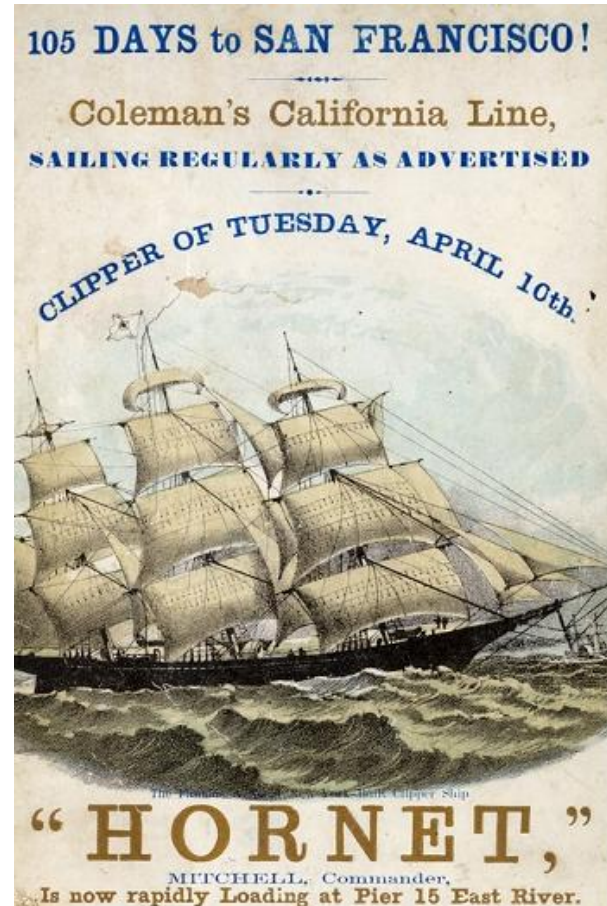
- Gold Rush (1849)
 - Beneficiaries: mining suppliers and gold brokers
 - Henry Wells and William Fargo: express freight (1851)
 - Levi Strauss (German immigrant): durable trousers for miners (1853), blue jeans (1873)
 - John Studebaker: wheelbarrows for miners (1853)
 - Railroad barons

What the Victorian Age knew

- Gold Rush (1849)
 - 1850: California's population has increased from 15,000 (1840) to 165,000
 - 1851: San Francisco's population has increased from 459 (1847) to 35,000
 - 1853: Extreme clippers shorten the trip from New York to San Francisco to 106 days
 - 1850s: San Francisco becomes an important trading post along the route to China
 - San Francisco is the first city to be born racially and ethnically diverse
 - California is the first state to be first urbanized then farmed

What the Victorian Age knew

- Gold Rush (1849)
 - Extreme clipper



What the Victorian Age knew

- Gold Rush (1849)
 - The boom creates the myth of easy riches
 - 1859: Comstock silver
 - Unlike gold, silver requires large capital
 - 1861: California largely immune to the Civil War
 - 1862: Lincoln signs the bill for the transcontinental railroad to keep California in the Union
 - As many as 100,000 Native Americans murdered by miners
 - "That a war of extermination will continue to be waged between the two races until the Indian race becomes extinct must be expected." California governor Peter Burnett (1849-1851)

What the Victorian Age knew

- USA
 - Boom of gold
 - The USA annexes California in the Mexican–American War (1846-47)
 - 1848: James Marshall’s discovery of gold in California
 - USA gold production increases from 1.2 tons in 1847 to 55 tons in 1849
 - Not capital intensive at all: anyone with a pan can search for gold
 - Mass migrations west
 - Mostly male population (92% of California’s population in 1850, when it belatedly becomes a state)
 - Gold moves the center of mass of the USA west

What the Victorian Age knew

- USA
 - Boom of gold
 - Three ways to reach California from New York
 - » Six months by horse carriage
 - » Six months by sailship around Cape Horn
 - » Through Panama
 - 1852: Wells Fargo transcontinental express service
 - 1860: Pony Express (ten days from Missouri to Sacramento, 3000 kms): lasted only one year
 - 1861: Telegraph link with California (Pacific Telegraphy Co)
 - 1869: Transcontinental railway

What the Victorian Age knew

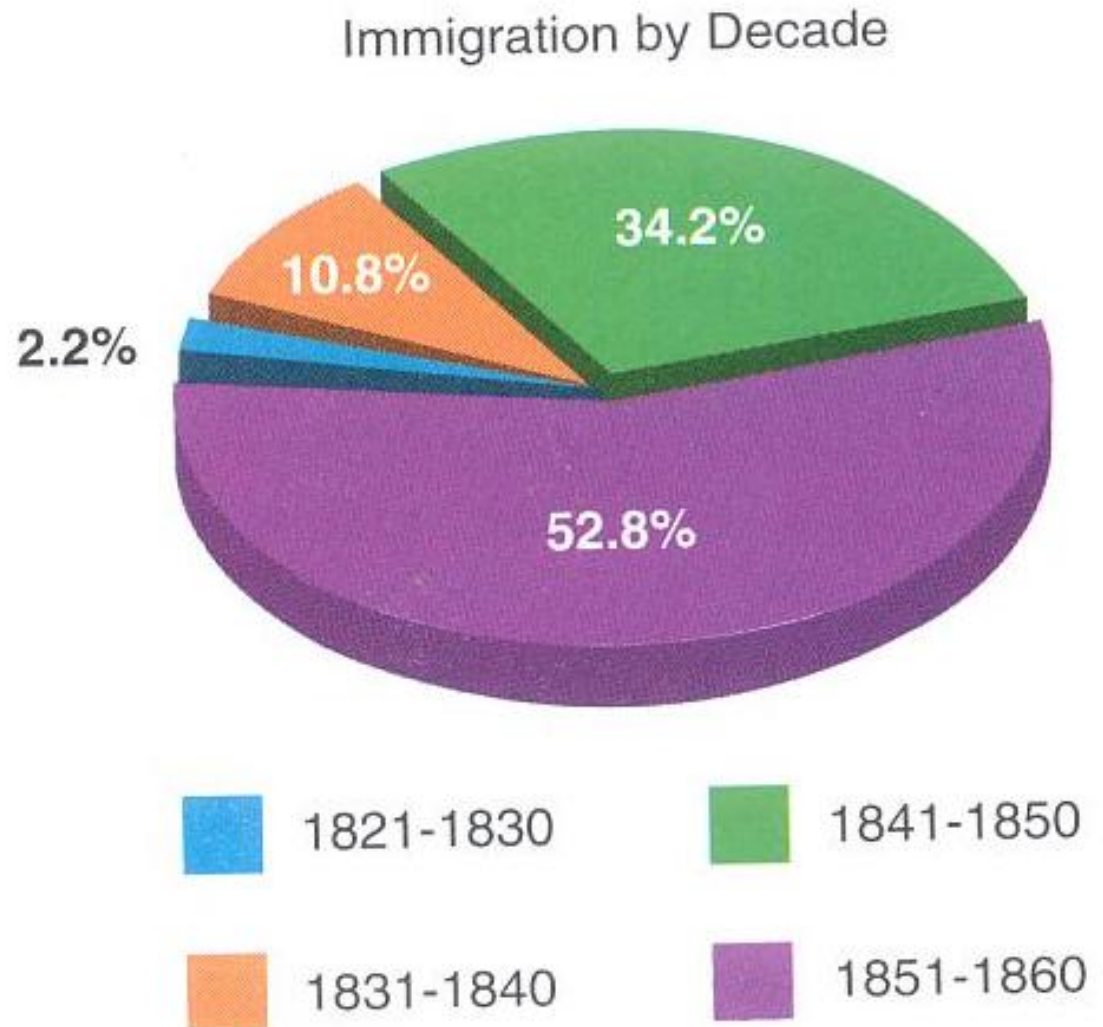
- USA
 - Boom of gold
 - China is twice closer to California than New York
 - Taiping rebellion (1850-64) causes Chinese to leave China
 - Thousands of Chinese men take sailing ships to California, nicknamed “Gum Saan” (“gold mountain”)
 - Contract labor (not much better than slave labor)
 - Contract laborer = “coolie”
 - California becomes the most cosmopolitan state in the Union

What the Victorian Age knew

- USA
 - Boom of mining and lumbering
 - Boom towns of the West
 - 1880: Men outnumber women by more than 2 to 1 in Colorado, Nevada and Arizona

What the Victorian Age knew

- USA revolution
– Immigration



What the Victorian Age knew

- USA revolution
 - Immigration
 - The USA depends on immigration to fuel both industrialization and expansion
 - Germans: traditionally the second largest group of immigrants (4.5 million out of 15 million in 1820-90)

What the Victorian Age knew

- USA revolution
 - Immigration
 - Irish potato famine 1840s: coal miners in Pennsylvania, railroad workers for the transcontinental railroad (on the eastern side), maids in Eastern cities (women are the majority of Irish immigrants)
 - 1850s: immigration is 12.1% of the 1850 population
 - 1863: Riots between Irish immigrants and blacks in New York
 - 1861-65: The Civil War drafts most able men
 - 1864: The USA passes the “Acts to Encourage Immigration”

What the Victorian Age knew

- USA
 - Immigration
 - 1848: First Chinese immigrants (Gold Rush in California)
 - Taiping rebellion (1850-64) kills millions
 - Chinese workers in California for the gold rush, agriculture and the transcontinental railroad (on the western side)
 - Chinese immigrants do not integrate in the mostly Christian European society
 - Chinese immigrants view themselves as temporary laborers not immigrants
 - Strong anti-Chinese sentiments (massacres of Chinese immigrants in 1871 in Los Angeles)

What the Victorian Age knew

- USA
 - Immigration
 - Chinese immigrants develop agriculture in Central Valley of California (dykes, irrigation canals, intensive farming)
 - 1880: about one third of all farm laborers in California are Chinese
 - 1880: 100,000 male Chinese and only 3,000 female Chinese living in the western USA
 - The naturalization law of 1790 bars Asians from citizenship, not being “free white persons”
 - San Francisco’s Chinatown is a veritable ghetto

