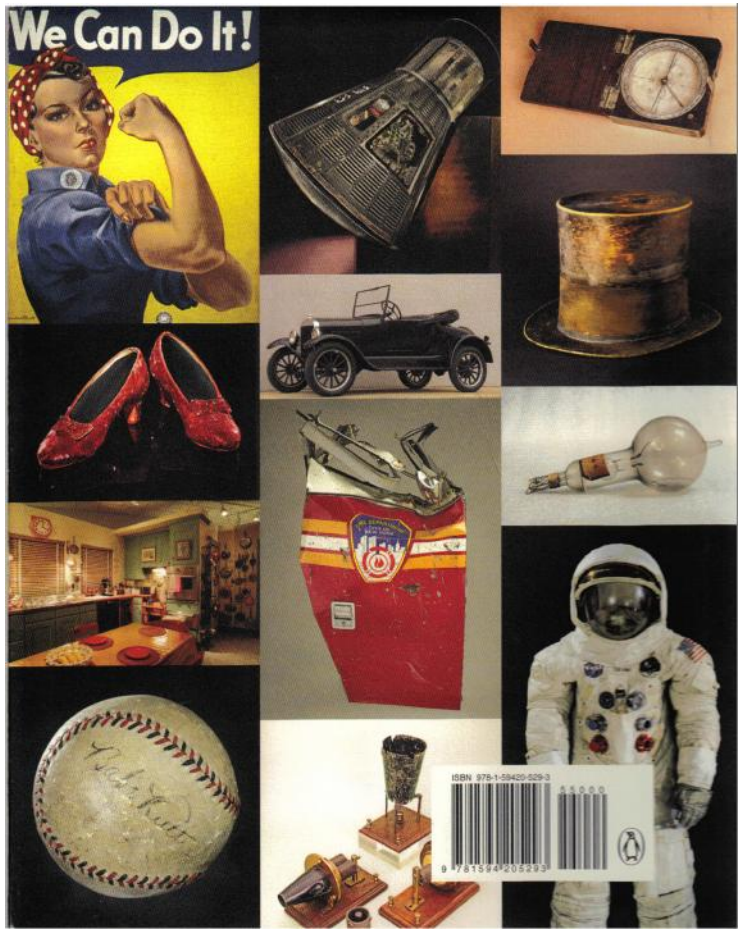
Smithsonian

the Atlantic

History of America in 101 Objects© and Then Some

Part 1, Session 3



History Timeline [1845-1910]

Manifest Destiny (1845-1910)

Industrial Revolution (1859-1910)

- 1854 Commercial treaty with Japan by Commodore Matthew C. Perry "opens" the East to trade and culture; Gadsden Purchase expands U.S. territory in the southwest.
- 1855 Third Seminole War begins in Florida to re-move American Indians and restrict their settlement.
- 1862 Land grant colleges established with the Morrill Act; Congress passes Homestead Act, spurring settlement of the Midwest.
- 1867 Congress passes Reconstruction Acts in Confederate States; United States purchases Alaska from Russia [$7.2M].
- 1868 President Andrew Johnson impeached; Four-teenth Amendment providing for due process and equal protection of the law ratified.

History Timeline [1845-1910]

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Industrial Revolution (1859-1910)

- 1869 Golden Spike at Promontory Point, Utah, joins the Central Pacific and Union Pacific railroads to create Transcontinental Railroad; Yellowstone in Wyoming Territory becomes first national park.
- 1870 Fifteenth Amendment giving African American men the right to vote ratified; first African Americans elected to the U.S. Congress; John D. Rockefeller and partners establish Standard Oil in Ohio.
- 1871 Chicago fire destroys much of downtown area.
- 1873 Mark Twain and Charles Dudley Warner coin "The Gilded Age" for era of political corruption and economic disparity; Comstock Act prohibiting mailing of obscene literature is passed.

History Timeline [1845-1910]

Manifest Destiny (1845-1910)

Industrial Revolution (1859-1910)

- 1876 Alexander Graham Bell patents telephone.
- 1876 U.S. Centennial Exposition opens in Philadelphia; Lt Col George A. Custer defeated by Sioux at Little Bighorn.
- 1877 Federal troops withdraw from the South, marking the end of Reconstruction; Thomas Edison invents phonograph.
- 1879 Edison patents incandescent light bulb
- 1881 President James D. Garfield assassinated; Booker T. Washington opens Tuskegee institute.
- 1882 Chinese Exclusion Acts forbid Chinese immigration.
- 1886 Dedication of Statue of Liberty in New York Harbor; American Federation of Labor organized to advocate for fair wages and better working conditions.

History Timeline [1845-1910]

Manifest Destiny (1845-1910)

Industrial Revolution (1859-1910)

- **1888 George Eastman invents first Kodak camera.**
- **1890 National American Woman Suffrage Association founded; Sherman antitrust law prohibits certain monopolies; Ghost Dance religion gains adherents in Indian country; Battle: Wounded Knee.**
- **1892 Ellis Island in New York Harbor opens and becomes the busiest U.S. immigration station; Sierra Club founded to protect the natural environment; Homestead Strike at Andrew Carnegie's steelworks.**
- **1893 World's Columbian Exposition opens in Chicago; Panic of 1893 results from poor railroad investments and a run on the gold supply.**

History Timeline [1845-1910]

Manifest Destiny (1845-1910)

Industrial Revolution (1859-1910)

- **1894 Pullman Palace Car workers in Illinois stage labor action, leading to massive American Railway Union strike led by Eugene Debs; President Grover Cleveland calls in troops and breaks the strike.**
- **1895 Booker T. Washington and other African-American leaders acquiesce to segregation in return for basic services in the South - called the "Atlanta Compromise.**
- **1896 Supreme Court in *Plessy v. Ferguson* rules that separate but equal is constitutional; Jim Crow laws proliferate; William McKinley elected president on a Pro-gold, high tariff platform.**

History Timeline [1845-1910]

Manifest Destiny (1845-1910)

Industrial Revolution (1859-1910)

- **1898 Spanish-American War begins with U.S.S. *Maine* blown up in Havana Harbor; Cuba becomes independent while territories of Puerto Rico, Guam, and the Philippines are ceded by Spain to the United States; Hawaii annexed to the United States.**
- **1900 U. S. population reaches 76 million, 60 percent rural.**
- **1901 President McKinley assassinated, Theodore Roosevelt succeeds him; J.P. Morgan buys out Andrew Carnegie, organizes U.S. Steel, nation's first billion-dollar company.**
- **1903 Orville and Wilbur Wright fly the first manned airplane at Kitty Hawk, North Carolina; United States "acquires" Panama Canal Zone from Colombia, clearing way to build passage between Atlantic and Pacific.**

