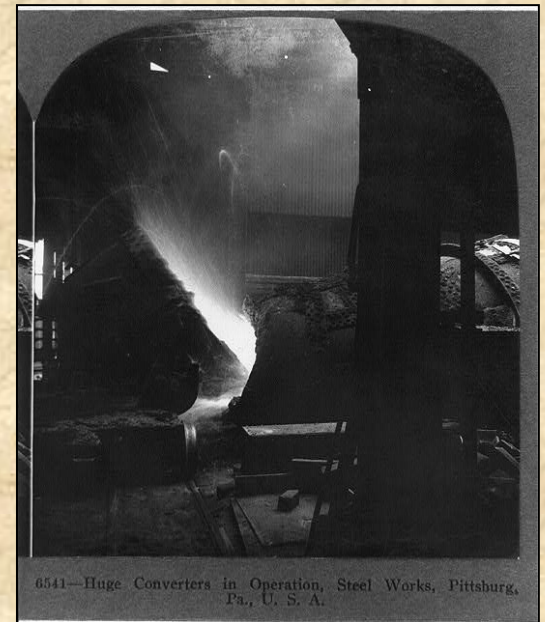


Rise of Industrial America: 1865-1900



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WRITTEN BY

HERSCHEL SARNOFF

&

DANA BAGDASARIAN

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CONTACT INFORMATION:

hsarnoff@gmail.com

danabag@gmail.com

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National History Standards addressed

Era 6 The Development of the Industrial United States (1870-1900)

Standard 1A

The student understands the connections among industrialization, the advent of the modern corporation, and material well-being.

Grade Level

Therefore, the student is able to

5-12

Explain how organized industrial research produced technological breakthroughs, especially the Bessemer steel process, conversion to electrical power, and telephonic communication, and how these innovations transformed the economy, work processes, and domestic life.

[Utilize quantitative data]

9-12

Compare various types of business organizations in production and marketing. [Compare and contrast differing sets of ideas]

5-12

Evaluate the careers of prominent industrial and financial leaders. [Assess the importance of the individual in history]

7-12

Explain how business leaders sought to limit competition and maximize profits in the late 19th century. [Examine the influence of ideas]

9-12

Examine how industrialization made consumer goods more available, increased the standard of living for most Americans, and redistributed wealth. [Utilize quantitative data]

9-12

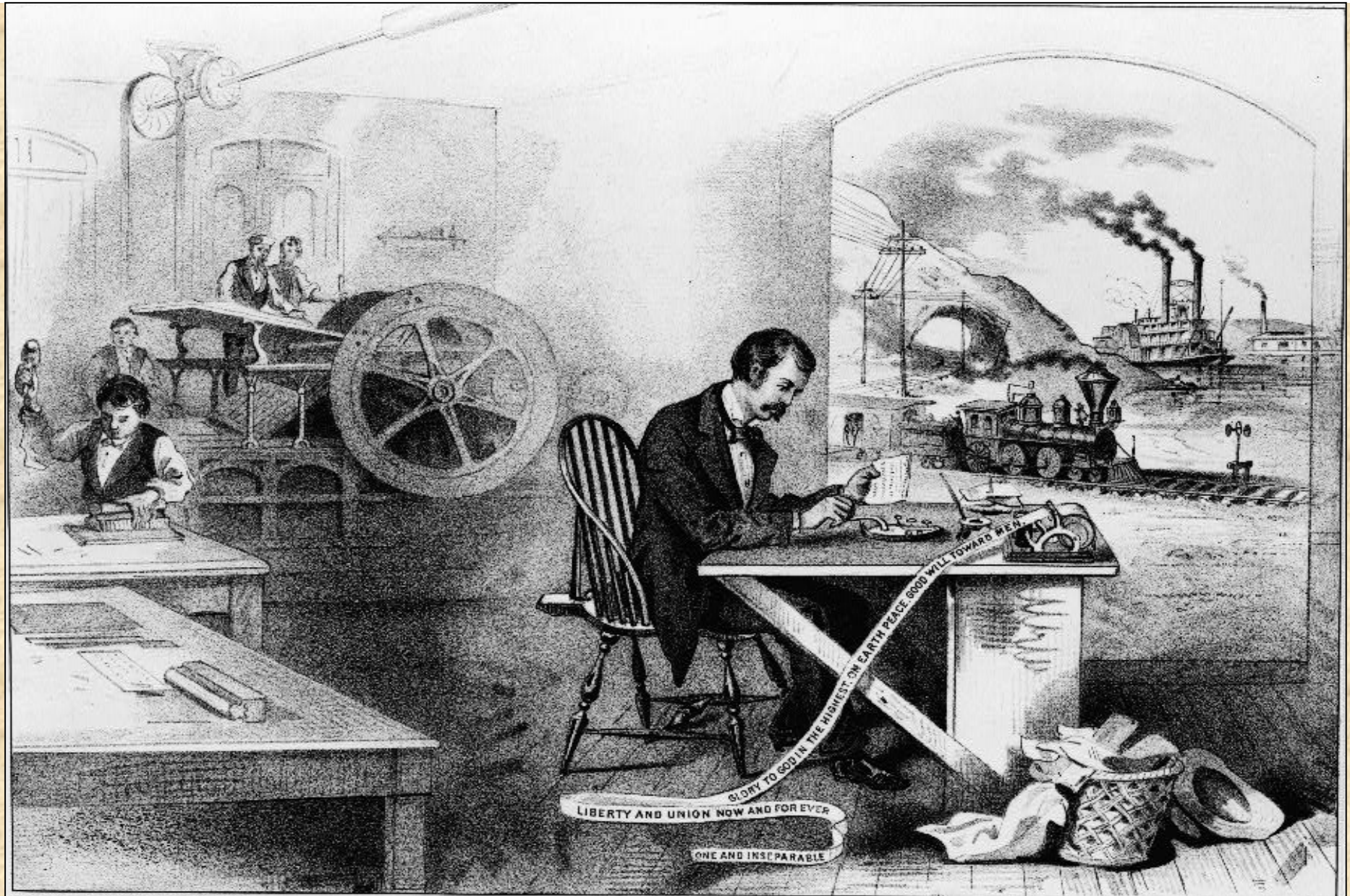
Compare the ascent of new industries today with those of a century ago. [Hypothesize the influence of the past]

Examples of Pre-Civil War technology:

Age of Steam and Iron 1790-1860

- ❖ **Major inventions from the First Industrial Revolution**
- ❖ **John Stevens, the father of American railroads**
- ❖ **Cyrus McCormick, mechanical mower reaper 1831**
- ❖ **Samuel B. Morse telegraph 1838**
- ❖ **John Deere, steel plow 1840s**
- ❖ **Richard Hoe, rotary printing press 1840s**
- ❖ **Elias Howe & Isaac Singer and the sewing machine 1846**
- ❖ **Cyrus Field and the Transatlantic Cable**





PUBLISHED BY CURRIER & IVES

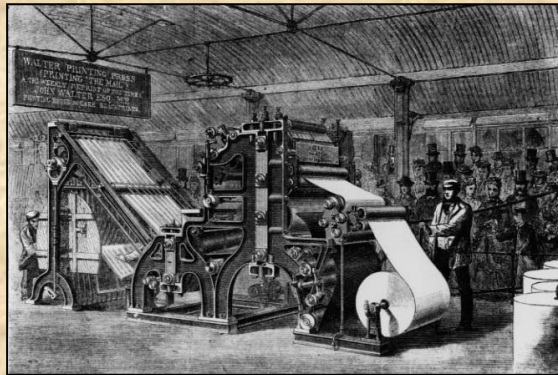
Copyright 1876 by Currier & Ives N.Y.

125 NASSAU ST. NEW YORK.

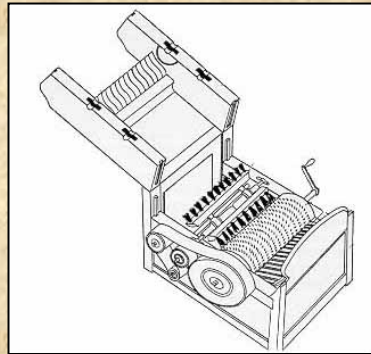
THE PROGRESS OF THE CENTURY.

THE LIGHTNING STEAM PRESS. THE ELECTRIC TELEGRAPH. THE LOCOMOTIVE. THE STEAMBOAT.

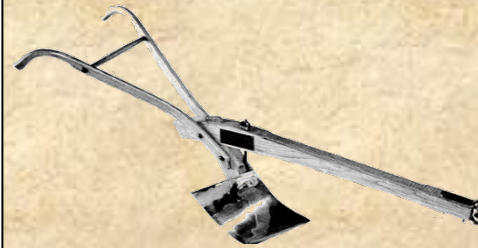
First Industrial Revolution: Late 18th century to 1860



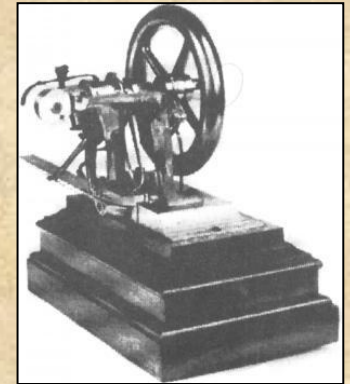
Rotary press



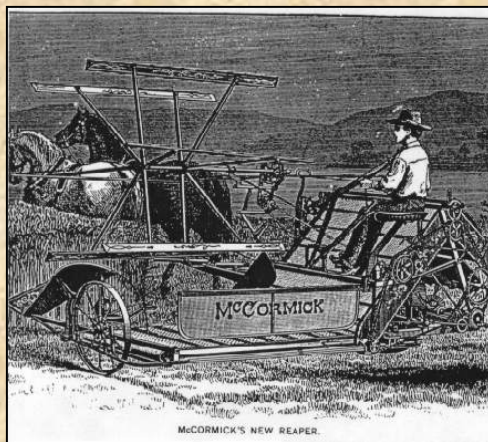
Cotton gin



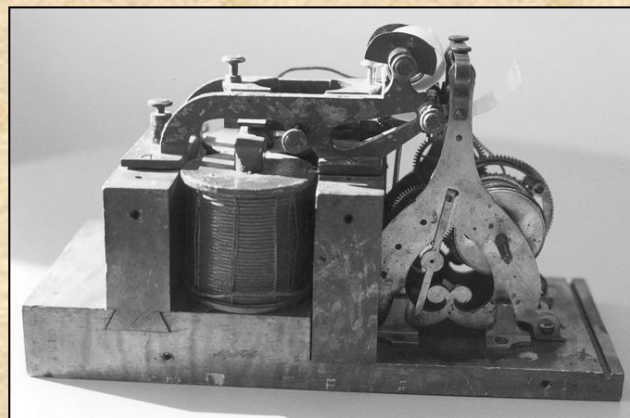
Steel plow



Sewing machine



Mechanical reaper

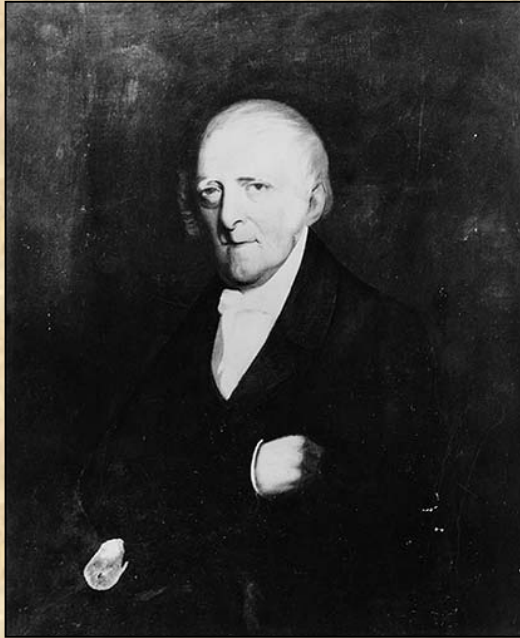


Telegraph

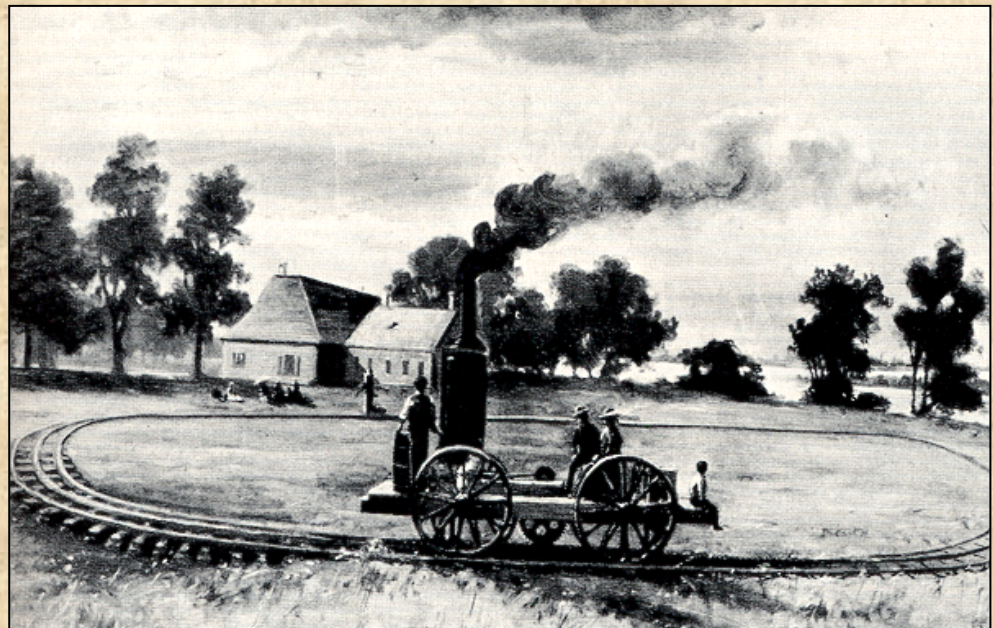
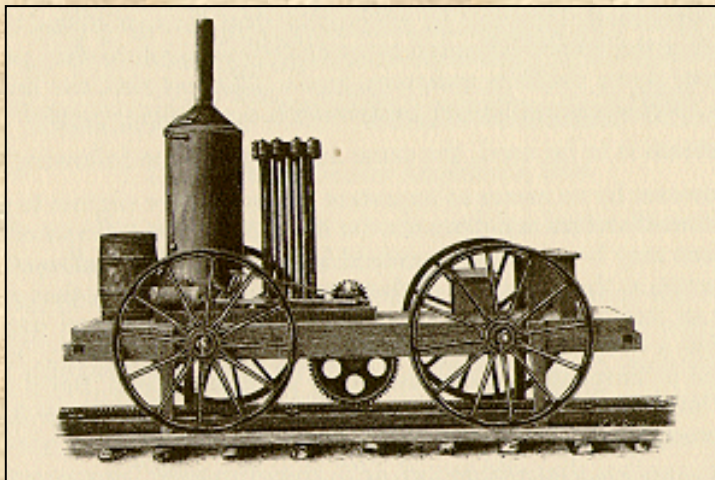


Early train

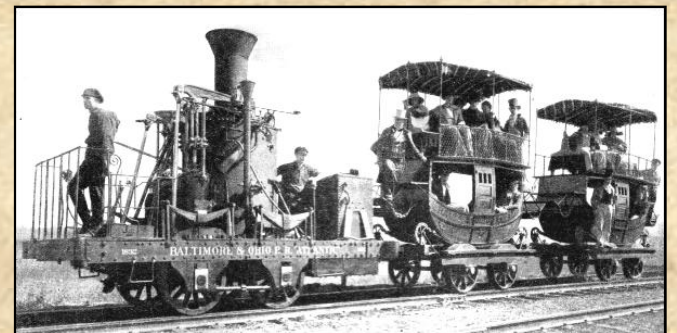
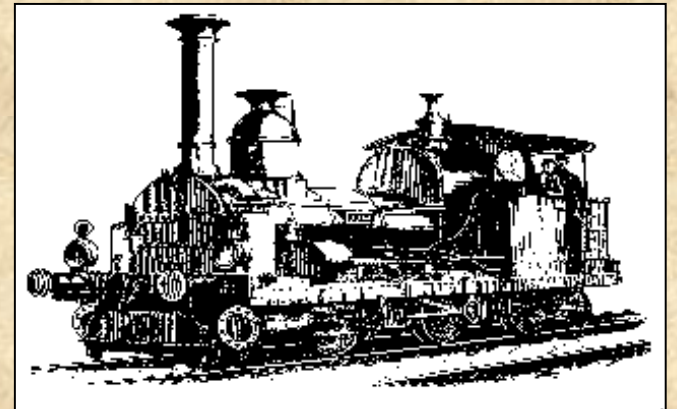
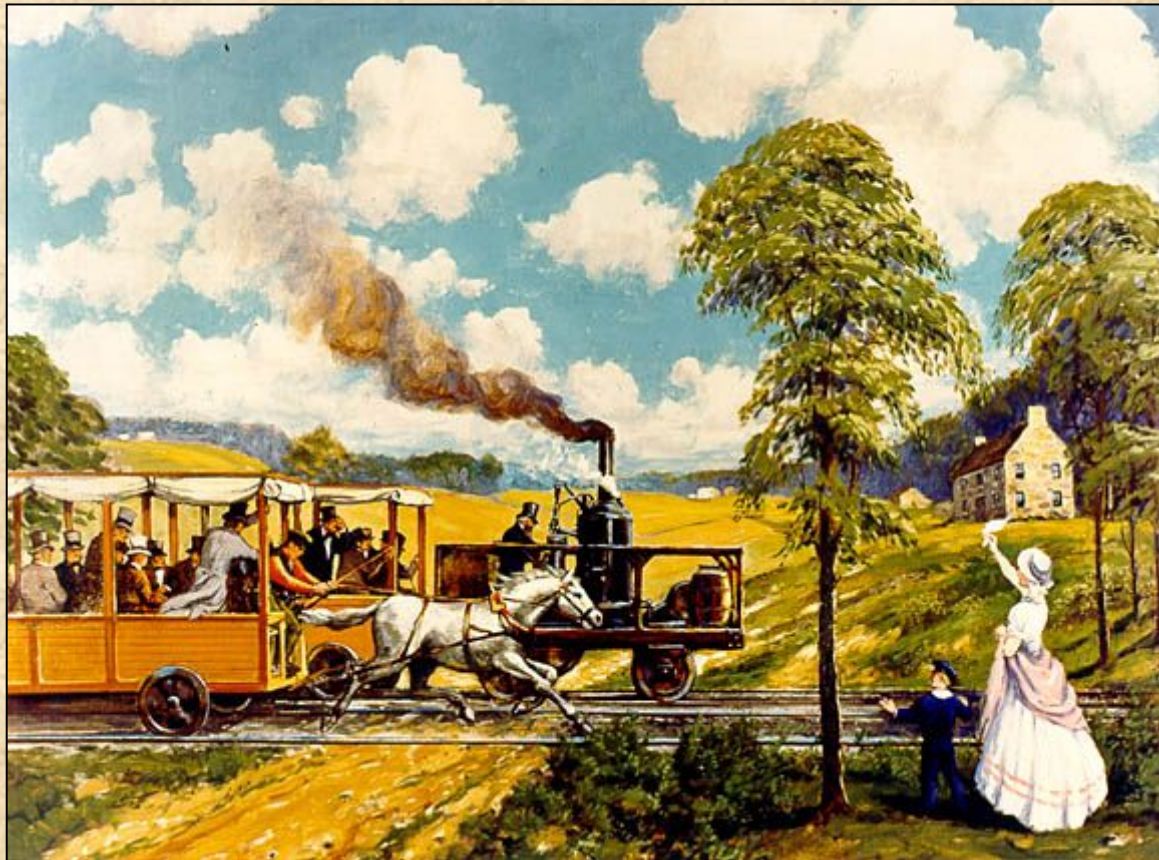
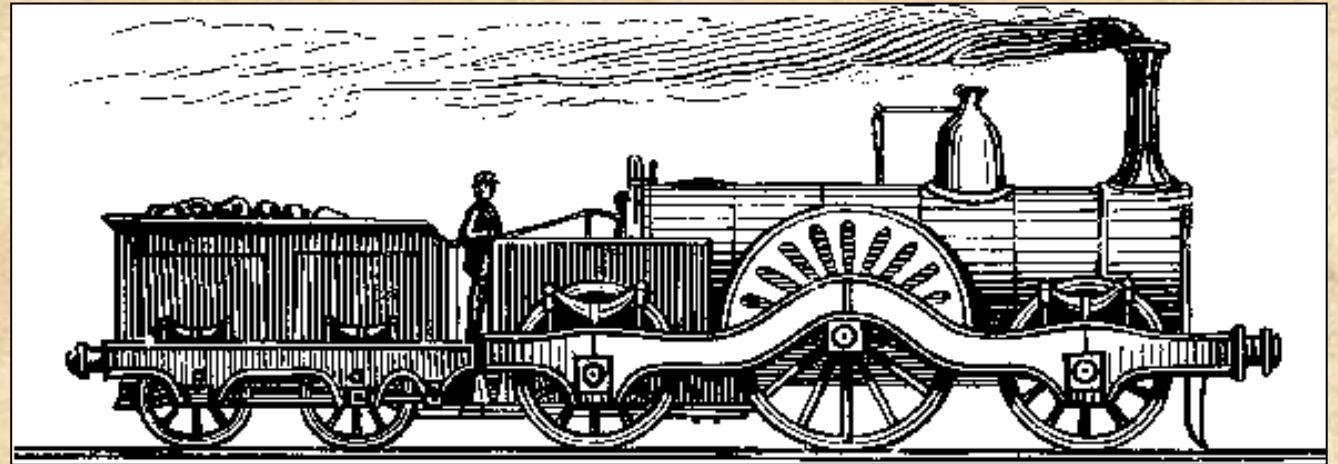
John Stevens



John Stevens became interested in steam locomotion in the 1780's. He established the world's first steam ferry, and later built the first operating steam locomotive in the United States.

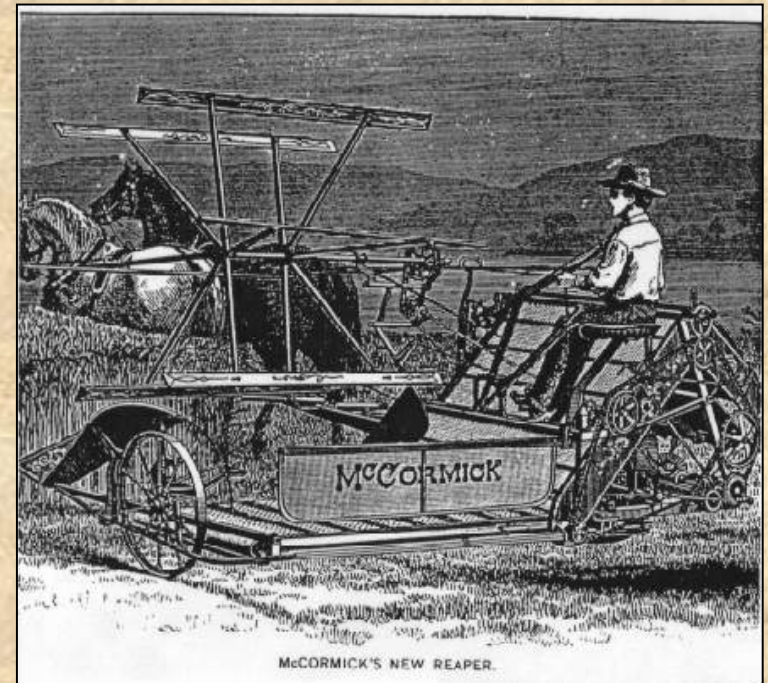


Early train models



Cyrus McCormick

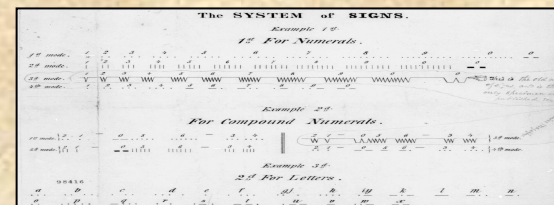
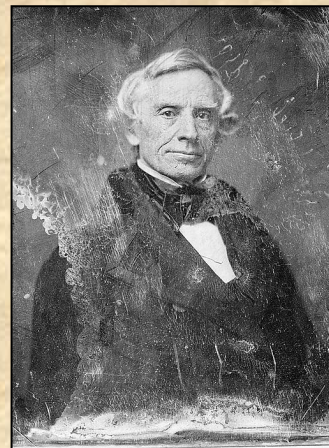
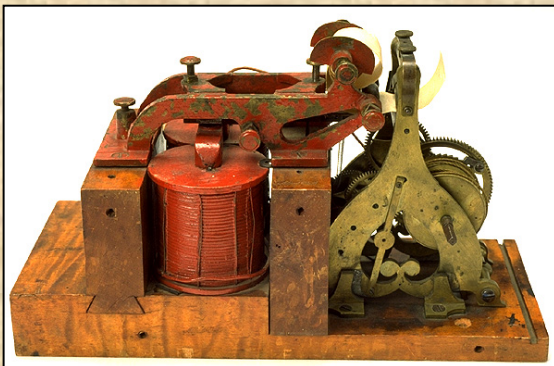
At the age of 22, McCormick invented the first successful mechanical reaper in 1831, which later led to the harvesting machine industry. McCormick ushered in a new era of agriculture mechanization. In this new era fewer farmers could feed more non farmers. This made it possible for millions of people to leave farms for jobs and careers in the new cities and factories.



Samuel Morse

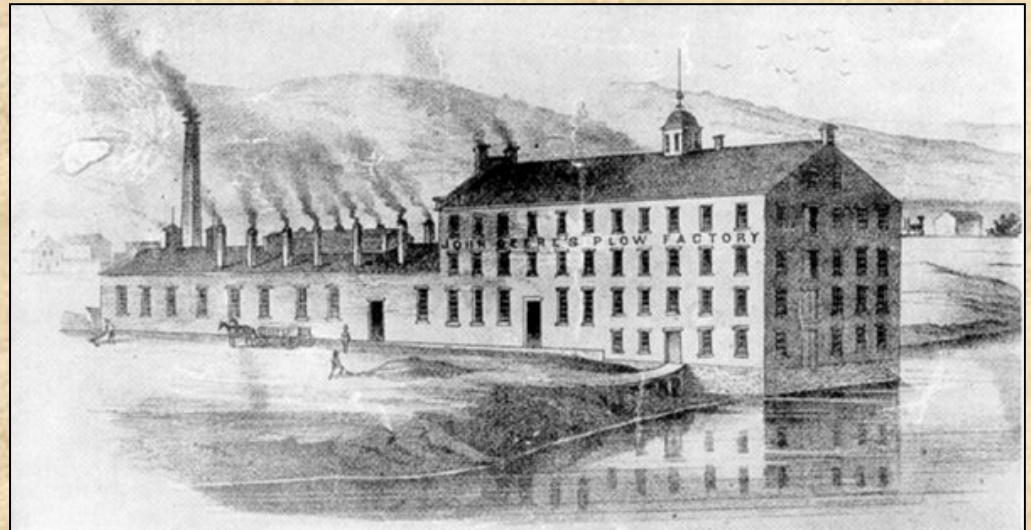


In 1835, Samuel Morse proved that signals could be transmitted by wire. He invented the Morse Code which used dots and dashes to transmit messages. In 1838 Congress funded construction of an experimental telegraph line from Washington to Baltimore, a distance of 40 miles. The first official message "What hath God wrought?" opened the completed line on May 24, 1844.