What the Victorian Age knew

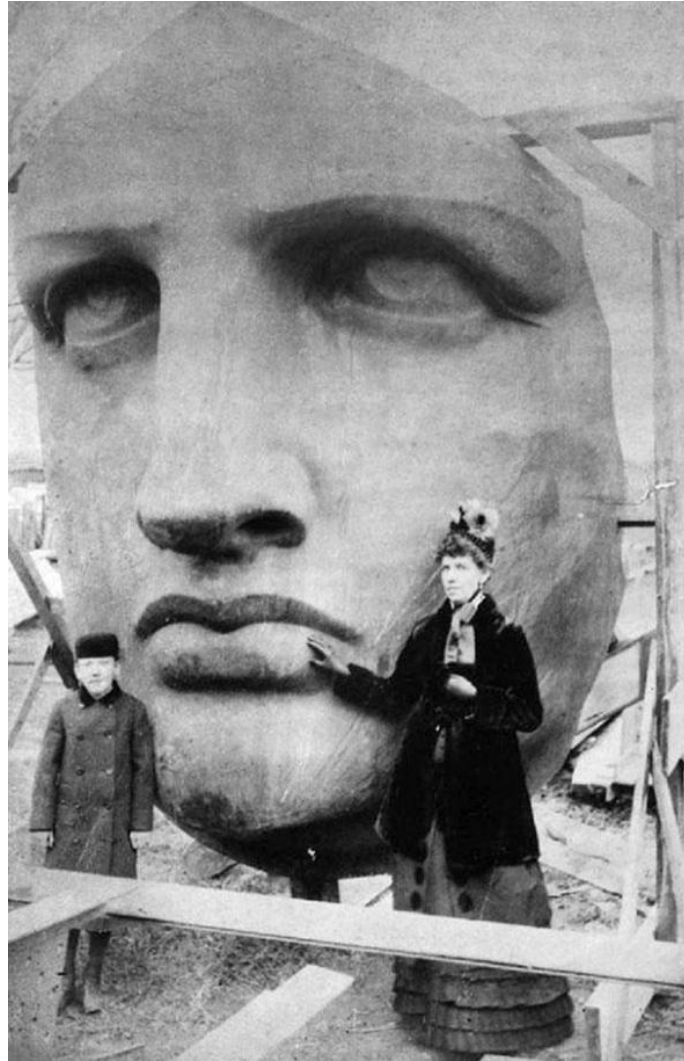
- USA
 - Immigration
 - 1882-1943: The USA bans immigration from China
 - Massacres of Chinese by both Caucasians and Native Americans (28 Chinese miners killed in Rock Springs, Wyoming, in 1885; 34 Chinese gold miners killed by the Snake River, Oregon, in 1887)
 - 1909: about 40% of all farm laborers in California are Japanese

What the Victorian Age knew

- USA revolution
 - Immigration
 - Russian pogroms of 1881: Jews leave Russia
 - 1882: peak of immigration (789,000 immigrants in one year)
 - 1880s: immigration is 10.5% of the 1880 population (5.3 million out of 50 million)
 - 1890: Cheaper steamship tickets and national railroads allow Italians and Russians to emigrate, shifting immigration from northern Europe to southern and eastern Europe
 - Irish and Italians are not Protestant
 - Chinese and Jews are not Christian
 - Italians and Russians have no experience with democracy

What the Victorian Age knew

- USA revolution



Frédéric Bartholdi's "Statue of Liberty" (1886)

What the Victorian Age knew

- USA
 - Railroads
 - The government subsidizes the industry in order to expand the nation
 - 80 companies receive over 170 million acres of public land

What the Victorian Age knew

- USA
 - Railroads
 - Foster boom in coal and steel
 - Foster formation of stock-holder corporation
 - Cornelius Vanderbilt invests in the NY Central Railroad in 1867
 - Promote settlement on the Great Plains
 - Cement the nation by linking east and west
 - Create a global market for goods by linking the Atlantic to the Pacific
 - Essentially trigger the second industrial revolution

What the Victorian Age knew

- USA
 - The Transcontinental Railroad
 - To link California with the Union during the Civil War
 - Union Pacific (Thomas Durant) between Utah and the Missouri River across the Great Plains, using war veterans and Irish immigrants
 - Central Pacific (Leland Stanford) between Sacramento and Utah over the mountains, using 6,000 Chinese
 - Western Pacific between Oakland and Sacramento
 - Completion at Promontory Point Utah in 1869

What the Victorian Age knew

- USA
 - The Transcontinental Railroad
 - Bribes win government approval
 - Subsidized by the government in 1862 in the middle of the civil war (1861-65)
 - The government absorbs most of the risk
 - Work begins in 1863
 - It shortens to ten days the journey from New York to San Francisco
 - William Sherman's trip to California during the Mexican war (1846) had taken 196 days

What the Victorian Age knew

- USA
 - The Transcontinental Railroad
 - Central Pacific: engineering problems (mountains) solved with newly invented nitroglycerin (perfected by Alfred Nobel in 1863), but plenty of manpower (Chinese coolies of the gold rush) and plenty of material/food along the route
 - Union Pacific: logistical problems (food, materials, fuel have to be transported from very far), limited manpower (men are at war), “Indians” (Sioux and Cheyenne, 1867)

What the Victorian Age knew

- USA
 - The Transcontinental Railroad
 - In California it creates the wealth of the “big four” robber barons: Leland Stanford (California governor in 1861), Collis Potter Huntington, Mark Hopkins, Charles Crocker
 - Funded by: the big four, the city of Sacramento, the city of Los Angeles, the state of California
 - Built by cheap Chinese labor in California (and by cheap Irish labor in the east)
 - The Big Four’s Southern Pacific eventually dominate transport west of the Colorado
 - In 1877 the Southern Pacific begins exporting California produce to St Louis

What the Victorian Age knew

- USA
 - The Transcontinental Railroad
 - By 1900 four other transcontinental railroads are completed
 - The Southern Pacific: connected New Orleans with Los Angeles (1883: second transcontinental railroad)
 - The Atchison, Topeka, & Santa Fe: Kansas City to Los Angeles (1882)
 - The Northern Pacific: St Paul to Seattle (1883)
 - The Minneapolis & St Cloud Railroad Company (renamed Great Northern Railroad): St. Paul to Seattle (1893), the only one with no federal subsidies (mostly by James Jerome Hill's acquisitions)
 - Canada: Ottawa to British Columbia (1885)

What the Victorian Age knew

- USA
 - The Transcontinental Railroad
 - Railroads in Britain and the USA are largely private ventures, whereas in continental Europe and Japan are government ventures
 - But the USA provides subsidies, protects the railroads with the cavalry and absorbs most of the risks
 - Railroads in Europe displace the old economy (barge owners, artisans, horse-drawn vehicles) but the transcontinental railroads simply settle a new world and create a new market (bigger than the whole of Europe)
 - North-American railroad technology (steel rails, locomotives, comfortable rail cars) becomes the best in the world

What the Victorian Age knew

- USA
 - The boom of railroads
 - Railroads require huge investments, extend over thousands of kms, require a sophisticated system of planning and managing, need cost analysis to determine rates
 - Railroads pioneer managerial, financial and labor practices of large corporations as well as labor relations
 - Railroads provide the means to reach the urban markets that sustain the growth of large corporations
 - 1849: New York-based Winslow, Lanier & Co funds railroads, thus pioneering investment banking

What the Victorian Age knew

- USA
 - The boom of railroads
 - 1850: The rail network is about 15,000 kms
 - 1860: The rail network is about 48,000 kms vs 5,000 kms of canals
 - 1860: All the major cities are linked by railroad
 - 1860s: Granger Laws sponsored by farmers to regulate rising fare prices
 - 1890: The rail network is about 264,000 kms whereas canals have not expanded

What the Victorian Age knew

- USA
 - The boom of railroads
 - The telegraph and the railroads shrink time and space
 - In 1775 it had taken more than a month for Britain to learn that a revolution had started in Boston
 - In 1829 it had taken a month for newly elected president Andrew Jackson to travel by horse from Nashville to Washington
 - The railroad introduce a uniform time schedule
 - 1883: four time zones (linked to Greenwich Mean Time in England) instead of the chaotic system of the Midwest (dozens of different time zones in Michigan, Indiana, Wisconsin, Illinois, etc)

What the Victorian Age knew

- USA
 - The boom of railroads
 - The railroads provide the industrial urban Northwest with access to ample supplies of minerals (iron, coal, copper, gold) and food (wheat, citrus and soon cattle)

What the Victorian Age knew

- USA
 - The boom of railroads
 - 1893: Financial Panic forces many railroad companies into bankruptcy and bankers like JP Morgan consolidate them into larger companies, greatly reducing competition in the railroad industry
 - 1920: The Transportation Act de facto turns the railroads into a government-regulated industry

What the Victorian Age knew

- USA
 - The boom of iron
 - 1839: Dunlap's Creek Bridge proves the feasibility of iron bridges
 - 1840: More than 200 charcoal furnaces in Pennsylvania alone
 - 1845: The nation's first iron railroad bridge (Maryland)
 - Adoption of the advanced British technology: furnaces fired with bituminous coke, capable of producing wrought-iron products faster and cheaper
 - Replacing charcoal as the principal fuel with anthracite coal and then bituminous coal and coke

What the Victorian Age knew

- USA
 - The boom of iron
 - Rapid decline of the land- and labor-intensive practices of the “iron plantation”
 - 1850: Industry dominated by anthracite-coal and bituminous-coke furnaces and large rolling mills
 - 1862: Iron workers win concessions after an eight-month strike in Pittsburgh
 - Gogebic Range (Michigan and Wisconsin) in 1884, Mesabi Range (Minnesota) in 1892

What the Victorian Age knew

- USA
 - The boom of iron
 - 1892: The iron industry violently defeats the "Homestead strike" of iron workers
 - 1898: Frederick Taylor's "high-speed" steel (Pennsylvania)
 - 1900: Coke furnaces produce 70% of Pennsylvania's iron
 - Iron industry transplanted to the Midwest, eg 1903: US Steel's colossal integrated steel mill, Gary Works (Indiana)

What the Victorian Age knew

- USA
 - The boom of steel
 - The Bessemer converter (1856) jumpstarts the boom of steel (first installed at Wyandotte, Michigan, in 1864)
 - The Great Lakes region has abundant coal and iron and becomes the nations' capital of steel
 - Andrew Carnegie: steel manufacturing in Pittsburgh (1870s)
 - Vertical integration: a company controls every stage of the industrial process, from mining to distribution
 - 1900: JP Morgan's US Steel Corporation buys Carnegie and becomes the largest company in the world (3/5th of the nation's steel business)

What the Victorian Age knew

- USA

- The boom of steel

*“Two pounds of iron-stone purchased on the shores of lake Superior and transported to Pittsburgh;
two pounds of coal mined in Connellsville and
manufactured into coke and brought to Pittsburgh;
one half pound of limestone mined east of the Alleghenies
and brought to Pittsburgh;
a little manganese ore, mined in Virginia and brought to
Pittsburgh.*

*And these four and one half pounds of material
manufactured into one pound of solid steel and sold for
one cent.*

*That’s all that need be said
about the steel business.”*

(Andrew Carnegie)

What the Victorian Age knew

- USA
 - The boom of steel
 - Machine tools made of iron and steel replace machine tools made of wood (greater longevity, precision and complexity)
 - Steel alloys revolutionize the industry of guns and cannons
 - The internal combustion engine (with its long-term airtight pistons and valves at high temperature and strong pressure) becomes feasible after Bessemer's invention

What the Victorian Age knew

- USA
 - Chemical Industry
 - 1802: Eleuthère du Pont founds the water-driven gunpowder mill DuPont in Delaware
 - 1847: Ascanio Sobrero invents nitroglycerin (Italy)
 - 1861: DuPont supplies half the gunpowder used by the Union during the Civil War
 - 1867: Alfred Nobel invents dynamite (Sweden)
 - 1881: dynamite used by anarchists to assassinate the czar
 - 1885: Russell Penniman invents "ammonium dynamite" which triggers the boom of dynamite
 - 1905: 165 million kgs of explosives produced in the USA

What the Victorian Age knew

- USA
 - Chemical Industry
 - 19th century: Most pharmaceuticals in the USA come from Germany
 - 19th century: Main pharmaceutical companies in New York founded by German immigrants (Charles Pfizer, 1849; George Merck, 1891)
 - 1869: John Hyatt commercializes celluloid, the first industrial plastic
 - 1907: Leo Baekeland invents "bakelite", the first entirely synthetic plastic (USA)
 - 1912: The government breaks up DuPont, with the main company refocusing on chemical engineering
 - The USA's chemical industry focuses on synthetic products based on petroleum