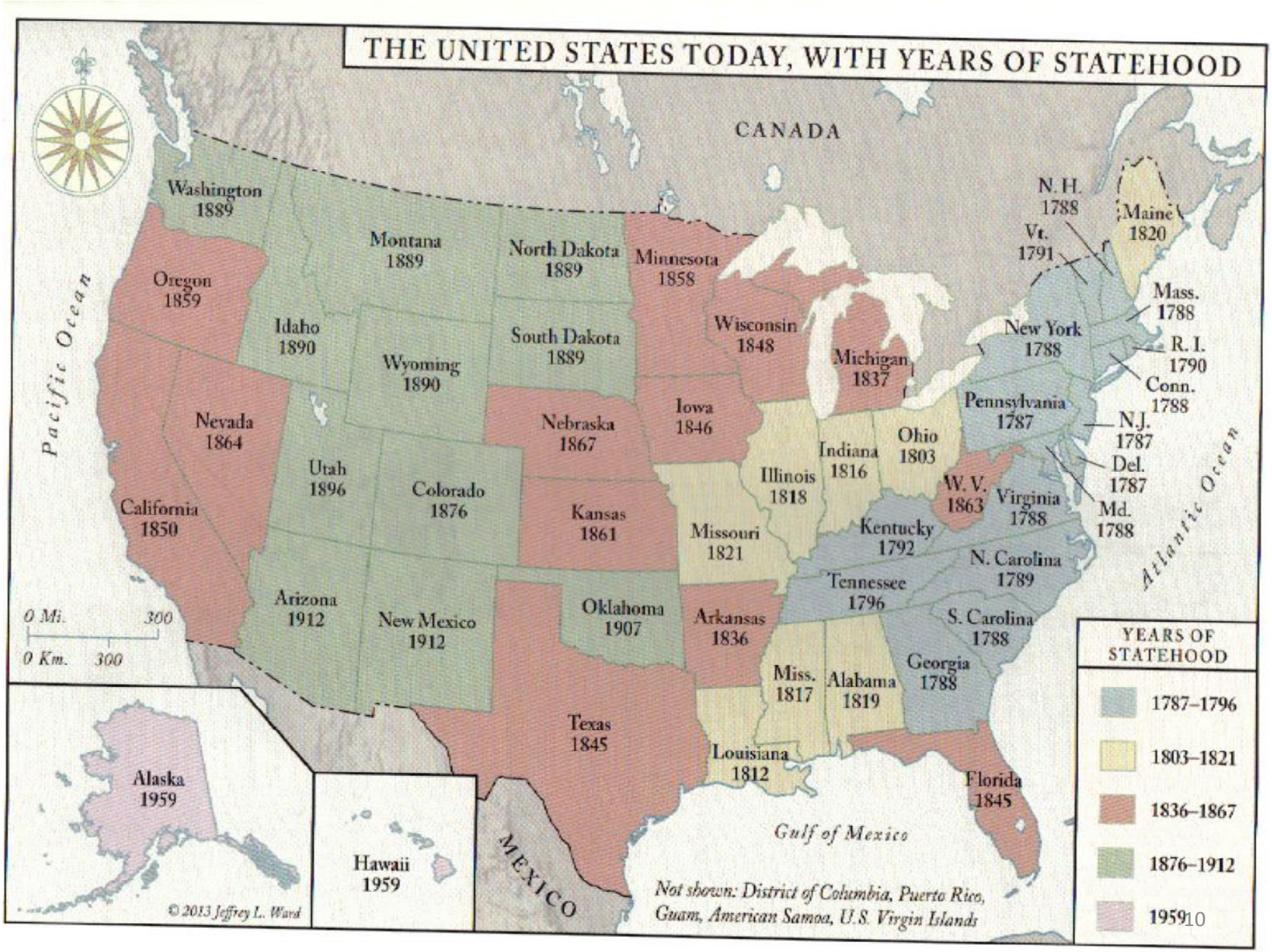
History Timeline [1845-1910]

Manifest Destiny (1845-1910)

Industrial Revolution (1859-1910)

- **1905 Founding convention of Industrial Workers of the World; Audubon Society founded to promote protection of endangered species of birds and their habitats.**
- **1907 Patent for Bakelite, a synthetic plastic, filed by L. H. Baekeland.**
- **1908 Henry Ford's company produces the first Ford Model T.**
- **1909 National Association for the Advancement of Colored People founded in Springfield, Illinois.**

Band 7
Manifest Destiny
(1845 to early 20th Century)


THE UNITED STATES TODAY, WITH YEARS OF STATEHOOD
CANADA
Pacific Ocean
Atlantic Ocean
Gulf of Mexico
MEXICO
Washington 1889
Oregon 1859
California 1850
Nevada 1864
Idaho 1890
Montana 1889
Wyoming 1890
Utah 1896
Arizona 1912
Colorado 1876
New Mexico 1912
North Dakota 1889
South Dakota 1889
Nebraska 1867
Kansas 1861
Oklahoma 1907
Texas 1845
Minnesota 1858
Iowa 1846
Missouri 1821
Arkansas 1836
Louisiana 1812
Wisconsin 1848
Illinois 1818
Michigan 1837
Indiana 1816
Ohio 1803
Kentucky 1792
Tennessee 1796
Miss. 1817
Alabama 1819
Georgia 1788
Florida 1845
S. Carolina 1788
N. Carolina 1789
Virginia 1788
W. V. 1863
Pennsylvania 1787
New York 1788
N.H. 1788
Vt. 1791
Maine 1820
Mass. 1788
R. I. 1790
Conn. 1788
N.J. 1787
Del. 1787
Md. 1788
Alaska 1959
Hawaii 1959
0 Mi. 300
0 Km. 300
© 2013 Jeffrey L. Ward
Not shown: District of Columbia, Puerto Rico, Guam, American Samoa, U.S. Virgin Islands
YEARS OF STATEHOOD
1787–1796
1803–1821
1836–1867
1876–1912
1959

Manifest Destiny
(1845 to early 20th Century)

- **35. Alfred Bierstadt's *Along the Sierra Nevada California***
- **36. King Kamehameha III's Feather Cape**
- **37. American Buffalo**
- **38. Siting Bull's Drawing Book**
- **39. Bugle from the U.S.S. Maine**

35. Alfred Bierstadt's *Along the Sierra Nevada California*

An 1859 6 x10 foot painting of the Western landscape give American a sense of Manifest Destiny

