American Social and Cultural History, 1865 to the present

Class 2

What We Will Cover Today

- Two innovations that began before the Civil War but reached their zenith in the later-19th Century
  - Railroads
  - Telegraph

What We Will Cover Today

- New Communication innovations
  - The telephone
  - The Post Office and the mail
  - Cheap mass-circulation newspapers and magazines
  - The typewriter and changes in the American office
- Changes in the home from 1865 to electrification

Post-Civil War Railroad

Year	1860	1865	1870	1880	1890
Mileage	30,000	35,000	53,000	93,000	164,000

Post-Civil War Railroad

- A Few Key Notes
  - Railroads differed from previous business enterprises
    - They were a public service enterprise that required enormous up-front outlays of capital
    - They were geographically spread-out entities that required extensive coordination to operate
    - Once built, they were expensive to run and maintain – i.e. they were not only capital-intensive but also labor-intensive
    - Their profitability required both eminent domain, limited liability, and government subsidy

Post-Civil War Railroad

- Some Notes
  - Post-Civil War Railroads were corporations – only corporations could raise the enormous amounts of capital needed and had limited liability
  - In addition to capital from stockholders and bondholders, railroads required government subsidies
    - These subsidies took the form of state and municipal purchases of stock and Federal government land grants

Post-Civil War Railroad

- Some Notes – 2
  - Railroads were the first firms that that needed C^2 systems
  - Before the telegraph, railroads were also the fastest known means of communication as well as of transportation.
  - Coordination remained a major problem until railroads adopted the telegraph.
    - The use of the telegraph for railroad dispatching began with the Erie RR in 1851

Post-Civil War Railroad

- Economic Impacts - 1
  - The railroad created new economic resources by making economically possible exploitation of
    - PA, WV, and KY coal deposits
    - Iron ore deposits in the Mesabi region of MN
    - Copper deposits in MT
  - The railroad created a national market for goods by destroying the transportation cost barrier that had protected local manufacturing monopolies from competition

Post-Civil War Railroad

- Economic Impacts – 2
  - The railroad, as a consumer, created a massive demand for iron, steel, coal, lumber, steam engines, telegraphic equipment, and machine tools
  - The railroad created a whole host of new occupations
  - The railroad linked different parts of the country together

Post-Civil War Railroad

- Economic Impacts -3
  - The railroad turned some villages into cities and others into hamlets and ghost towns
  - The railroad relegated the stagecoach and wagon from a primary mode of land transport to feeder status
  - The railroad fostered the development of capital markets and the New York Stock Exchange

Post-Civil War Railroad

- Economic Impacts – 4
  - The railroads initially fostered the cattle drives of the 1860s and 1870s when they built lines to Dodge City and Abilene
  - By building railroads to Texas and the northern Plains, the railroads made the cattle drives obsolete
  - Railroads provided an organizational model for later mass merchandisers and manufacturers

Post-Civil War Railroad

- Social Effects - 1
  - The railroads, with their need for trains to be at specific places at specific times, altered people's consciousness of time and made us slaves to the clock
    - The railroad created both timetables and a major market for watches since both railroad employees and passengers needed to know the exact time
    - The railroad created standardized time and time zones

Post-Civil War Railroad

- Social Effects – 2
  - The railroad with the help of the telegraph and newspaper built a national audience for certain actors, speakers, and entertainers
    - The railroads permitted performers and speakers to tour much of the country and become famous
  - The railroad, with the aid of the postage stamp, fostered the growth of the postal service

Post-Civil War Railroad

- Social Effects – 3
  - The railroads created the first city suburbs.
    - Different from the later automobile suburbs
    - Railroad suburbs were small communities strung out like beads on a string separated by rural areas
  - The railroad, with the help of the post office, made possible a national market for books and other publications

Post-Civil War Railroad

- Social Effects – 4
  - The train altered the psychological experience of travel
  - The train and the refrigerated rail car diversified the American diet by enabling the transportation of perishable foods like milk, meat, and seafood
    - Crisfield MD and the Eastern Shore became major exporters first of oysters and then of soft-shell Blue Crabs

Post-Civil War Railroad

- Social Effects – 5
  - Congestion in the horse-drawn city
    - Almost every passenger journey or freight shipment began or ended with a horse-drawn vehicle or horse
    - To haul passengers and freight, the large Percherons and Clydesdales by the 1880s became familiar sights on the streets
      - One result: a lot of horse-caused pollution. Each horse produced about 12,000 lbs of manure and 400 gallons of urine per year, much of which ended up in the street

Telegraph

- Theoretically, Telegraphy became possible when Stephen Gray of England in 1729 discovered that electric current could be conveyed along a wire and activate some sort of receptacle at the other end
  - Variation in the number or duration of the impulses could signal different letters or numbers which could be strung together to form a message
- Practically, creating a telegraph system proved possible only when reasonably reliable and economical batteries became available