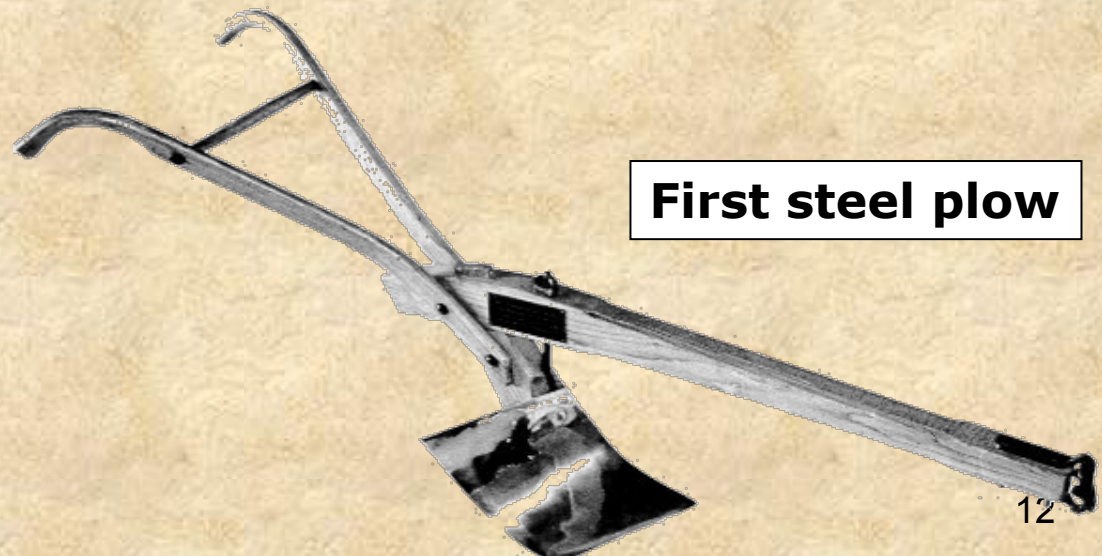
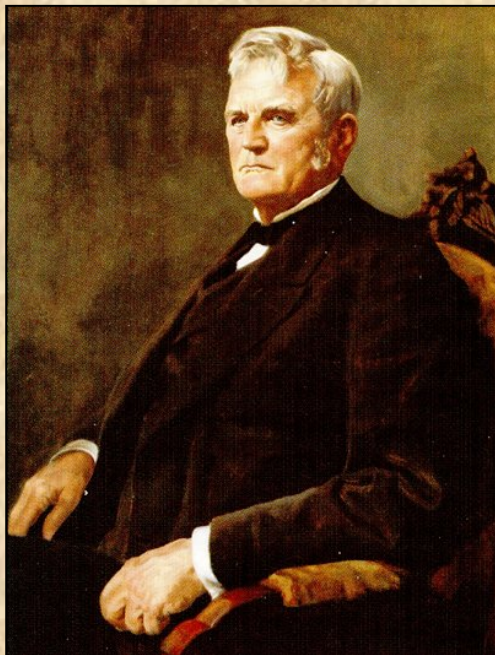


Morse Code

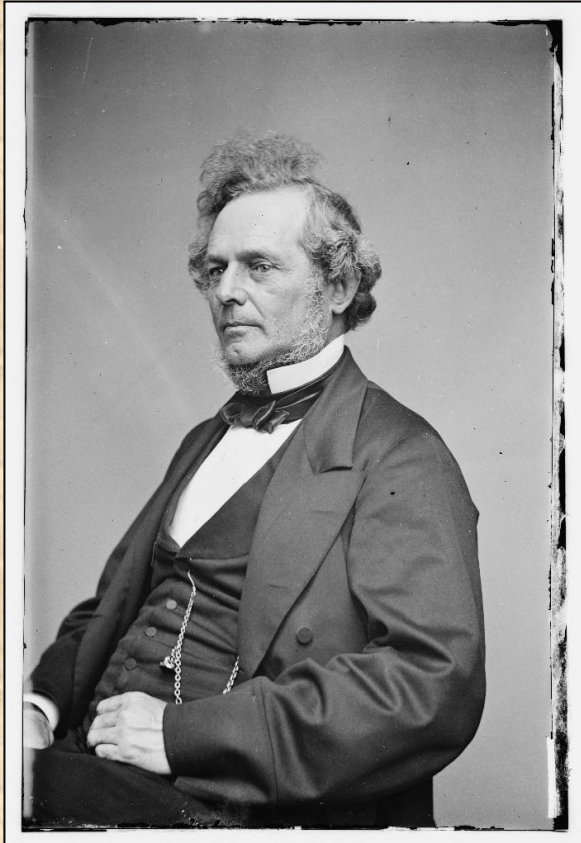
John Deere invented a steel plow that could cut through land that in the past could not be cultivated with iron plows. He went on to build a large agricultural implement business.



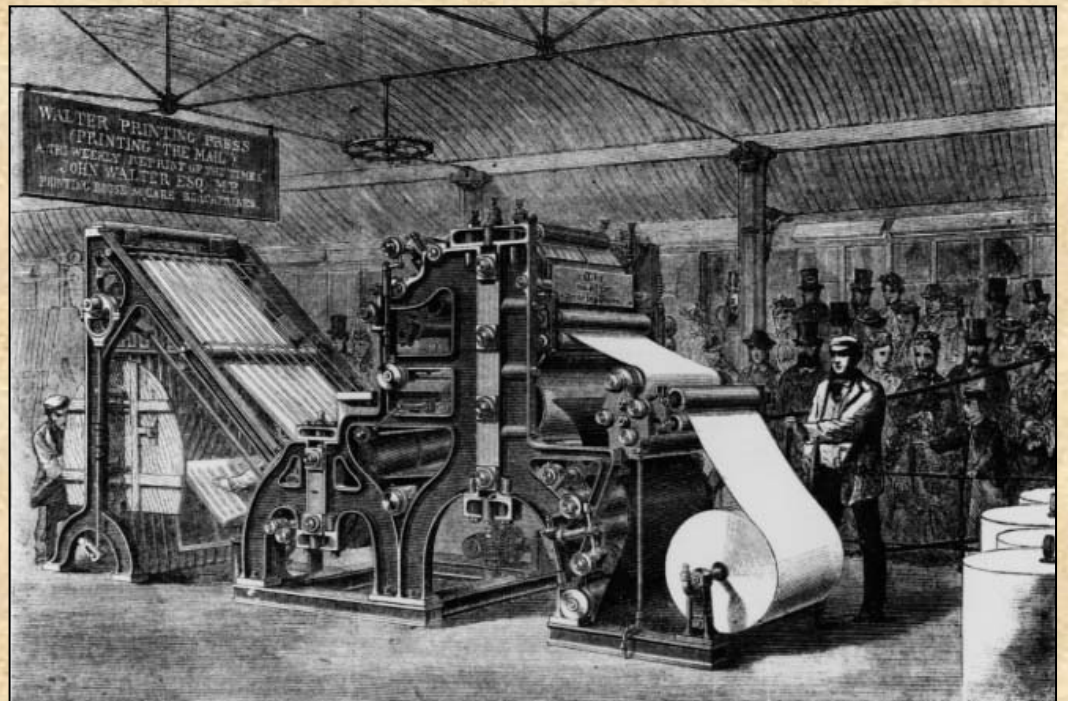
John Deere 1859 factory



First steel plow



In 1843, Richard Hoe invented the rotary printing press, a design that allowed much faster printing than the old style of printing press. With Hoe's design more cylinders could be placed around the main cylinder, moving much faster in one direction. Some versions of the press were able to create up to 20,000 impressions per hour.



1846 Advertisement

R. HOE & CO.

Manufacturers of Single and Double Cylinder Printing Machines, Washington and Smith Hand Presses, Self-Inking Machines, Steam Engines, Cast Steel Saws, Machinery, &c. &c. &c.

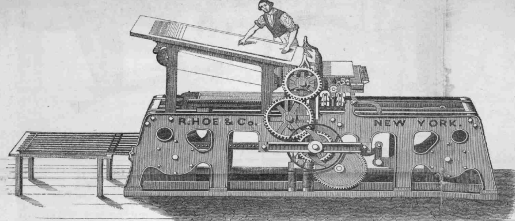
EVERY ARTICLE CONNECTED WITH THE ART OF

TYPOGRAPHY, COPPERPLATE AND LITHOGRAPHIC PRINTING AND BOOKBINDING.

ALWAYS ON HAND, OR FURNISHED AT SHORT NOTICE.

MANUFACTORIES, NOS. 29 & 31 GOLD STREET, AND CORNER OF BROOME AND SHERIFF STREETS, NEW YORK.

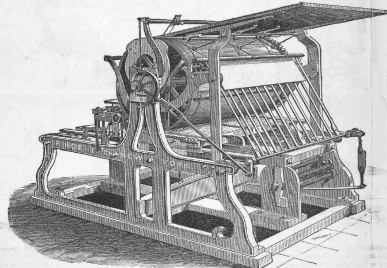
PATENT SINGLE SMALL CYLINDER PRINTING MACHINE.



Our Single Small Cylinder Press has two or more revolutions of the cylinder to an impression, depending on the speed required, and is calculated for very expeditious Newspaper Printing, throwing off from 1200 to 1600 impressions per hour. It is constructed with our patent feed gears and sheet-flyer, and requires only one boy to put on the sheets, and may be driven by man or steam power. The present reduced prices of these presses will render them accessible to the greater part of the Newspaper establishments throughout the United States and other countries.

SIZES AND PRICES.					
No. 6, Bed 35 by 25	\$1200	No. 9, Bed 50 by 33	.....	1900
" 7, " 41 " 28 1/2	1600	" 10, " 54 " 35	.....	2100
" 8, " 46 " 31	1750	" 11, " 57 " 38	.....	2300

PATENT SINGLE LARGE CYLINDER PRINTING MACHINE.



This Machine is particularly adapted to Book and fine Newspaper work. It has a perfect registering apparatus and sheet-flyer. One boy is required to lay on the sheets, and the press may be driven by man or steam power. With the same attendance it will print twice as fast as any bed and platen machine, and equally as well in every respect.

SIZES AND PRICES.					
Large Footing, Bed 23 by 18 in.	\$ 850	No. 2, Bed 46 by 31 in.	.....	\$1950
Medium, " 28 1/2 " 23 in.	1300	" 3, " 54 " 31 in.	.....	2100
Super Royal, " 37 " 32 in.	1450	" 4, " 54 " 38 in.	.....	2300
No. 1, Double Medium, " 41 " 32 1/2 in.	1600	" 5, " 57 " 38 in.	.....	2500

PATENT IMPROVED DOUBLE CYLINDER PRINTING MACHINE.



The Proprietors have also spared neither pains or expense in improving their Double Cylinder Press, and have made many important improvements in its construction. Great additional speed in Printing has been gained, at the same time particular attention has been paid to simplicity in its movements, with a view to ease and still greater durability. The addition of the patent sheet-flyer apparatus to this Press dispenses with the necessity of two boys to take off the sheets. The Press, therefore, now requires but two boys to attend it instead of four as formerly, and will print as fast as they can feed it, say from 2000 to 3000 impressions per hour, depending on its size. For simplicity, ease, great expedition, economy of labor, perfection of workmanship, strength of material, and consequent durability, this machine is altogether unequalled.

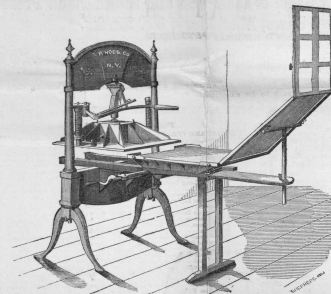
SIZES AND PRICES.					
No. 1, Bed 41 by 35	\$3500	No. 4, Bed 54 by 34	.....	\$3950
" 2, " 44 " 31	2250	" 5, " 57 " 35	.....	3500
" 3, " 46 " 33	2000			

Each Cylinder Machine is furnished with Roller Moulds, Two Sets of Roller Stocks, Blankets and Band.

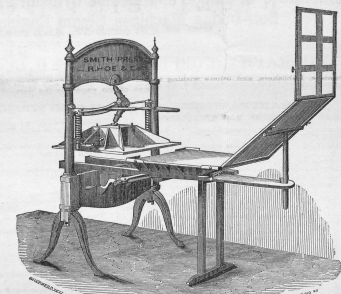
GEO. W. WOOD, Printer, No. 29 Gold Street.

HAND PRESSES, SELF-INKING MACHINES, HYDRAULIC PRESSES, &c., &c., &c.

PATENT WASHINGTON PRINTING PRESS.



PATENT SMITH PRINTING PRESS.

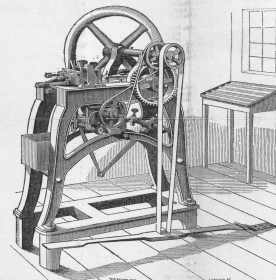


The celebrity which our Patent Washington and Smith Hand Presses have obtained, and their exclusive and constant use in almost every Printing Office in the United States and other countries, during the last twenty years, renders any remarks upon their superiority unnecessary. They are neat and elegant in appearance, peculiarly simple in principle, quick and powerful in operation, and combine in their construction every facility for the production of superior printing. Each press is thoroughly tried at the manufactory, and warranted for twelve months.

PATENT WASHINGTON AND SMITH PRESSES.

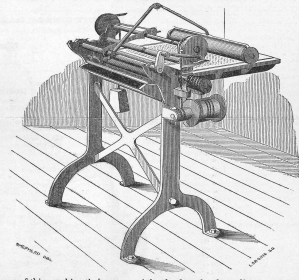
MAMMOTH: Size of Platen 43 1/2 by 31 1/2 inches; Bed 48 by 32 1/2 inches	.....	\$350 00
IMPERIAL: No. 5, " 40 " 28 " " 44 " 28 1/2 " " 44 " 28 1/2 " "	.....	350 00
" 4, " 38 1/2 " 28 " " 40 " 28 1/2 " " 40 " 28 1/2 " "	.....	340 00
" 3, " 36 1/2 " 28 " " 37 " 26 1/2 " " 37 " 26 1/2 " "	.....	330 00
" 2, " 34 1/2 " 28 " " 35 " 24 " " 35 " 24 " "	.....	320 00
SUPER ROYAL: " 30 " 26 1/2 " " 30 " 26 1/2 " "	.....	310 00
MEDIUM: " 28 " 24 " " 28 " 24 " "	.....	300 00
POULSCAP: " 17 1/2 " 14 " " 17 1/2 " 14 " "	.....	130 00

PATENT MACHINE CARD PRESS.



For Printing Cards and Small Circulars this Machine is not surpassed. It is worked by either a crank or treadle, and will print from 1000 to 1500 cards per hour in the best manner, and may be used also for printing note paper and small circulars. Its inking apparatus is self-acting. Price \$150.

PATENT SELF-INKING MACHINE.



By means of this machine the pressman takes the form by the ordinary operation of the press, and gives a perfect distribution of ink. They have been in very extensive use in this and other countries for many years, and their superior merits are universally acknowledged.

SIZES AND PRICES.

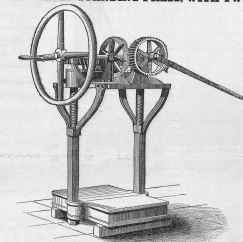
Footcap, . . . \$75	Super Royal, . . . \$ 95
Medium, . . . 85	Imperial, . . . 110

We also manufacture a superior inking machine for a hand press, driven by steam power, with two rollers to pass over the form, one or more times to each impression. The strongest inks may be used. The distribution is perfect and uninterrupted. Nothing can be better adapted for cuts and the finest work.

SIZES AND PRICES.

Medium, with Counter Shaft and Pulleys, \$150
Super Royal, " " " 165
Imperial, " " " 180

IMPROVED GEARED STANDING PRESS, WITH TWO SCREWS.



Many combination Screw Standing Presses have been offered to the trade, but we believe the above is more simple, strong and powerful, and less liable to get out of repair than any heretofore in use.

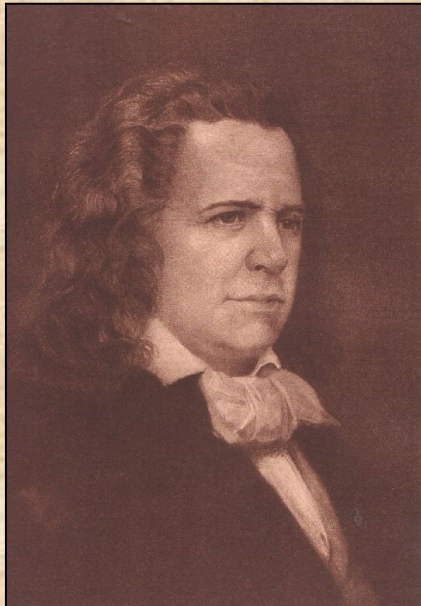
Double Medium Size, . . . \$350.

SIZES AND PRICES.

8 inch Ram, with Single Pump, Platen 28 by 28 inches	.....	\$ 800
10 " " " " 40 " 28 " "	.....	1000
12 " " " " 45 " 32 " "	.....	1250

With separate cylinders, \$50 extra. Larger and smaller sizes to order. Also made to work by steam power, with one or more pumps.

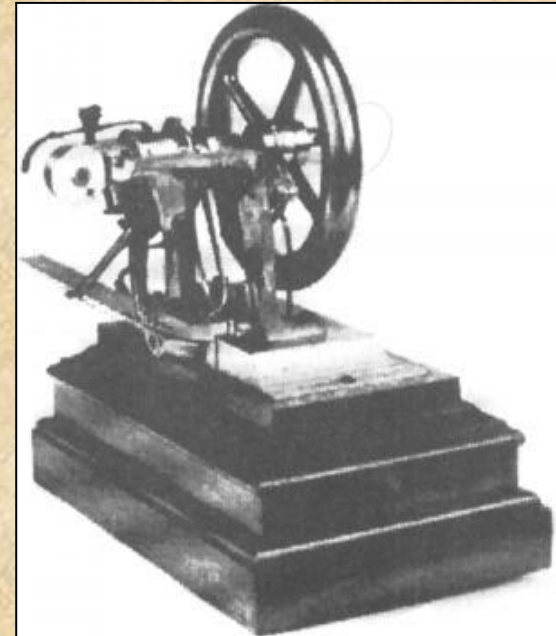
Elias Howe & Isaac Singer and the sewing machine



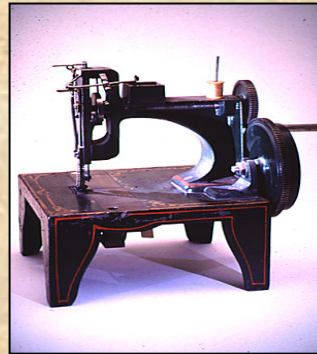
Elias Howe



Isaac Singer



Elias Howe invented the first practical sewing machine in 1845, but was unable to successfully market the product in the U.S. or abroad. Upon his return from Europe many designers modified his machine, the most successful of which was Issac Singer, who was able to sell them commercially on a large scale.



No. 11 July 24, '69

THE UNITED STATES
Sewing Machine Company

**TWELVE DOLLAR
FAMILY SEWING MACHINE**

Something Entirely New! Invented in 1869.

In the elegance and beauty of its finish, the wonderful simplicity of its construction, the certainty of its operation, and the quality of its work, it stands entirely without a rival in the Sewing Machine world.

FULLY WARRANTED FOR FIVE YEARS.

TEN REASONS

WHY THE UNITED STATES TWELVE DOLLAR FAMILY SEWING MACHINE IS SUPERIOR TO ALL OTHERS.

- 1st. They are the simplest Sewing Machine ever constructed, and are consequently less liable to get out of order than any other.
- 2d. They are the best of Thread, Silk or Wool, from the finest to the coarsest, directly from the spool, without twisting or pulling.
- 3d. They draw the Thread, Quilt, Cloth, Cotton, and Wool, in the most regular manner, and can be adjusted to sew all kinds of goods from the finest thread to the coarsest of any fabric, without any change of mechanism.
- 4th. They make the ordinary stitch just as quick, as elastic in the most elastic bias, and are universally acknowledged to be the best for all family sewing.
- 5th. They are the best for making a professional article, which is essential in heavy work, all curved needles being liable to break.
- 6th. They are the best for making a professional article, which is essential in heavy work, all curved needles being liable to break.
- 7th. They have an superior like the highest quality of Wheeler & Wilson, Sewer, and they will run without noise at the rate of two thousand stitches per hour.
- 8th. They are so simple to use that the operator need not have to be taken apart to be used.
- 9th. It is not necessary to separate the parts of any of our machines, and a great deal of trouble in this respect, especially in passing seams.
- 10th. A perfect course of Book Sewing Old Law, Sewer, Sewer, Sewer, or do not get out of order by pulling or by turning in the wrong direction.
- 11th. They are the best for making a professional article, which is essential in heavy work, all curved needles being liable to break.
- 12th. They are the best for making a professional article, which is essential in heavy work, all curved needles being liable to break.

At _____ State of _____
County of _____



**"Now I can sew my clothes in half the time."
1853
Singer advertisement**

"I pity those women whose staff is their needle, for, when they lean upon it, it pierces, not their side, but their heart. . . . I think the needle has slain more than the sword of war."
HESY WARD BEECHER.

**GROVER & BAKER'S
CELEBRATED
Family Sewing Machines.**

The **E A S E** with which these machines can be operated is a distinguishable feature.

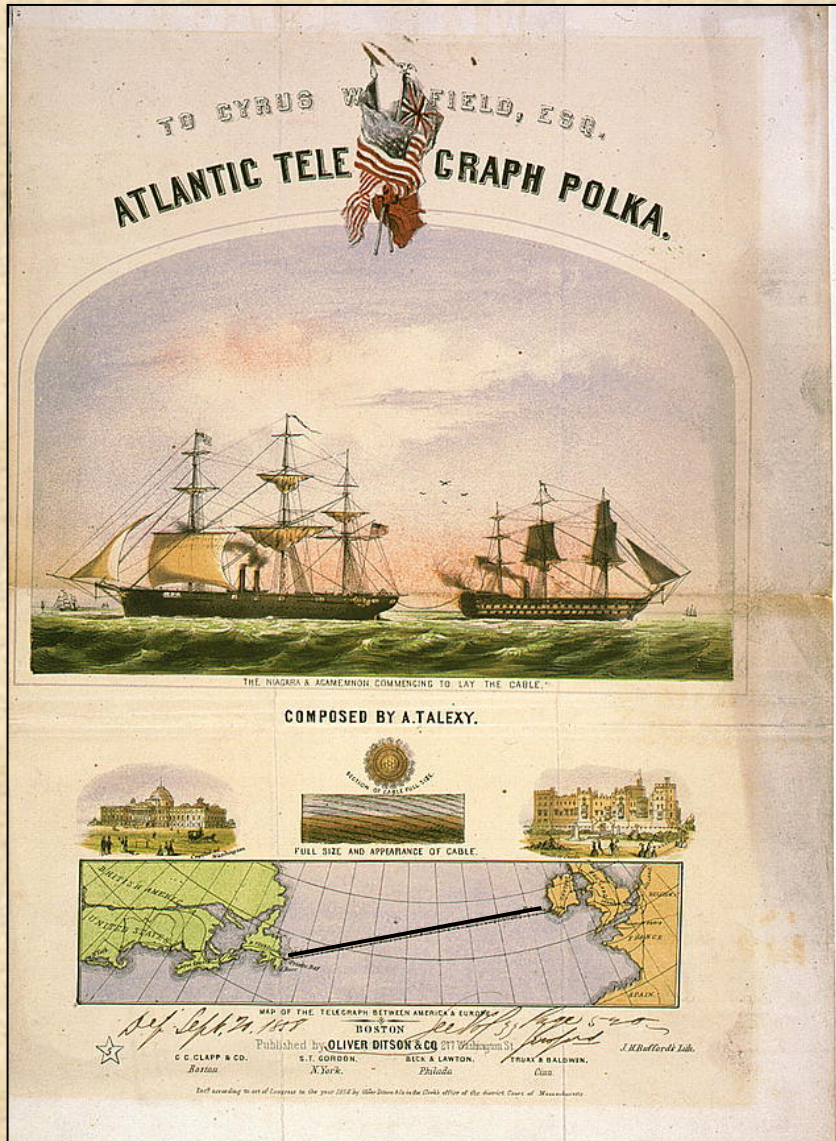
The Scientific American, Nov. 5th, 1859, says: "The machines manufactured by the Grover and Baker Sewing Machine Company are too well known by the public at large to need any recommendations at our hands, and we will simply add that we have had one of them in use in our family for some time past, and it is considered the most useful article in the house, next to the cradle, and no less indispensable than that."

Zion's Herald, Nov. 16th, 1859, says: "We would recommend to families and to those about to organize a homestead, to be sure and have a Family Bible, and also one of Grover & Baker's SEWING MACHINES."

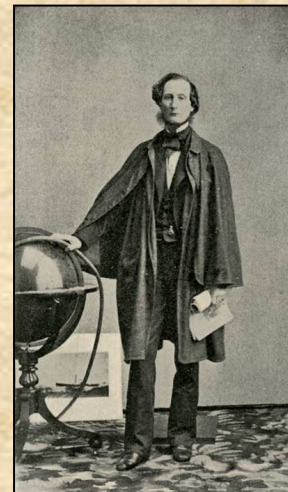
**SALES ROOM IN BOSTON,
18 Summer Street,
495 Broadway,
NEW YORK,
730 Chestnut Street,
PHILADELPHIA,
181 Baltimore Street,
BALTIMORE,
58 West Fourth Street,
CINCINNATI.**

AGENCIES THROUGHOUT THE WORLD.

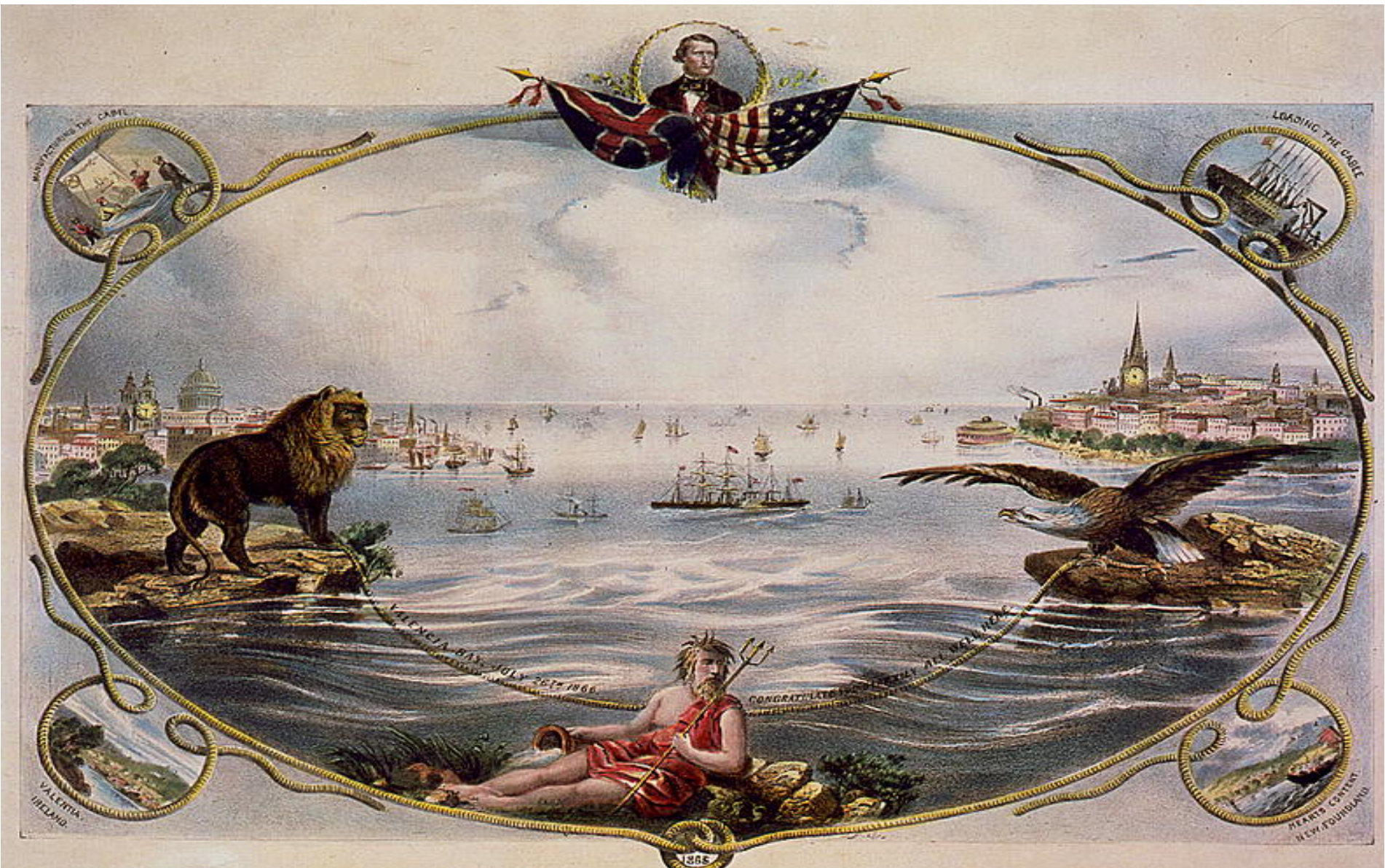
Transatlantic Cable Telegraph



The first cable crossed the Atlantic Ocean from Valentia Island, in western Ireland to Newfoundland. The Transatlantic cable connected North America with Europe, making communication possible in minutes rather than the usual days by ship. A stable connection was established in 1866 and more cables were laid down until the turn of the century.



Cyrus W. Field played a crucial role in coordinating the transatlantic cable telegraph



THE EIGHTH WONDER OF THE WORLD.

THE ATLANTIC CABLE.

Hearts Content, July 27th 1866.

I hope that it will prove a blessing to England, and the United States, and increase the intercourse between our Country & the Eastern Hemisphere.

Your faithfully
Cyrus W. Field.