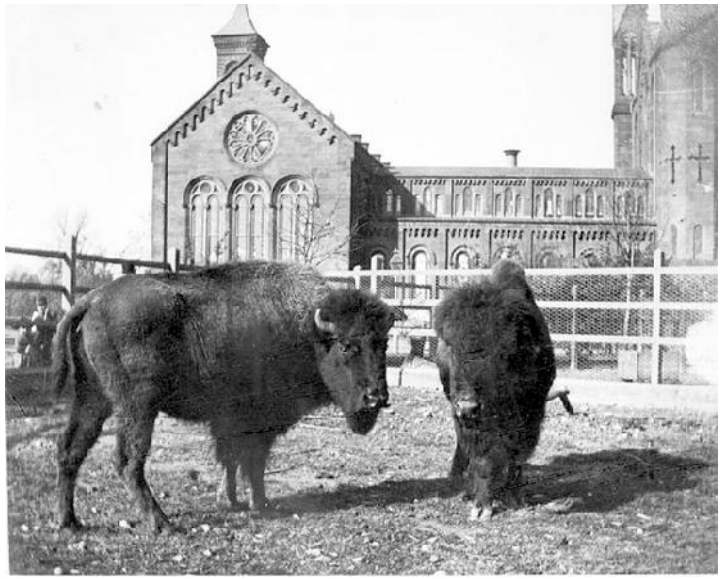
A later Ansel Adams' Photo of El Capitan

36. King Kamehameha III's Feather Cape

A Hawaiian King bestows a gift to a people who would later dismantle his kingdom.

- **The kingdom of Hawaii like the bird whose Feathers made the cape is extinct.**
- **Capt. Cook "discovered" Hawaii in 1778. It had a Polynesian population of 450,000.**
- **Being the first island west of the US, it attracted US and British planters, sailors adventurers and missionaries.**
- **They brought western diseases and in a 100 years the native population was down to 80,000.**
- **US planters strongly influenced the Government along a European model.**
- **American planters gained considerable power and disenfranchised native Hawaiian voters.**
- **With the Panama canal and growing Pacific trade and the need for port for the newly enlarged Pacific fleet; the American planters, over-threw the last Queen, formed a Republic and requested annexation, which occurred in 1898.**

37. American Buffalo



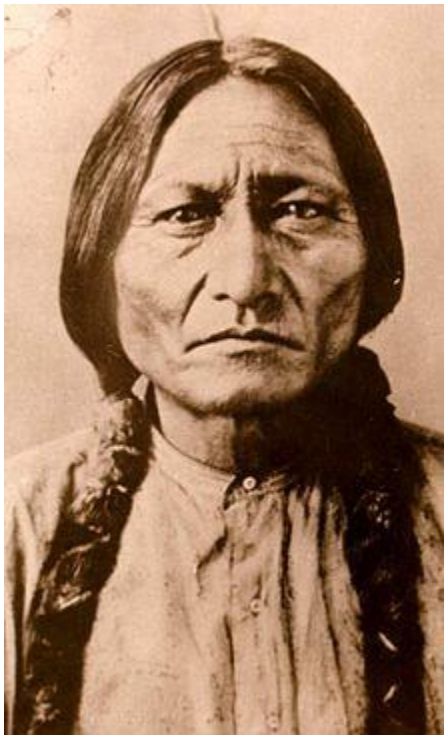
An animal vitally important to native peoples is commercially hunted to — almost to extinction — before inspiring the conservation movement.

Buffalo Nation

- **Buffalo were the lords of the prairie. To European settlers traveling across America's Great Plains in the early 1800s, the prairie wind was a constant companion: a gentle whisper echoing across the vast sea of grass that carpeted the center of the North American continent.**
- **Sometimes, however, the rumbling of thunder could be heard in the distance, though no storm clouds could be seen. Then the ground would begin to tremble, and suddenly the astonished newcomers would be surrounded by a thundering herd of hulking animals that stretched further than the eye could see.**
- **The majestic welcoming committee made it clear that the settlers had, at last, arrived in the buffalo nation — a land where tens of million of American Bison held sway.**

38. Siting Bull's Drawing Book

He was among the greatest native American leaders of his people resisting the encroachment of the US into his Lands



- **Sitting Bull, a Lakota Sioux warrior, holy man and tribal leader.** He resisted US and other tribes from entering his lands and organized his tribes to resist.
- On June 25th, 1876 at the battle of Little Big Horn, warriors inspired by Siting Bull's vision defeated Custer and his entire unit.
- **"Custer's defeat"** shocked many Americans who were convinced of white racial superiority and the inevitability of bring all US Continental territory under their control."
- The US Army responded in great force and he retreated to Canada. With their main source of food, the buffalo, being decimated; he returned to the US to obtain food for his followers.
- He was imprisoned and there sketched life on the plains and his life as a warrior. He also dictated narratives of the various events.
- **In 1883 he returned to his land, he maintain his dignity, refused Christianity, lived with his two wives and rejected Federal requests that he embrace white settlements in the area.**
- He was to lead a Ghost Dance in 1890, Federal Agents were afraid that he would lead a new revolt. He was killed in a skirmish.

39. Bugle from the U.S.S. Maine

A poignant relict is recovered from a destroyed ship that became the Battle Cry for expanded US influence In the Caribbean and the beyond.

Our *manifest destiny* takes the US into the Pacific and sets the stage for a profound clash of vital interests 40 years into the future.

Spanish American War 1898

- **This bugle was recovered from the wreck of the U.S.S. Maine, which blew up in Havana Harbor, Cuba, on February 15, 1898, killing more than 250 American sailors.**

- **Although most likely an accidental explosion, it was reported as an enemy attack by the sensational "yellow" press of the day to incite enthusiasm for war.**

- **Two months later, rallied by the cry "Remember the Maine!" the U.S. Congress declared war on Spain.**

- **After the conclusion of the Spanish-American War, the U.S. Navy salvaged relics from the Maine, many of which, including this bugle, were transferred to the Smithsonian in 1920.**

Band 8
Industrial Revolution
(1845 to early 20th Century)

Industrial Revolution
(1845 to early 20th Century)

- 46. Anesthesia
- 13. Refrigeration
- 39. Oil Drilling
- 2. Electricity [Generation and transmission], the electric motor — Shared
- 40/24. Alexander Graham Bell's Telephone
- 41. Thomas Edison's Light Bulb
- 42. Frederic Bartholdi's *Liberty*
- 35. Oil Refining

Industrial Revolution
(1845 to early 20th Century)

- **43. Andrew Carnegie's Mansion**
- **49. Assembly Line Production [Shared]**
- **44. Ford Model T**
- **45/15. Wright Brother's *Kitty Hawk Flyer***
- **46. Bakelizer Plastic Maker**

46. Anesthesia

Contemporary re-enactment of Morton's 16 October 1846, ether operation at Boston's Massachusetts General Hospital [MGH].

Daguerrotype by Southworth & Hawes

In response to the first public demonstration of either at MGH; Dr. Oliver Wendell Holmes, Sr. wrote "The fierce extremity of suffering has now been steeped in the waters of forgetfulness, and the deepest furrow in the knotted brow of agony has been smoothed for ever."