What the Victorian Age knew

- USA
 - Lighting
 - 1796: Philadelphia pioneers gaslight
 - 1830s: Street lighting in all major eastern cities
 - 1840s: Gaslight common in homes
 - 1840s: Central heating common in homes
 - People can stay up till late and read
 - Boom of books, magazines and newspapers
 - Lighting is essential for factories, that cannot depend on sunlight the way farmers used to

What the Victorian Age knew

- USA
 - Lighting
 - Population boom and industrialization increase demand for artificial illumination
 - Best fuel for lamps: whale oil
 - Decimation of whale schools and spike in the price of whale oil
 - Scarcity of whale oil for illumination drives search for alternatives

What the Victorian Age knew

- USA
 - Lighting
 - 1846: Abraham Gesner invents kerosene, based on coal
 - 1851: Sam Kier develops kerosene from crude oil
 - 1854: North American Gas Light Company in New York begins selling Gesner's kerosene for lighting

What the Victorian Age knew

- USA
 - Boom of oil
 - 1859: First oil well in the world (Edwin Drake, Pennsylvania)
 - Oil is used to make kerosene, gasoline is discarded
 - Lighting drives the great demand for oil until gasoline-powered cars
 - Technology of drilling for salt (Chinese invented)
 - Boom of oil also driven by the need to lubricate machines
 - Capital intensive (private investors)



What the Victorian Age knew

- USA
 - Boom of oil
 - Main refining centers to make kerosene and other products: Pittsburgh, Philadelphia, Cleveland
 - 1861: The Civil War increases demand for Pennsylvania's oil (cheaper lubricant than whale and coal oils)
 - 1861: The first oil tanker leaves Philadelphia
 - Kerosene used in lamps is a significant fire risk
 - 1865: the first oil pipeline (Samuel Van Syckel in Pennsylvania), cheaper than the railway

What the Victorian Age knew

- USA
 - Boom of Oil
 - 1862: John Rockefeller founds a company to refine oil in Cleveland, the urban gateway to oil fields (refining oil is less risky than producing it; e.g. prices plunge in the 1860s because of overproduction)
 - 1871: The first oil well is drilled in Baku, Caucasus, Russia
 - 1882: John Rockefeller's Standard Oil pioneers the "trust" to control multiple companies (later the "holding company"), moving its headquarters to New York
 - 1890: Rockefeller has a virtual monopoly on the oil industry

What the Victorian Age knew

- USA
 - Boom of Oil
 - Horizontal integration: former competitors are brought under a single corporate umbrella
 - Standard Oil becomes the model for “trusts” (monopolies) in other industries
 - 1890: The Sherman Anti-Trust Act
 - 1911: The government dissolves Rockefeller's Standard Oil

What the Victorian Age knew

- USA
 - Boom of Oil
 - Caucasus oil is difficult to distribute (Caspian Sea + Volga river + railway to reach northern and western destinations)
 - 1876: Nikolaus Otto invents the internal combustion engine
 - 1878: Ludwig Nobel introduces the first oil tanker in the Caucasus
 - The Nobel family builds an integrated industry of wells, pipelines, refineries, tankers, depots, railroads
 - 1879: Edison's light bulb changes the dynamics of lighting
 - Oil is sold to make kerosene, heat and power

What the Victorian Age knew

- USA
 - Boom of Oil
 - 1883: The Netherlands begins to drill for oil in Sumatra, Indonesia
 - 1886: Alphonse Rothschild, a French Jew, forms the Black Sea Petroleum Company
 - 1890: The Royal Dutch Company is founded in the Netherlands for oil exploration
 - 1891: USA oil accounts for 78% of illuminating oil exports vs 29% of Russia
 - 1892: Edward Doheny strikes oil in Los Angeles
 - 1892: Marcus Samuel, a British Jew, introduces an oil tanker that can sail through the Suez canal to Bangkok

What the Victorian Age knew

- USA
 - Boom of Oil
 - 1892: Edward Doheny strikes oil in Los Angeles
 - 1897: Marcus Samuel founds the Shell Transport and Trading Company
 - 1900: California is the main producer of oil in the world
 - 1900: 2,300 automobiles are registered in the USA, of which 1,170 are steam-powered, 800 are electric, and 400 are gasoline-powered

What the Victorian Age knew

- USA
 - Boom of oil
 - Texas
 - Sparsely populated because too hot
 - Comanches and lawless settlers
 - 1835: Texas Rangers, the oldest state law enforcement body in the USA
 - 1845-60: Cotton slave plantations dominate the economy and the politics
 - 1860: 430,000 white residents and 182,000 black slaves

What the Victorian Age knew

- USA
 - Boom of oil
 - Texas
 - 1880-1900: Cattle ranches dominate the economy and the politics
 - Railroads to ship cattle to Missouri and Kansas (and then to meat production centers in Chicago)
 - 1904: Texas has more kms of railroads than any other state
 - 1900: The largest city in Texas is San Antonio with a population of 53,000

What the Victorian Age knew

- USA
 - Boom of oil
 - Texas
 - 1901: A huge oil field is discovered in Beaumont (Spindletop oil field)
 - Pennsylvania oil is top quality, Texas oil is of poor quality (not suitable for kerosene)
 - Texas oil marketed to railways and steamships (locomotion, not lighting)
 - 1901: Andrew Mellon founds the Gulf Oil Company in Texas
 - 1901: Joseph Cullinan founds the Texas Fuel Company (later Texaco)
 - 1905: the Glenn Pool oil field (Tulsa, Oklahoma), oil of Pennsylvania quality in Texas quantities

What the Victorian Age knew

- USA
 - Boom of oil
 - 1902: a female journalist, Ida-Minerva Tarbell, exposes Standard Oil's dubious practices
 - 1903: Wilbur and Orville Wright fly the first airplane, powered by gasoline
 - 1909: The USA forces the dissolution of Standard Oil, which creates Chevron, Mobil, Amoco, Socal, etc
 - 1910: California produces 22% of the world's oil (more than any country in the world except the USA)
 - 1911: Sales of gasoline exceed sales of kerosene

What the Victorian Age knew

- USA
 - Boom of oil
 - Texas
 - A state of boom towns
 - 1917: the “Roaring Ranger” oil field (Eastland County, Texas)
 - 1928: Texas passes California in oil production
 - 1930s: air conditioning becomes available for homes
 - 2013: 8 of the 15 fastest-growing cities of the USA are in Texas

What the Victorian Age knew

- USA
 - Boom of oil
 - Geopolitics
 - 1901: Edward Doheny strikes oil in Mexico
 - 1904: The Trans-Siberian Railroad is inaugurated, using Shell's oil
 - Since Russia has to import coal from Britain, the Russian government encourages a switch from coal to oil
 - 1907: Royal Dutch and Shell merge, creating a company that controls more than 50% of shipments to Russia and Far East

What the Victorian Age knew

- USA
 - Boom of oil
 - Geopolitics
 - 1908: British company Anglo-Persian discovers oil in Iran, the first oil well in the Middle East
 - 1910: Weetman Pearson discovers huge oil field that trigger Mexico's oil boom
 - 1911: Churchill switches Britain's navy from coal to oil to counter the German build-up

What the Victorian Age knew

- USA
 - Boom of oil
 - Geopolitics
 - 1912: Armenian-born Calouste Gulbenkian and Anglo-Persian form the Turkish Petroleum Company (TPC) to dig oil in Iraq
 - 1912: Royal Dutch Shell acquires Rothschild's Russian oil organization
 - 1914: The British government purchases part of Anglo-Persian, only the second time the British government has purchased a private company
 - 1921: Mexico is the second oil producer in the world

What the Victorian Age knew

- USA
 - Boom of electricity
 - Thomas Edison
 - 1876: first industrial (non-university) research laboratory to industrialize innovation
 - 1877: phonograph
 - 1879: light bulb
 - 1880: first power plant (New York): direct current at low voltage
 - 1882: first lighting in an office building (New York)
 - Edison also invented a system to distribute electricity

What the Victorian Age knew

- USA
 - Boom of electricity
 - 1889: Thomas Edison's business empire is consolidated in the Edison General Electrical Company
 - 1892: Thomas Edison's Edison General Electrical Company merges with Thompson-Houston and becomes General Electric
 - General Electric: to make electricity affordable for the masses (by using turbines for generators)
 - General Electric trains its own sales force to explain how electrical products work and trains its own support engineers to design customized solutions

What the Victorian Age knew

- USA
 - Boom of electricity
 - 1885: George Westinghouse builds the first practical transformer
 - 1886: George Westinghouse founds the Westinghouse Electric Company
 - 1888: Nikola Tesla invents the alternating-current motor (USA)
 - George Westinghouse uses alternating current at high voltage and transformers to reduce the cost of electricity distribution over long-distance

What the Victorian Age knew

- USA
 - Boom of electricity
 - 1860s: Horatio Livermore's Natoma Water and Mining Company builds an extensive network of dams, ditches, and reservoirs to supply water to mines on the American River
 - 1880s: Hydraulic mines in Sierra experiment with hydroelectric power (electric power created by water turbines)

What the Victorian Age knew

- USA
 - Boom of electricity
 - Jul 1895: The Livermore company opens a 35 km hydroelectric power line to bring electricity from Folsom to Sacramento, with water powering four colossal electrical generators (dynamamos), the first time that high-voltage alternating current had been successfully conducted over a long distance

Sep 1895: Grand Electrical Carnival
in Sacramento



What the Victorian Age knew

- USA
 - Boom of electricity
 - Electricity in California is mainly for domestic and public use (lighting, streetcars)
 - 1890s: Machines can be equipped with an electric motor connected by a wire to an electrical outlet
 - Steam engines used to produce electricity (electric generator)
 - 1896: Nikola Tesla and George Westinghouse build a hydro-electric power plant to bring electricity from Niagara Falls to Buffalo
 - Power stations begin to distribute electricity to customers

What the Victorian Age knew

- USA
 - Boom of electricity
 - The main advantage of electrical power is that the layout of the factory becomes more flexible (wires can be bent, extended, shortened...)
 - Electrical motors make very large factories easier to design
 - 1902: the USA produces 6,000,000,000 Kwatt-hours
 - Massive productivity increase
 - Appliances replace servants

What the Victorian Age knew

- USA
 - Boom of aluminum
 - 1825: Aluminum isolated by Hans-Christian Orsted but the process is very complicated
 - 1855: Aluminum exhibited at the Universal Exposition of Paris as an expensive novelty (almost as expensive as gold)
 - 1888: Charles Hall's electrolytic process enables large-scale low-cost production of aluminium (Pittsburgh Reduction Company, later Alcoa)
 - 1898: Union Carbide (Virginia) for ferroalloys
 - Manufacturing aluminum requires a lot of electricity
 - Aluminum lighter than steel, ideal for transportation
 - 100% recyclable

What the Victorian Age knew

- USA
 - Boom of banking
 - 1904: Amadeo Giannini's Bank of Italy (Bank of America) for the middle-class, not only the wealthy class
 - Financial panic: 1873, 1893, 1929
 - 1913: Federal Bank founded to prevent market crashes