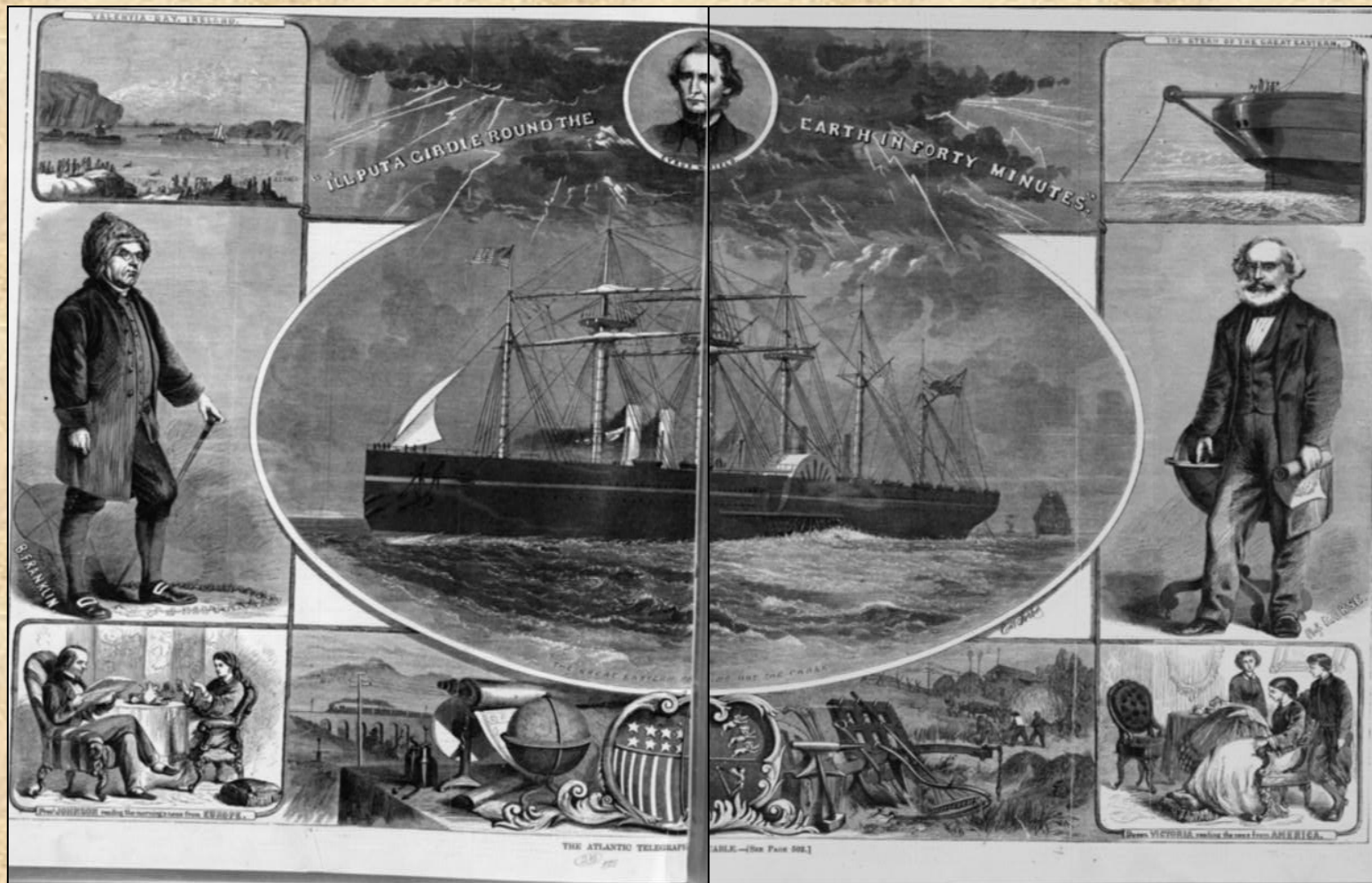
PRINTED BY LAMMEL & FOSTER, 254 256 NASSAU ST. N. Y.

Washington, July 29th 1866.

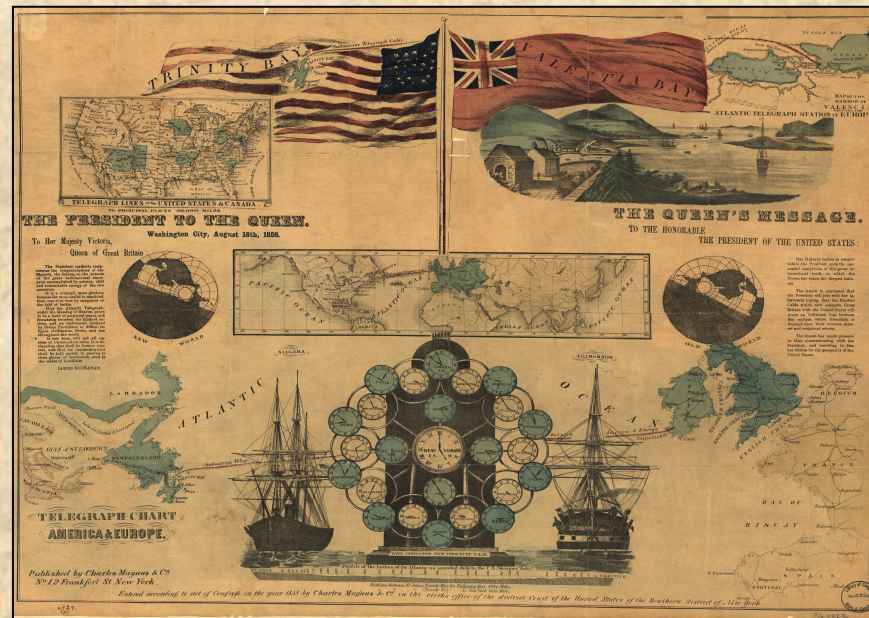
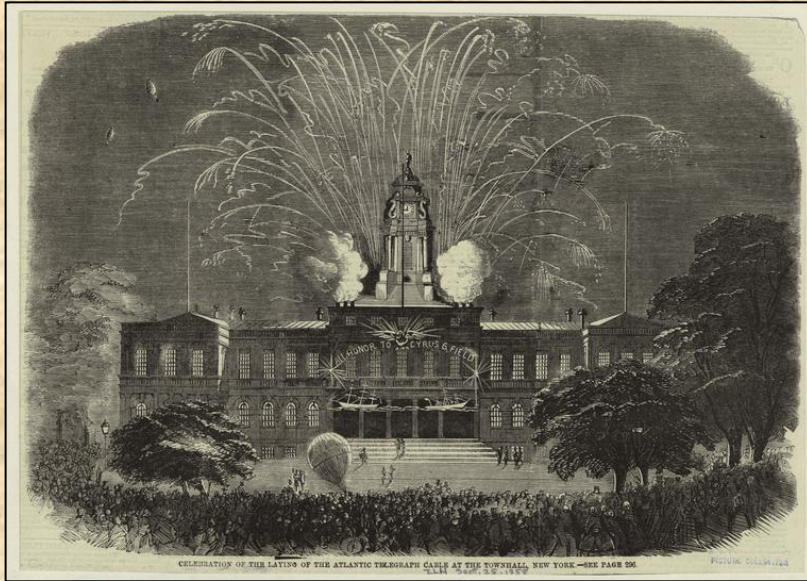
To Cyrus W. Field, Hearts Content: May the Cable, under the sea tend to promote harmony between the Republics of the West and the Governments of the Eastern Hemisphere.

Andrew Johnson

This engraving includes scenes and people related to the laying of the Atlantic telegraph cable and the invention of the telegraph including Benjamin Franklin, Cyrus W. Field & Samuel Morse. President Johnson is shown reading the morning news from Europe, and Queen Victoria reading the news from America with the cable-laying ship at center, 1865.



The completion of the transatlantic cable was celebrated as one of the great events of history



Railroad expansion was the key to the 2nd Industrial Revolution

- ❖ **Importance of the railroad**
- ❖ **Early railroads**
- ❖ **Innovations improved rail transportation**
- ❖ **Transcontinental railroad**
- ❖ **Native Americans**
- ❖ **Chinese laborers**
- ❖ **Impact of the transcontinental railroad**
- ❖ **Key dates in railroad development**
- ❖ **Recent railroad track map**



Why were railroads so important for the industrial growth of the United States?



Prior to the railroad it was difficult for companies to move products to distant locations.



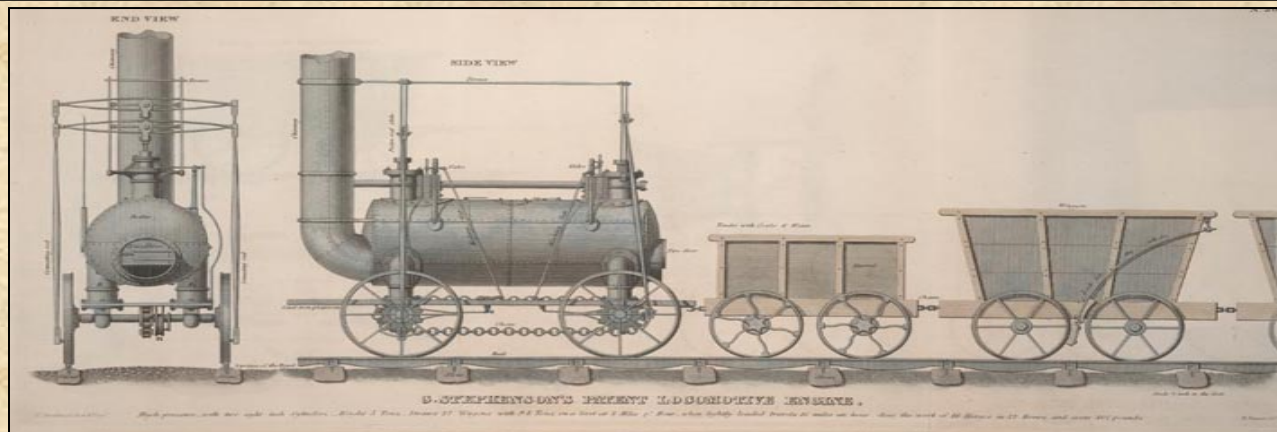
A transportation system was needed to efficiently and cheaply move both raw materials to the factories and the finished goods to the consumers.



River and canal transportation were limited to areas near water routes. In addition, frozen water prevented their use during the winter.



Railroads solved the problems and within a few decades of development, railroads became the most important method of moving goods and people.





Early American trains



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The First Steam Railroad Passenger Train in America.

In 1826 a Charter was granted to the MOHAWK & HUDSON R.R. Co. for a Railroad to run from Albany to Schenectady, N. Y.; 16 miles. In 1830 work was commenced on the Road, which went through the populous towns along the open streets, without restriction or fear of the consequences, and travelled across fields, up hill and down. The land was either given to the Railway Company, or sold for a trifling consideration, and it was finished in 1831. Both Locomotive Engines and Horses were used on the Road, and the tickets were sold at stores or shops, or by the conductor, and the trains proceeded at a very slow rate. Stationary Engines were at the top of the hills, and the train was hauled up hill or let down hill by a strong rope. The brakemen used hand-levers to stop or check the train.

The first Steam Railroad Passenger Excursion Train in America was run on this Road in 1831. The Engine was named "JOHN BULL;" it was imported from England—its weight was 4 tons. The Engineer was John Hampson, an Englishman. There were fifteen passengers on the Train of two coaches, among whom were the following,—(commencing at the rear of the train)

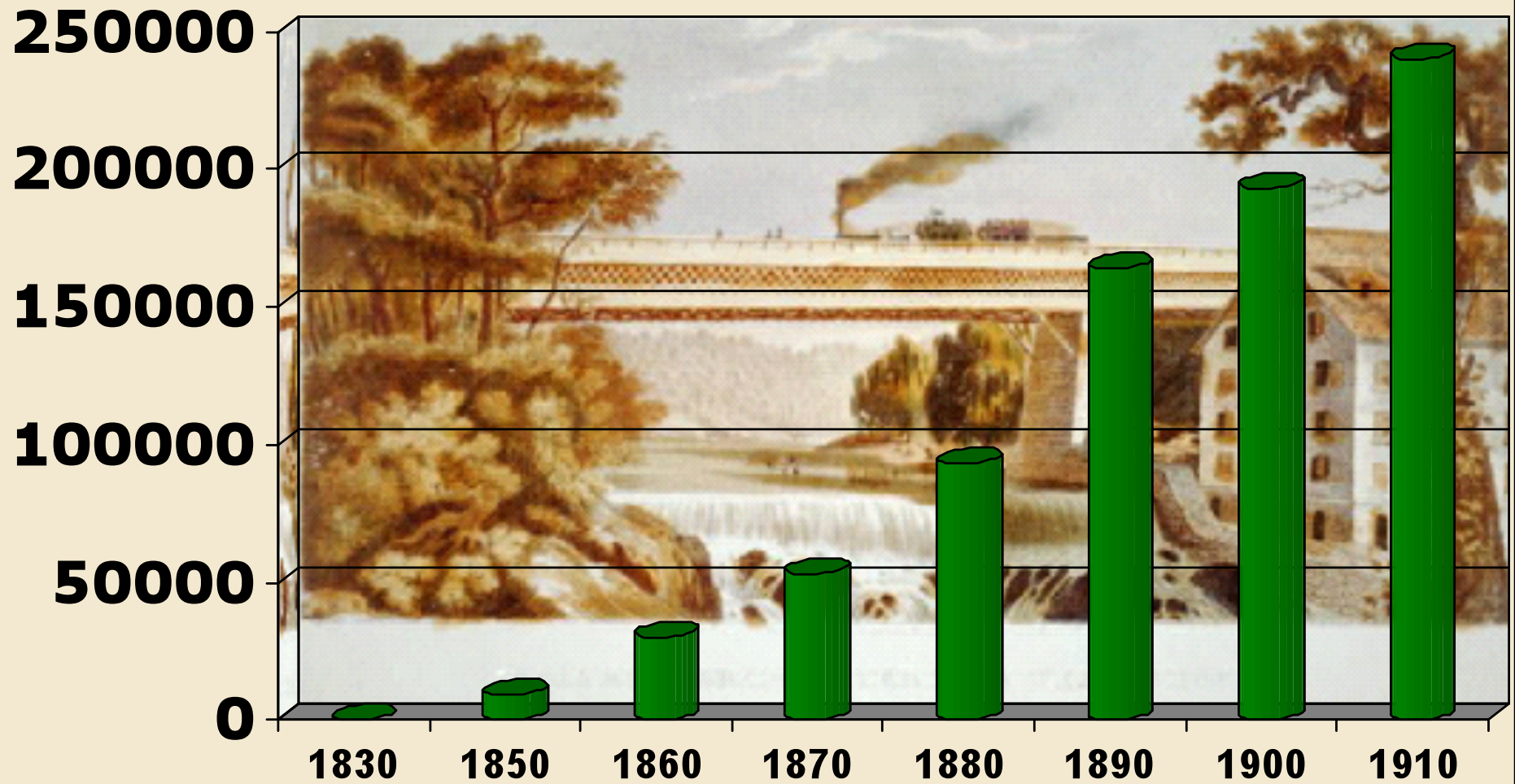
1. UNKNOWN.	6. MAJOR MEGGS, - - - Sheriff.	12. UNKNOWN.
2. LEWIS BENEDICT.	7. UNKNOWN.	13. EX. GOV. JOS. C. YATES.
3. JAMES ALEXANDER, - - - Pres't Commercial Bank.	8. BILLY WINNIS, - - - Penny Postman.	14. UNKNOWN.
4. CHARLES E. DUDLEY, - - Dudley Observatory.	9. UNKNOWN.	15. UNKNOWN.
5. JACOB HAYES, - - - - High Constable of New York.	10. UNKNOWN.	16. JOHN HAMPSON, - - - Engineer.
	11. THURLOW WEED.	

V. 37204

1835 map showing railroads, canals and roads



Railroad track mileage increased at a rapid pace from 1830 to 1910



■ Miles of track

Original Air Line and United States Mail Route!
1857. Summer Arrangement. 1857.

St. LOUIS AND CHICAGO
 AIR LINE
RAILROAD.

The only direct Route from Chicago or Joliet to

ST. LOUIS
 KANSAS AND NEBRASKA,

ALSO TO

Bloomington, Springfield, Jacksonville, Naples, Alton
 AND ALL POINTS SOUTHWEST.

IN DIRECT CONNECTION AT BUFFALO WITH THE
LAKE SHORE AND MICHIGAN SOUTHERN ROUTE
 And **BUFFALO AND LAKE HURON RAILWAY**, and
GREAT WESTERN AND MICHIGAN CENTRAL LINE
 VIA **SUSPENSION BRIDGE**,
 AND THE VARIOUS LINES OF STEAMERS ON LAKE ERIE.

NEW AND IMPORTANT CONNECTIONS ARE ALSO MADE WITH

Peoria and Oquawka Railroad,

For Peoria, Walnut Grove, Washington, Pekin, Brimfield, Elmfield, Knoxville,
 Galosburgh, Monmouth and Burlington, and by the **BURLINGTON and MISSOURI**
RIVER R. R. to Mt. Pleasant, and its connections to all parts of Southern Iowa.

Trains leave Chicago daily, from Depot of Michigan Southern and Rock Island R. R.

At 10.30 A. M. and 10.30 P. M.

(SUNDAYS EXCEPTED.) (DAILY.)

Passengers by this Route make "Direct connections" at ST. LOUIS with Trains on

THE PACIFIC RAILROAD,

AND STEAMERS ON THE MISSOURI RIVER, FOR
KANSAS & NEBRASKA,
 AND ALSO WITH FIRST CLASS STEAMERS FOR
NEW ORLEANS AND ALL POINTS ON THE MISSISSIPPI RIVER.

Fare and Freight as Low as by any other Route.

THROUGH TICKETS

By this AIR LINE ROUTE can be obtained at all the Railroad and Steam-
 boat Offices in the Eastern States.

THROUGH FREIGHTS VIA CHICAGO OR JOLIET,
 Contracted at the Lowest Rates, at all the Principal Eastern Railroad and Shipping
 Offices, and For warded with Dispatch.

E. M. GOODRICH,
 Gen. Eastern Agent.

A. H. MOORE,
 General Sup't,
 Bloomington, Ill.

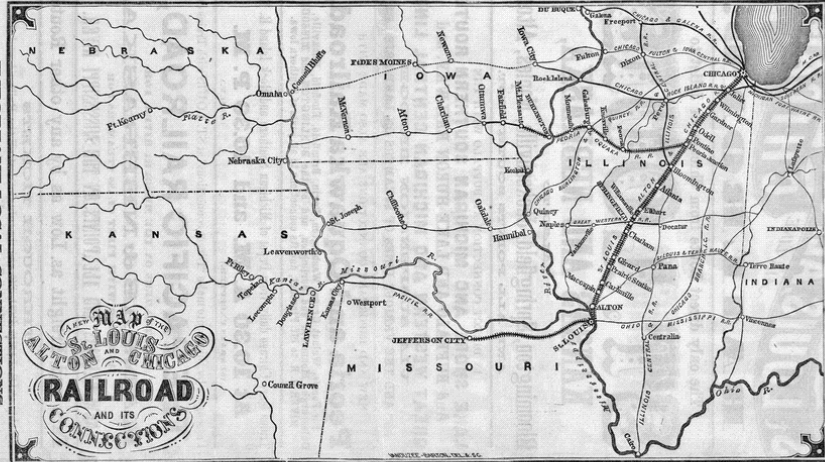
[SEE OTHER SIDE.]

BAGGAGE RE-CHECKED AT CHICAGO & TRANSPORTED FREE FROM DEPOT OF MICHIGAN CENT'L R. R.

NO CHANGE OF CARS OR BAGGAGE FROM CHICAGO TO ST. LOUIS...THROUGH TIME, 13 HOURS.

Large quantities of Cheap and Valuable Farming Lands yet to be obtained

IMPORTANT LOCAL CONNECTIONS.
 AT BLOOMINGTON with Illinois Central Railroad, North and South.
 AT PEORIA JUNCTION with Peoria and Oquawka Railroad to all points on the Line of that
 and Burlington and Missouri River R. R. in Iowa.
 AT ST. LOUIS with Peoria and Oquawka Railroad to Peoria, Jacksonville, Naples and Alton River.
 AT ALTON with Daily Lines of Packets for Hannibal, Quincy and Keokuk; the most Expeditious
 and Reliable Route to all portions of Northwestern Missouri.
 AT ST. LOUIS with Trains on the Peoria and Oquawka Railroad, on Missouri River for
KANSAS AND NEBRASKA.
 And also with First Class Steamers for Cairo, New Orleans and all points on Mississippi River.



SHORTEST AND MOST DIRECT ROUTE TO
 BLOOMINGTON, SPRINGFIELD, JACKSONVILLE, NAPLES, ALTON,
ST. LOUIS
 KANSAS AND NEBRASKA, AND ALL PARTS OF THE SOUTHWEST.

Along the Line of this Road. Apply at General Land Office, 48 Dearborn Street, Chicago.

PRODUCTS WILL PAY FOR LAND AND IMPROVEMENTS!

MILLIONS OF ACRES

View on the Big Blue, between Camden and Crest, representing Valley and Rolling Prairie Land in Nebraska.

IOWA AND NEBRASKA
LANDS
 FOR SALE ON **10 YEARS CREDIT**
 BY THE
Burlington & Missouri River R.R. Co.

AT 6 PER CT. INTEREST AND LOW PRICES.
 Only One-Seventh of Principal Due Annually, beginning Four Years after purchase.
 20 PER CENT. DEDUCTED FROM 10 YEARS PRICE, FOR CASH.

LAND EXPLORING TICKETS SOLD
 and Cost allowed in First-Interest paid, on Land bought in 30 days from date of ticket.
 Thus our Land Traders GET A FREE PASS in the State where the Land bought is located.
 These FREE EXCURSION TICKETS GO to St. Louis to government United States Land of \$50.00 per Acre.
 EXTRAORDINARY INDUCEMENTS ON FREIGHT AND PASSAGE ARE AFFORDED TO PURCHASERS AND THEIR FAMILIES.

Address **GEO. S. HARRIS, LAND COMMISSIONER,**
 or **T. H. LEAVITT, Ass't Land Comm'r,** Burlington, Iowa.
 Or apply to
FREE ROOMS for buyers to board themselves are provided at Burlington and Lincoln.

Innovations led to the creation of an efficient rail network in the United States



The width of the rail tracts (gauge) was standardized which allowed trains from different railroads to switch tracks.



Four standardized time zones were created for the entire nation in 1883. This made it possible to create train arrival and departure times across the country.



Steel rails replaced iron rails, which could carry heavier loads.

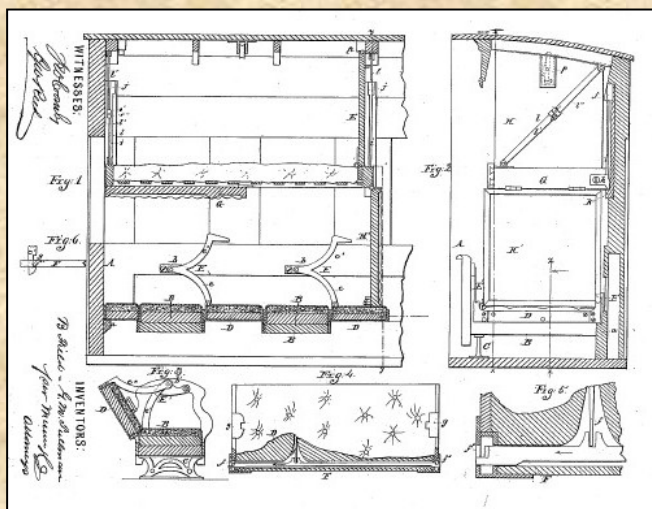
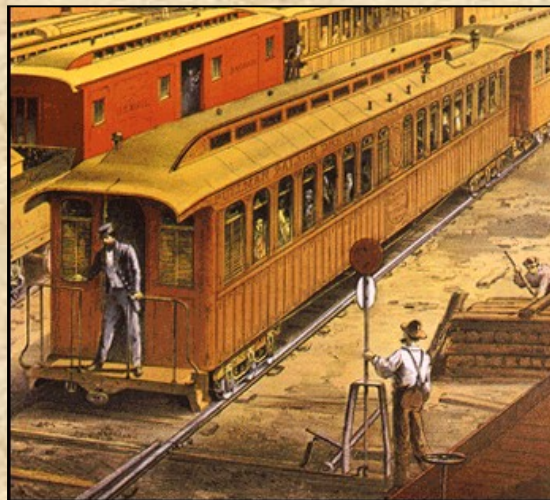
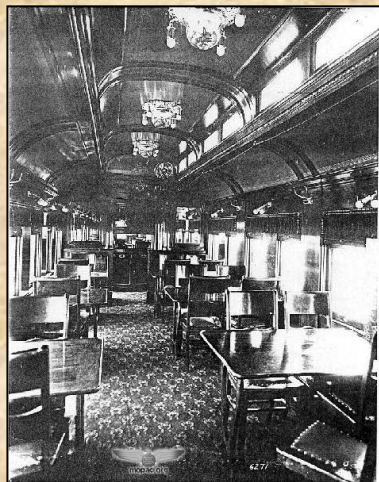


The state and federal governments gave railroads huge grants of land amounting to over 180 million acres. This provided an incentive to build more lines and encouraged settlement.



George Westinghouse patented the first automatic air brake, which made train travel much safer.

George Pullman designed a sleeping car including the services of supplying the linens, housekeeping, and attendants for the sleeping cars, making train travel much more comfortable. Pullman's car gained much attention after it housed President's Lincoln's body through 8 states during the funeral procession.



**Westinghouse
Air Brake Co.
Westinghouse Co. Works
(Casting Scene)**

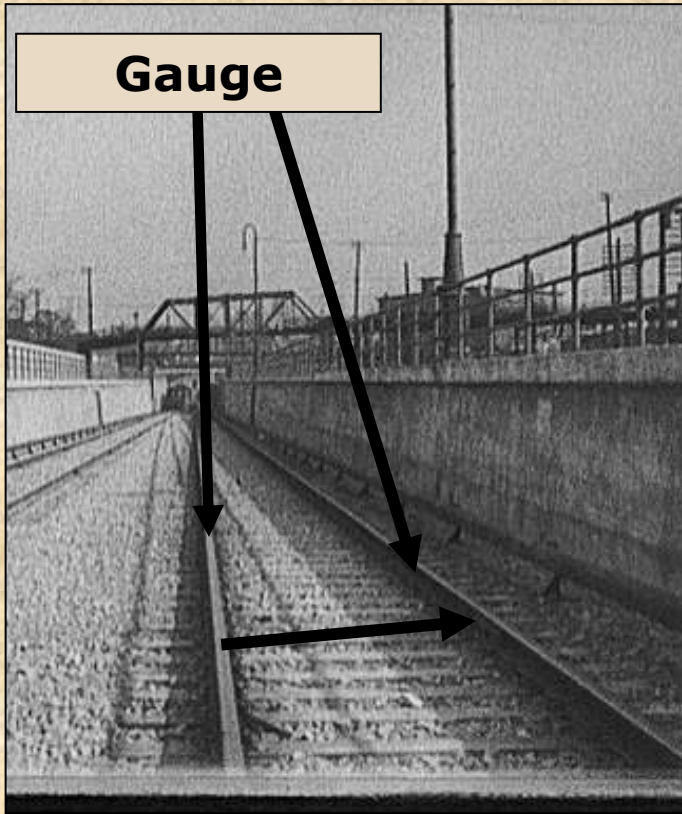
**©July 23, 1904
American Mutoscope
& Biograph Company**

**Fast Mail,
Northern Pacific R.R.**

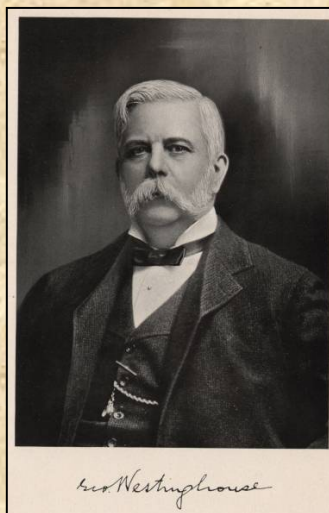
©December 6, 1897

Thomas A. Edison

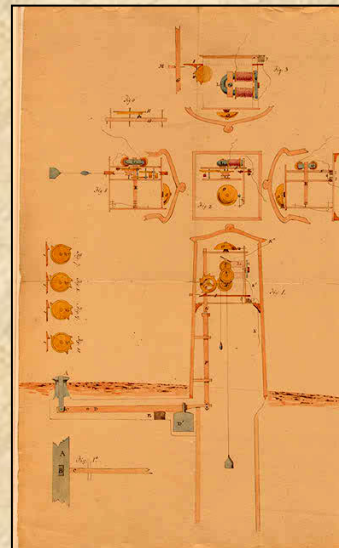
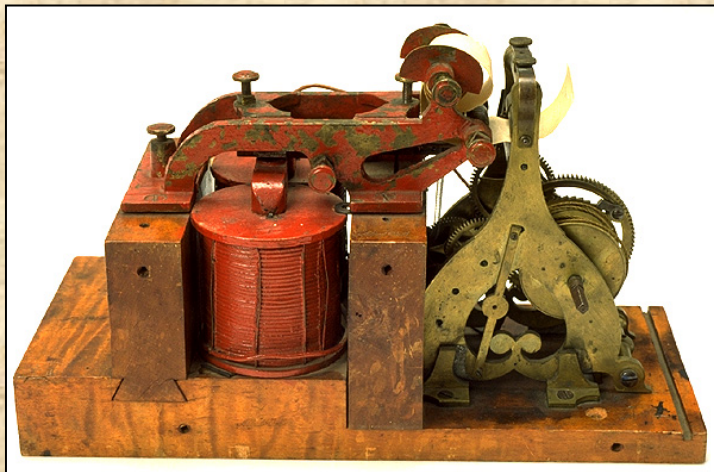
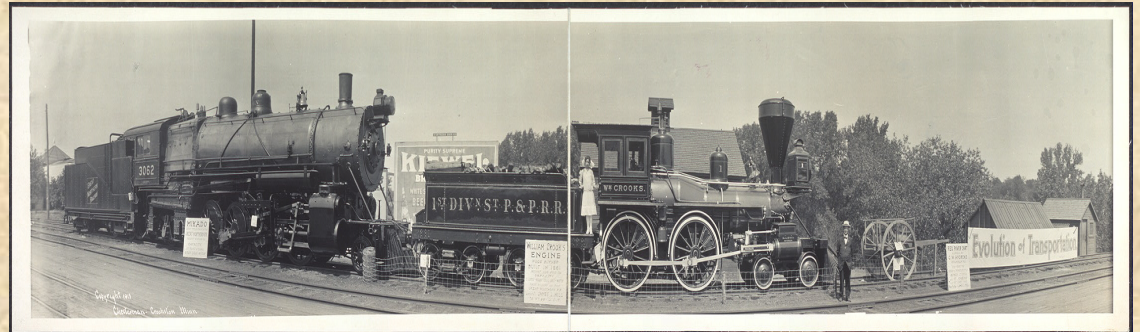
Four standardized time zones replaced the original 100 on November 18, 1883, which made scheduling much easier



George Westinghouse created a better braking system based on compressed air which revolutionized the train industry



Operation of railroads depended on the use of the telegraph to communicate location and prevent collisions



Transcontinental Railroad

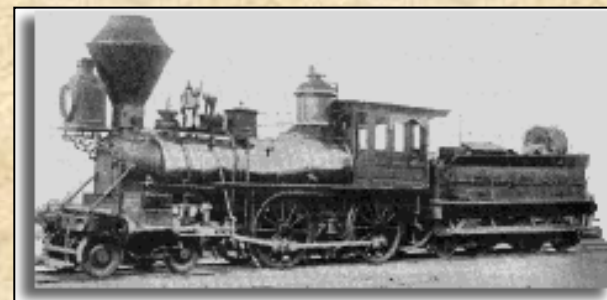
The goal of building a transcontinental railroad was addressed by the antebellum Congress beginning in 1838.