Holmes proposed naming the state produced "anesthesia", and the procedure an "anesthetic".

Anesthesia began to distinguish surgery from torture.

46. Anesthesia — As We Know It

- **Humans has been seeking an "Anesthesia" for centuries: Chemicals, plant concoctions, gases, hypnoses and other means to render pain bearable or better to not experience it.**
- **Notable early English experiments included the gas nitrous oxide. in small doses it induced laughter, thus its name — laughing gas.**
- **William Morton, a Boston dentist, conducted the first public demonstration of the nitrous oxide inhalational anesthetic.**

One of the Most Profound Discoveries that expanded vast new vistas of Medicine

- **Morton, was invited to MGH to demonstrate his new technique for painless surgery.**
- **After Morton had induced anesthesia, surgeon John Warren removed a tumor from the neck of Edward Abbott. This occurred in the surgical amphitheater now called the Ether Dome.**
- **Once discovered and perfected is was a truly profound discovery and through its effective medical disciple and the vast array of different products, a boon to all of mankind.**

13. Refrigeration

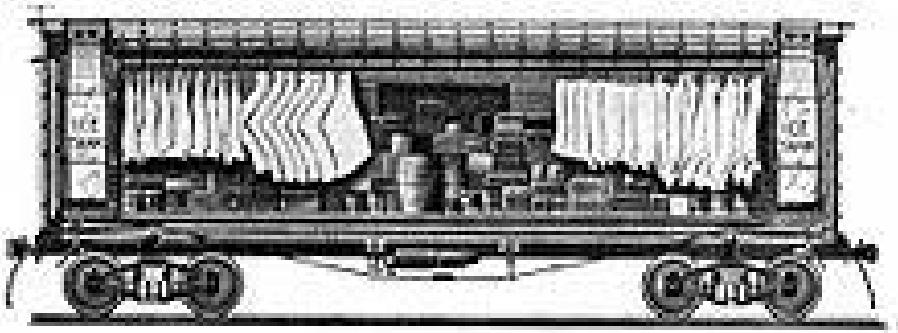
The Early Goal: Year Round Ice

- **Scottish professor William Cullen designed a small refrigerating machine in 1755. In 1758, Benjamin Franklin and John Hadley, a chemistry professor at Cambridge University, conducted an experiment to explore the principle of evaporation as a means to rapidly cool an object.**
- **Franklin and Hadley confirmed that evaporation of highly volatile liquids such as alcohol and ether could be used to drive down the temperature of an object past the freezing point of water.**
- **In 1842, Florida physician John Gorrie used compressor technology to create ice, which he used to cool air for his patients in his hospital in Apalachicola, Florida.**
- **He hoped eventually to use his ice-making machine to regulate the temperature of buildings. He even envisioned centralized air conditioning that could cool entire cities.**

Ice

- **Early refrigeration used natural ice. If you lived in a four seasons climate; lake and pond ice was cut and stored in cellars, in cave and "Ice Houses" packed in saw dust.**
- **In the US, there was a thriving trade in shipping ice from the rural north to the cities and the south.**
  - **A luxury for a wealthy New Orleans cotton broker was to serve chilled drinks to his guests**

Salted Meat to the Supermarket by way of the Refrigerator Rail Car



An 1870s refrigerator car design.

Hatches in the roof provided access to the tanks for the storage of harvested ice at each end.

Effects on Lifestyle, Diet and Nutrition

- **A trip to the market, before refrigeration became widespread, would have been different from a trip today.**
- **In the late 19th Century and into the very early 20th Century, other than staple foods (sugar, rice, and beans), your diet was affected heavily by the seasons and what could be grown relatively close to your region.**
- **Year round variety—Refrigeration played a large part in the feasibility and then popularity of the modern supermarket. If you are willing to pay slightly more for a fruit or vegetable that is out of season in your region, your local supermarket will most likely have what you are looking for.**

Effects on Lifestyle, Diet and Nutrition

- **Refrigerators have led to a huge increase in meat and dairy as a portion of overall supermarket sales. As well as changing the goods purchased at the market, the ability to store these foods for extended periods of time has led to an increase in leisure time.**
- **Prior to the advent of the household refrigerator, people would have to shop on a daily basis for the supplies needed for their meals.**
- **Refrigeration allows for the hygienic handling and storage of perishables, and as such, promoted output growth, consumption, and better nutrition. The change in our method of food preservation moved us away from salts to a more manageable sodium level.**

Industrial Progress
The Iceman Cometh and Go-eth (sp?)

Ice delivery window card

39. Oil Drilling

Exploration is world-wide on land and on sea and driven by extraction technology. Wells that were abandoned years ago because the natural gas was used up are new being reopened.