What the Victorian Age knew

- **USA**

- Boom of wheat

- Virtually unlimited wheat from the central farmlands of the USA but slaveholders of the southern boycott the development of the central farmlands
 - 1861: The US Civil War – northern states develop the central farmlands
 - The US wheat trade overtakes Russia's thanks to river steamboats, railways, ocean steamers (1900: New York exports as many tons of grain per week as Odessa at its height exported per year)
 - 1867: dynamite (which allows engineers to build tunnels and canals, and to deep ports for larger ships)

What the Victorian Age knew

- **USA**

- Boom of wheat

- European immigrants (sometimes from Ukraine) plant wheat in the central farmlands
 - Milling centers for the plains thrive (eg Minneapolis)
 - 1870s: the value of US food exports to Europe increases by 611%
 - Food prices drop in Europe thanks to cheap wheat from the USA and to cheap potatoes
 - European life expectancy, which has remained nearly static for a century, rises from 36 years in 1850 to 43 in 1900 (also because of public sanitation)

What the Victorian Age knew

- **USA**

- Boom of wheat

- Food production is no longer a problem (no more famines in Europe except in Russia!)
 - 1870-71: Prussia buys wheat from the USA to fight France
 - Wheat doesn't have to be grown locally to feed an army
 - Russian agriculture declines (and bread riots trigger the revolutions of 1905 and 1917)

What the Victorian Age knew

- **USA**

- Junk food for the masses

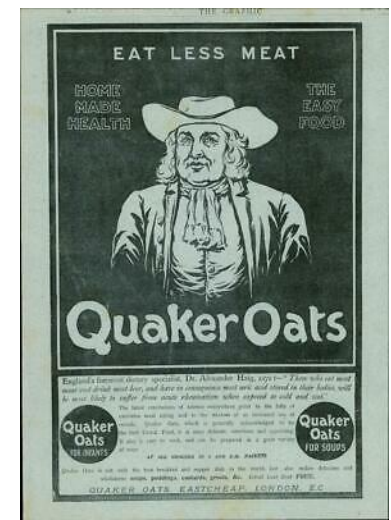
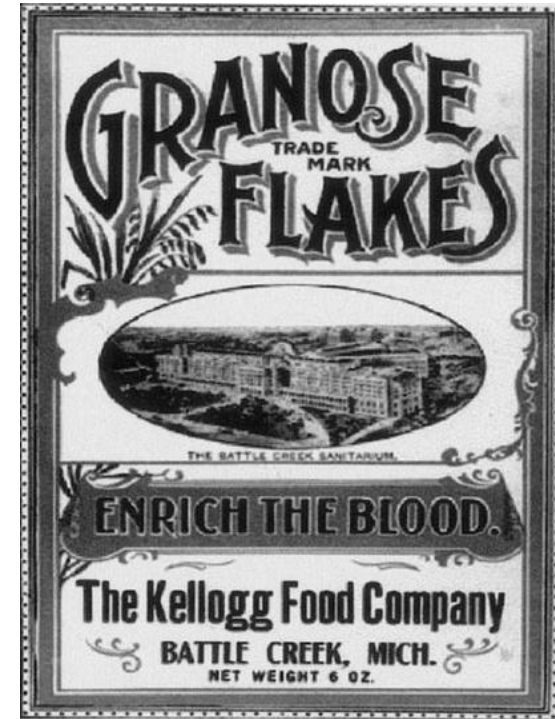
- 1809: Benjamin Silliman's soda fountain (important for female socializing, the female equivalent of the beer saloon)
- 1843: Nancy Johnson's icecream-maker
- 1845: Peter Cooper's powdered gelatin (New York)
- 1847: Oliver Chase's candy machine (Boston - later Necco)
- 1850s: John Curtis' chewing gum factory (Portland, Maine)

What the Victorian Age knew

- **USA**

- Junk food for the masses

- 1853: Louis Susini's factory to make cigarettes (Havana, Cuba)
- 1856: Gail Borden's condensed milk which can be transported and stored without refrigeration
- 1866: Corn syrup, a sugar substitute
- 1869: Campbell soup
- 1877: Kellogg's breakfast cereal
- 1881: Quaker Oats
- 1885: Charles Alderton's Dr Pepper (Texas)



What the Victorian Age knew

- **USA**

- Junk food for the masses

- 1886: John Pemberton's Coca Cola (Georgia)
- 1888: James Tufts' milk shake
- 1890: Duke's American Tobacco (later Reynolds)
- 1897: Pearle Wait 's Jell-O (Le Roy, New York), later Genesee's Jelly-O
- 1898: Caleb Bradham's Pepsi Cola (North Carolina)
- 1900: Milton Hershey's chocolate factory

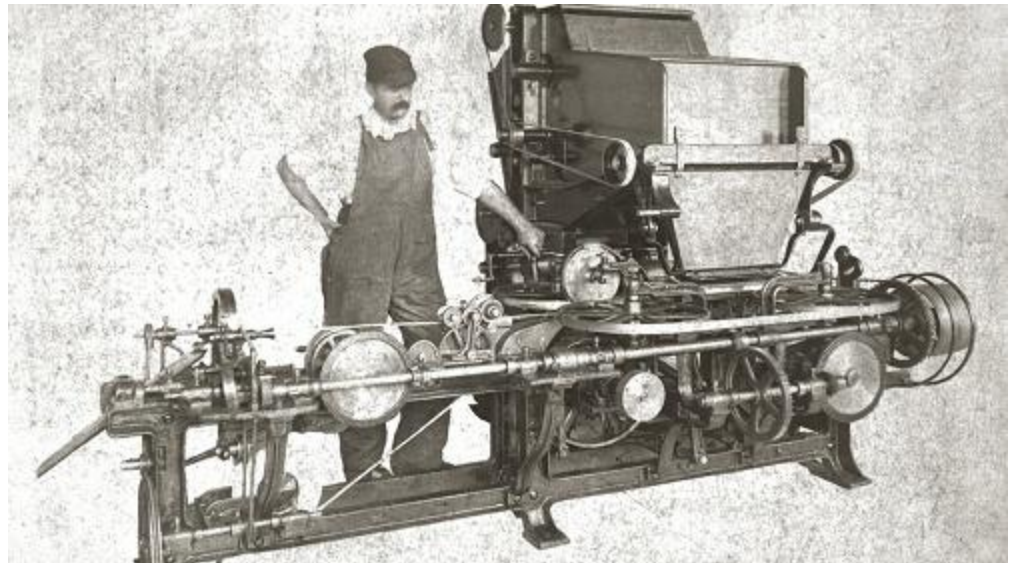


What the Victorian Age knew

- **USA**

- Inventions simplify manufacturing containers

- 1852: Francis Wolle's paper bag-making machine
- 1870: 30 million cans are produced in the USA in one year
- 1881: James Bonsack machine to make cigarettes (2,000 per hour)



What the Victorian Age knew

- **USA**

- Inventions simplify manufacturing containers
 - 1890s: Michael Owens' glass bottle-blowing machine (used by Coca Cola since 1899)
 - 1896: Colgate toothpaste in tubes instead of jars

What the Victorian Age knew

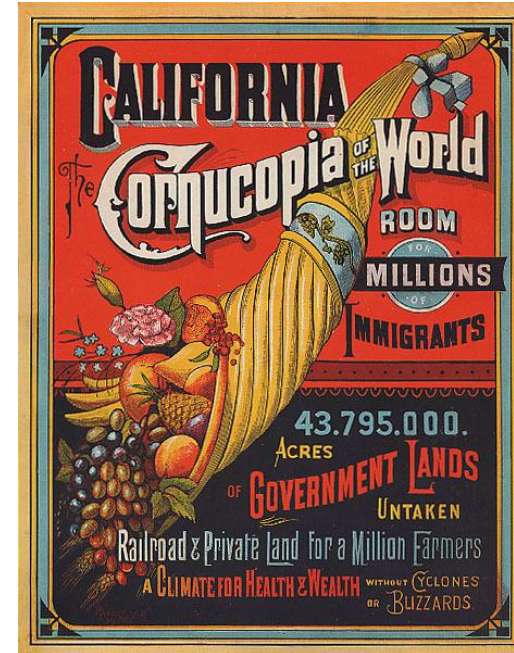
- **USA**

- Food/ California

- 1841: First orange grove in southern California (near Los Angeles)
 - Extensive wheat cultivation
 - California is a blank slate for agriculture
 - Cheap labor force, mostly Chinese farm workers from the end of the Gold Rush to 1900, then mostly Japanese, then (1924) Mexicans
 - 1855: California's wheat output exceeds local consumption and wheat can easily be exported (does not require refrigeration)

What the Victorian Age knew

- USA
 - Food/ California
 - 1869: Transcontinental Railroad (near San Francisco)
 - 1875: Luther Burbank settles in California and develops hundreds of new varieties of fruits
 - 1876: First major oil well (near Los Angeles)
 - 1877: First shipment of California produce to the east
 - 1879: Wheat and barley are grown on over 75% of the state's cropland



What the Victorian Age knew

- USA
 - Food/ California
 - 1880s: Rapid mechanization: California pioneers the adoption of new machines (gang plows, large headers, combined harvesters) not invented here (eg Hiram Moore's combine invented Michigan in 1835) but built here (mostly in Stockton)
 - 1880: Gustavus Swift's refrigerating car
 - 1887: The Santa Fe railway reaches Los Angeles
 - 1887: First electric trolley in Los Angeles
 - 1889: First cooled shipment of fruit from California to the east

What the Victorian Age knew

- USA
 - Food/ California
 - Large-scale industrial agriculture
 - Fruit replaces wheat as the main produce of California
 - Citrus towns around Los Angeles: Pasadena (an Indiana colony), Anaheim (a German colony), Redlands (a Chicago colony), Riverside, Pomona
 - Shift from large-scale grain cultivation to small-scale intensive fruit cultivation
 - Experiments with genetically modified fruit
 - Christian fundamentalism rises among the citrus communities ("The Fundamentals", published 1910-15 by the Bible Institute of Los Angeles)

What the Victorian Age knew

- USA
 - Food/ California
 - 1909: Los Angeles' port of San Pedro
 - 1913: William Mulholland's aqueduct from Owens Valley to Los Angeles
 - Water, electricity, land and climate attract white middle-class immigrants (many retirees, mostly from the Midwest)
 - Los Angeles expands rapidly
 - Irrigation creates new fertile lands

What the Victorian Age knew

- USA
 - Food/ California
 - 1914: Panama Canal shortens journey to California
 - 1919: California produces 57% of the oranges, 70% of the prunes/plums, over 80% of the grapes and figs, and virtually all of the apricots, almonds, walnuts, olives, and lemons grown in the USA
 - 1920: More than 10% of California farms have tractors compared with 3.6% for the nation as a whole
 - 1920s: Los Angeles passes San Francisco as the busiest port of the West Coast

What the Victorian Age knew

- USA
 - Food/ Bananas
 - 1890: Minor Keith completes a railway in Costa Rica to link the capital with the sea and begins shipping bananas to the USA
 - 1899: Minor Keith's Tropical Trading and Transport Company and Andrew Preston's Boston Fruit Company merge to become United Fruit in Boston with its own network linking plantations and sales