Various plans and routes were proposed because the North and the South each wanted the route to start in their own section.



1855 map showing a proposed Pacific Railroad route commissioned by then Secretary of War Jefferson Davis

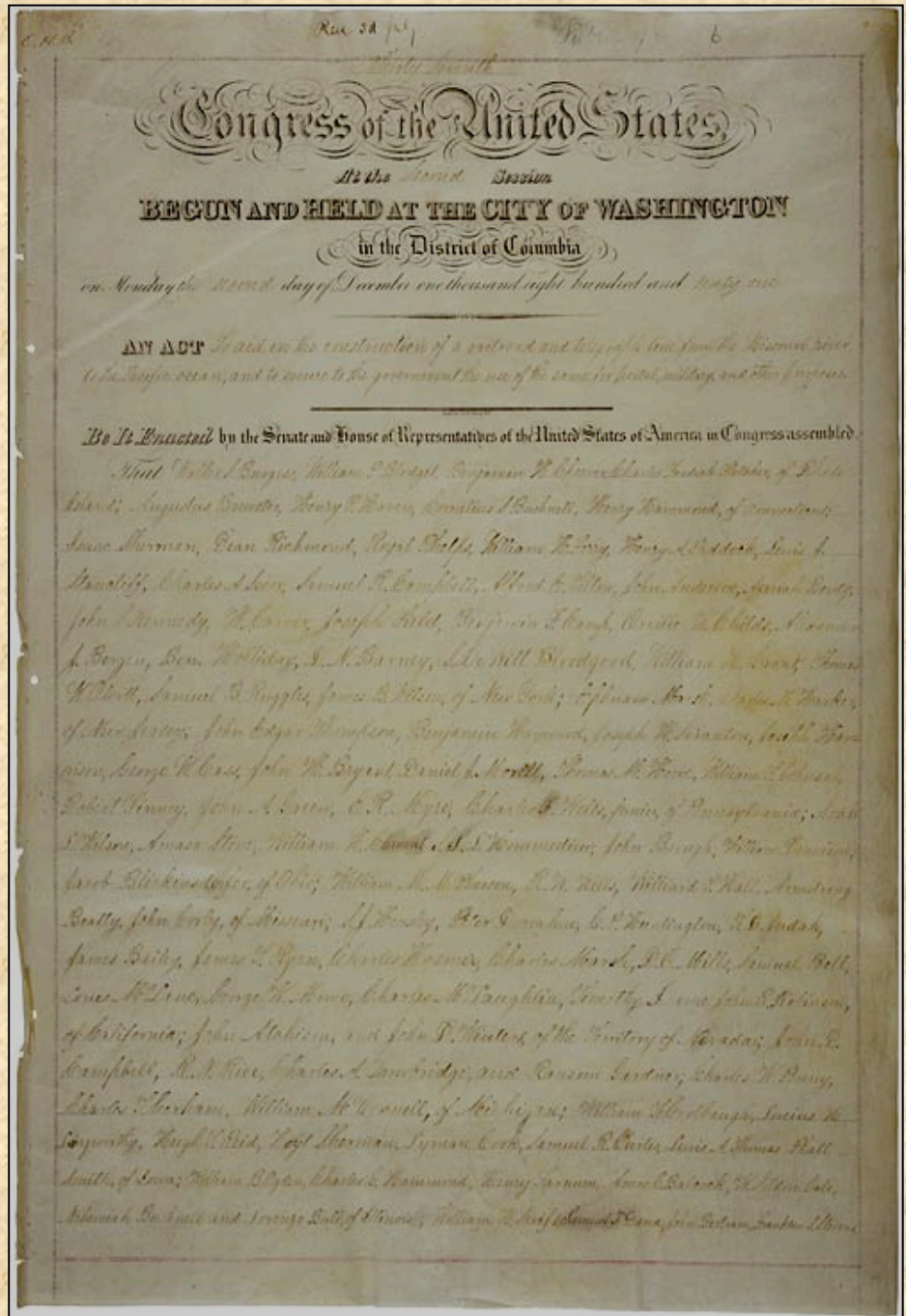
The secession of the southern states in 1861 cleared the way for construction to begin in the North. During the Civil War Congress approved a northern route that would connect Omaha, Nebraska with Sacramento, California. The lines were to be built by the Central Pacific in California and the Union Pacific from the Missouri River west.



Pacific Railway Acts

In 1862 and 1864 the federal government passed the Pacific Railway Acts.

These two acts permitted the government to make grants of public land to private corporations for the construction of a trans-continental railroad. The grants stipulated that for every mile of track laid, the government would grant to private railroad corporations 20 sections of public land (12,800 acres). In addition to the land grants the government guaranteed a payment of \$48,000 for every mile of track built in mountainous terrain and promised low interest loans.



Native Americans and the railroad

The land granted to the railroad companies was often times occupied by Native Americans.

Indian raiding parties would attack construction workers, pull up rails, and other forms of sabotage.

Native Americans were upset by the hunting of buffalo and occupation of their land.

Ultimately this struggle was won by the railroad companies.



Chinese workers played an essential role in the completion of the railroad

A few factors led to the need for more labor on the Central Pacific line.

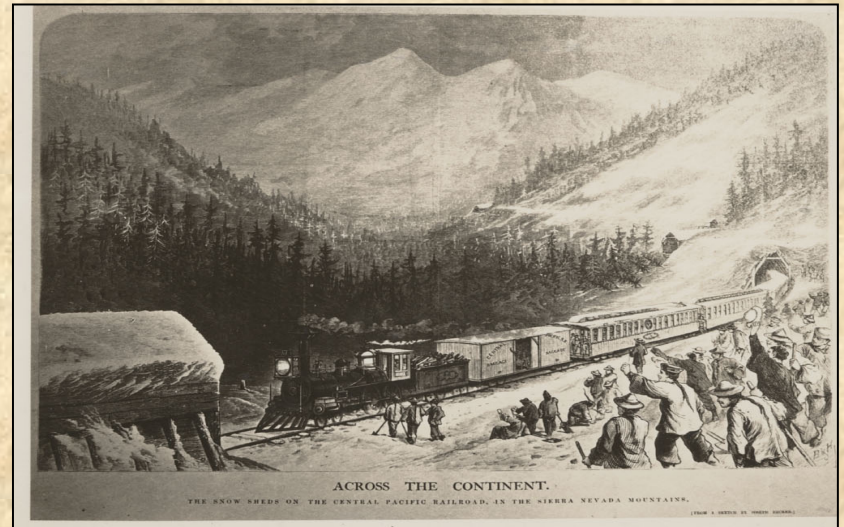
First, a silver rush in Nevada drew away many workers. Second, the white workers often went on strike for higher wages. Third, the completion deadline was rapidly approaching.

Charles Crocker convinced his partners to hire the Chinese, many of whom had emigrated during the Gold Rush in the 1840s.



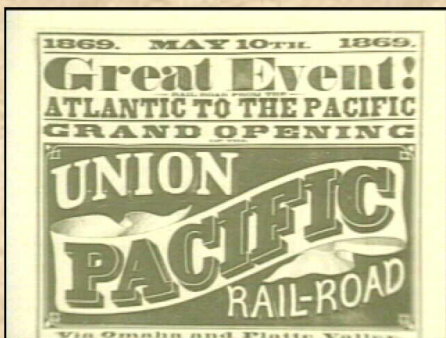
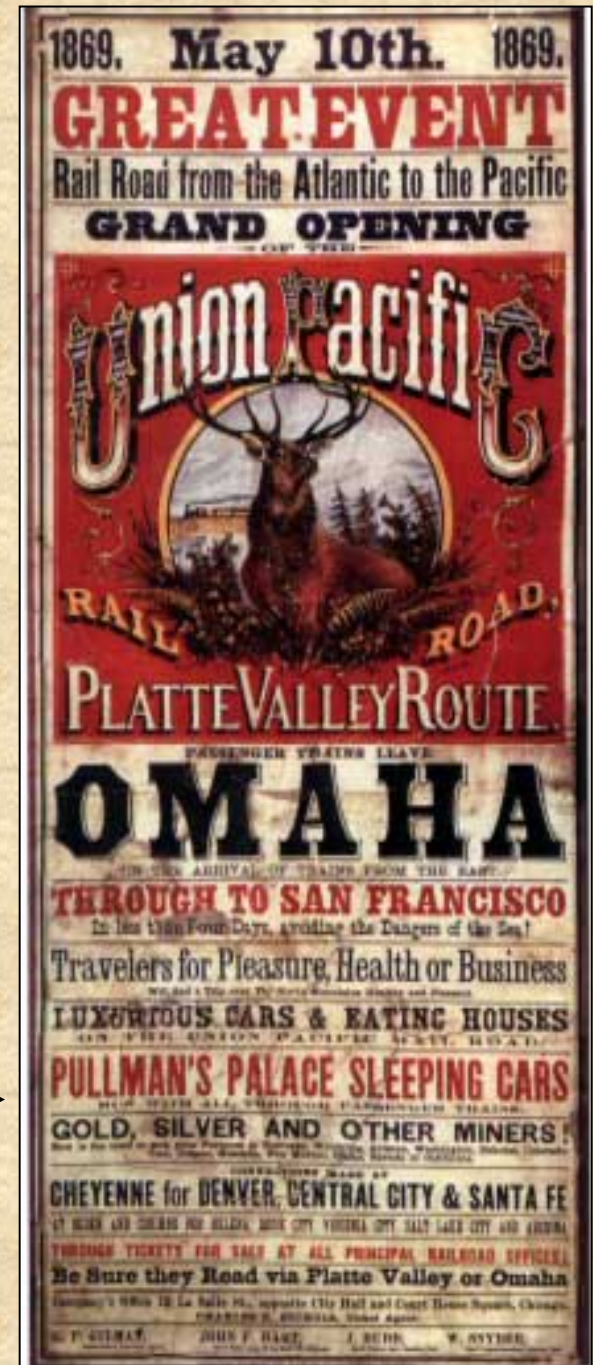
Chinese laborers

Building the railroad was extremely difficult labor done mostly by hand. Rail beds were created with pickaxes, hammers, and crowbars. Dirt and rock had to be carried away in baskets and carts. Tree stumps were rooted out, tracks laid, spikes driven, aqueducts and tunnels constructed. The ridges in the Sierra Nevada mountains, where tracks had to be laid, were 2,000 feet above the valley. Chinese laborers were lowered in baskets to hammer at solid shale and granite and insert dynamite. Much of the work on this passage was completed during the winter of 1865-1866, by 3,000 workers who lived and worked in tunnels dug beneath 40-foot snowdrifts. Accidents, avalanches, and explosions left an estimated 1,200 Chinese immigrant workers dead.





Visiting the railroad construction site at the 100th meridian, 1866



Posters celebrating the completion of the railroad

Meeting of the Union Pacific and Central Pacific at Promontory Mountain in southern Utah in 1869



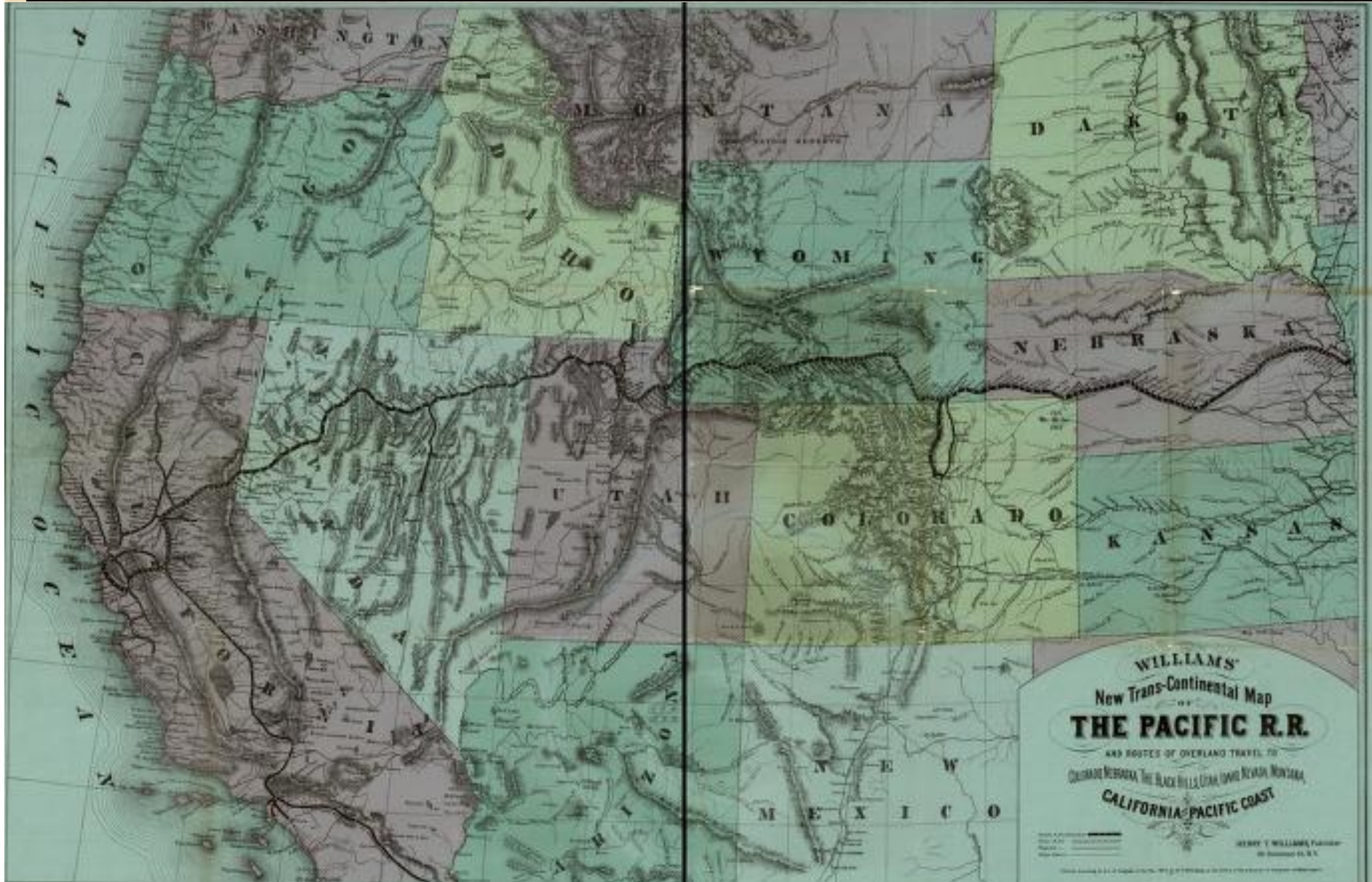
After much hardship the transcontinental railroad was completed in 1869, several years ahead of schedule.

Because the railroad was built so fast and with inferior materials, the whole route had to be replaced fifteen years later.



1883 train

1877 transcontinental map of the Pacific R.R. and routes of overland travel to Colorado, Nebraska, the Black Hills, Utah, Idaho, Nevada, Montana, California and the Pacific Coast



Impact of the transcontinental railroad

The completion of the transcontinental railroad changed the nation. The East and West were now united.

The nationwide railroad allowed for delivery in a much shorter time period. Items that had taken months to move could be sent in a matter of days at a fraction of the cost.

Western products like agriculture, coal, and other minerals could be moved easily to the east coast. Passengers and freight from the east coast could reach the west coast in a matter of days instead of months at cheap prices.

Many people began settling in western areas. The 1890 Census showed new migration patterns and settlement. Many historians cite the transcontinental railroad as a major factor in the closing of the western frontier.

Blandys Portable Steam Engine and Saw Mills, Zanesville & Newark, Ohio



This is the Portable Engine and Saw Mill, the most perfect and useful of the kind ever invented. It is the only one of the kind that can be taken to any part of the country, and will run on any kind of fuel. It is the only one of the kind that can be used in any part of the country, and will run on any kind of fuel. It is the only one of the kind that can be used in any part of the country, and will run on any kind of fuel.

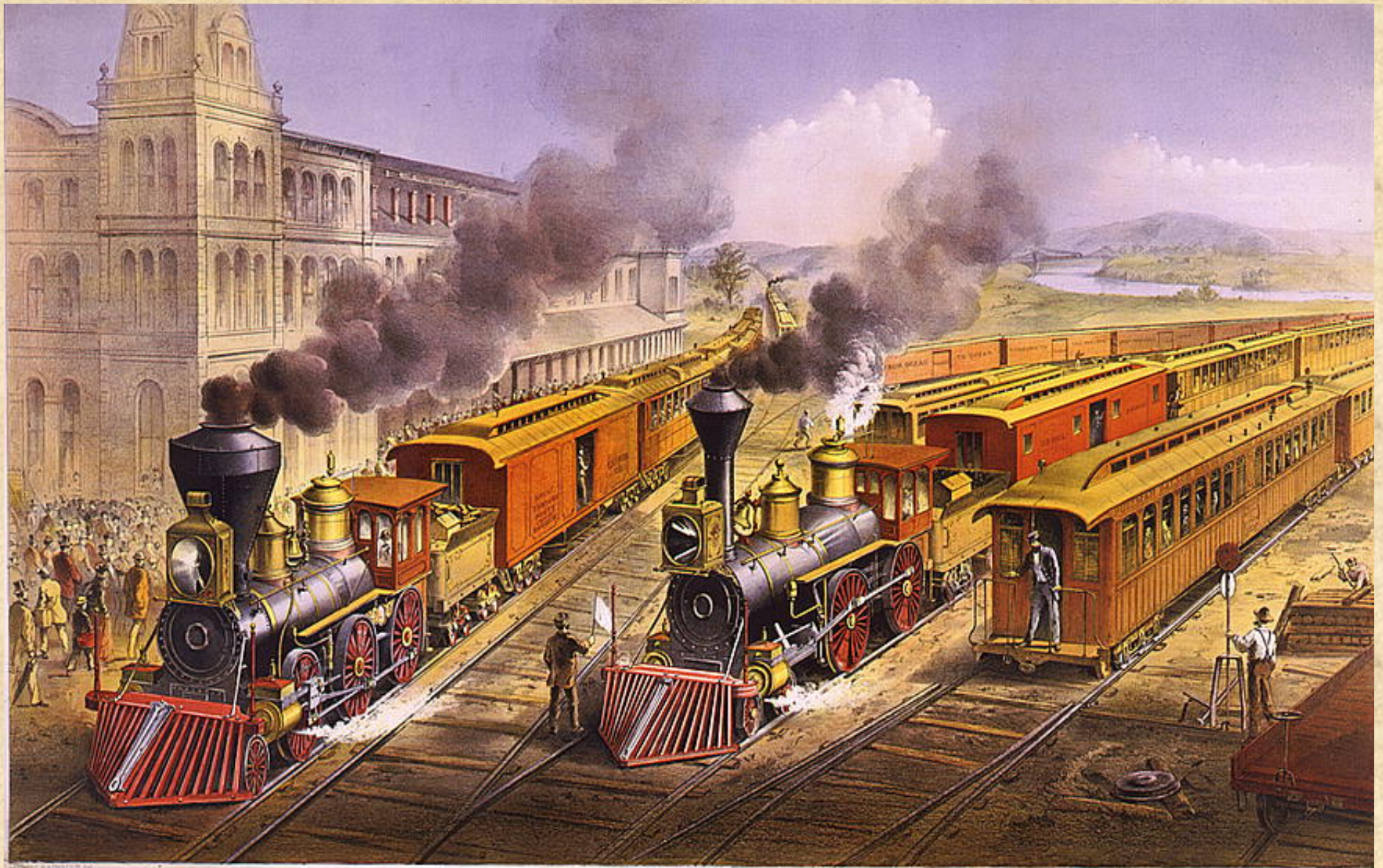
Blandys' Machine Works are equipped for all purposes. They are capable of turning out any kind of machinery and saw mills of any size.

Blandys' Portable Steam Engine and Saw Mill are the most perfect and useful of the kind ever invented. They are the only ones of the kind that can be taken to any part of the country, and will run on any kind of fuel. They are the only ones of the kind that can be used in any part of the country, and will run on any kind of fuel.

Manufacturers of the Portable Steam Engine and Saw Mill, the most perfect and useful of the kind ever invented. They are the only ones of the kind that can be taken to any part of the country, and will run on any kind of fuel. They are the only ones of the kind that can be used in any part of the country, and will run on any kind of fuel.

H. & F. BLANDY
ZANESVILLE
& NEWARK, OHIO.

Blandys' Portable Steam Engine and Saw Mill are the most perfect and useful of the kind ever invented. They are the only ones of the kind that can be taken to any part of the country, and will run on any kind of fuel. They are the only ones of the kind that can be used in any part of the country, and will run on any kind of fuel.



AMERICAN RAILROAD SCENE:
LIGHTNING EXPRESS TRAINS LEAVING THE JUNCTION.

1874



NEW YORK, PUBLISHED BY HENRIE & SONS, 109 NASSAU ST.

KEY DATES IN THE HISTORY OF THE RAILROADS IN THE U.S.

- 1804 - Oliver Evans, builds the first American locomotive.**
- 1830 - First steam locomotive, The Best Friend of Charleston, put into service on the South Carolina Railroad.**
- 1830 - First common-carrier railroad on the Baltimore & Ohio.**
- 1831 - First mail carried on railroad in South Carolina.**
- 1851 - First train reaches Lake Erie.**
- 1852 - First train reaches Chicago from the East.**
- 1858 - First Pullman sleeping car goes into operation.**
- 1863 - First successful rail labor union, Brotherhood of the Footboard.**
- 1869 - First transcontinental railway completed.**
- 1869 - Westinghouse patents air brake.**
- 1870 - First train traveled coast to coast, Boston-San Francisco.**
- 1875 - First parlor car by Pullman.**
- 1883 - Standard time zones adopted.**
- 1885 - Janney automatic coupler approved.**
- 1893 - Federal law requires air brakes and automatic couplers.**

Railroads in 2000



Mechanization of Agriculture

- ❖ **Major causes of mechanization of agriculture**
- ❖ **Westward expansion**
- ❖ **Major inventions**
- ❖ **Increased farm productivity**
- ❖ **Scientific research**
- ❖ **Farmers affected by new technologies**



Between 1860 and 1890, the U.S. changed dramatically in many ways. The population more than doubled and agricultural output far exceeded any earlier period.

The American farmer was able to produce enough agricultural products not only for the increased demand but also enough surpluses for export in wheat, corn, cotton, beef, pork, and wool for these reasons:

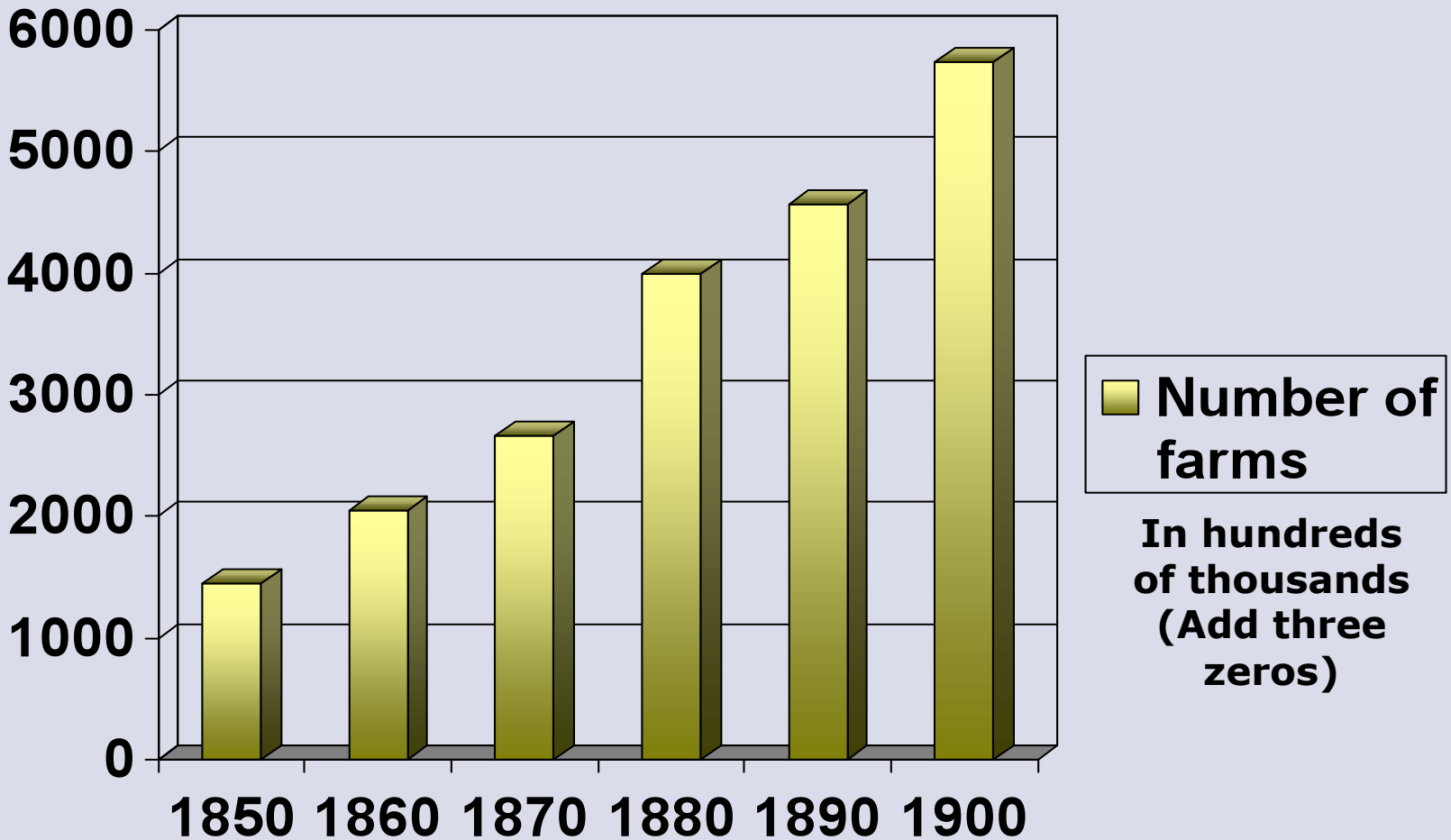
- 1. Westward expansion increased the amount of farmland**
- 2. New farming machinery**
- 3. Scientific research at land grant colleges led to agricultural advancements**

This poster illustrates the movement of farmers into the west

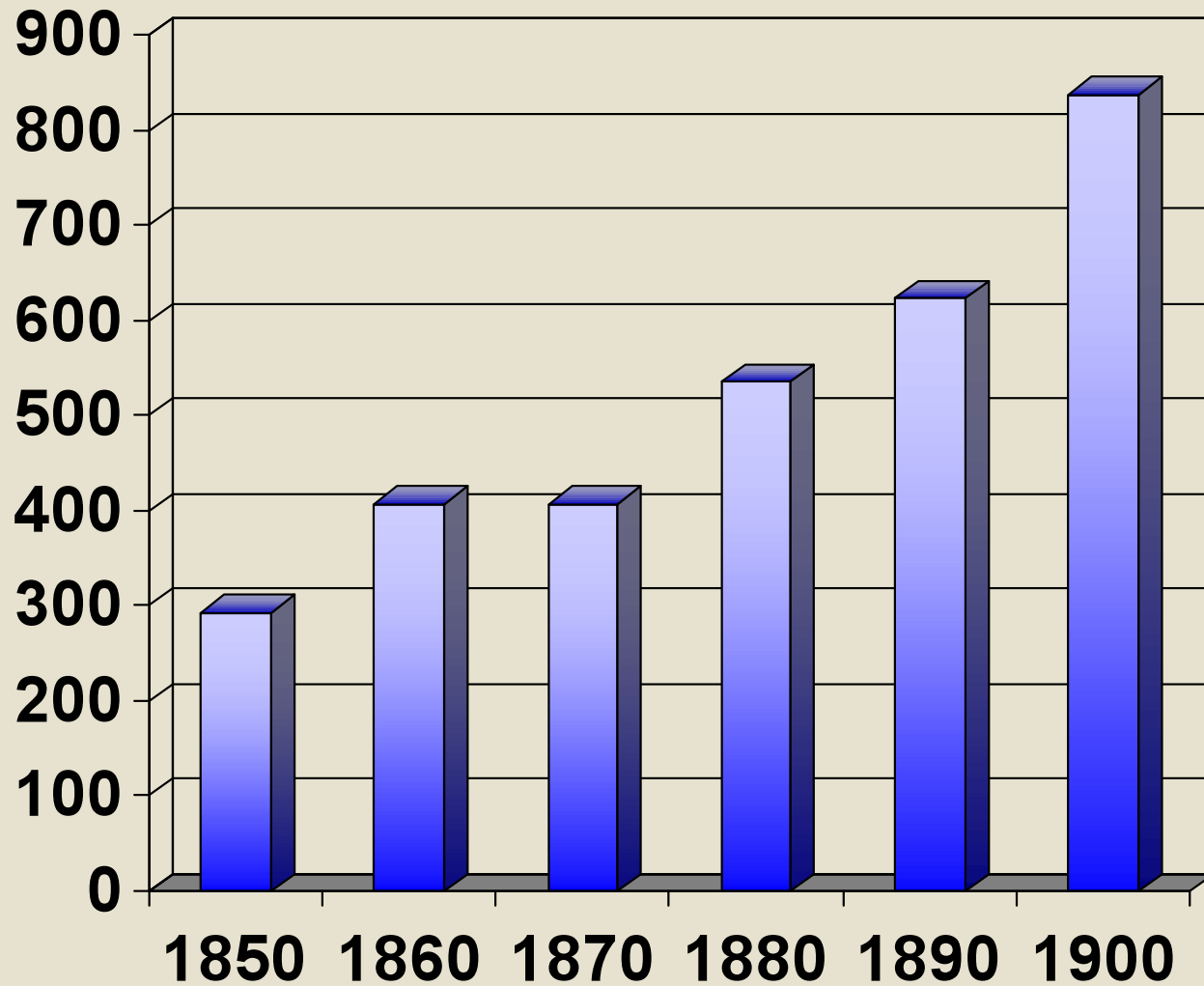


What was only a few years ago the grazing ground of the buffalo's is now the home of the McCormick.