40/24. Alexander Graham Bell's Telephone

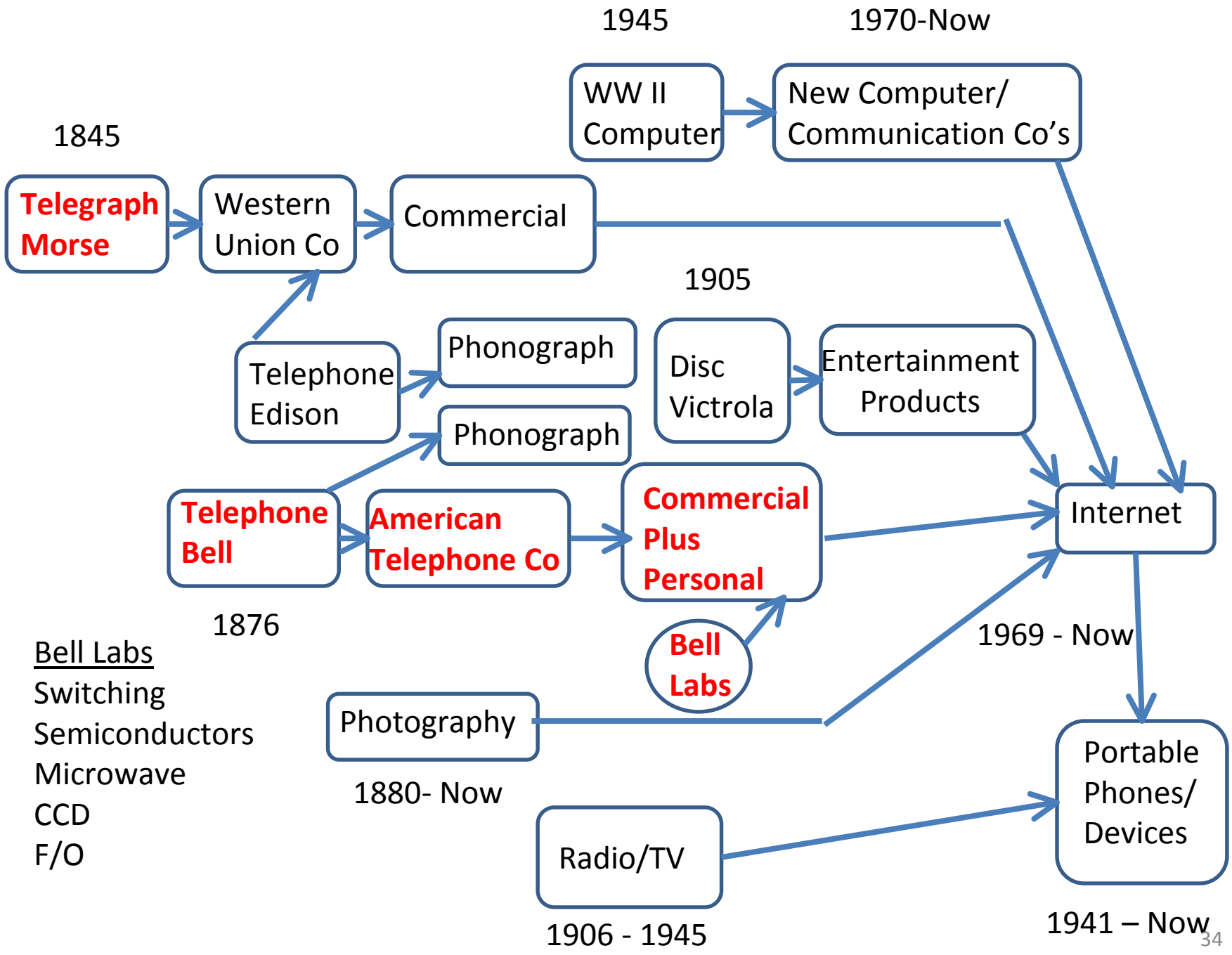
"Mr. Watson, come here. I want to see you!"

March 10, 1876

The Phone Company

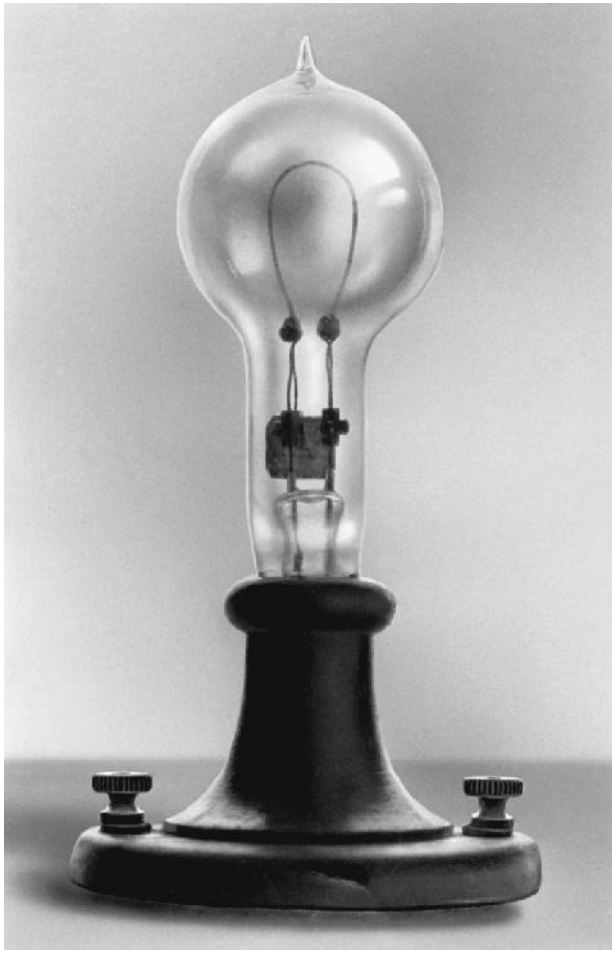
- In the minds of many the Bell System was the Phone Company. It was the predominant urban system within the US and its inter-connecting long distance lines.
- There were hundreds of other smaller phone companies, predominately rural. They were interconnected thr 

&T's monopoly Long Lines.
- One of the largest, was in 41 states.
- The FCC and the States granted monopoly areas and over saw the companies as "regulated utilities."
- At its zenith, AT&T build all its hardware and software, did all installations and repairs, ran all operations and conducted extensive research at Bell Labs.


1945
1970-Now
WW II Computer
New Computer/ Communication Co's
1845
Telegraph Morse
Western Union Co
Commercial
1905
Telephone Edison
Phonograph
Phonograph
Disc Victrola
Entertainment Products
Telephone Bell
American Telephone Co
Commercial Plus Personal
Internet
1876
Bell Labs
Switching
Semiconductors
Microwave
CCD
F/O
Bell Labs
1969 - Now
Photography
1880- Now
Radio/TV
1906 - 1945
Portable Phones/ Devices
1941 – Now

41. Thomas Edison's Light Bulb

What would life be like without that switch on the wall?



"Beyond the many practical transformations Edison's invention gave Americans and the world a sense of resounding triumph over nature, and faith that human intelligence, perseverance, and business acumen could transcend the limitation of the past."

Relieved!

Thomas Alva Edison

"The Wizard of Menlo Park"

- Prior to light bulb, human efforts were dictated by the tyranny of dawn and dusk, except for the most wealthy.
- Edison was self taught and went to work for Western Union as a telegraph operator.
- He quickly developed a means to send multiple signals over a single wire and a stock ticker tape machine.
- With funds from these inventions, he embarked on his own.
- He constructed a telephone for Western Union. He then developed a means of recording voice and music, hence the "Wizard"
- Then over a few year he developed, in 1879, a practical light bulb, and always the business man developed the entire electric system: meters, cables, generators, switches to power his lights. This was a first step in bringing power to industry and the home - World wide.
- In 1889 Edison General Electric was formed, it was to become

2. Electricity [Generation and transmission] Shared

In 1878, Thomas Edison developed and sold a commercially viable replacement for gas lighting and heating using locally generated and distributed direct current electricity.