What the Victorian Age knew

- USA
 - Plantation Agriculture
 - Sugar
 - 1887: 18 sugar refiners form American Sugar Refining
 - Tobacco
 - 1880: James Bonsack invents the cigarette-rolling machine in Virginia
 - 1885: James Duke starts selling cigarette-making machine in North Carolina
 - 1890: James Duke and his four major competitors in the business of cigarettes form the American Tobacco Company, a New York-based trust modeled after Standard Oil
 - 1911: The government breaks up the American Tobacco Company

What the Victorian Age knew

- USA
 - Detroit
 - Great Lakes region
 - Close to centers of coal, iron, and copper mining
 - Easily accessible by water and by land
 - 1820s: Detroit's main export is flour
 - Mill machinery and shipyards
 - Detroit shipyards among the first in the world to build steam ships
 - 1860s: Engine manufacturers and parts/tools makers are the main exporters
 - 1860-80: Detroit's biggest export is copper
 - 1880: All copper deposits run out

What the Victorian Age knew

- USA
 - Detroit
 - Migrations cause a boom of coaches and carriages
 - Detroit has iron, wood and leather
 - 1849: Gold Rush in California
 - Studebaker (1852)
 - Largest carriage manufacturing plant in the world (Studebaker, 1875)
 - William Durant son of a lumber baron and founder of a carriage company (1886)
 - The internal combustion engine is first developed for boats

What the Victorian Age knew

- USA
 - Boom of the automobile
 - 1890s: bicycle craze (testbed for many technologies that will be used by the automobile industry)
 - 1897: First manufacturer of passenger cars (Ransom Olds' Oldsmobile)
 - 1900: 4,000 cars are manufactured in the USA
 - 1903: Henry Ford's Ford: permanent drive to lower manufacturing costs
 - 1905: First gas station (St Louis)
 - 1908: Ford Model T, a car for the masses
 - 1908: William Durant's General Motors: Olds, Pontiac, Cadillac, Buick and later Chevrolet

What the Victorian Age knew

- USA
 - Cars
 - 1908: Ford introduces the 4-cylinder 20-horsepower open-top one-color Model T for \$825 (compared with an average of over \$2,000), the first mass vehicle (15 million sold in the next 20 years)
 - 1913: Ford installs the first moving assembly line (at Highland Park), inspired by meat-packing factories, bringing down the time to build a car from a record 12 hour to an average 1.5 hour, with the capability of producing 1000 cars a day, and removing skills from the process
 - 1913: The Lincoln Highway, the first transcontinental highway (New York to San Francisco)
 - High turnover because workers alienated

What the Victorian Age knew

- USA

Cars



Easter 1900



Photo: Easter 1913, New York. Fifth Avenue looking north.

What the Victorian Age knew

- USA
 - Boom of the automobile
 - In 2005 four of the ten largest companies are oil companies (BP, Shell, Exxon, Total) and four are car makers (General Motors, Toyota, DaimlerChrysler) and only two are consumer products (Walmart and General Electrics)
 - Ford's Model T (the first mass manufactured gasoline-powered vehicle) made oil a necessity and weakened the West by making it dependent on oil producers (Gulf countries)

What the Victorian Age knew

- USA
 - Boom of California
 - 1895: Hydroelectric power from Folsom to Sacramento
 - Electricity in California is mainly for domestic and public use (lighting, streetcars)
 - 1900: California is the main producer of oil in the world
 - 1901: Henry Huntington founds the Pacific Electric Railroad to create a network of electrical trolley cars and a network of new suburbs around Los Angeles (and becomes one of the richest men in the USA thanks to land speculation)
 - 1902: Thomas Tally opens a movie theater (the Electric Theater), in Los Angeles

What the Victorian Age knew

- USA
 - Boom of California
 - 1904: Bank of Italy (Bank of America) for the middle-class, not only the wealthy class
 - 1905: Los Angeles has more cars than any other city
 - Cars and electricity project the myth of clean, safe, spacious, high-tech living
 - The car restores the personal freedom that had been lost in the age of the railroad
 - 1907: John Bullock opens a department store in Los Angeles (1929: Bullock's Wilshire luxury branch)
 - 1910: The first film is shot in Hollywood
 - 1911: The Pacific Electric serves 56 communities within a 160 km radius, thereby creating Los Angeles suburbia

What the Victorian Age knew

- USA
 - Boom of California
 - 1910-30: San Francisco's population triples and Los Angeles' population increases 727% to 2.3 million (with most immigrants now coming by personal car)
 - 1913: The Lincoln Highway, the first transcontinental highway (New York to San Francisco)
 - 1920: The USA has one car for every 13 people and Los Angeles has one car for every 5 people (Britain: 1 for every 228, Germany 1 for every 1017)
 - 1921: The "All Weather Club" is formed to advertise Southern California tourism to the East Coast

What the Victorian Age knew

- USA
 - Boom of California
 - 1929: Cinema has become the USA's fifth largest industry by revenue, and most films are made in Hollywood
 - Citrus farming, cinema and the aircraft industry requires land, thereby increasing the need to expand outside the center
 - 1930: The port of Los Angeles is second after New York in tonnage
 - 1930: Only 20% of Los Angeles' inhabitants were born in California
 - 1930: Population density in Los Angeles is 1768 per sq km, almost 1/9th of New York's

What the Victorian Age knew

- USA
 - Boom of California
 - Los Angeles' establishment is mostly made of uneducated men from poor families who made a fortune in oil, real estate, cinema, etc
 - Los Angeles is a white city (very small ethnic minorities: 70,000 Jews, 45,000 Hispanics, 30,000 Asians and 30,000 blacks in 1930 out of more than one million people), most immigrants come from other WASP cities/towns of the USA
 - 1933: Los Angeles county is #1 in the USA in food, cinema, oil, aerospace
 - 1936: The Hoover Dam delivers water and power mainly to California, and creates the fortunes of contractors Warren Bechtel's sons and Henry Kaiser

What the Victorian Age knew

- USA



Los Angeles
In 1882

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Few countries in history created so many giant companies in such a short time
 - Main sectors: railroads, manufacturing, banking

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Before 1861:
 - Most manufacturing businesses are small, family-owned, die with the owner
 - The cost of entering a business is very small
 - Operate locally (insularity) except for maritime merchants
 - High degree of specialization
 - Only one kind of product
 - The only bureaucracy required is bookkeeping

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Before 1861:
 - A clear owner of the business who makes decisions for workers and customers
 - The worker knows exactly his/her role in the organization
 - Distribution of economic power around the country
 - Still a rural world

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Before 1861:
 - “What most astonishes me in the United States is not so much the marvelous grandeur of some undertakings as the innumerable multitudes of small ones” (Tocqueville)
 - Giant corporations only in the textile industry

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Civil War (1861-65):
 - John Pierpont Morgan (son of a banker, educated at European universities, an exception) speculates in commodities and weapons
 - Jay Cooke (bank clerk) speculates in Union war bonds (first major investment banker)
 - Andrew Carnegie (telegraph messenger boy) speculates in oil and railroads
 - John Rockefeller (bookkeeper) speculates in oil (cheap lubricant for machines)
 - Leland Stanford (lawyer and shopkeeper, governor of California in 1861) speculates in railroads

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Civil War:
 - Legal Tender Act: The Union mandates that debtors must accept its currency (painted green, i.e. the "greenback")
 - National Bank Act: The Union bans banknotes issued by state banks
 - Internal Revenue Act: The Union imposes an income tax on all citizens of all states
 - Market fluctuations of the value of the greenback compared with the gold dollar
 - Wall Street speculation

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Wall Street:
 - 1800: Manhattan is mostly farmland and Broadway is a cattle trail 1825: The opening of the Erie Canal boosts New York's economy
 - 1833: Andrew Jackson defeats Philadelphia's Bank of the United States ("Bank War") and financial power shifts to New York
 - European investors invest in the USA (railroads and telegraphs), a more stable place than Latin America (civil wars), Europe (1848 revolutions) or Asia (Indian insurrencies)

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Wall Street:
 - 1850s: Samuel Morse's telegraph makes Wall Street "the" stock market of the nation
 - 1850s: Several railroads become publicly traded companies and trigger a boom in Wall Street
 - 1861: The Civil War increases Wall Street's financial power
 - 1866: The transatlantic telegraph line facilitates European investment in Wall Street

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - The great capitalists:
 - Cornelius Vanderbilt (ferryman) speculates in railroads (Harlem 1863, Hudson River 1864, New York Central 1867)
 - Daniel Drew (cowboy) speculates in railroads
 - Jay Gould (tanner) speculates in railroads (Erie 1868) and gold (1869)
 - James Fisk (peddler) speculates in railroads (Erie 1868)

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - The great capitalists:
 - No education in economics (just like inventors had no education in science)
 - Little or no knowledge of why things are the way they are (eg the geological reason for oil wells being where they are)
 - Widespread bribery of politicians
 - European capitalists invest anywhere in the world, US capitalists invest only in the USA

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - The great capitalists:
 - Gould causes the 1869 stock market crash (“Black Friday”)
 - Cooke goes bankrupt and causes another stock market crash (1873)
 - Drew dies poor after bankruptcy

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Limits of traditional model:
 - Wholesale merchants form the distribution channels, providing credit and transportation
 - Wholesale merchants fail to deal with perishable goods (beef, bananas) and technologically complex goods (electrical)

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Transformational factors:
 - Transportation revolution (due to canals and railroads replacing coach and wagon travel) allows corporations to expand operations
 - Communication revolution (due to the telegraph replacing mail) allows corporations to manage remote operations

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Vertical integration: a corporation expands towards both raw materials and retail stores to avoid the limitations of wholesale merchants
 - Horizontal integration: a corporation expands by merging with competitors

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - The new corporation:
 - Requires a lot of capital
 - Several owners (shareholders)
 - Separation of ownership and management
 - Immortal institution
 - Operate on a large territory (globalization) both in terms of factories and in terms of retailing
 - Vertical integration instead of specialization (different economic functions within the same organization)
 - Range of products (diversification)

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - The new corporation:
 - Bureaucracy: huge administrative network
 - An impersonal management that makes decisions for workers and customers
 - The worker does not understand his/her role in the organization
 - Concentration of economic power in the hands of very few individuals
 - Urbanization and industrialization

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Financial revolution
 - Technology brings about "economies of scale" in many fields (e.g. Bessemer in steel, petroleum refining, sugar refining, cigarette-making machines)
 - 1866-1890: Falling consumer prices caused by economies of scale and fierce competition
 - Cooperation makes more sense than competition
 - The only widely traded stocks and bonds are those of railroads, very few invest in industrial stocks

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Financial revolution
 - 1870-1900: Boom of foreign investment in the USA
 - 1870-80: Boom of saving in the USA
 - Railroad expansion slows down, lots of capital (both domestic and international) available for investment in something else: capital begins flowing towards industrial stocks
 - 1873: JP Morgan and Rockefeller buy companies after the stock crash

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Financial revolution
 - A financier, JP Morgan, restructures the railway industry (1885-)
 - Rockefeller's Standard Oil starts drilling oil, not just refining it (the Lima- Indiana, the first giant oil and gas field, 1884)
 - 1890: Sherman Antitrust Act breaks up several of the largest monopolies but does little to slow down business consolidation
 - 1895: Standard Oil has become the USA's largest producer of oil and the largest corporation in the world