Growth in the number of farms in the U.S.



Growth of farm acreage in millions



■ Acres of farmland

Add six zeros
(In millions)

New inventions led to the mechanization of agriculture

There were hundreds of inventions that increased output for farmers beginning in the 1840s. Major new machinery included:

Reapers
Automatic wire binder

Threshing machine
Mechanical planter
Mechanical cutter
Huskers and shellers

Cream separators
Manure spreaders

Potato planters

Hay driers
Poultry incubators

was awarded the first premium at the Roanoke and Tar River Agricultural Fair, Nov., 1883, where it shelled over three barrels of Corn, (ears) without leaving a grain on a cob. We use a larger balance wheel than that shown in cut, which, together with the fact that all the boxes are bored out smooth and true, makes it the **LIGHTEST RUNNING OF ALL.**

WHITE'S NEW DOUBLE SPOUT SHELLER.

We have just completed a new set of patterns for our Double Spout Sheller, and offer it as the most complete, effective and durable of any on the market. It is provided with two spouts to take two ears of corn at a time. It is scientifically geared and arranged in all its parts, which, together with its heavy balance wheel will run twenty-five per cent. lighter than other similar Shellers. As shown in cut it is provided with a Separator Attachment for taking out small imperfect grains and discharging the cobs at outer end of Separator. This Sheller has a crank for hand power on one side and a pulley on opposite side for steam or horse power. It is strongly and substantially made, and the shafts are turned and the wheel bored the same size in all so that if repairs are needed they are certain to fit. Capacity by hand 400 to 500 bushels per day. Capacity by power 500 to 600 bus. per day. Price without Separator, \$18.00. Price with Separator, \$22.00.

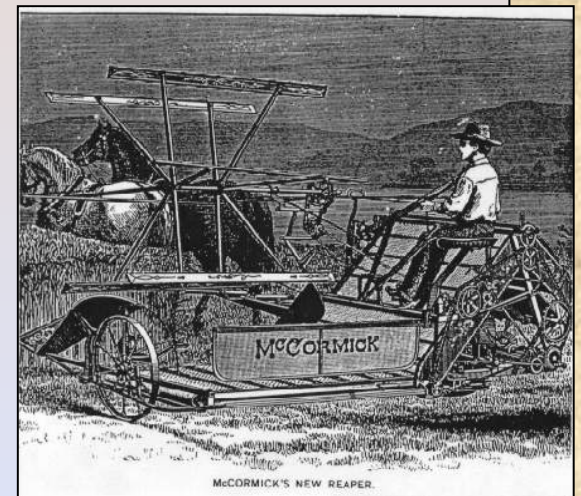


WHITE'S SUPERIOR SINGLE SPOUT SHELLER.

Price, One Wheel.....\$8.00 | Price Two Wheel.....\$8.50

SINCLAIR PATTERN SINGLE SPOUT SHELLER.

Is similar in construction to the Superior, but lighter. Price, One Wheel, \$7.00. Two Wheel, \$7.50. Reading Power Sheller, plain, \$55.00. Reading Sheller, with Fan, \$80.00.

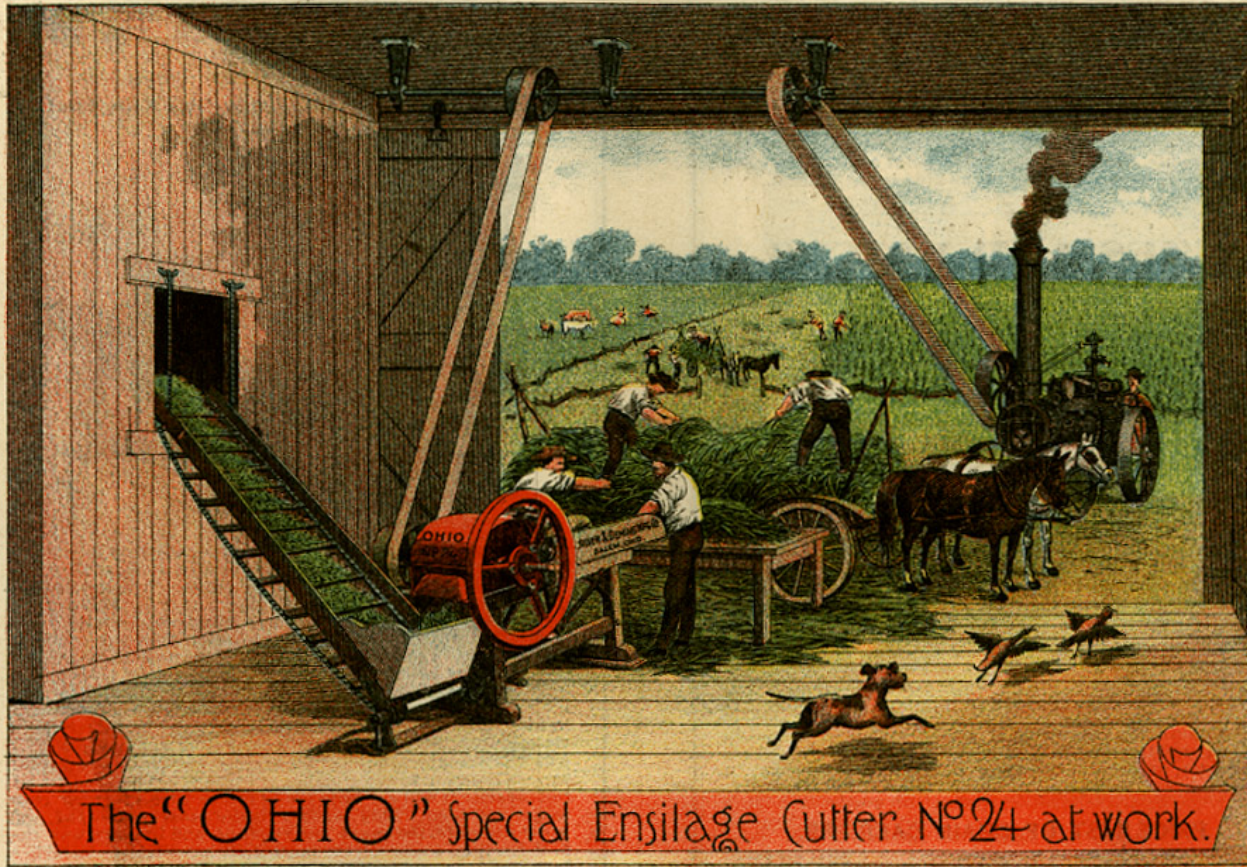


McCORMICK'S NEW REAPER.

Mechanical Cutter

ILLUSTRATED AND DESCRIPTIVE CATALOGUE

WE WILL MAIL ON APPLICATION OUR



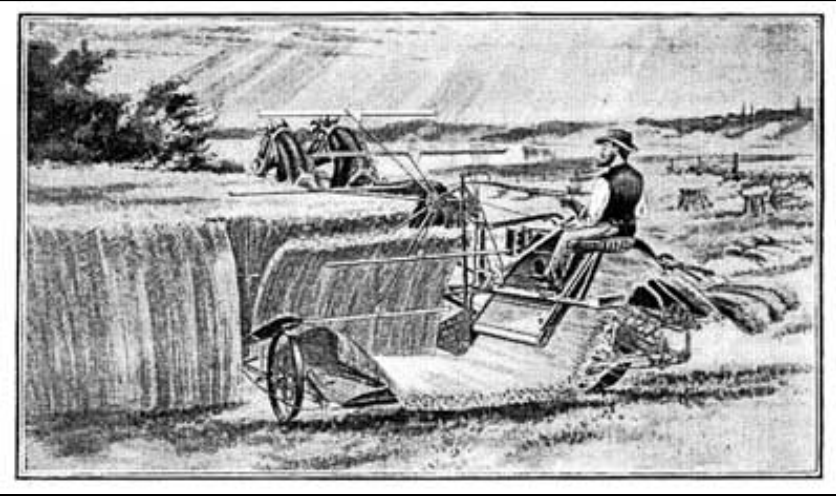
AND TREATISE ON SILOS AND ENSILAGE.

The "OHIO" Special Ensilage Cutter No. 24 at work.

WE CHALLENGE THE WORLD TO PRODUCE THE EQUAL
OF THIS CUTTER IN POINT OF CAPACITY, DURABILITY,
CONVENIENCE AND MECHANICAL WORKMANSHIP.

The binder or reaper-binder, improved upon the reaper. Not only were grains cut, they were also tied into bundles, and stacked to dry.

Early binders used wire but there were too many problems and eventually twine was used for the bundling.



A FACT WORTHY THE ATTENTION OF EVERY SCHOLAR.

The McCormick Output of Twine

WAS
8000 TONS IN 1888,
EQUIVALENT TO
64 TIMES ROUND
THE EARTH.

BLUE JAY
PURE MANILA
PURE SISAL

Every farmer knows that the McCormick Harvesting Machine Company have more at stake in their reputation for making machines than in twine, and to insure the good working of their machines it is important that their patrons use none but good twine. THIS FACT IS A GUARANTEE sufficient that no poor twine with the genuine McCormick brand upon it will be offered to the public. * Not so with the jobber and cheap twine vender, for they only have the one object, i. e., to get the farmer's money at a profit to themselves, not caring a fig about the result.

An illustration of a man in a suit standing next to a globe. Several bundles of twine are draped over the globe, with labels 'PURE MANILA', 'PURE SISAL', and 'BLUE JAY'. The man is pointing towards the globe. The globe is on a stand.

That is the reason why one should buy of a reliable house like the McCormick, that has the proudest of reputations to maintain, with an honest desire to give customers value received rather than foster upon their patrons a cheap and worthless article for sake of a profit. This fact is clear to every one and accounts for the mammoth and unprecedented sales in a single season of EIGHT THOUSAND TONS. * Think of it! Enough to reach sixty-four times around the world, a fact worthy the attention of every scholar, young or old, and still the demand is almost greater than the McCormick Works can supply. * Leave your orders early with the nearest McCormick agent. YOU WILL NOT PAY DEARLY FOR AN EXPERIMENT. * The three brands which bear the McCormick trade mark are: Pure Manila, Blue Jay and Pure Sisal. The Blue Jay brand is a mixed twine, designed by the McCormick Company, and is the BEST MIXED TWINE ON EARTH. Beware of imitations and buy twine only which bears the McCormick Tag.



THE TWO HORSE THOMAS RAKE.

The "THOMAS"
SULKY RAKE,
125,000 IN USE.

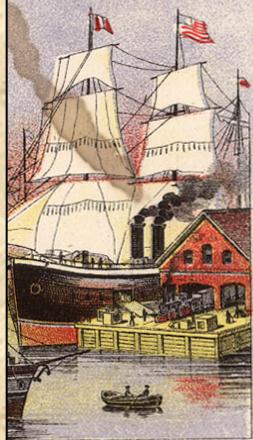


ADMITTED TO BE THE BEST RAKE IN THE WORLD.

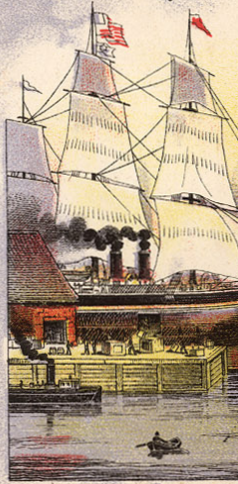
THE LARGEST ON EARTH.

THIS PYRAMID SHOWS
OUR WONDERFUL GROWTH
BEGINNING WITH 50
MACHINES SOLD IN
1844,

AND ENDING WITH THE
UNEQUALED NUMBER
OF 76,534 MACHINES
SOLD IN
1888.



FOR AFRICA,
AUSTRALIA AND
NEW ZEALAND.



FOR ENGLAND, FRANCE
ITALY, RUSSIA AND
SOUTH AMERICA.

1844
50.

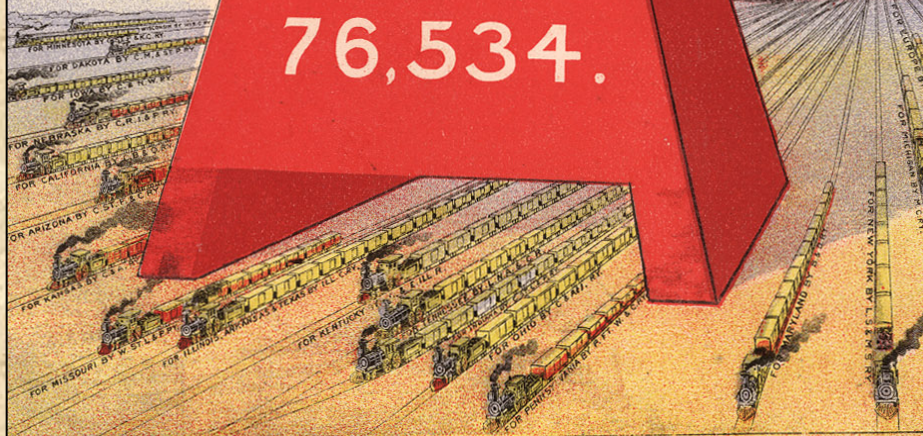
1854
1,558.

1864
6,090.

1874
18,401.

1888
SALES
OF
McCORMICK
MACHINES
76,534.

THE McCORMICK WORKS
CHICAGO



THE McCORMICK MACHINES EN ROUTE TO ALL PARTS OF THE EARTH.

AMAZING INCREASE.

The diagram below shows better than words can express, the wonderful increase in the manufacture and sale of the McCormick Machines during the past fifty years, the sales every tenth year only being given.

The Reaping Machine was invented and first tested in 1831, by the late Cyrus Hall McCormick. Sales began in 1841 with two machines, and have increased to 54,841 in 1884.

This increase establishes two facts—the great progress the world has made in agriculture since the invention of the reaper, and the amazing and constantly increasing popularity of the McCormick Machines.

Sales in 1844, 50 Machines.

Sales in year 1854,
1,558.

Sales in year 1864,
6,090.

Sales in year 1874,
10,114.

Sales in year 1884,
54,841 Machines.

4065
R. G. ...
H. ...

Our X Plows

SERIES



Great pains and care will always be taken with this Series to make them pre-eminently the BEST. Can be furnished in any size or combination, Wood or Steel Beam. Always mention X in ordering Plows or Repairs of this Series.

In giving to the trade this new Series of Plows, we do it with the feeling that there is not a plow made of a pattern similar to it, that is in any way its equal, for handsome finish or perfect construction.

Send for Descriptive Circular


SOUTH BEND CHILLED PLOW COMPANY
SOUTH BEND, INDIANA, U. S. A.
PIONEERS IN CHILLED PLOW MANUFACTURE



WITH ADJUSTABLE (LEVIS.)

"BROWN"

GAVE TO THE WORLD THE DOUBLE SHOVEL PLOW.



PATENTED DEC. 2. 1884.

No. 1. STEEL BEAM - IMPROVED.

IMITATED BUT NEVER EQUALED.

THE BEST ON EARTH.




PATENTED DEC. 2. 1884.

No. 2. WOOD BEAM WITH STEEL SHANKS - IMPROVED.

EXTRA HEAVY STEEL BEAM.

FURNISHED WITH SHOVELS FROM 6 1/2 TO 16 in. WIDE.



No. 15. SINGLE SHOVEL PLOW - IMPROVED.

420000
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GALE'S PATENT HORSE HAY RAKE!



Gale's Patent Rake has taken the First Premium at the Michigan State Fairs for the Past Six Years and the Special Premium of \$20 in 1875.

This Rake has gained its reputation entirely on its merits. It has been in use several years and has proved itself one of the very best Rakes in use. Its castings are now made of MALLEABLE IRON, thus reducing its weight at the same time adding to its strength.

It is Made Better and Operates Easier Than Any Other Rake in the Market.

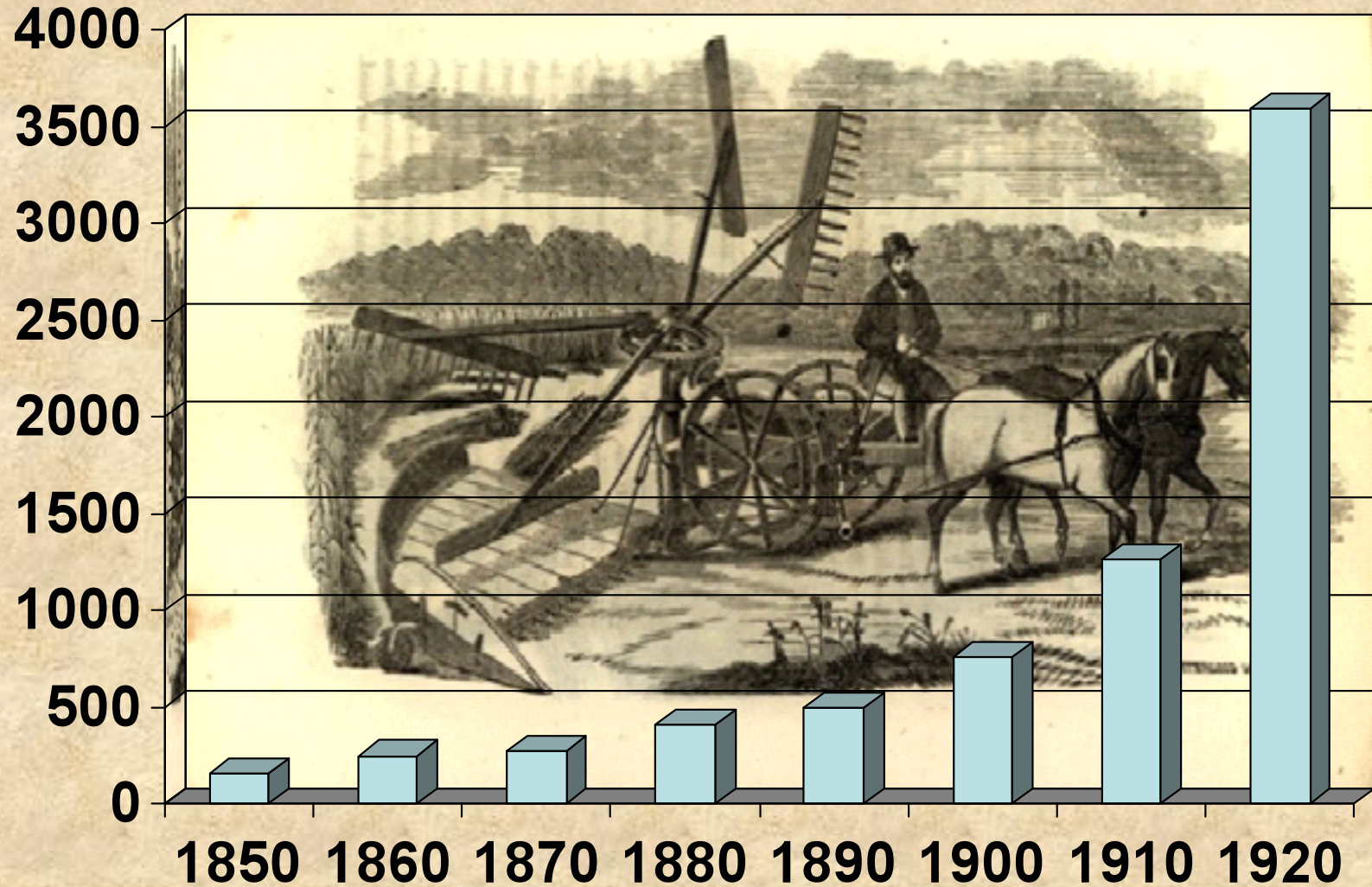
And has been Greatly Improved for the present season. Has a LARGER WHEEL, and is Adjustable to Foot or Lock Lever, and is so easily managed that a small Boy can run it with very little effort.

It meets with entire favor wherever introduced.

MANUFACTURED BY
GALE MANUFACTURING CO.,
ALBION, MICH.

For Sale by *Washburn & ...*

Value of farm machinery and implements in millions of dollars



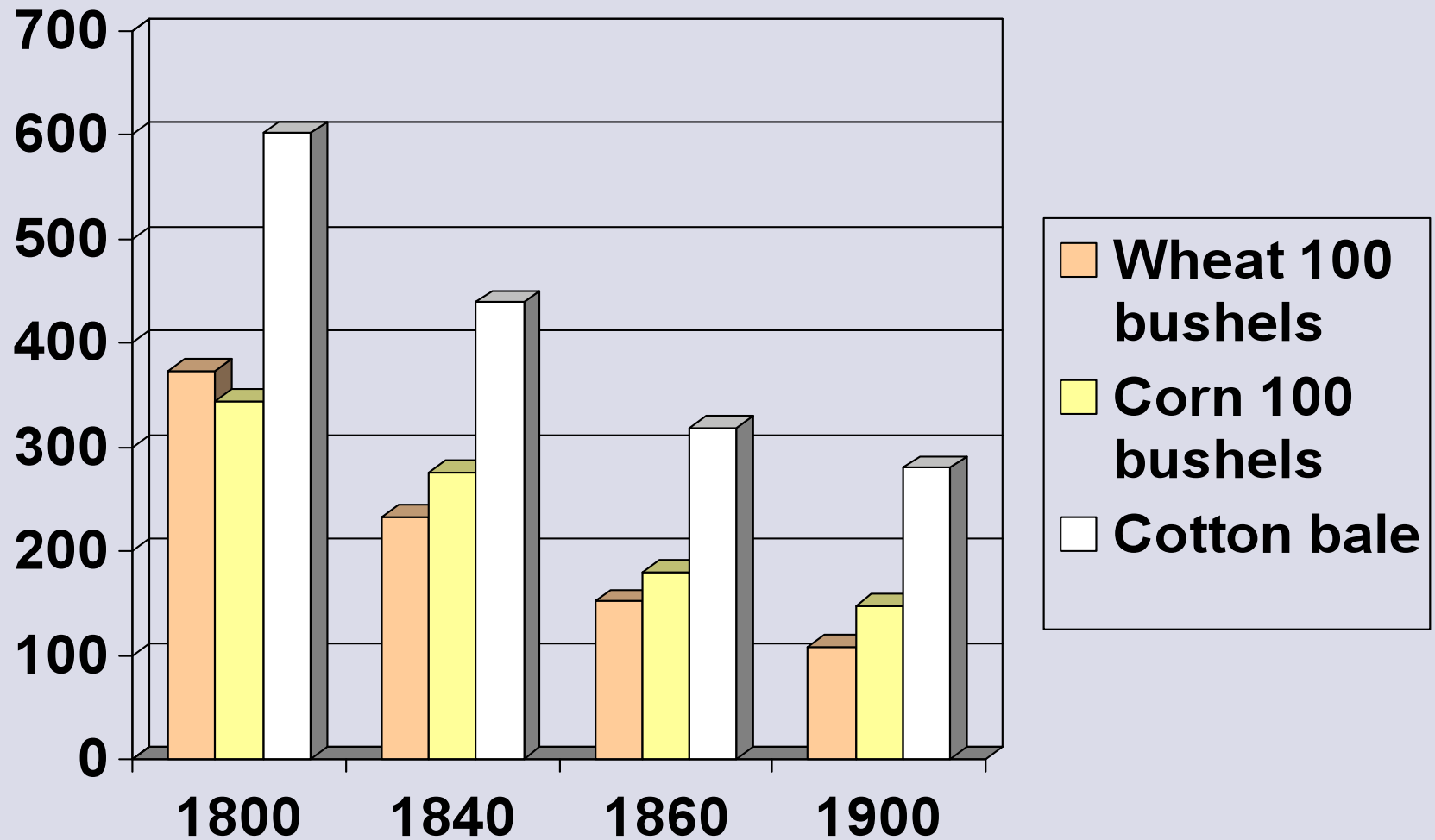
**The United States
became a major
exporter of
agricultural
machinery**