Electricity Generation

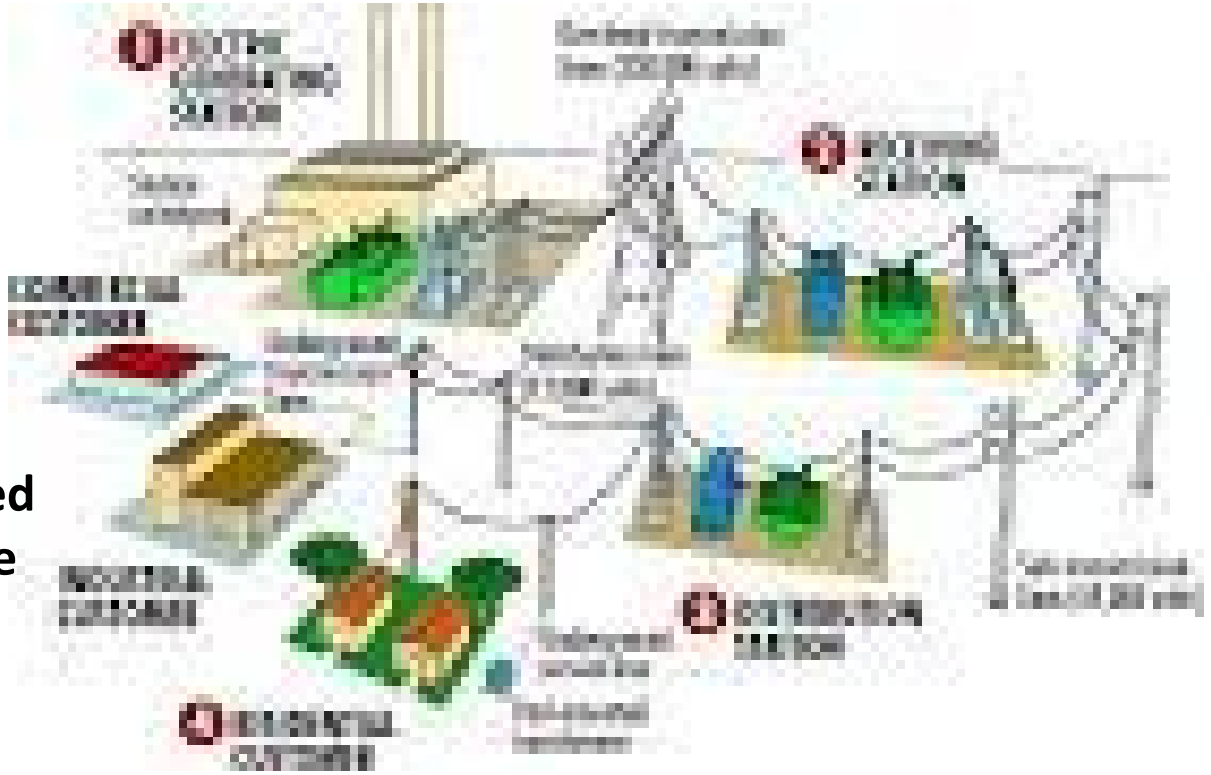
- **Electricity generation is the process of generating electric power from other sources of primary energy.**
- **The fundamental principles of electricity generation were discovered during the 1820s and early 1830s by the British scientist Michael Faraday. His basic method is still used today: electricity is generated by the movement of a loop of wire, or disc of copper between the poles of a magnet.**
- **For electric utilities, it is the first process in the delivery of electricity to consumers. The other processes, electricity transmission, distribution, and electrical power storage and recovery using pumped-storage methods are normally carried out by the electric power industry.**
- **Electricity is most often generated at a power station by electromechanical generators, primarily driven by heat engines fueled by chemical combustion or nuclear fission but also by other means such as the kinetic energy of flowing water and wind.**
- **Other energy sources include solar, photo – voltaic and geothermal.**

Impact: Generation and Transmission

Electricity effects every aspect of what we consider a modern life.

What would our lives be like with out it?

We take it absoluty for granted that it will be there every time we flip a switch.



42. Frédéric Bartholdi's *Liberty*

A symbol of Liberty and immigration

A model [SI artifact] for a monument to international Friendship that became a welcome sign to millions of immigrants to our shores.

Immigration to the United States is a complex demographic phenomenon that has been a major source of population growth and cultural change throughout much of US history.

American immigration history can be viewed in four epochs: [1] colonial period, [2] mid-19th century, [2] start of the 20th century, and [4] post-1965. Each period brought distinct national groups, races and ethnicities to the United States.

The history of immigration to America is the history of the country itself, and the journey from beyond the sea is an element found in American Folklore— books, songs, movies.

35. Oil Refining and the Chemical Industry

Fuels the modern, economy established its geopolitics, and changed the climate

One of the major technologies and economic drivers
Is oil transportation, refining and related chemical industries.

Industrial Revolution
(1845 to early 20th Century)

- **43. Andrew Carnegie's Mansion**
- **49. Assembly Line Production [Shared]**
- **44. Ford Model T**
- **45/15. Wright Brother's *Kitty Hawk Flyer***
- **46. Bakelizer Plastic Maker**

43. Andrew Carnegie's Mansion

Major US Industrialist, Financier and Philanthropist

The Andrew Carnegie Mansion is located at 2 East 91st Street at Fifth Avenue in Manhattan, New York City, New York.

Andrew Carnegie built his mansion in 1903 and lived there until his death in 1919; his wife, Louise, lived there until her death in 1946.

The building is now the Cooper-Hewitt, National Design Museum, part of the Smithsonian Institution.

He use his vast fortune to endow a large number of philanthropic, educational and peace oriented organizations that still exist today.

Andrew Carnegie's Role in the Industrial Revolution

- One of his first jobs was with the Pennsylvania Railroad and observed the need for vast quantities of rails.
- He was in Pittsburg and went to work in the iron industry and witnessed steel coming into vogue.
- Steel needed to be produced from hot iron and quickly transformed into the shapes needed in manufacturing.
- During this period he engaged in a number of successful engineering and financial ventures.
- From this base he build the first end-to-end integrated steel mill. He expanded. He recognized the need for a manager class to run it.
- In 1901 he merged his Carnegie steel with J.P. Morgan's holding and formed US Steel the first Billion $ company.

49. Assembly Line Production [Shared] Craftsmanship and Small Quantities to large Quantities, Drudgery and lower Costs?

The beginning of the corporate research center to work processes and new designs

The heart of Industrialization

- **Vastly increased quantities per employee per hour**
- **Turned a craft based economy into a mass market economy**
- **Lower production costs through mechanization and quantity**
- **Consistency of the product**
- **Modularity — interchangeable parts**
- **Changes could be implemented easier**
- **Huge complex items could be built at one site in layers/stages**

44. Ford Model T

It came in any color you want as long as it was black.

The automobile that put Americans on the road and drives its 20th century manufacturing economy. Ford picks up on the assembly line.
He pays his workers $5/hour and sells the car for $850.