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Financial revolution
 - Stock exchanges mostly traded railroad shares
 - 1891: New Jersey legalizes the the trust certificates issued by trusts since the 1880s
 - 1892: Carnegie Steel incorporated
 - 1893: The depression of 1893 affects railroad stocks more than industrials, and sentiment turns towards investing in industrials, e.g. financing mergers
 - 1895: Morgan saves the US government by ending the run on gold

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Financial revolution
 - 1897: 270 industrial stocks traded in stock exchanges
 - 1898: JP Morgan (a railroad investment banker) underwrites an industrial stock, Federal Steel
 - 1895-1904: Wave of mergers changes the industrial landscape, with horizontal integration becoming more frequent than vertical integration
 - 1901: Morgan merges Federal Steel with Carnegie Steel, Rockefeller's iron mines, etc to create US Steel, the largest corporation in the world

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Financial revolution/ Antitrust cases
 - 1901: Teddy Roosevelt becomes president and launches an antitrust campaign
 - 1904: The Supreme Court orders the dissolution of Northern Securities (Morgan's railroad trust)
 - 1911: The Supreme Court orders the dissolution of Rockefeller's Standard Oil
 - 1913: The USA creates a Federal Reserve that takes away power from Morgan's "money trust"

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Recessions
 - 1819
 - 1837-43
 - 1857-61 (first international market crash caused by the USA market crash)
 - 1873-79
 - 1893

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Oil: Standard Oil, Texaco
 - Rubber: Uniroyal, Goodyear
 - Metals: US Steel, Bethlehem Steel, American Smelting, Jones & Laughlin, Anaconda Copper, Phelps-Dodge, International Nickel, National Lead
 - Electrical: General Electric, Westinghouse
 - Food: American Sugar, Nabisco, United Fruit, Swift, Armour, American Tobacco
 - Chemical: DuPont
 - Photography: Eastman Kodak

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Richest man in the USA
 - 1870s: Cornelius Vanderbilt
 - 1900s: Andrew Carnegie
 - 1910s: John Rockefeller
 - 1920s: Henry Ford

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Panic of 1893: Depression caused by a chain reaction of bankruptcies because the economy has become a network of interdependent businesses
 - 1893-97: Economic depression (GDP per person won't return to the 1892 level until 1899)
 - 1900: 1% of USA corporations account for 33% of all manufacturing
 - 1913: 2% of USA citizens control 60% of the national product (Morgan and Rockefeller alone control 20%)
 - 1914: The majority of big industrial companies are publicly held corporations

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Industrial research labs
 - 1884: Standard Oil manages to remove the smell of the Lima-Indiana oil field thanks to chemists
 - Carnegie hires chemists to improve steel
 - 1912 George Eastman's lab in Rochester
 - "The greatest invention of the 19th century was the invention of the method of invention" (AN Whitehead)
 - Industrial research pioneered by German chemical industry in the 1870s

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Consolidation of information empires
 - Within a few decades of their invention:
 - the telegraph is dominated by Western Union,
 - the telephone is dominated by Bell (AT&T),
 - the radio by NBC and CBS,
 - cinema by the Hollywood studios

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Big corporations coexist with small companies: small companies actually increase in number between 1895 and 1913 by more than 30%
 - But small businesses operate according to the rules...
 - ...big businesses can change the rules (political influence)

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Science and technology had progressed independently in Britain, and so they did in the USA
 - Until the 1870s technological progress was mainly due to non-scientists, mostly artisans and engineers
 - Science has explained electrical and chemical phenomena but those explanations are not useful to "invent"
 - Artisans and engineers know what society needs, scientists know how nature works

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Industrial research laboratories begin to bridge the gap between science and the economy
 - Many inventors cannot even explain why their invention works
 - Independent scientific laboratories for teaching and consulting
 - Charles Jackson: analytical chemistry laboratory for geological applications (Boston 1836)
 - James Booth: chemistry laboratory (Philadelphia 1836)
 - Thomas Edison: electricity laboratory (New Jersey 1876)

What the Victorian Age knew

- USA
 - Rise of Giant Corporations/ 1861-1899
 - Chemical labs in chemical companies (Germany 1890s)
 - Chemistry is the first branch of science with widespread applications in the industry
 - Science contributes explanation, quality, optimization
 - Science does not invent or invents by accident

What the Victorian Age knew

- USA
 - Government-assisted expansionism
 - Homestead Acts (1862-1916) grant lands to farmers west of the Mississippi by Congress
 - Homesteading: a new concept of private property

What the Victorian Age knew

- USA
 - Government-assisted capitalism
 - Transcontinental railroad (1869) subsidized by Congress
 - Roosevelt Dam in Phoenix (1911) funded by Congress
 - Owens Valley aqueduct to Los Angeles (1913) funded by Los Angeles
 - Panama Canal (1914) funded by Congress

What the Victorian Age knew

- USA
 - The proletariat
 - Mass production subdivides manufacturing into unskilled tasks
 - The worker is just a number
 - Mass production creates a new social class: “blue collar” workers
 - The working class consists of employees, not independent artisans, who are paid a salary
 - The salary is not proportional to the value of the goods that are produced
 - The goal of the employer is to maximize productivity, efficiency and, ultimately, profit

What the Victorian Age knew

- USA
 - The proletariat
 - It is not the worker who decides when to work and for how long, when to start and when to end the work day
 - It is not the worker who decides what to make, how to make it and when to make it

What the Victorian Age knew

- USA
 - The proletariat
 - Mechanization creates light unskilled tasks in the factory
 - Light unskilled tasks open the work force to women (2.6 million to 8.6 million between 1880 and 1900) and children (e.g., textile industry)
 - The structure of corporations and the advent of office machines (typewriter, cash register, telephone) create a new category of jobs: office clerical (“white-collar”) jobs (book-keeping, typist, secretary, receptionist)
 - White-collar jobs create more opportunities for women (4% of white-collar workers are women in 1880, almost 50% in 1900)

What the Victorian Age knew

- USA
 - The proletariat
 - 1880: The Pullman Palace Car Company builds its own town, Pullman, on a 16 square-km area near Chicago, providing housing, stores, churches and night clubs for the 6,000 company employees and their dependents
 - 1913: First moving assembly line at Ford

What the Victorian Age knew

- USA
 - The proletariat
 - 1867: Farms organize in “Granges”
 - 1869: Knights of Labor founded in Philadelphia
 - 1869: Avondale mine disaster (110 miners die)
 - 1873: Stock market crash force rate cuts and then wage cuts by the railroads
 - 1877: Nation-wide strikes by railroad workers (in West Virginia and Maryland against the Baltimore & Ohio Railroad, in Pennsylvania against the Pennsylvania Railroad)

What the Victorian Age knew

- USA
 - The proletariat
 - 1886: Nation-wide strikes called by Knights of Labor (and “Haymarket riots” in Chicago)
 - 1886: American Federation of Labor founded in Columbus
 - 1890s: Economic depression
 - 1892: Strike and riots at Carnegie’s Homestead Steel Works in Pittsburgh

What the Victorian Age knew

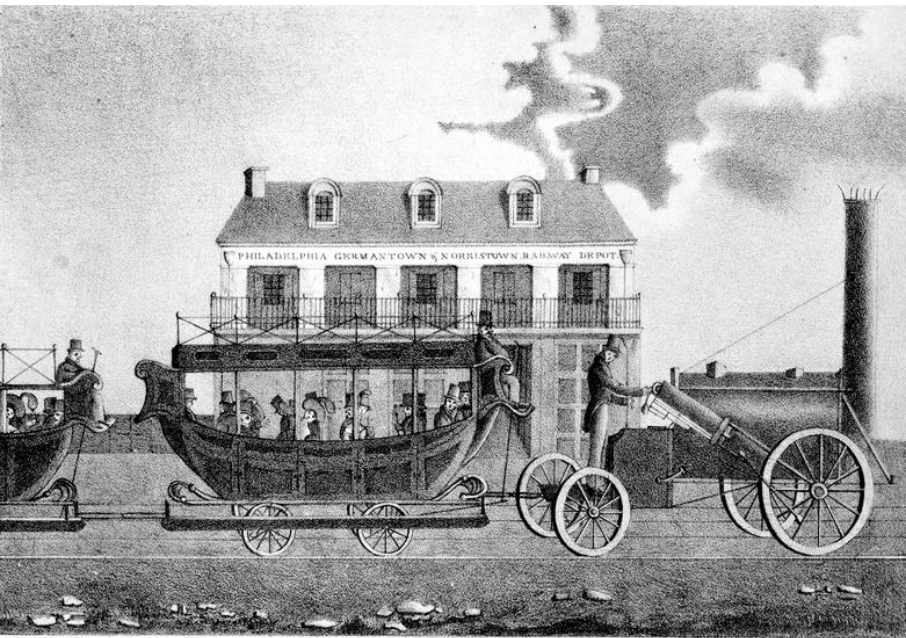
- USA
 - The proletariat
 - 1893: The American Railway Union (ARU) is founded in Chicago
 - 1894: Strike at Pullman Palace Car Company near Chicago that spreads nationwide against the main railroads
 - 1894: Jacob Coxey leads a march of unemployed men from Ohio via Pittsburgh to Washington
 - 1914: Gunmen hired by Rockefeller's Standard Oil kill 20 people at a coal strike in Colorado ("Ludlow Massacre")

What the Victorian Age knew

- USA
 - Standardization
 - Scarcity of labor leads to standard sizes
 - From carpentry (custom-made sizes) to millwork (standard sizes)
 - Standardization optimizes labor
 - Standardization creates goods that are not particularly beautiful but cheap and functional
 - For the first time in history, ordinary families can afford clocks, bicycles, domestic machines (and eventually telephones, radios, cars) that traditionally only the rich could afford
 - Standardization enables mass production

What the Victorian Age knew

- USA
 - Boom of the city
 - 1832: Philadelphia's water and sewer system
 - 1842: New York's water system
 - Popularity of the shower



RAILROAD DEPOT AT PHILADELPHIA.