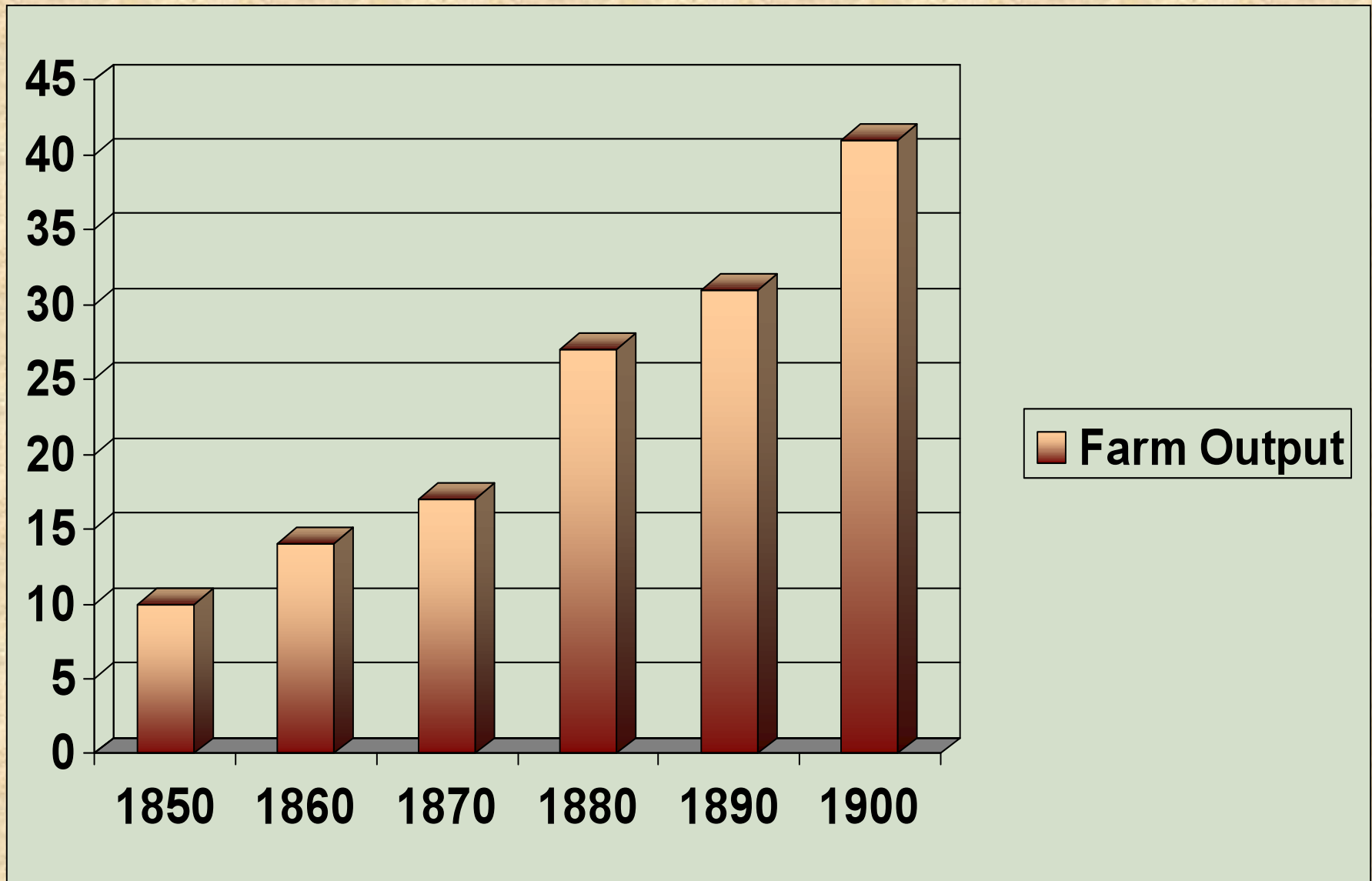
One effect of the new technologies was that less labor time was needed to produce the same number of products



Number of man-hours to produce crop



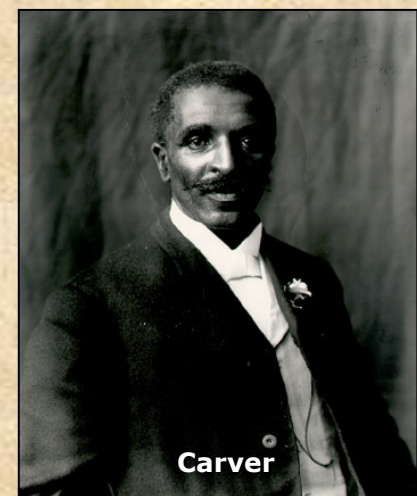
Increase in amount of agricultural products produced on farms, 1850-1900



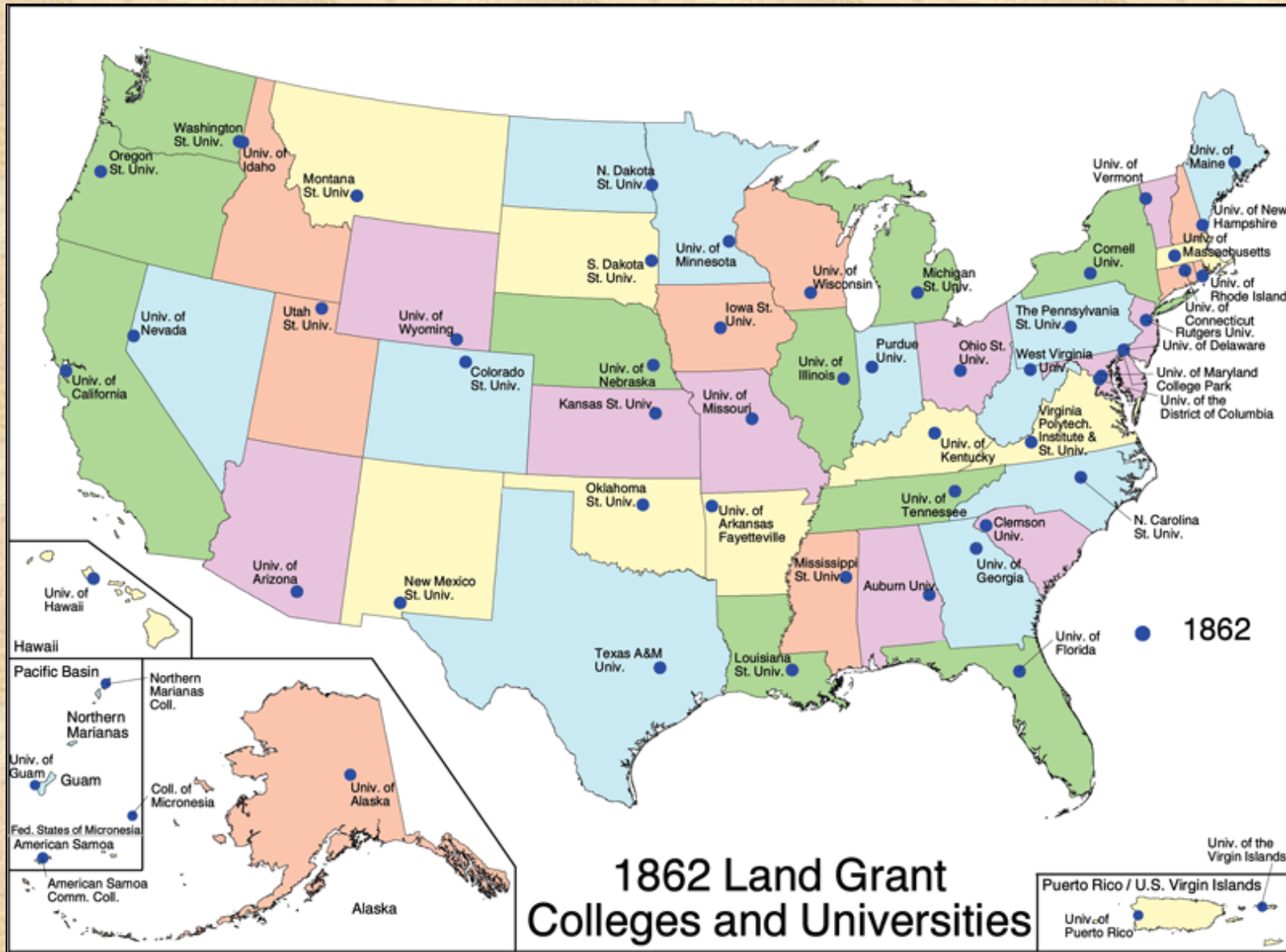
Scientific innovations

There were many scientific discoveries funded by the government that were made during this era including:

- a. Scientists were sent around the globe to find superior agricultural products including rust- and drought-resistant winter wheat from Russia, kaffir corn was imported from North Africa, and yellow-flowering alfalfa was brought to the U.S. from Turkistan**
- b. Hog cholera was conquered**
- c. Some botanists also were able to produce new fruits and vegetables like Luther Burbank**
- d. It was determined how to measure the butterfat content of milk**
- e. At the Tuskegee Institute in Alabama, George Washington Carver found hundreds of new uses for the peanut, sweet potato and soybean**

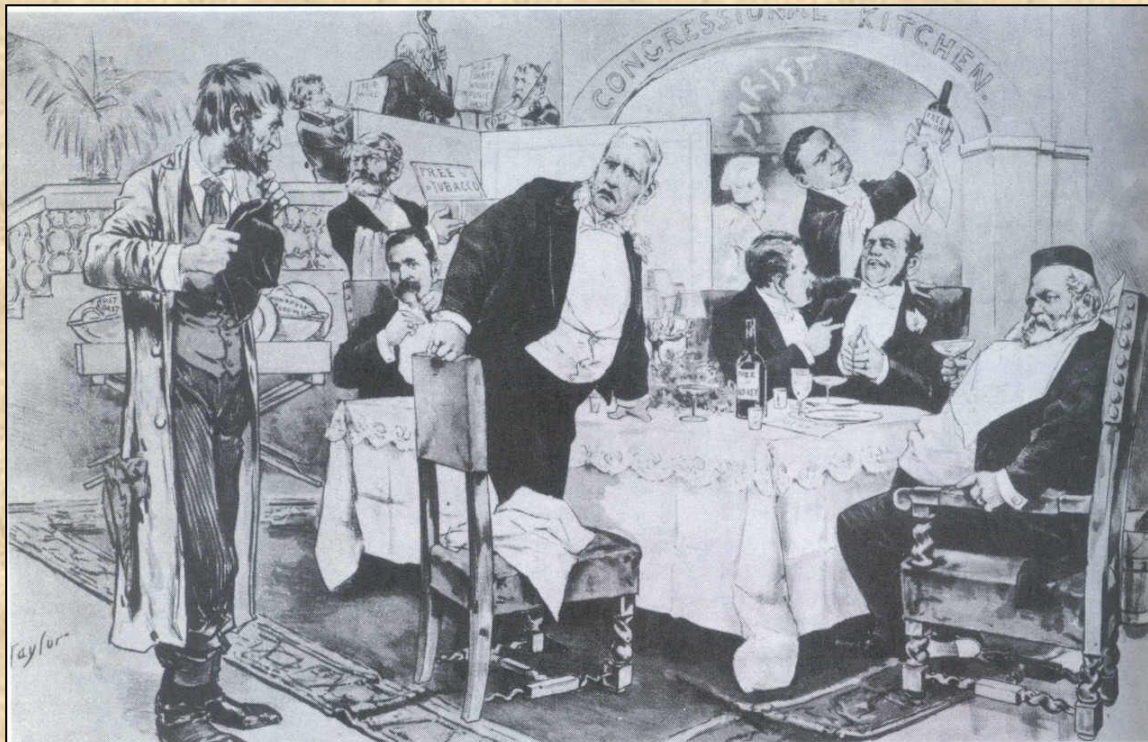


Land grant colleges were centers of research in scientific farming

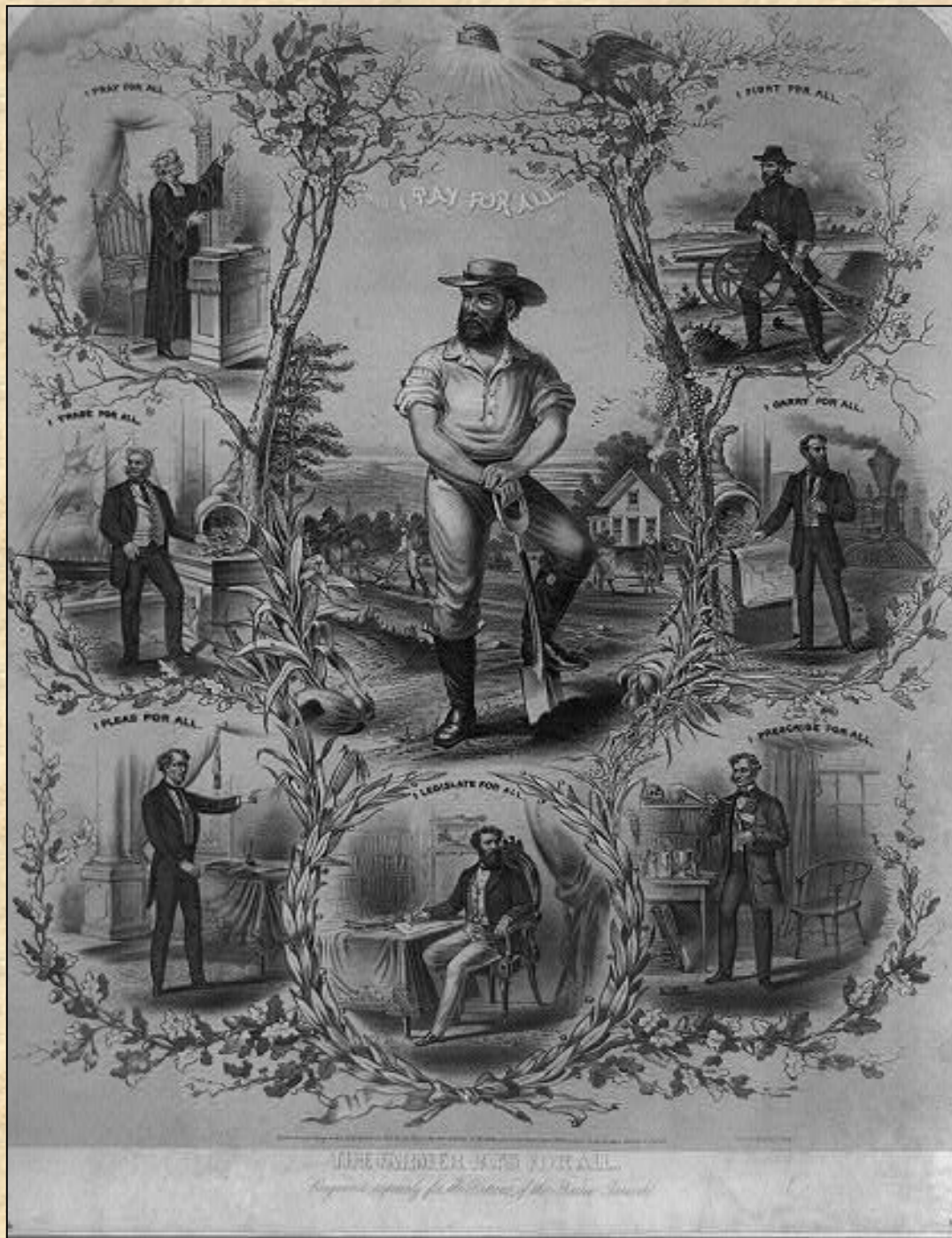


Farmers were affected by innovations

One of the unintended consequences of the agricultural research funded by the government was lower prices on food. Farmers were able to increase the amount of crops produced which drove market prices down, which ultimately hurt farmers. In others words, scientific innovations in the agricultural field led to the industry becoming less profitable and much discontent in the era by farmers, unlike other industries that profited from new technology.



The farmer is shown as poor and begging from the wealthy industrialists and government officials



"When the banker says he's broke And the merchants up in smoke, They forget that it's farmer who feeds them all. It would put them to the test If the farmer took a rest; Then they'd know that it's the farmer feeds them all."

Written by a farmer in the late 1890's

The Second Industrial Revolution

- ❖ **Second Industrial Revolution defined**
- ❖ **U.S. became an industrial giant**
- ❖ **Transition from a rural to urban nation**
- ❖ **Natural resources**
- ❖ **Immigrants**

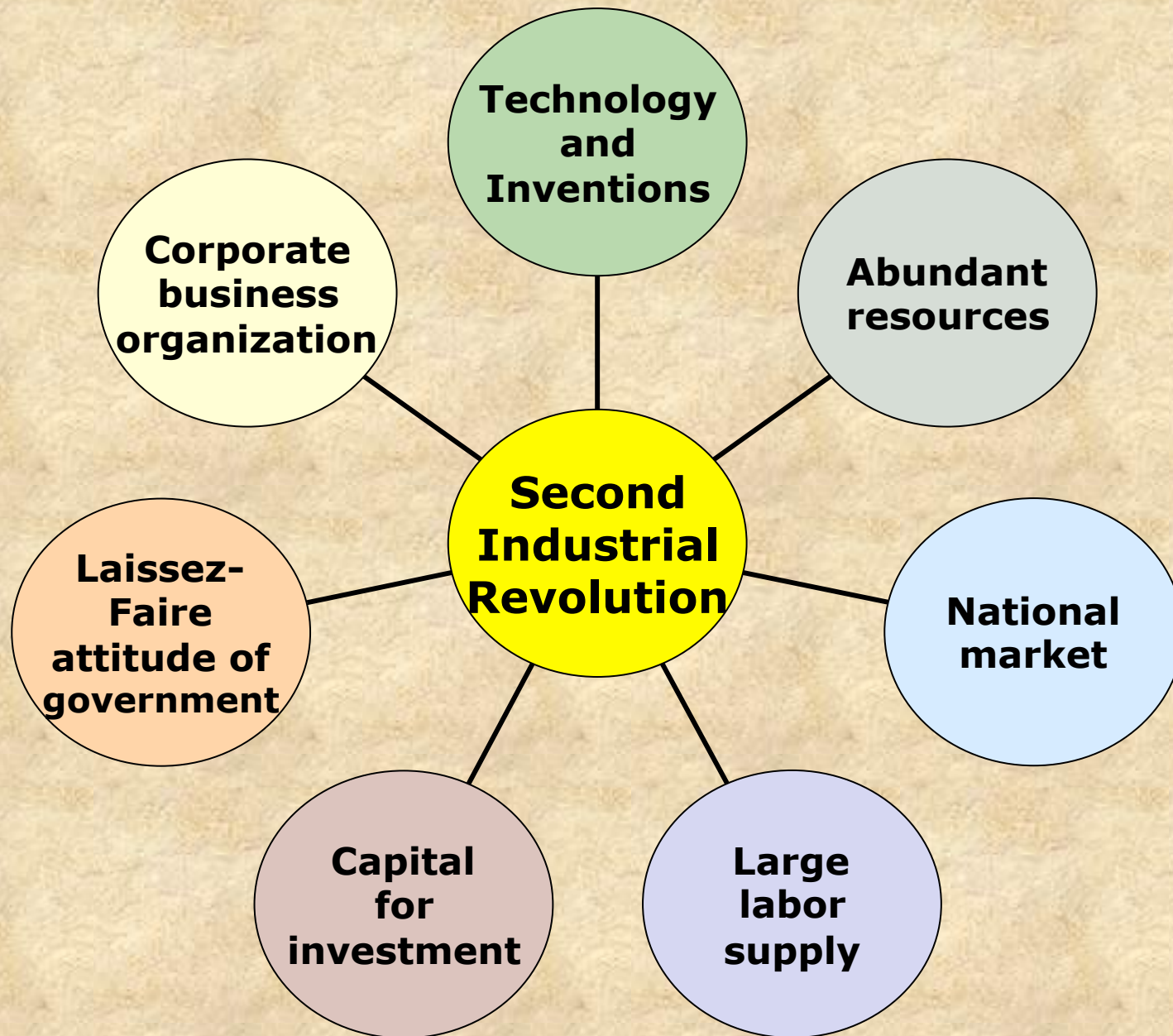


Second Industrial Revolution defined

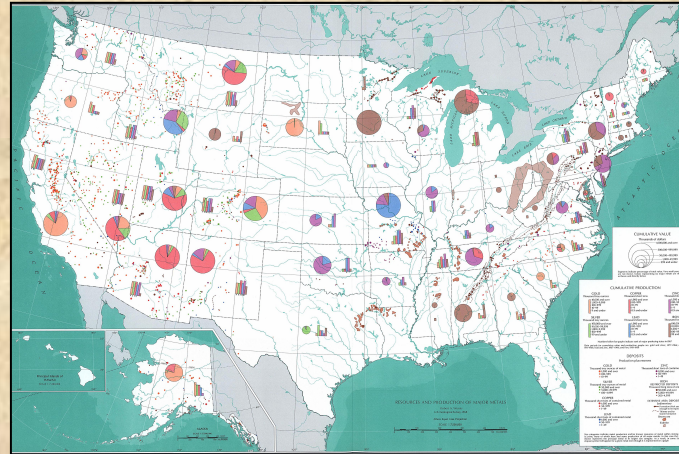
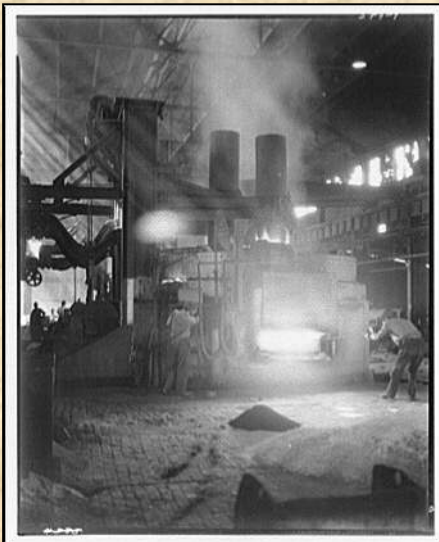
Although this movement is termed the “second industrial revolution” there is no clear separation between this period and the first industrial revolution.

The factors that created this second industrial revolution include:

- ❖ Abundance of natural resources**
- ❖ Large pool of workers from domestic and immigration sources**
- ❖ Large amounts of capital (money) available for investment in new industries and processes**
- ❖ Many new inventions and innovations**



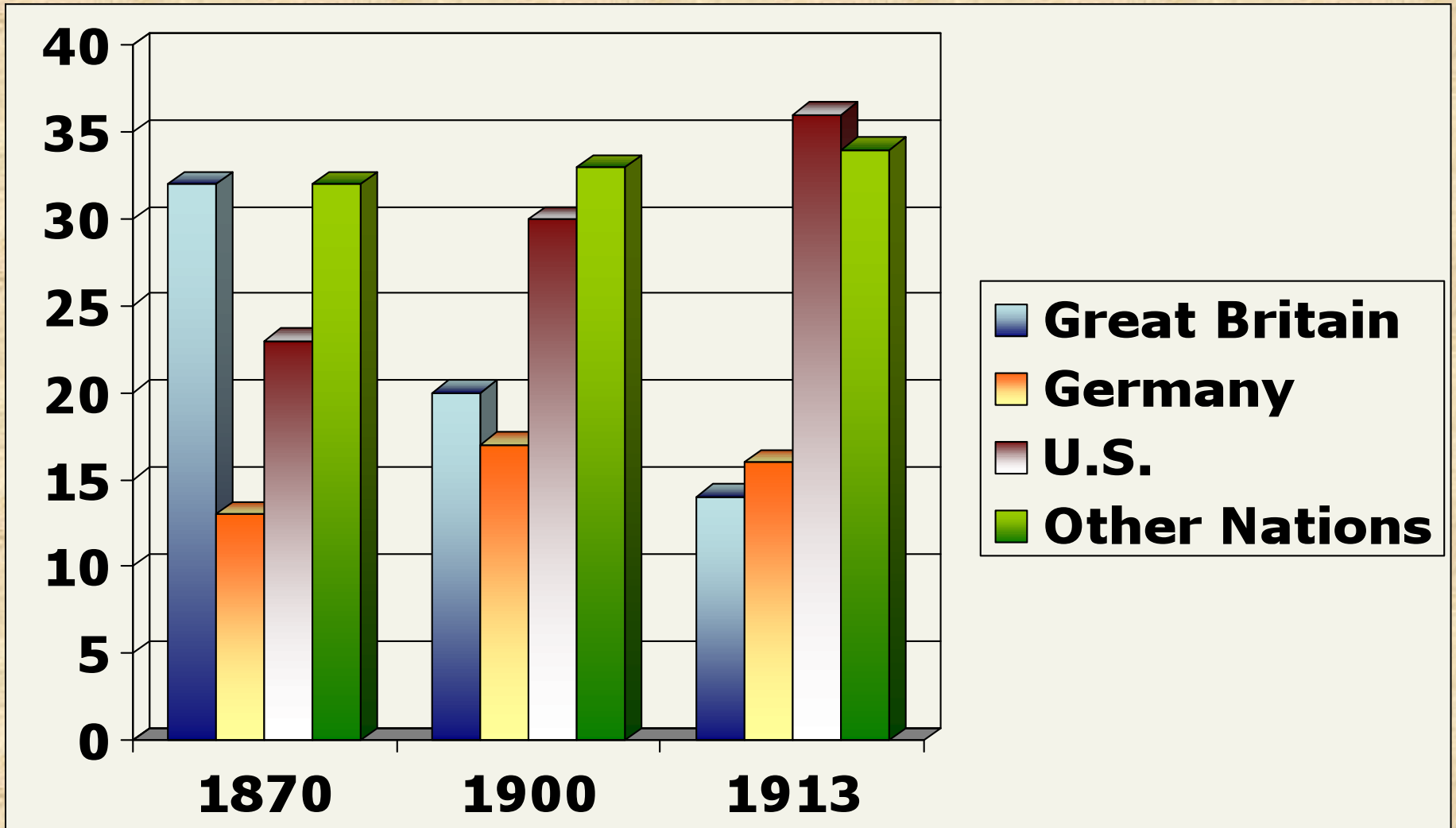
United States emerged as an industrial giant



Before and after the Civil War expansion of railroads and steam ships helped the U.S. economy grow. New industries such as petroleum refining, steel manufacturing, and electrical power also contributed to growth in the U.S. economy.

The Second Industrial Revolution saw many new inventions in machine tools, factory equipment, rubber and steel products, and communications devices. The total number of patents grew tremendously during the period.

**% of world manufacturing by nations 1870-1913.
"Other Nations" means every other country in the
world combined.**



Industrialization changed the U.S.

- From the 1860s to the 1910s the U.S. transformed from a rural to an urban nation.**
- The west was settled, closing the frontier.**
- Large factories, steel mills, transcontinental railroad lines, flourishing cities and vast agricultural holdings covered the nation.**

Along with this economic growth and affluence came problems. Nationwide, business dominated whole industries, either independently or in combination with others. Working conditions were often unsafe and unregulated. Cities grew so quickly they could not properly house or govern their growing populations.