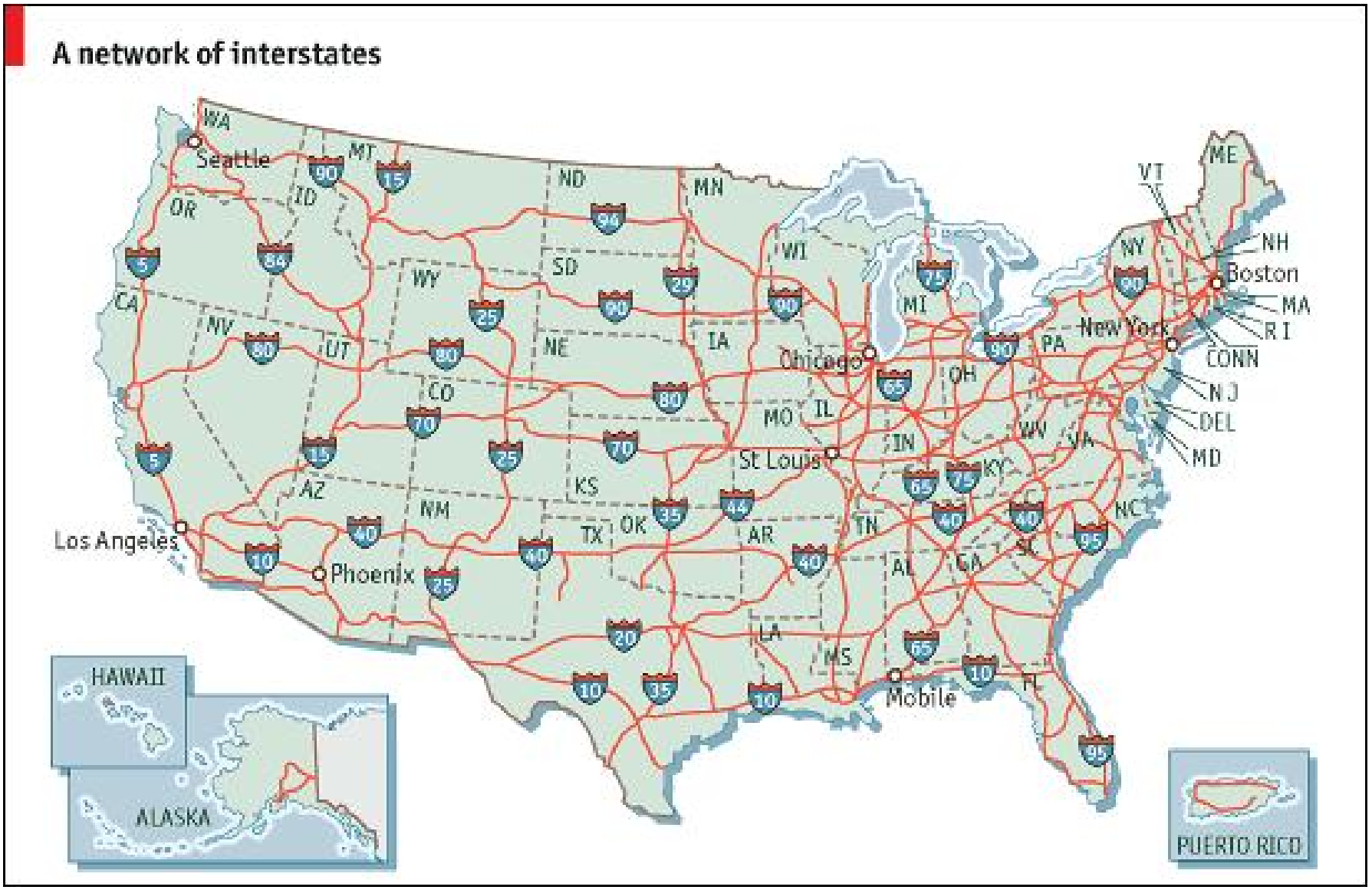
In 1911 there were 88 miles of paved roads in the US. Mostly in downtown areas of major cities

Street traffic in New York City, 1915

Jump Ahead —Transportation today

- **The US system comprises of 3.9 million miles of public roads and 2 million miles of oil and natural gas pipelines.**
- **There are networks consisting of 120,000 miles of major railroads, over 25,000 miles of commercially navigable waterways, and over 5,000 public-use airports.**
- **This vast system also includes over 500 major urban public transit operators and more than 300 ports on the coasts, Great Lakes, and inland waterways.**

The major links in the Interstate Highway system



Impact on Society

- Automobiles/trucks are now everywhere.
- The worldwide search for fuel is frantic.
- Jittery economies—OMG $3.75/gallon. The world as we know it is about to collapse.
- Who has the answer: the drive for increased fuel efficiency means fewer gallons of fuel to be consumed. Our infrastructure is financed with fuel taxes. Is there the political courage to raise the taxes necessary to pay for infrastructure?
- If we are lucky it is an equal $$ trade off.
- The aspiring middle classes from the second world want cars, too.
- Climate impact?

American Entitlement

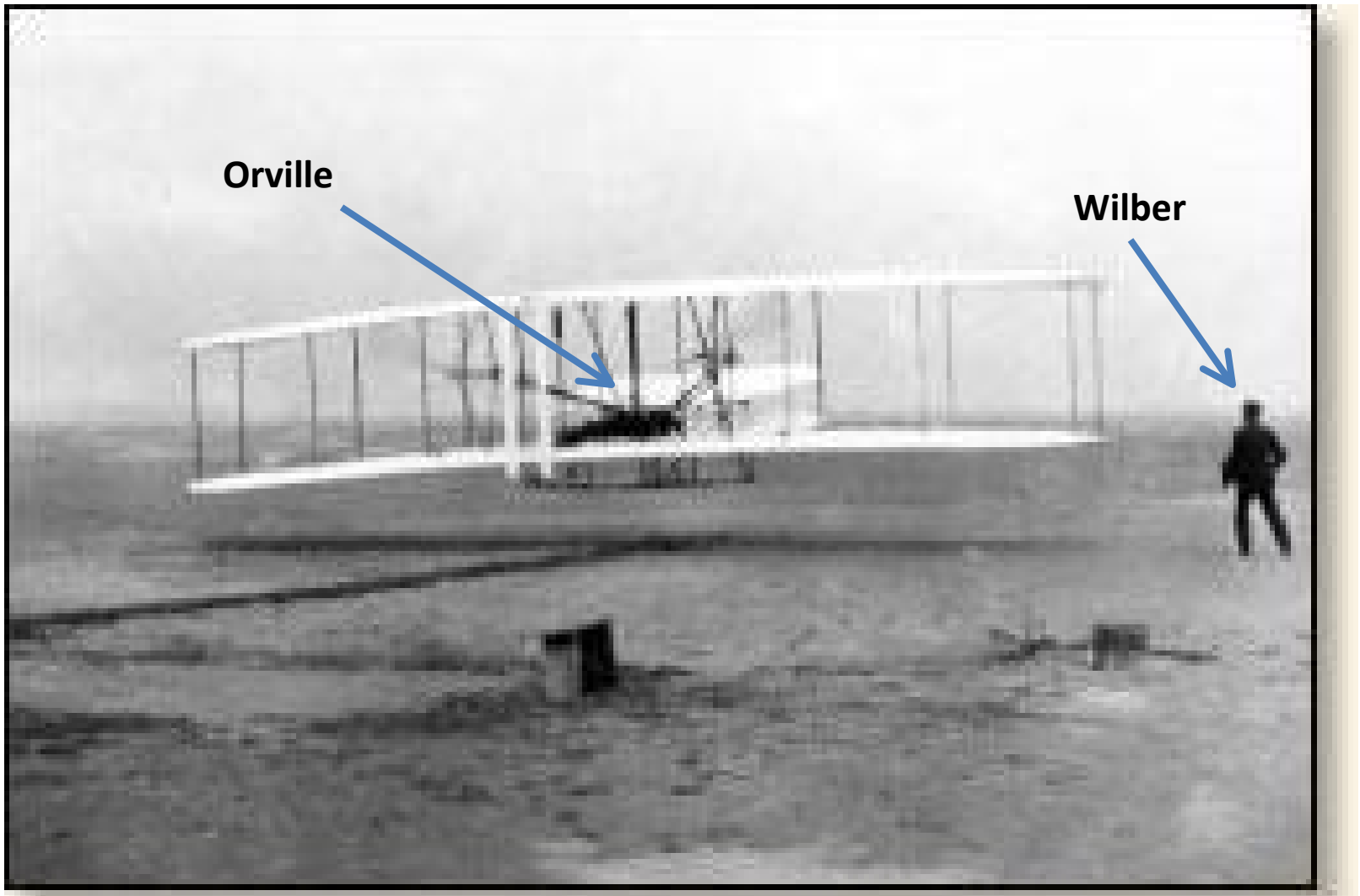
- **Buried in the Bill of Rights are two inferred inalienable rights of every American Citizen:**