Philadelphia circa 1832

What the Victorian Age knew

- USA
 - The Far West



Billy the Kid (second from left) and Pat Garrett (far right)

What the Victorian Age knew

- USA
 - Urbanization of the West/ Chicago
 - 5000 people in 1840, 100 thousand in 1860, second city of the USA by 1882
 - 1848: The first railway reaches Chicago
 - 1848: The Illinois and Michigan Canal opens, linking the Great Lakes with the Mississippi River
 - 1853: New York-Chicago railway
 - Access to the food production of the prairies

What the Victorian Age knew

- USA
 - Urbanization of the West/ Chicago
 - Chicago connects New York with New Orleans through canals, the Great Lakes, and the Mississippi
 - Chicago connects the western prairies to the eastern forests
 - Chicago connects the farm with the factory
 - Railroads change Chicago's economic orientation: rather than gravitating towards the South, via the Mississippi, Chicago integrated with the eastern cities via the railroad

What the Victorian Age knew

- USA
 - Urbanization of the West/ Chicago
 - Chicago's early growth driven by trade in commodities
 - Wheat spurs the birth of the futures market
 - the steam-powered grain elevator allows rapid unloading of large amounts of wheat
 - Multiple farmers can load grain at the same time
 - The Chicago Board of Trade defines wheat standards
 - Farmers receive a receipt for the grain deposited into elevators
 - The receipts are bought and sold
 - Grain turns into a financial abstraction

What the Victorian Age knew

- USA
 - Urbanization of the West/ Chicago
 - 1871: New York's Great Atlantic & Pacific Tea Company (A&P), the first "chain"
 - 1871: A fire destroys 17,000 buildings and kills 300 people
 - 1872: Montgomery Ward's mail-order catalog
 - 1873: William Hale perfects the hydraulic elevator
 - 1883: The Montauk Building, designed by John Root and Daniel Burnham, is the first to be called a "skyscraper"

What the Victorian Age knew

- USA
 - Urbanization of the West/ Chicago
 - Chicago is the railway hub for the distribution of livestock from the Great Plains to the Eastern cities
 - 1880: Gustavus Swift's refrigerating car replace the need to ship live cattle to slaughterhouses in the cities
 - Swift's Chicago plants adopt industrial methods for meat-packing, pioneering assembly-line production techniques
 - Chicago perfects the "disassembly line" for reducing live animals into meat products

What the Victorian Age knew

- USA
 - Urbanization of the West/ Chicago
 - 1892: The 22-story Masonic Temple Building is the world's tallest building
 - 1893: Richard Warren Sears and Alvah Curtis Roebuck's mail-order catalog
 - 1893: Columbian Exposition
 - 1894: 26 railway lines converge on Chicago
 - 1895: John Root's Reliance Building for William Hale
 - 1896: Louis Sullivan proclaims that "form follows function"
 - 1903: US Steel's colossal integrated steel mill, Gary Works

What the Victorian Age knew

- USA
 - Boom of the city
 - 1863: London opens the world's first underground railway (subway)
 - 1868: Charles Harvey builds New York's first elevated railroad
 - 1870: Alfred Beach inaugurates a short underground railway, the Beach Pneumatic Transit, in New York
 - 1888: Frank Sprague installs the first major electric street railway system in Richmond, Virginia

What the Victorian Age knew

- USA
 - Boom of the city
 - 1890: The first electrical subway (London)
 - 1892: Chicago opens the South Side Rapid Transit Railroad (the "L")
 - 1894: New Jersey inaugurates the world's first funicular railway
 - 1897: Boston opens the first subway of the USA
 - 1904: The New York subway opens

What the Victorian Age knew

- USA
 - Boom of the city
 - Mechanization of mass transit
 - Cable-cars in Chicago, San Francisco, etc (1880s)
 - Electric powered street cars (1890s)
 - Urban dwellers can move to the outskirts of the city
 - Safer, quieter, cheaper, more space
 - Downtown becomes the financial district (offices, factories, warehouses)
 - Commuter traffic vs city traffic
 - Price of a six-room house in 1900: \$3,000

What the Victorian Age knew

- USA
 - Boom of the city
 - 1883: New York opens the Brooklyn Bridge, designed by John Roebling, the world's longest suspension bridge and the first to use steel cables

What the Victorian Age knew

- USA
 - Boom of the city
 - Tall buildings
 - 1853: Elisha Otis demonstrates the elevator at the New York World's Fair
 - 1854: Elisha Otis in New York invents the elevator with a safety break
 - 1857: The first steam-driven elevator with a safety break is installed by Otis in New York
 - 1865: Trinity Church is the tallest building in New York
 - 1867: New York mandates fire escapes, ventilation and toilets in all tenements
 - 1869: The first apartment home in New York is the Stuyvesant, designed by Richard Morris Hunt

What the Victorian Age knew

- USA
 - Boom of the city
 - Tall buildings
 - 1870: The nine-story Equitable Building, with a steam-driven elevator, is the tallest building in New York
 - 1870: Cyrus Baldwin in Boston invents the hydraulic elevator
 - 1873: William Hale in Chicago perfects the hydraulic elevator
 - 1875: The nine-story Western Union Telegraph Building in New York and Richard Morris Hunt's ten-story New York Tribune Building
 - 1878: Siemens builds the first electric elevator in Mannheim, faster than hydraulic or steam elevators

What the Victorian Age knew

- USA
 - Boom of the city
 - Tall buildings
 - 1883: Chicago's Montauk Building, designed by John Root and Daniel Burnham, is the first to be called a “skyscraper”
 - 1885: Chicago's Home Insurance Building, designed by William Le Baron Jenney, is the world's first steel-frame skyscraper
 - 1889: The Eiffel Tower features five steam-driven hydraulic elevators
 - 1889: Otis in New York installs the first alternate-current elevator

What the Victorian Age knew

- USA
 - Boom of the city
 - Tall buildings
 - 1890: Joseph Pulitzer's "New York World" becomes the tallest building in New York
 - 1890: Louis Sullivan's Wainwright Building in St Louis, the first straight-up skyscraper
 - 1892: Frank Sprague founds the Sprague Electric Elevator Company in New York
 - 1893: The first moving walkway is presented at the World's Columbian Exposition in Chicago
 - 1896: Jesse Reno in New York installs the world's first escalator

What the Victorian Age knew

- USA
 - Boom of the city
 - Tall buildings
 - 1899: Robert Robertson's Park Row Building in New York is the world's tallest building
 - 1902: Daniel Burnham's Flatiron Building in New York
 - 1909: Napoleon LeBrun's Metropolitan Life Insurance Tower in New York is the world's tallest building
 - 1913: Cass Gilbert's Woolworth Building in New York is the world's tallest building
 - 1915: Ernest Graham's Equitable Building in New York

What the Victorian Age knew

- USA
 - Boom of the city
 - Population growth
 - The population of the USA grows 25% between 1880 and 1890 reaching 63 million of which 9 million are foreign-born
 - New York: 1.5 million
 - Chicago: 1.1 million
 - Philadelphia: 1 million
 - Brooklyn: 800,000

What the Victorian Age knew

- USA
 - Boom of the city
 - New York in 1898 after annexing nearby cities: 3.5 million people, second largest city after London



Fifth Avenue in 1898



THE SKYSCRAPERS AT THE SOUTH END OF MANHATTAN ISLAND.

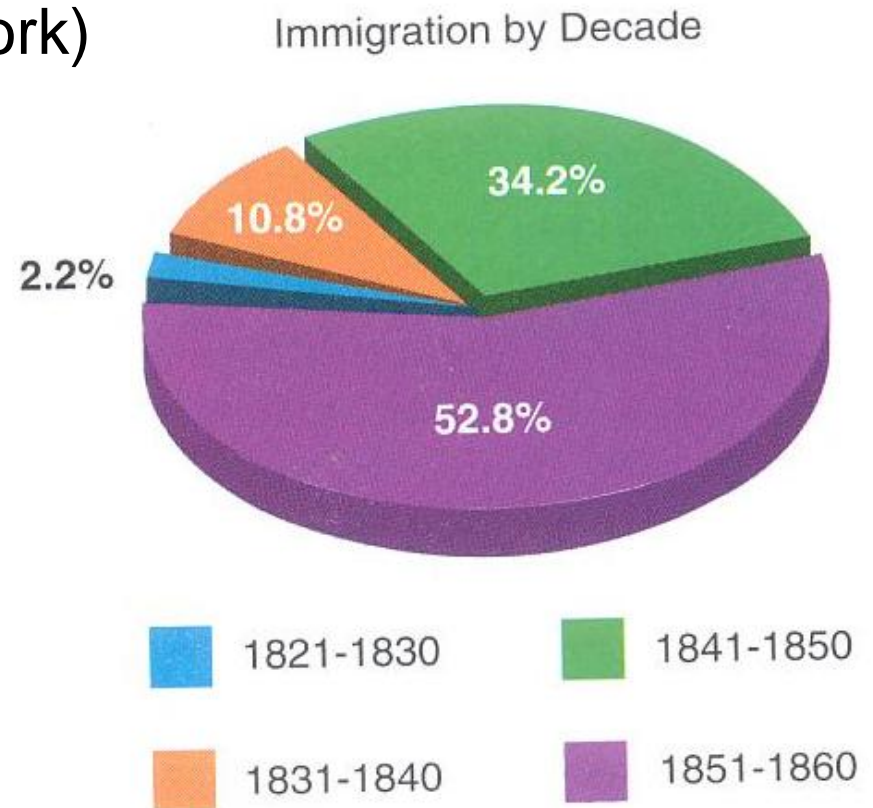


Orchard St in 1898

Manhattan skyline in
1898
(Munsey's Magazine,
March 1898)

What the Victorian Age knew

- USA
 - Boom of the city
 - Most of the urban population consists of foreign immigrants (87% in Chicago, 84% in London, 80% in New York)



What the Victorian Age knew

- USA
 - Boom of the city
 - Population turnover: movement (from one city to another) means improvement (in the rest of the world movement is rare and usually caused not by opportunity but by catastrophe)

What the Victorian Age knew

- USA
 - Boom of the city
 - City bosses
 - Power vacuum created by chaotic growth of cities
 - Easy domination by politicians of large immigrant communities
 - Political corruption
 - William Tweed in New York 1860s/1870s
 - George Cox in Cincinnati
 - Thomas Pendergast in Kansas City

What the Victorian Age knew

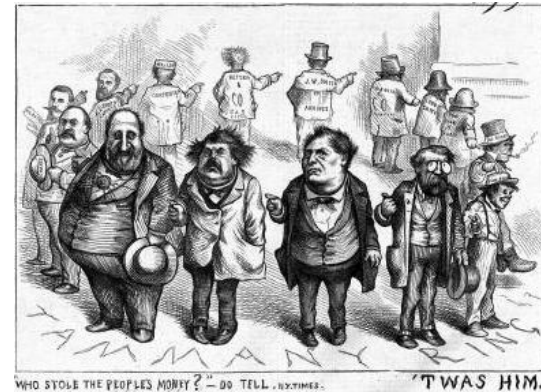
- USA

- Boom of the city

- The press

- Thomas Nast draws anti-Tweed cartoons for Harper's Weekly
 - Edwin Godkin's The Nation charges Grant's administration with rife corruption (1869)
 - The St Louis Democrat causes the downfall of White House aide Orville Babcock and the Whiskey Ring (1875)
 - Rockefeller, Carnegie, Morgan, Gould, Fisk, Stanford routinely corrupt officials but the press hardly notices

“the thoroughly corrupt and time-serving ring which has for some time past been managing the present administration . . . playing on General Grant's ignorance of affairs



What the Victorian Age knew

- USA
 - Boom of the middle class
 - Family income increases because women and children are added to the workforce
 - Clerical salary increases 36% between 1890 and 1910 to \$1,156, same as inflation
 - Worker's salary increases about 30% to \$630
 - Work hour reduced from 60 hours to 51 hours

What the Victorian Age knew

- USA
 - Boom of the middle class
 - Luxuries for every family
 - Water closet (1880s) and private bathrooms
 - Mass-produced and mass-distributed food
 - » Tin cans allow to preserve food
 - » Ice boxes allow to preserve meat
 - » Railroad refrigerators allow to distribute food around the country
 - » Condensed milk
 - » Diversified diet year-round (first time in the history of the world)

What the Victorian Age knew

- USA
 - Boom of the middle class
 - Luxuries for every family
 - Sewing machine enables mass-produced garments
 - The tailor turns to repairs not manufacturing
 - Style is no longer just for the rich
 - Boom of the fashion industry
 - Boom of department stores
 - First chain-store system: Great Atlantic Tea Company (1859)
 - Credit and deliveries to facilitate shopping
 - Anyone can enter a department store just to browse without buying