Abundance of natural resources



The U.S. was rich with raw materials such as iron, copper, lead, coal, iron ore, timber and petroleum



Many navigable rivers for low cost transportation

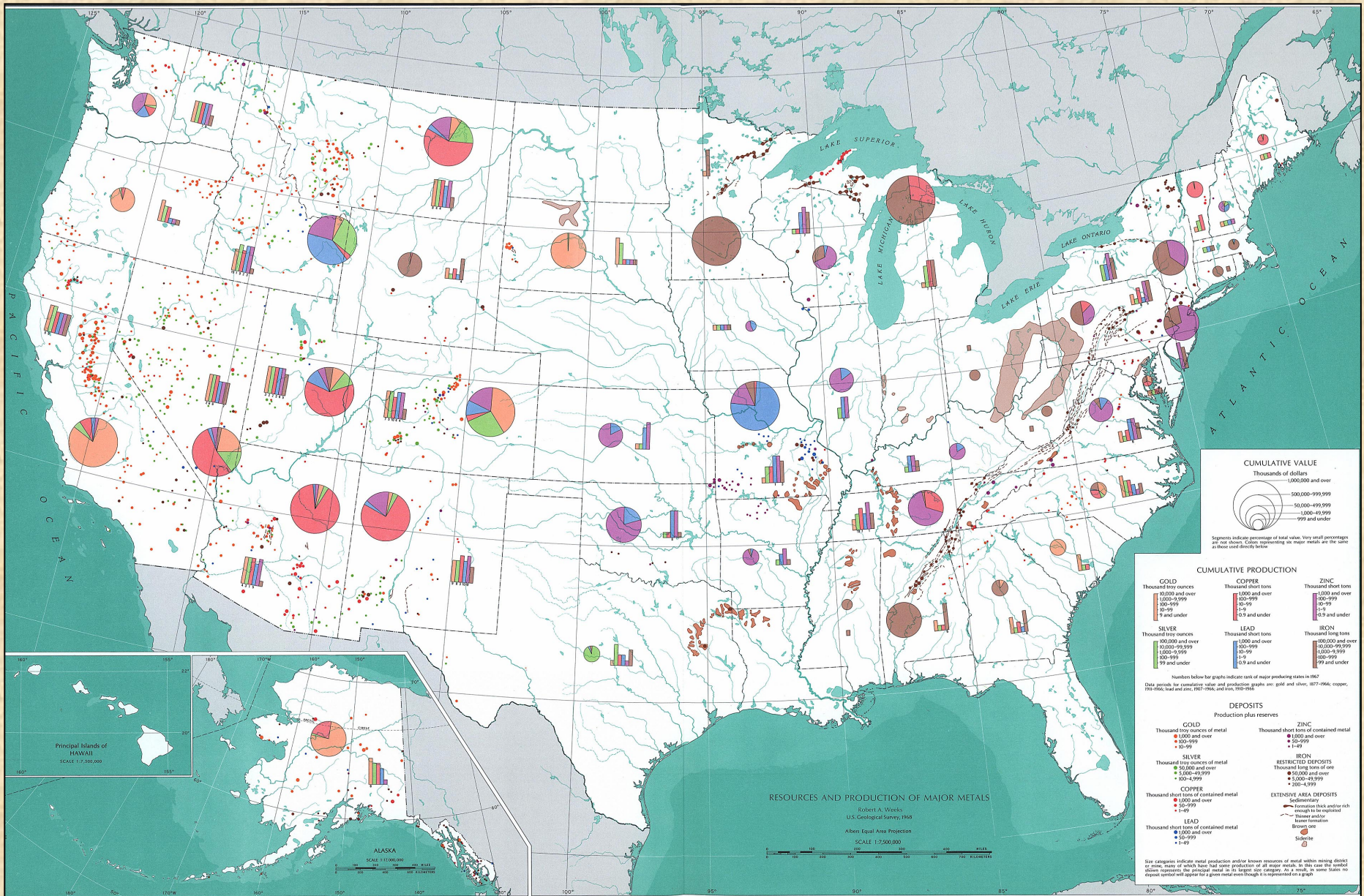


Rivers and streams provided water power for pre-steam engine factories and mills



Vast arable land allowed the U.S. to not only grow enough food for its own population but export huge amounts of agricultural crops for cash from foreign nations

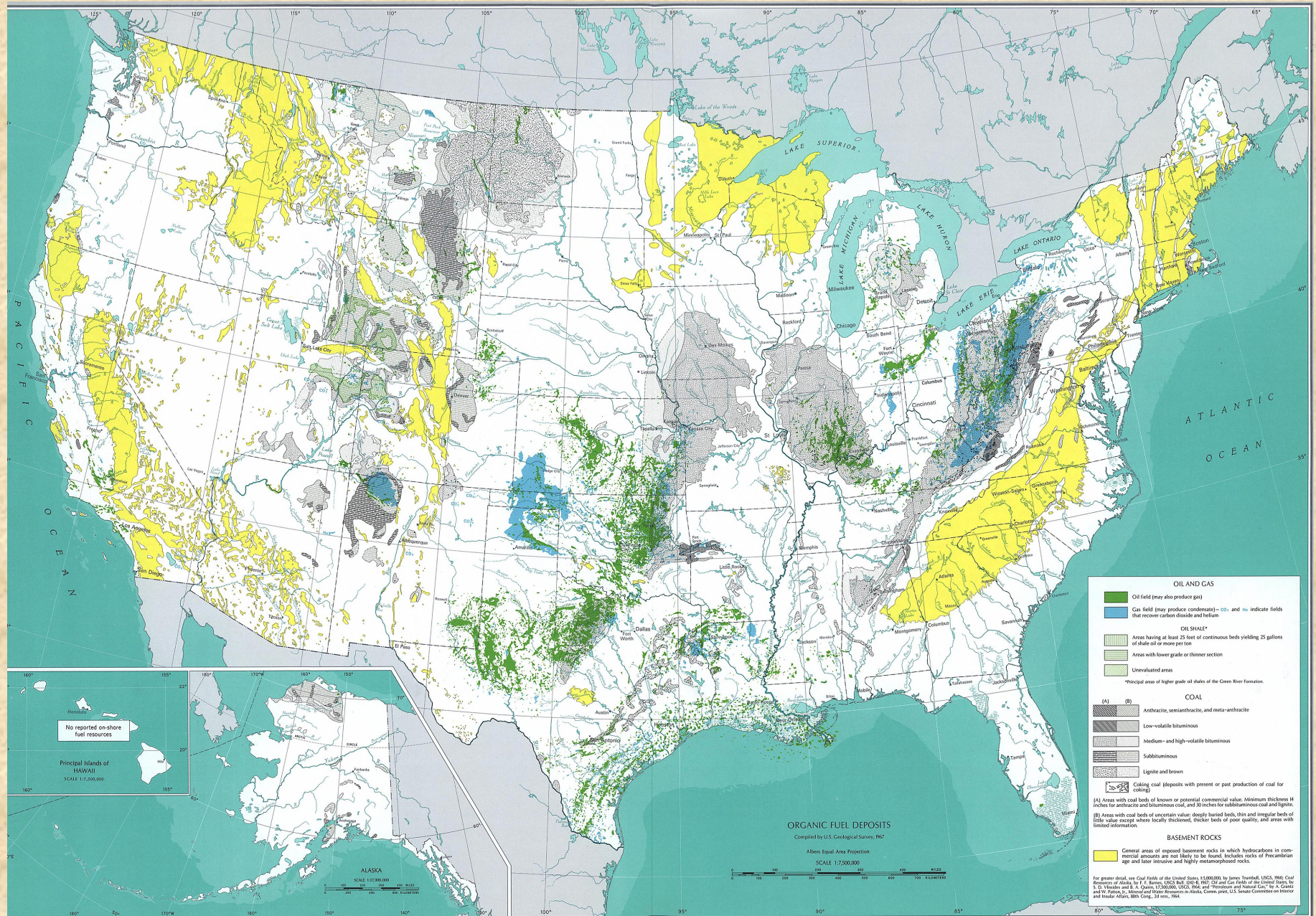
Natural resources



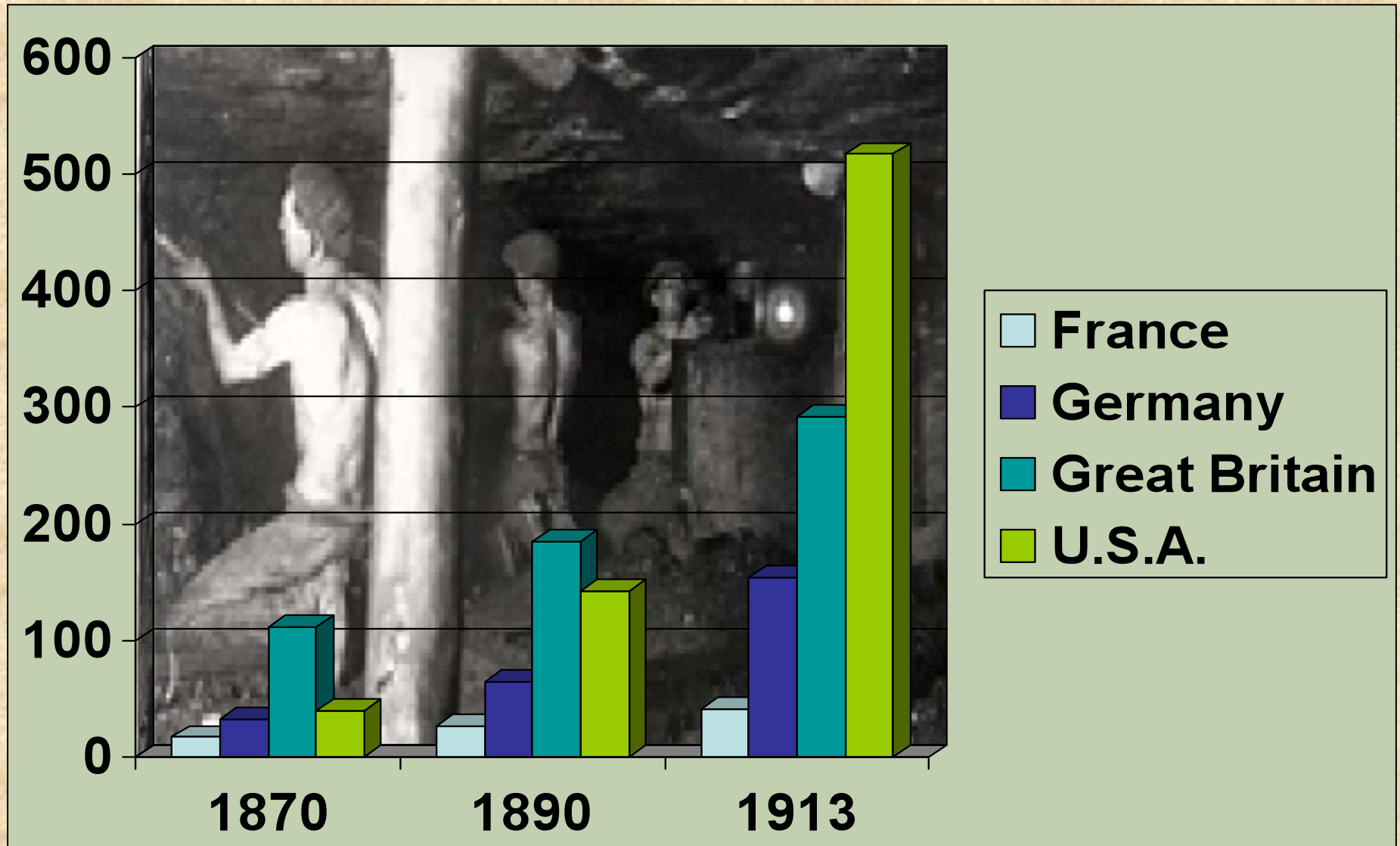
Major U.S. rivers and lakes



Coal, oil and gas location map

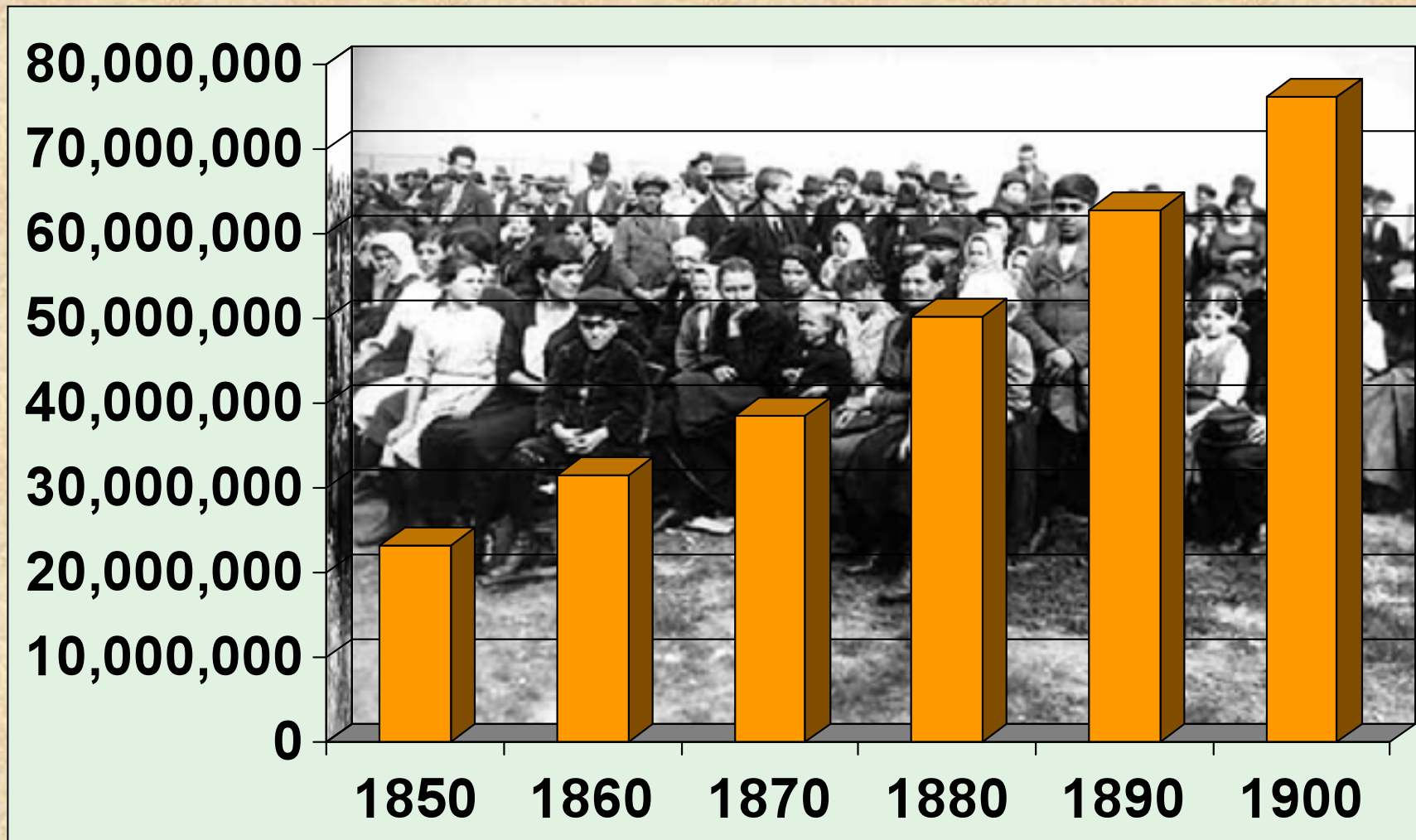


Coal production in millions of tons

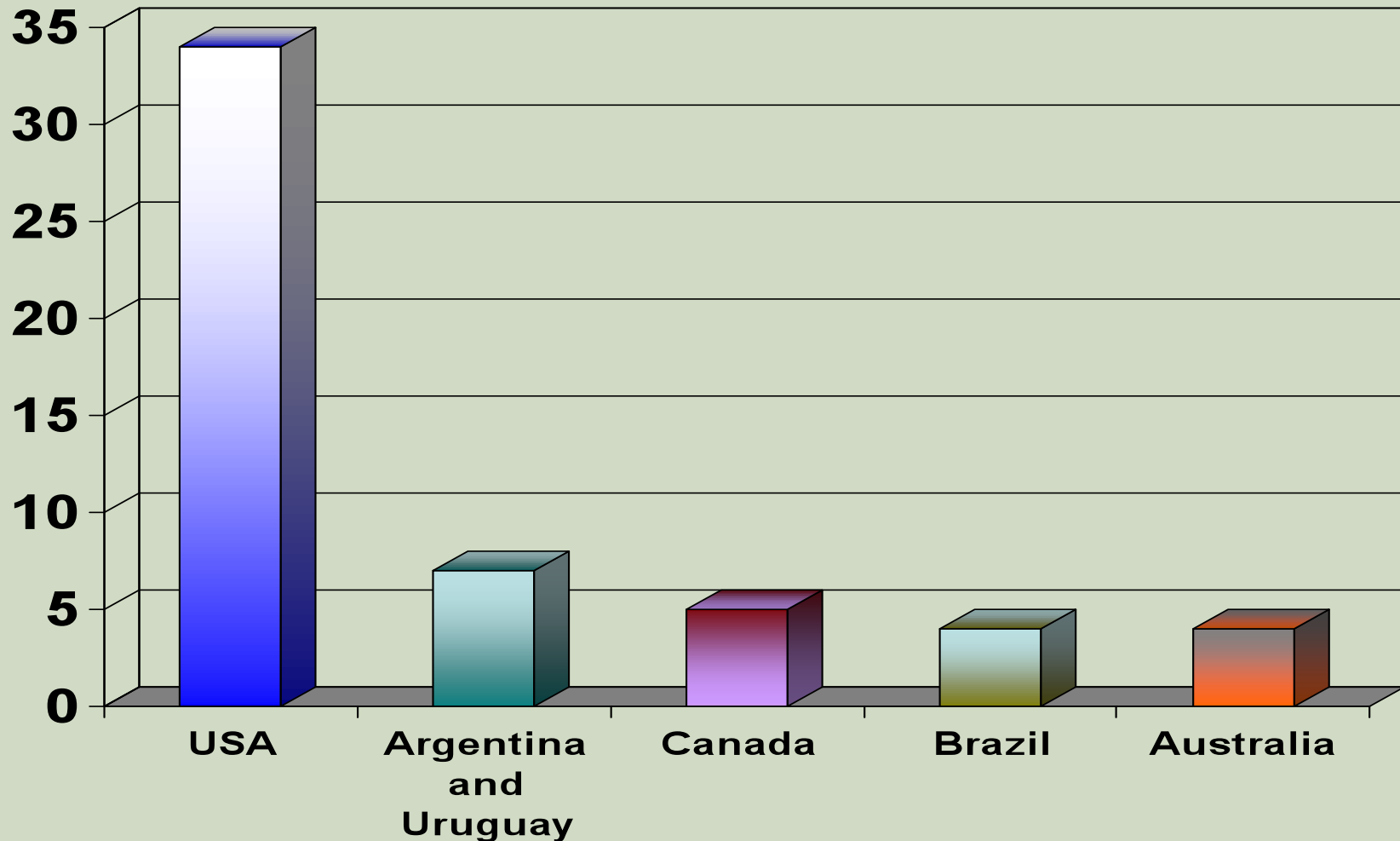


U.S. population increase: 1850 to 1900

Most of this increase can be attributed to the large number of immigrants who arrived in the U.S. during the second and third waves of immigration from Europe



% of European immigrants each nation received from the mid 19th century to the early 1930's



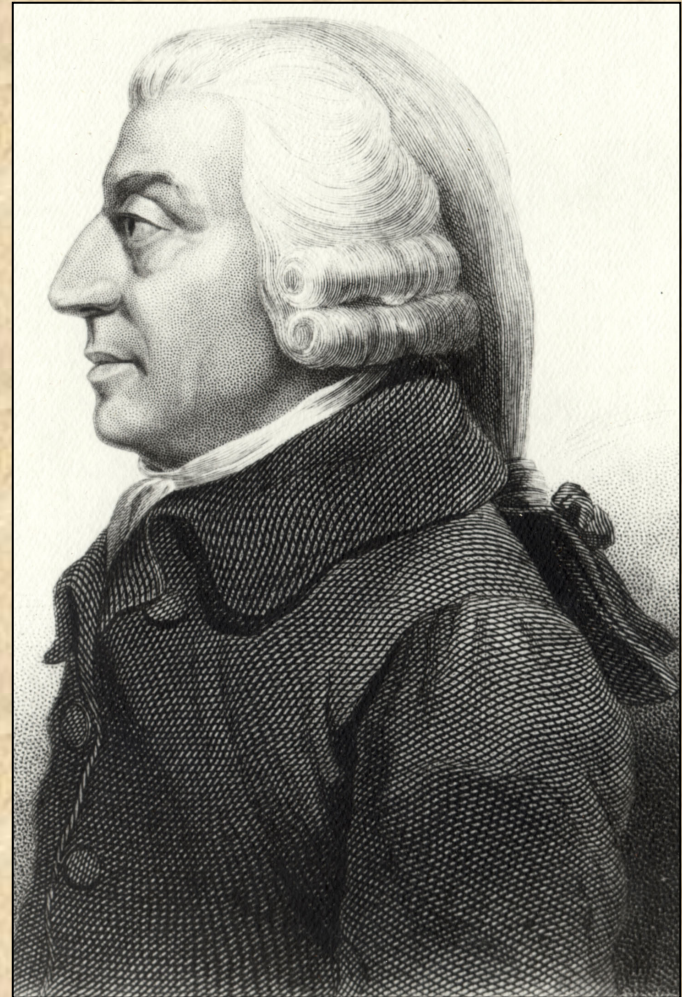
Philosophies that facilitated industrialization

- ❖ **Laissez-faire**
- ❖ **Social Darwinism**
- ❖ **Individualism**



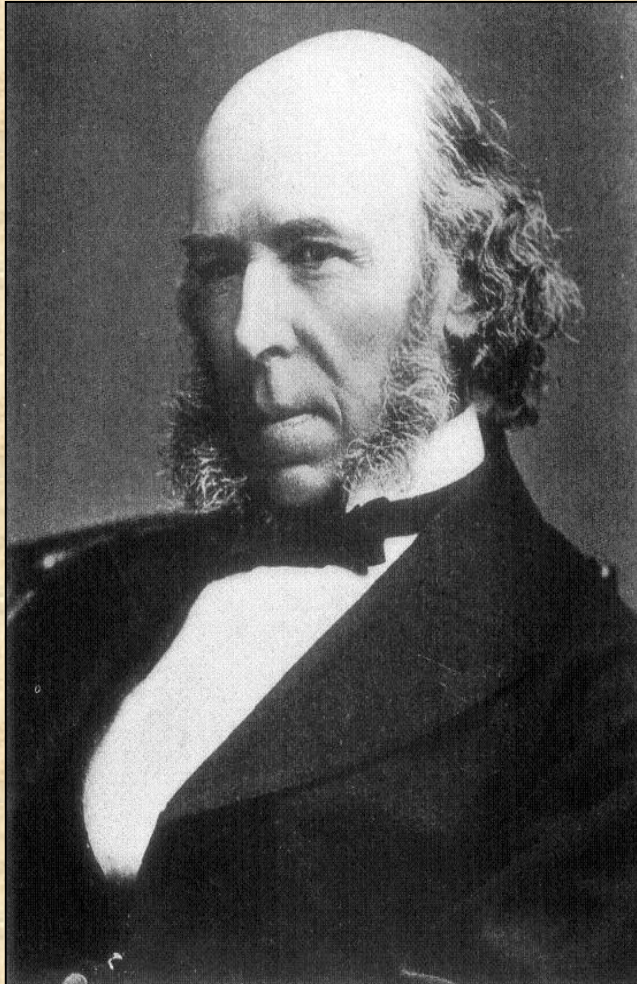
Laissez faire

- Term originated in France during the Enlightenment
- Based on the idea that the government should not intervene in business or the economy; instead natural law or market forces would regulate
- Adam Smith popularized the term and concept in his book Wealth of Nations in 1776
- This approach was embraced by industrialists during this era who did not want the government to regulate them in any way



Herbert Spencer

“Social Darwinism”



“Each individual should be allowed to do as he or she wills as long as it doesn’t infringe on the rights of another person.”

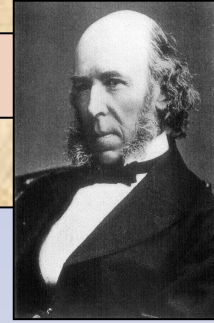
Spencer, an Englishman, was a philosopher who is best remembered for his ideas that have become known as “Social Darwinism”.

Social Darwinism advocated laissez-faire capitalism, an economic system that allows businesses to operate with little government interference. Spencer believed that competition was “the law of life” and resulted in the “survival of the fittest”, a phrase he used years before Darwin. Spencer argued in his various writings that society is best served when its fittest members operate without opposition.

Unlike Darwin, Spencer also believed that individuals genetically pass on their learned characteristics to their children. This meant the fittest persons inherited positive qualities such as intelligence, the desire to own property, and the ability to accumulate wealth. On the other hand, the unfit inherited laziness, stupidity, and immorality.

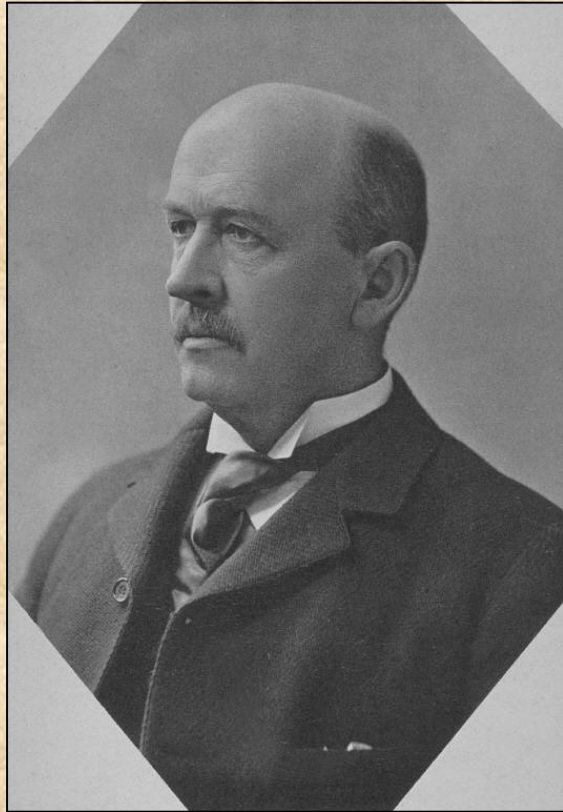
Spencer argued that the number of unfit would eventually disappear because of their inability to effectively compete with the fit. He was against any government aid to the poor because it interrupted the correct evolution of civilization.

Spencer's Social Darwinism



- ✓ **Opposed government aid to the poor because he believed it bred immorality**
- ✓ **Against a public school system since it forced taxpayers to pay for the education of other people's children**
- ✓ **Opposed laws regulating housing, sanitation, and health conditions because they interfered with the rights of property owners**
- ✓ **Disease was punishment for the ignorant and should not be tampered with**
- ✓ **Against most taxation because it interfered with the natural evolution of society**
- ✓ **Advocated a laissez-faire system in which there was no government regulation of private enterprise**
- ✓ **Spencer was against any legislation that regulated working conditions, maximum hours, and minimum wages because they interfered with the property rights of employers. He believed labor unions took away the freedom of individual workers to negotiate with employers**

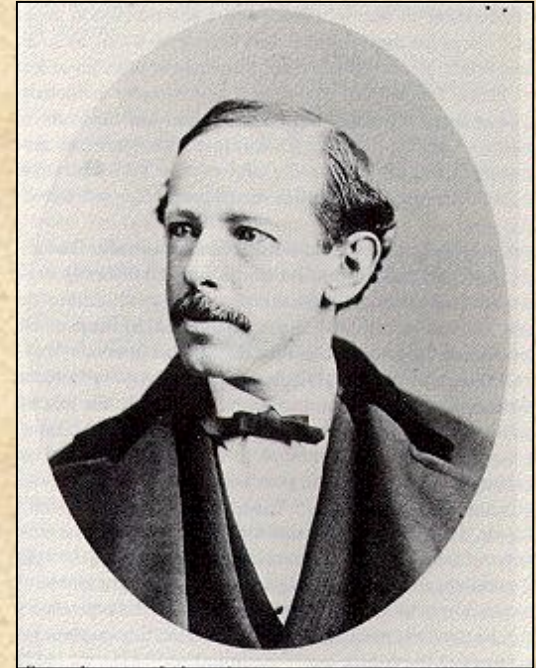
American scholars like sociologist William Graham Sumner were also advocates of Social Darwinism. He praised the new class of industrial millionaires. Sumner argued that social progress depended on the fittest families passing their wealth to the next generation.



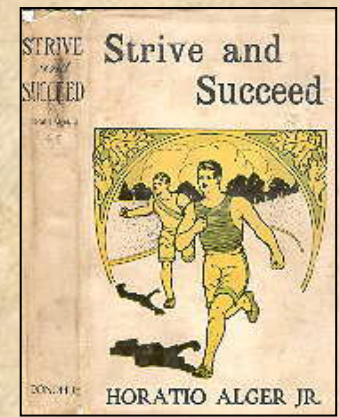
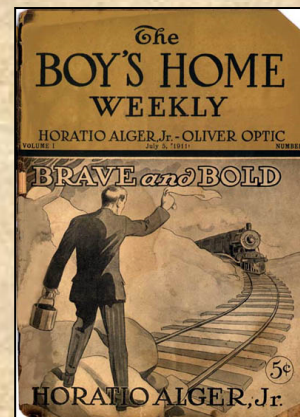
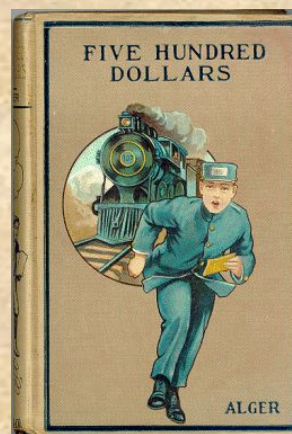
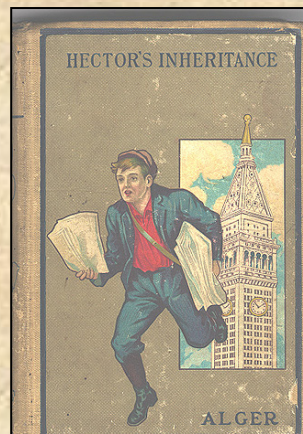
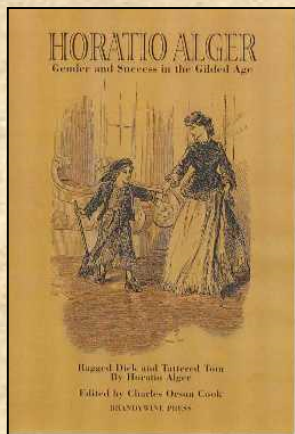
Sumner was a strong believer in an extreme laissez-faire philosophy. He argued that government had no role in the economy. Instead the economy was guided by natural laws. Regulation of any sort, including tariffs, hindered the natural development and evolution of civilization. Sumner believed that humans were born with different capacities and the weaker would be eliminated naturally. Interference by reform groups or the government would hinder the natural selection (similar to plants and animals) of society.