[1] An unending flow of cheap, readily available gas everywhere on every street corner at any hour in the nation and

[2] The price can only decrease.

- **The US has 4% of the World's population and we annually use 25% of its energy.**

45/15. Wright Brother's *Kitty Hawk Flyer*



Three seconds into Aviation History, December 17th 1903

111 Years of Aviation Advancement

The 1903 Wright Flyer

- **“A benchmark achievement born of careful research and focused experimentation broadens human horizons and imaginations.”**
- **The brother ‘joined at the hip” worked six years independent of others and self financed the project.**
- **Spent $1,000 drawn from their bicycle factory.**
- **Perfected a scientific process that lead to aeronautical engineering; there was nothing on the craft that didn’t have a purpose.**

The Airplane

- Revolutionized travel, the sea was no longer a barrier— look at how the World's populations now mingle.
- You can go almost anywhere in the world from Point A to Point B in less than a day.
- In the age of steam ships and railroads; it could take many weeks if not months.
- In the age of sail it took months.
- On land by horse and wagon—months. In many case you could not get there from here.

Why the Wright Brothers and why in 1903?

- Technology transfer from bicycle to aircraft
- Designed their propellers by means of wind tunnel experimentation
- Internal combustion engines were becoming more refined and they could get light weight aluminum
- They engineered the flyer, nothing was left to chance
- Evolving designs to reach "a machine of practical utility"
- Consider what they did:
  - They worked alone,
  - Spent no more than $1000 total of their funds,
  - They believed that they would ultimately be successful and
  - Were visionaries

46. Bakelizer Plastic Maker

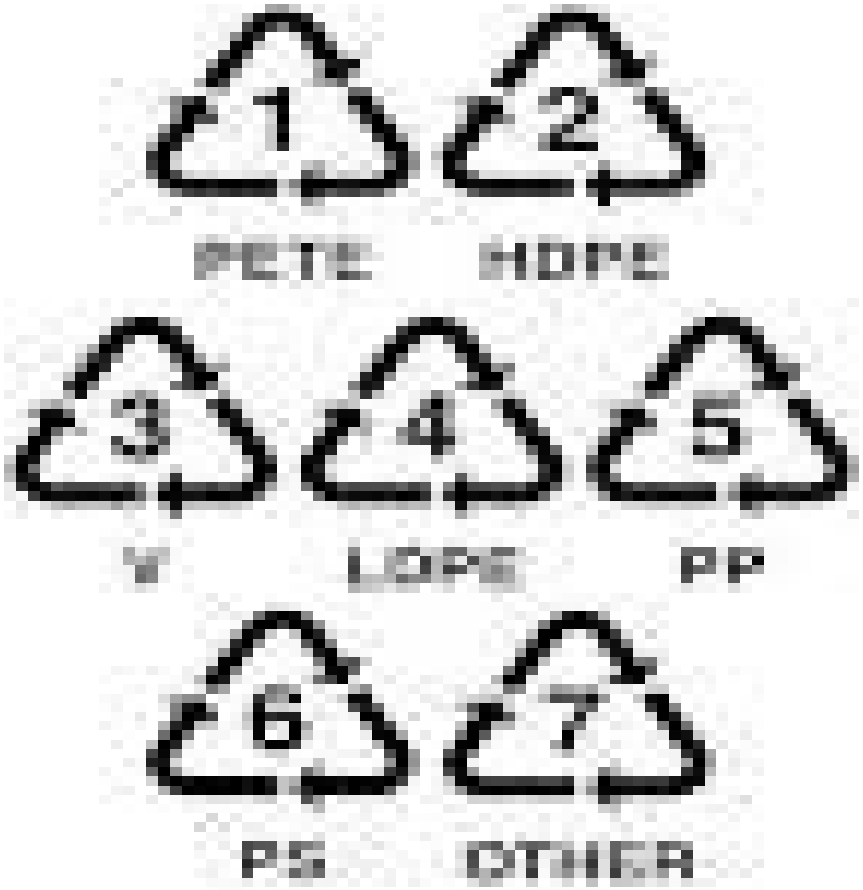
A machine that heralds the dawn
of the age of plastic.
Bakelite, a material of a thousand uses.

What was Mr. Robinson's Advice to young Benjamin in the movie The Graduate?

- Plastic!
- Think how today would have progressed, if you didn't have any of plastic products that we take for granted. In all probability you would have had to walk here.

Major Plastic Categories

Plastics Could Withstand Heat and Cold and Not Lose Their Shape



1. **PET/PETE** Polyethylene Terepthalate
2. **HDPE** High Density Polyethylene
3. **V/PVC** Vinyl/Poly Vinyl Chloride
4. **LDPE** Low Density Polyethylene
5. **PP** Polypropylene
6. **PS** Polystyrene (Styrofoam™)
7. **Other** Mixture