What the Victorian Age knew

- USA
 - Boom of the middle class
 - Luxuries for every family
 - The washing machine (James King, 1851)
 - The carpet sweeper (1859)
 - The dishwasher (Josephine Cochrane, 1886)
 - All of them hand-powered
 - The electric kitchen (first presented at the Columbia Exhibition of 1893)



What the Victorian Age knew

- USA
 - Automation of the household
 - Linus Yale's door padlock (1865) and dial combination lock
 - 1910s: Automation of the household (fans, irons, toasters, vacuum cleaners enter the mail-order catalogs)

What the Victorian Age knew

- USA
 - Boom of the middle class
 - Luxuries for every family
 - Advertising: not serving a need but creating a need

What the Victorian Age knew

- USA
 - Boom of the middle class
 - Causes of death
 - Vastly reduce danger of typhoid, diphtheria, influenza, tuberculosis, syphilis
 - New diseases: heart attack, cancer, diabetes
 - New causes of death: car accidents, murder

What the Victorian Age knew

- USA
 - Consumerism
 - 1840s: Immigration lowers the price of servants
 - 1850s: Middle-class family employs cook, waiter and maid
 - 1846: The “Marble Palace”, New York (first department store where customers can browse at leisure)
 - Sets the standard for middle-class lifestyle (furniture, carpeting, china, decoration)
 - Change the meaning of “necessity”
 - Turns Christmas into the main engine of retail business

What the Victorian Age knew

- USA revolution
 - Consumerism
 - 1851: Isaac Singer (New York)'s sewing machine
 - A tool to save on buying/fixing clothes and a tool to make money by making/fixing clothes
 - The price for ready-made clothes plunges and makes them affordable for the masses
 - 1816: Frederic Tudor (Boston)'s ice box (insulated with sawdust)
 - USA exports ice to Brazil, India, China and Indonesia

What the Victorian Age knew

- USA
 - Consumerism
 - 1871: New York's Great Atlantic & Pacific Tea Company (A&P), the first "chain"
 - 1872: Montgomery Ward's mail-order catalog
 - 1886: John Pemberton's Coca-Cola fountain soda (1916 the contour Coca Cola bottle)
 - 1893: Richard Warren Sears and Alvah Curtis Roebuck's mail-order catalog
 - 1899: 2 billion cigarettes sold
 - 1916: Clarence Saunders' Piggly Wiggly store (Memphis, Tennessee), the first self-service shop
 - 1920: A & P has 372 stores
 - 1921: 43 billion cigarettes sold

What the Victorian Age knew

- USA
 - The woman as a service worker
 - Servant jobs are taken up by former slaves and soon replaced by appliances
 - The machine age creates a new class of factory and office jobs for women: light, unskilled tasks
 - Shift from domestic service (50% of female workers in the USA in 1870) to white-collar jobs (38% in 1920)
 - White-collar jobs appeal also to middle-class urban women, not only country or poor urban girls
 - White-collar jobs create a new class of single women (most USA female college graduates between 1870 and 1900 lived single lives for several years)

What the Victorian Age knew

- USA
 - The woman as a consumer
 - The new mode of production creates a division between producer and consumer, and relegates the woman to the role of the consumer
 - In the new mode of production life was easier and safer, but confined to the domestic sphere
 - Eventually women are just a market segment (kitchenware, furniture, cosmetics, appliances)
 - Men invent them, make them and sell them. Women buy them.

What the Victorian Age knew

- USA
 - Boom of organized entertainment
 - Mechanization creates spare time (e.g., weekends and Friday evenings)
 - Entertainment for the masses, not only for the higher classes: sport, theater, music
 - Mass entertainment is the equivalent of mass production

What the Victorian Age knew

- USA
 - Boom of organized entertainment
 - Sport
 - Baseball (1845)
 - USA football (1869)
 - Circus
 - Traveling circus thanks to railroads
 - Freaks, acrobats, clowns, tamers
 - Theater
 - Musical comedy
 - Drama
 - Vaudeville/ variety show (magic, juggling, comedy, singing, dancing)

What the Victorian Age knew

- USA
 - Boom of organized entertainment
 - Organized entertainment provides economic opportunities for blacks, immigrants and women
 - Organized entertainment helps unify the ethnic groups and geographic zones of the country
 - Organized entertainment breaks the monopoly of the social elite on sport, theater, music, etc
 - Organized entertainment creates a new form of big business

What the Victorian Age knew

- USA
 - Boom of organized entertainment
 - Cinema and recording make it possible to experience the performance without the need for the performer
 - Technology makes the performance not unique but replicable in many places at the same time
 - Technology further helps unify the ethnic groups and geographic zones of the country

What the Victorian Age knew

- USA
 - Boom of organized entertainment
 - The newspaper for the masses becomes a form of entertainment
 - Joseph Pulitzer (New York World, 1893): sensationalist reportage about crime, corruption, sex scandal, disaster, plus comics, sports and women's section
 - William-Randolph Hearst (New York Journal, 1895)
 - Addiction to the news

What the Victorian Age knew

- USA
 - Boom of immigration from 1890 to 1920 changes the religious nature of the USA, from Protestant to a mixture of Protestant, Catholic and Jewish
 - Immigration also makes the USA population very young: the median age in 1880 is 21

What the Victorian Age knew

- USA
 - Indian Wars
 - 17th c: “Indians”, originally a pedestrian nation, adopt the horse
 - The horse expands the territory of the western Sioux (Lakotas) and Cheyennes
 - Wars with other tribes for control of pasture
 - First trade with whites: beaver skins (main trade until 1790s), then buffalo robes and meat
 - Wars with other tribes for control of buffalo hunting grounds
 - Sioux expand because of ruthless wars and less vulnerable to European diseases

What the Victorian Age knew

- USA
 - Indian Wars
 - 19th c: Lakotas and Cheyennes adopt the gun
 - Gold rush of 1849 does not affect the Sioux and Cheyennes because white people transit, do not settle
 - Gold rush of 1858 in Colorado (and the creation of the Territory of Colorado in 1861) affects the Indians because now gold diggers settle on Indian land
 - Discovery of gold in Montana in 1862 (home of the Sioux, their last hunting ground)
 - Indian nations have no central authority

What the Victorian Age knew

- USA
 - Indian Wars
 - Effects of the civil war
 - The Civil War protects not only the union of north and south but also access by the east to the west (New Orleans' port and the big rivers)
 - Railroads open the West to hunters, miners, farmers
 - A highly efficient cavalry and artillery
 - Rogue militias (John Chivington's Colorado volunteers, Sand Creek massacre of 1864)
 - William Sherman's "scorched earth" tactic applied to the Indian tribes

What the Victorian Age knew

- USA
 - Indian Wars
 - 1865: Cheyennes and Sioux massacre whites in Julesburg in Colorado to avenge the Sand Creek massacre
 - 1866: William Fetterman's troops are annihilated by Sioux and Cheyennes in Montana
 - 1868: Crazy Horse's Lakotas reject the Fort Laramie peace treaty, that assigns Dakota to the Lakotas



Lakota big chief
Red Cloud

William Sherman, general commander of the territory between the Mississippi River and the Rocky Mountains (1867): “their extermination... men, women, children”

Phil Sheridan, Sherman's general in Missouri (1867): “The only good Indians I ever saw were dead Indians”

What the Victorian Age knew

- USA
 - Indian Wars
 - 1873: Stock market crash increases pressure on the USA to open the Black Hills of Dakota to gold prospectors
 - 1874: Media frenzy (about gold found by general George Custer's expedition) generates an illegal gold rush to the Black Hills
 - 1876: George Custer's troops are annihilated by Crazy Horse's Lakotas
 - 1877: Crazy Horse surrenders
 - 1890: The army massacres the Lakotas in South Dakota ("Wounded Knee Massacre")



False photo of
Crazy Horse

What the Victorian Age knew

- USA
 - Indian Wars
 - Decline of the buffalo trade
 - 1820s: Steamboats open the West to trade with the American Fur Company
 - 1850s: The railroads increase trade in buffalo robes, meat and hides
 - 1870s: Special rifles and cartridges to hunt buffalos (Sharps Rifle Manufacturing Co)
 - 1880s: Buffalos exterminated

What the Victorian Age knew

- USA/ Detroit
 - 1847: The Jackson Mine near Negaunee, the first iron mine in the Lake Superior region
 - The Lake Superior area produces most of the USA's supply of iron ore
 - 1864: The Eureka Iron Works produces the first commercial steel made in the USA
 - 1872: Detroit Dry Docks starts making engines for ships
 - Detroit has easy access to wood (Michigan's forests) and iron ore, and has access to the Great Lakes system of rivers and canals

What the Victorian Age knew

- USA/ Detroit
 - 1880: Henry Ford works for Detroit Dry Docks
 - 1885: Billy Durant starts the Flint Road Cart Company to make horse-drawn carriages
 - 1890: Durant's company has become the USA's largest carriage manufacturer
 - German inventors have no patent protection in the USA
 - 1896: Ford produces a "quadricycle"
 - 1900: New York produces more cars than Detroit
 - 1908: Ford's Model T

What the Victorian Age knew

- USA
 - Scientific Management
 - Scientific organization of a factory to minimize time and resources
 - Discovering the fundamental principles of human skilled labor
 - Invented by self-taught non-scientists
 - 1906: Frederick Taylor (Philadelphia steel worker)
 - 1910s: Frank Gilbreth (Boston bricklayer)

What the Victorian Age knew

- USA
 - Foreign policy: decolonization and self-determination, but also control of the Americas (“Monroe Doctrine”)
 - 1895: Crisis with Britain over Venezuela-Guyana
 - 1895: Support of Cuban rebellion against Spain
 - 1898: Liberation of the Philippines from Spain
 - 1900: Support of China against European and Japanese control
 - 1918: Support of Mensheviks in Russia
 - Only non-European country that dared defy the European powers

What the Victorian Age knew

- USA
 - 1898: War against Spain (Philippines, Puerto Rico, Cuba)
 - Philippines war won by the Asiatic Squadron deployed from Nagasaki
 - The war is won easily but followed by 3 years of insurgency in the Philippines (220,000 civilians killed by the USA)
 - The Philippines become the first European-style colony of the USA
 - 1898: annexation of Hawaii
 - 1893: A coup by US nationals overthrows the monarchy of Hawaii

What the Victorian Age knew

- USA
 - 1907: the USA sends the navy around the world
 - 1913: The Lincoln Highway, the first transcontinental highway (New York to San Francisco)
 - 1914: The Panama Canal shortens the trip from San Francisco to New York by 12,000 kms

What the Victorian Age knew

- USA
 - World War I: economic opportunity
 - Record exports to Europe, both agricultural and manufacturing and military
 - Pierre DuPont's fortune (arms and chemicals)
 - Dow Jones' biggest percentage gain of all times: 1915 (86%)
 - USA goes from being the world's largest debtor nation to being a net creditor to France and Britain
 - USA replaces Britain as the world's financial power

What the Victorian Age knew

- USA
 - World War I: economic opportunity
 - Wartime mobilization creates job opportunities for women and blacks (mass emigration to the North)

What the Victorian Age knew

Piero Scaruffi

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