Individualism

- ✧ The idea that a person should not rely upon others for success
- ✧ This philosophy was evident from the beginning of United States history
- ✧ Author Horatio Alger made this concept the theme of his books in which a poor young man is able to create wealth and success through his hard work
- ✧ Later the term “rugged individualism” becomes popular



Horatio Alger



Major innovators and inventions

❖ Patents

❖ Alexander Graham Bell and the telephone

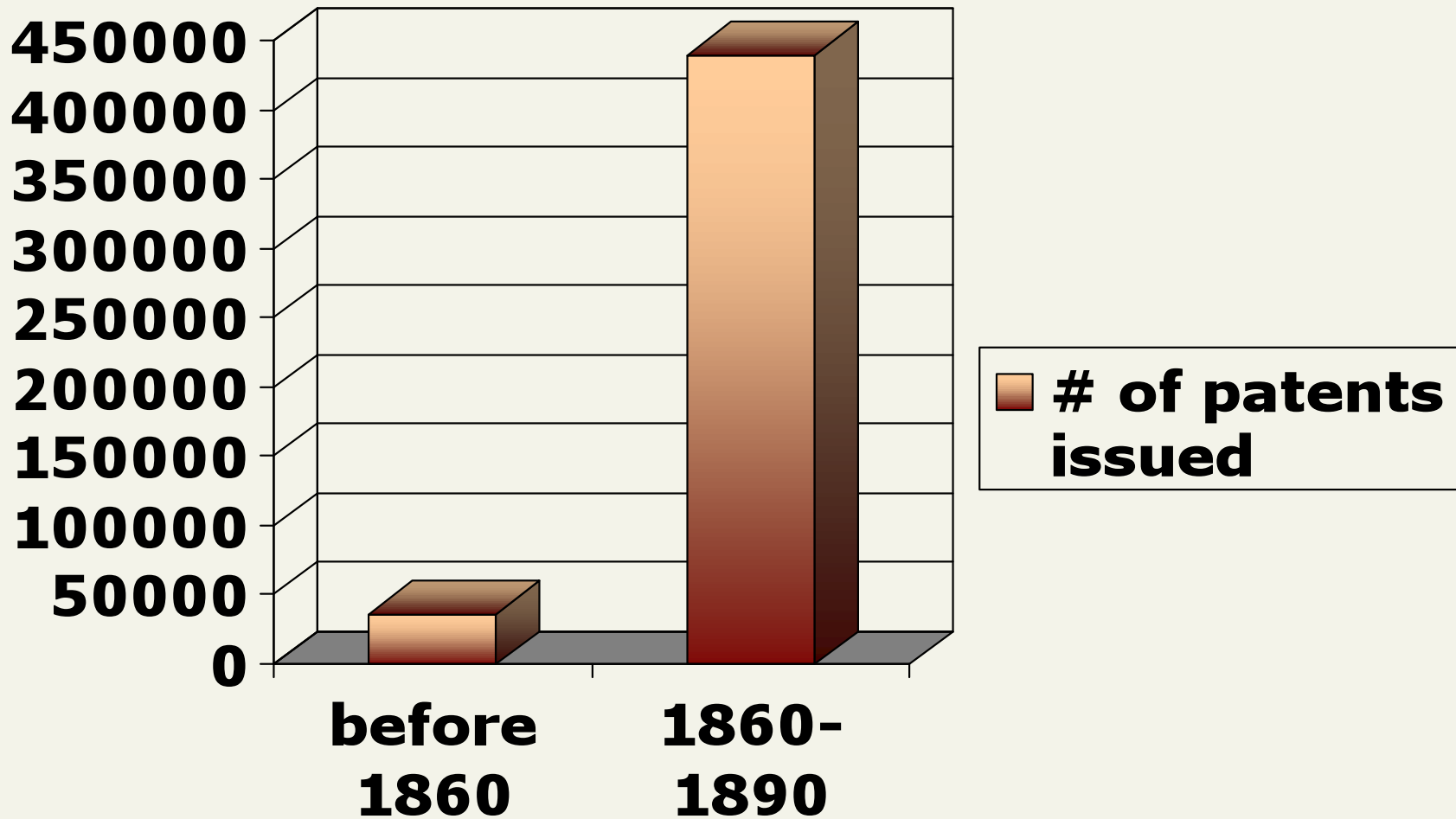
❖ Typewriter and new job opportunities for women

❖ Ottmar Mergenthaler and the linotype

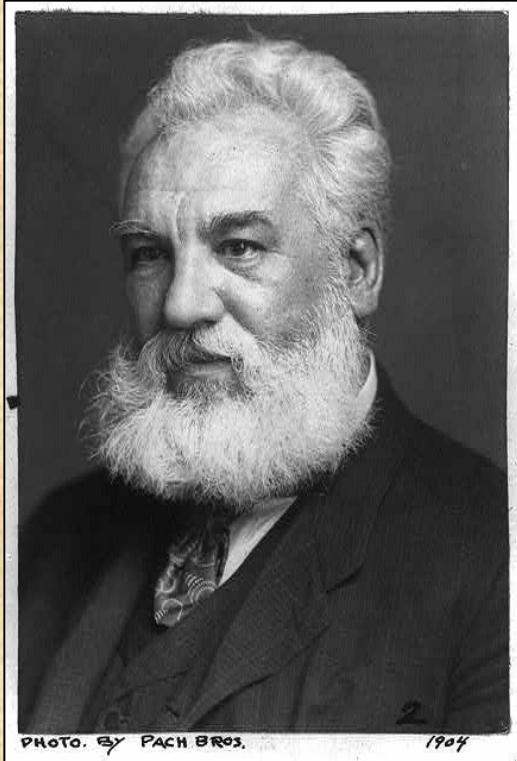


❖ Electricity

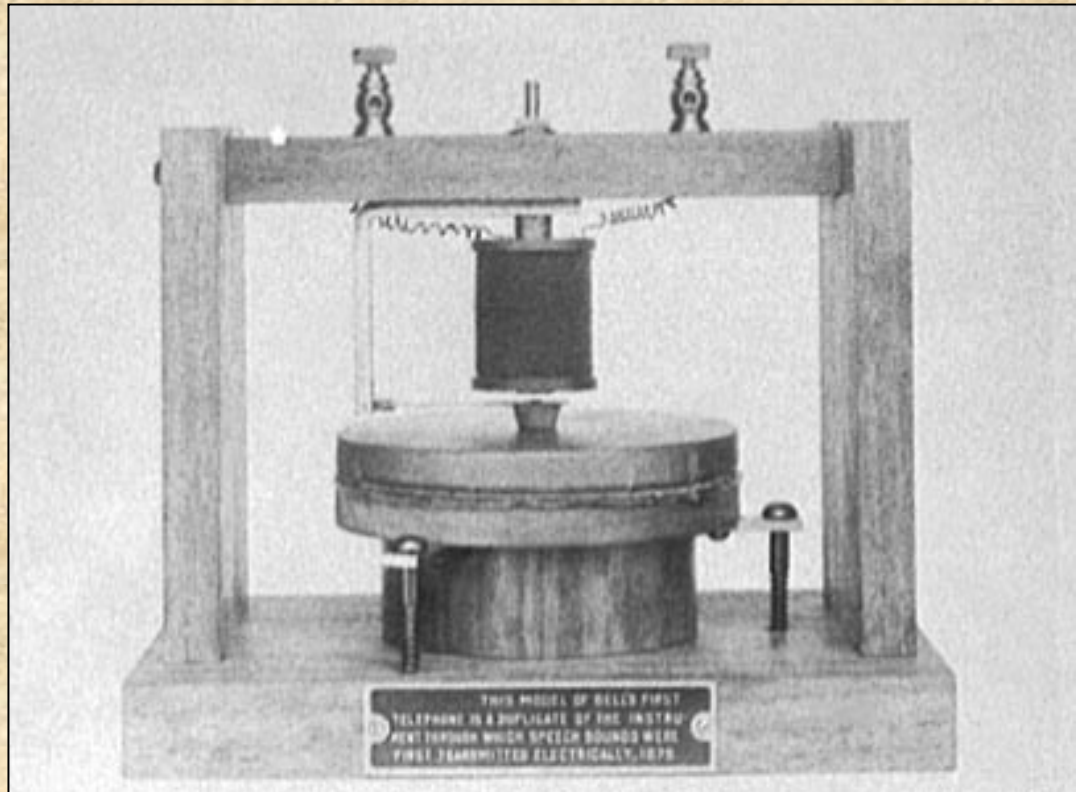
Comparison between 1st and 2nd Industrial Revolution patents



Alexander Graham Bell and the telephone

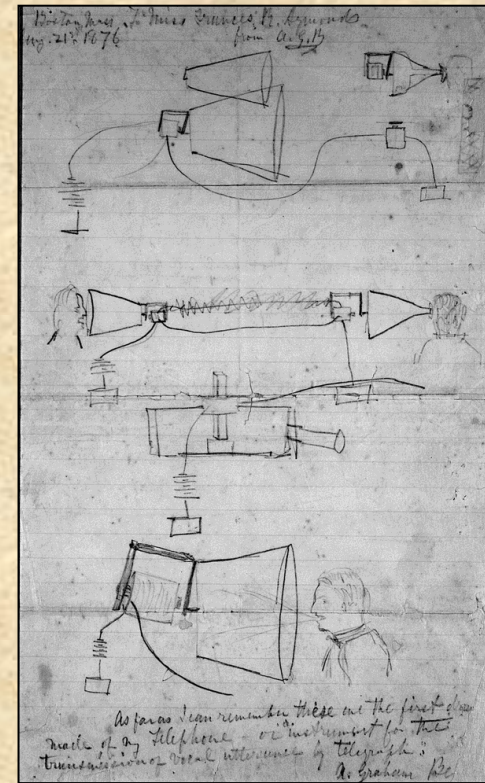


The birth of the telephone
Spoken by: Thomas A. Watson,
assistant to Alexander Graham
Bell
Recording date: c. 1914
Location: Edison motion picture
film studio, Bronx, NY



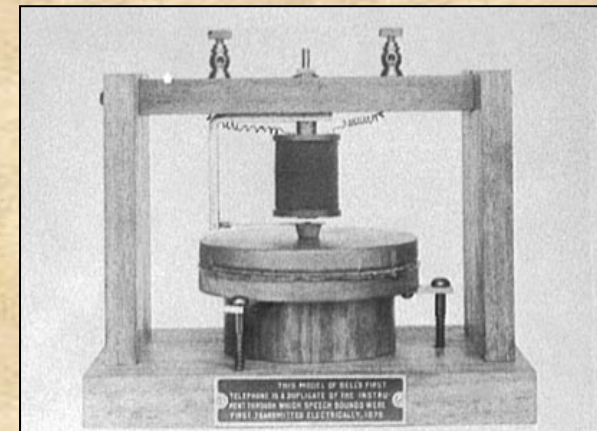


Bell family 1852

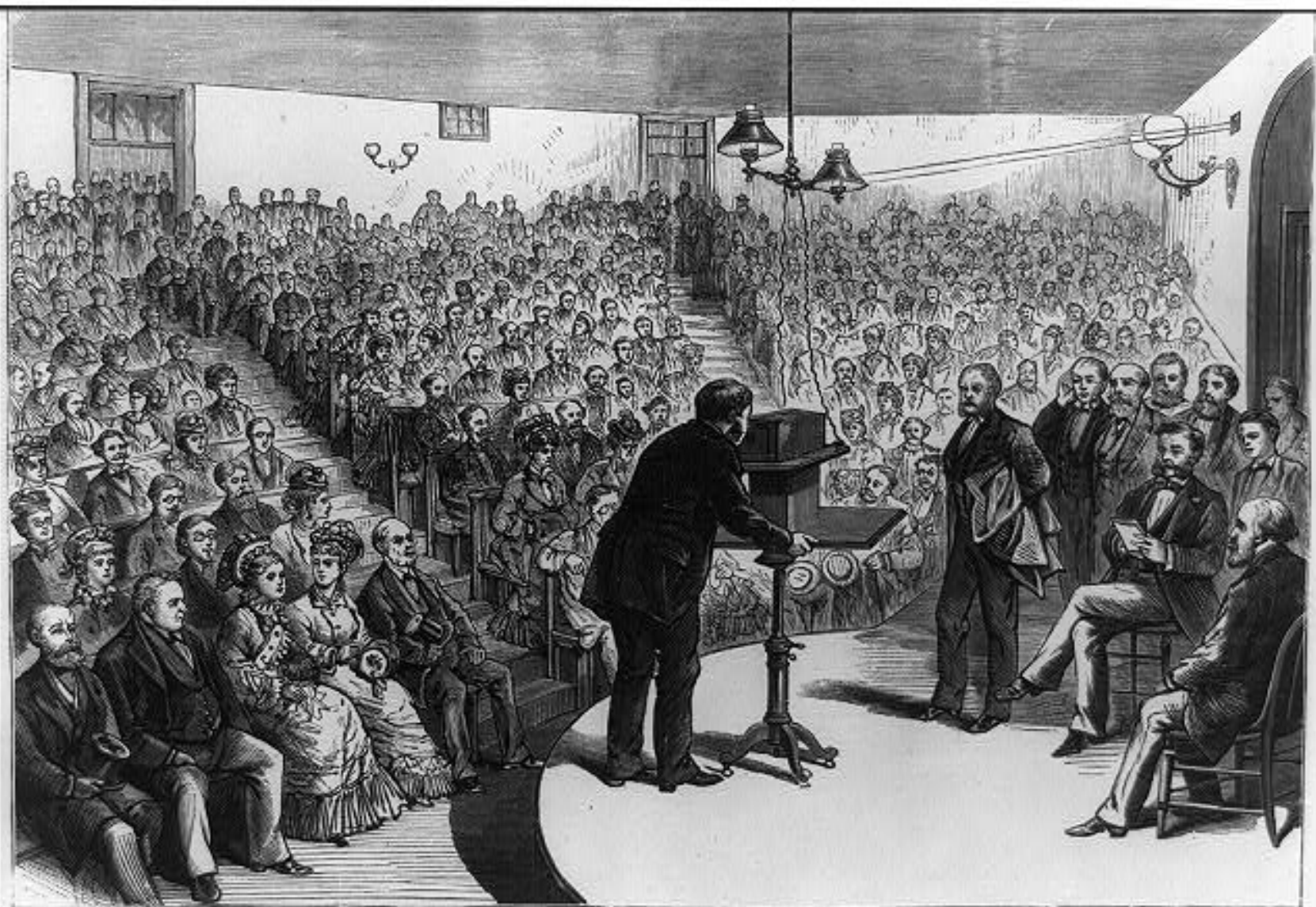


He invented the telephone and patented it 1876

Bell making the first long distance call in 1892



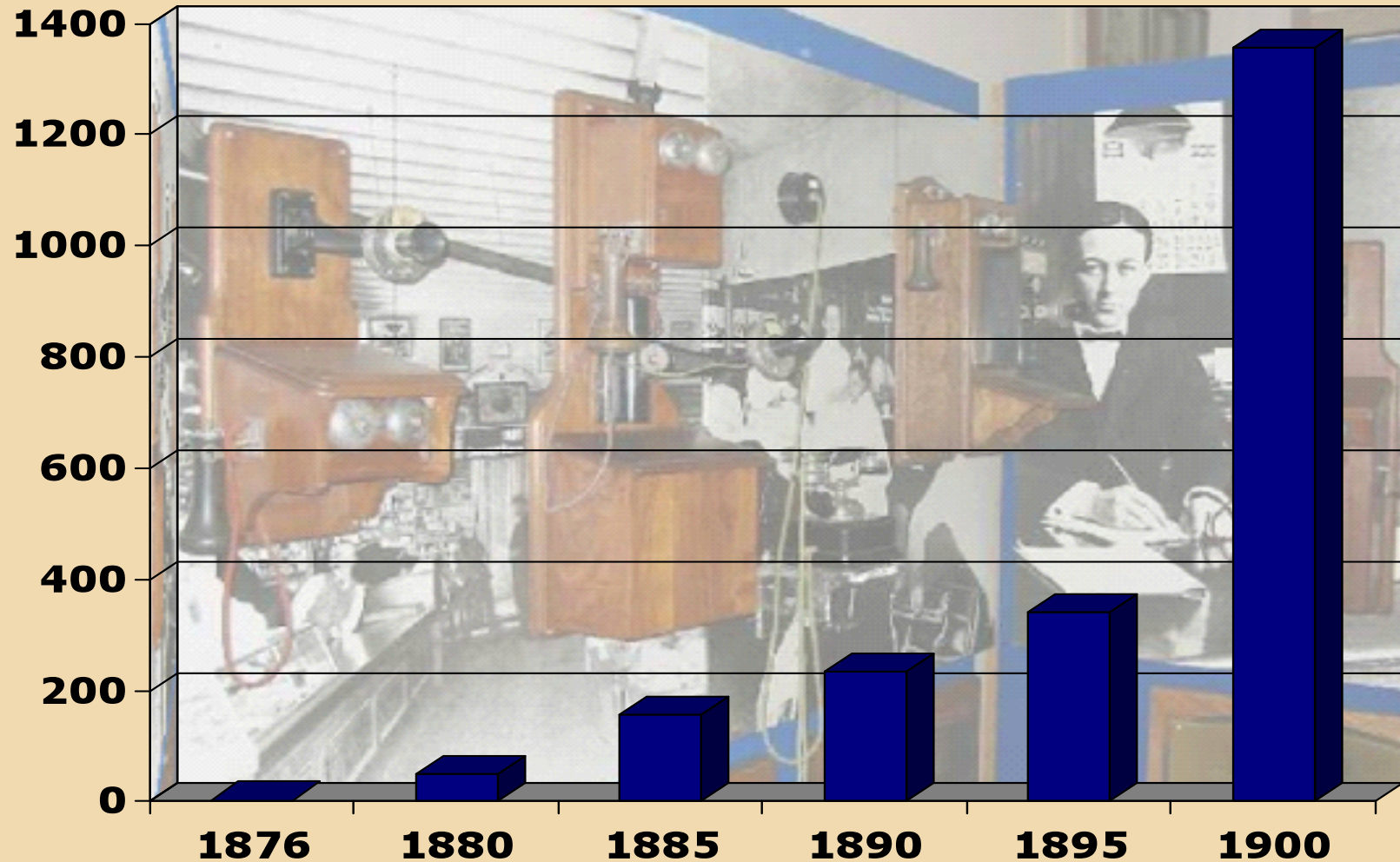
Demonstration of Bell's telephone between Salem and Boston, Massachusetts



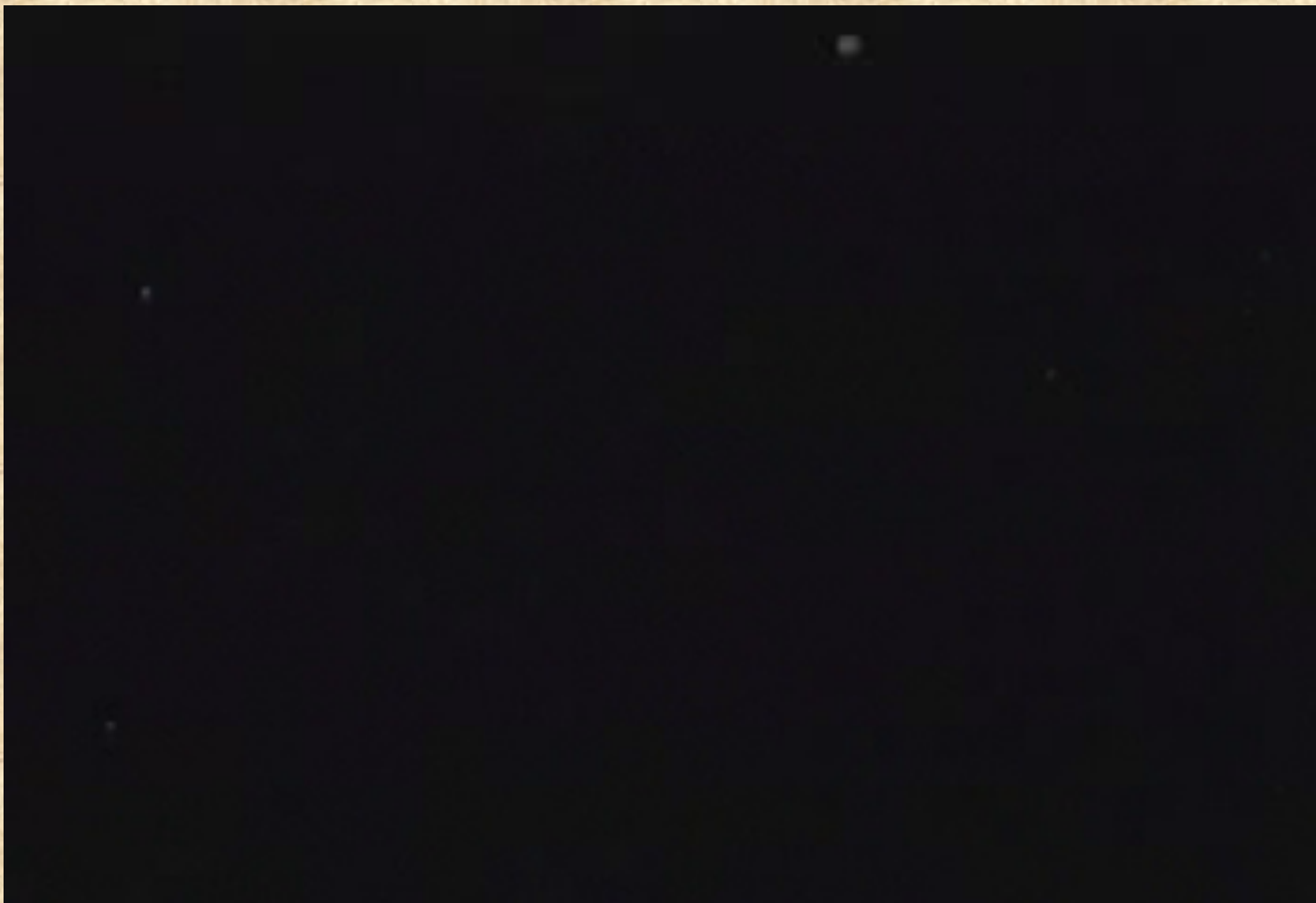
PROFESSOR BELL IN LYCEUM HALL, SALEM, ADDRESSING A PARTY OF SCIENTIFIC MEN IN BOSTON.

MASSACHUSETTS.—TRIAL EXHIBITION OF BELL'S TELEPHONE FOR THE TRANSMISSION OF SOUND BY ELECTRICITY, OPERATED BETWEEN SALEM AND BOSTON, MARCH 15TH.—FROM SKETCHES BY E. R. MORSE.—SEE PAGE 61.

Growth in telephones 1876-1900 (in thousands)



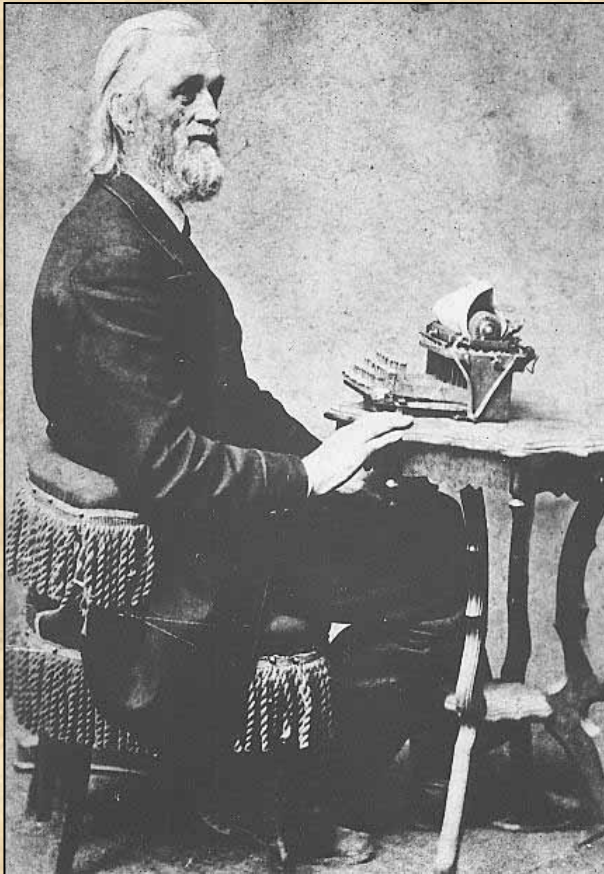
Part I: Alexander Bell



Part II: Alexander Bell



Christopher Latham Sholes, an engineer, invented the modern typewriter in 1867 and secured the patent in 1868. Sholes sold the rights to the Densmore brothers because he did not want to market the new product. The Densmores went to rifle manufacturer Philo Remington to help sell the device.



Small: Reproducting in all the countries.
Densmore, Remington, Washburn, Boston.
Dime and Paper Supercases,
See and other Bridges and Parts,
No. 35

Office of **Wm. G. Ellis**, Civil Engineer.
274 MAIN STREET,
Hartford, Conn., MAY 30TH, 1876.

ALEXANDER L. HOLLEY, ESQ.,
DEAR SIR,
YOUR CIRCULAR, WITH REQUEST
TO TAKE PART IN THE DISCUSSION OF THE SUBJECT OF TECHNICAL ED-
UCATION IS RECEIVED. I DO NOT EXPECT TO BE IN PHILADELPHIA AT THE
TIME, OR I SHOULD BE MUCH PLEASSED TO GIVE WHAT VIEWS I MAY HAVE
ON THE SUBJECT.

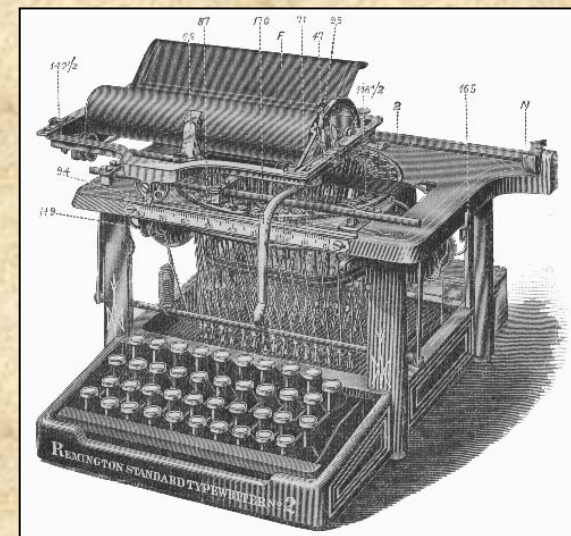
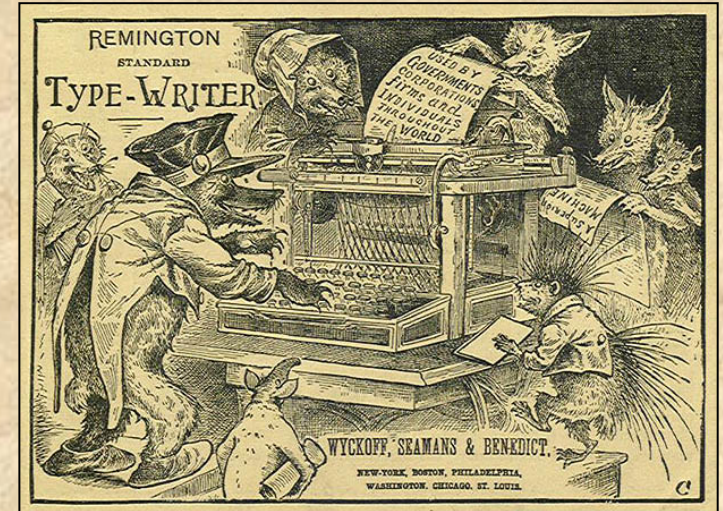
I HOPE TO SEE YOU AT THE TIME OF THE CONVENTION.

YOURS TRULY,
Wm. G. Ellis.



"Whatever I may have felt in the early days of the value of the typewriter, it is obviously a blessing to mankind, and especially to womankind. I am glad I had something to do with it. I builded wiser than I knew, and the world has the benefit of it." -Sholes

The first "Sholes & Glidden Typewriter" went on the market in 1874 with lukewarm results. Remington engineers made improvements a few years later and sales skyrocketed.

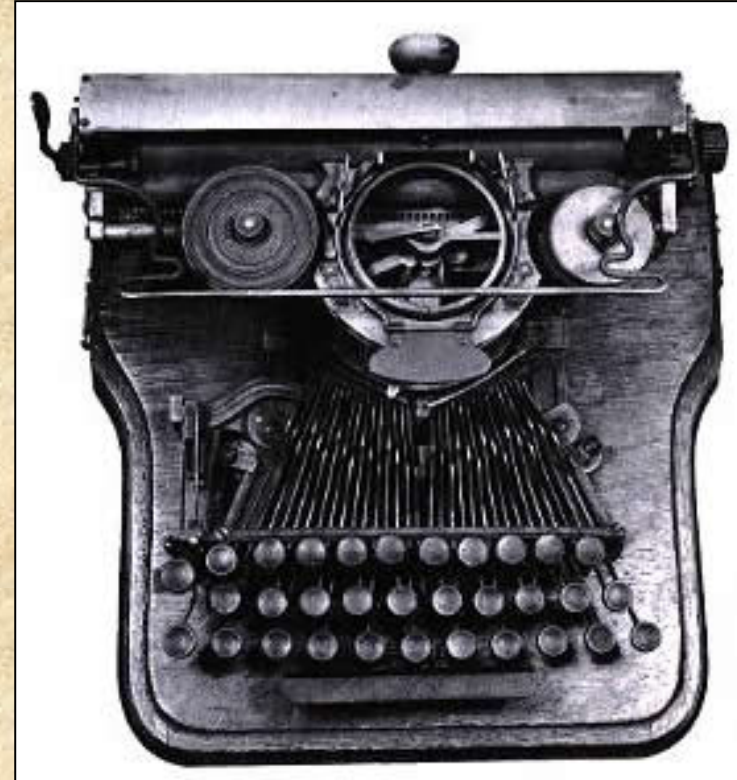




Twain showing his daughter one of his early typewriters.

"I will now claim--until dispossessed--that I was the first person in the world to apply the typewriter to literature...The early machine was full of caprices, full of defects--devilish ones. It had as many immoralities as the machine of today has virtues. After a year or two I found that it was degrading my character, so I thought I would give it to Howells...He took it home to Boston, and my morals began to improve, but his have never recovered."

- The First Writing Machines , Mark Twain



Mark Twain's 1880 typewriter. He was one of the first authors to use the machine.