Telegraph

- What Samuel F.B. Morse and Theodore Vail accomplished was:
  - A telegraphic system that used Morse Code
  - A telegraphic receiver that could both mark the dots and dashes onto a moving strip of paper and emit sounds that an experienced telegrapher could decipher at speeds up to 40-50 words a minute

Telegraph

- Some Notes About the Telegraph
  - Before the telegraph, the speed of information was tied to the speed of transportation. The telegraph broke that link and made possible the almost instantaneous communication of information
    - This revolutionized information-intensive industries and activities
      - News could now be reported as it occurred and instantly disseminated across a fairly wide region
      - Facilitated the operation and coordination of the railroads
      - Business transactions between merchants in different cities that formerly took days or weeks now took only minutes or hours

Telegraph

- Some Notes About the Telegraph – 2
  - It created a lot of technological hype and technological utopianism
    - The notion that new technology equals progress and that technological innovation can solve our socio-economic-political problems largely gets its start with the telegraph and the railroad.
  - It made possible the future creation of large-scale corporate entities

Telegraph

- Some Other Consequences
  - The combined desire for speed and the increasing costs involved in using the telegraph to get news led New York City newspapers in 1848 to create the first news wire service, the Associated Press
  - The unreliability of early telegraph lines (especially in wartime) led reporters to develop the 'inverted pyramid' style of news writing
    - The concern with essential facts led to a differentiation between news and opinion – with the latter being segregated into an editorial section or caged in quotation marks

Telegraph

- Some Other Consequences – 2
  - To economists, it is axiomatic that markets are limited to the area in which communications is effectively instant
    - Thus, before telegraphy, markets were inherently local. After telegraphy, they became regional and then national.
      - One effect was to concentrate the trading of items such as gold, stock, bonds, and commodities in the place where most of their related financial transactions took place:
        - » New York became a center of stock and bond trading
        - » Chicago became a center of commodities trading

Telegraph

- Some Other Consequences – 3
  - Created the first network-effect technology – the value and use of telegraphy increased as more nodes were added to the system
  - Made Western Union a major corporate entity
  - Along with the railroad, it facilitated travel and the holding of professional and business conventions
    - Telegraph allowed people to make hotel reservations
    - Allowed convention planners to coordinate convention planning with the hotels where the convention was to take place

Telegraph

- Some Other Consequences – 4
  - Paved the way for such future wire-related information technologies as the telephone, the teletype machine, the stock ticker, and the fax machine
  - Along with the railroad, the telegraph made modern sports and touring theatrical companies and their related stars possible by permitting long-distance transportation of teams, troupes, and fans (and the necessarily-related coordination) and the electrical transmission of sports news and theatrical publicity to city newspapers and mass-distribution magazines

Telegraph

- Historical Notes – 1
  - 1851 – Fire alarm telegraph
  - 1858 – Wheatstone Automatic Telegraph Sender that could transmit up to 400 words a minute from pre-punched tape
    - Used for news transmission
  - 1871 – Western Union begins money transfers
  - 1871 – Signal telegraph
    - Allowed a customer to signal a central police station, firehouse, or messenger service
  - 1872 – Duplex Telegraph
  - 1884 – Quadraplex Telegraph

Telegraph

- Historical Notes – 2
  - 1884 – Western Union is one of the original 11 stocks included in the first Dow Jones Average
  - 1900 – Fredrick Creed invents a way to convert Morse Code to text
  - 1913 – Western Union develops Multiplexing
  - 1914 – Western Union introduces the first charge card
  - 1920s-1930s – Telegrams experience peak popularity
  - 1925 – Teleprinter machines

Telegraph

- Historical Notes – 3
  - 1933 – Western Union introduces singing telegrams
  - 1936 – Varioplex Telegraph
  - 1938 – Facsimile
  - 1959 – TELEX
  - Jan 27, 2006 – Western Union delivers the last telegram

Telephone

- Alexander Graham Bell
  - Son of a professor of elocution in London & Edinburgh who emigrated to Canada
  - Taught deaf mutes in Boston. There
    - Met Gardiner G. Hubbard, an affluent businessman and philanthropist
    - Married Hubbard's deaf daughter, Mabel
    - Became professor of vocal physiology and elocution in 1873
    - Conceived of the telephone in July 1874

Telephone

- Origins of the Telephone
  - Invention of the duplex and quadraplex telegraph showed:
    - A telegraph wire could be made to carry the traffic of first two and then four wires
  - Concept of the harmonic telegraph
    - Bell's experience with a stuck reed led to the realization that a wire could also transmit a voice message
  - Bell obtained a patent for the telephone on March 7, 1876

Telephone

- How the Telephone Worked
  - Caller would talk into vibrating plates or reeds
    - This would induce a continuous fluctuating current
    - Current would carry the exact amplitude and voice frequency along a wire
    - An electromagnet at the receiver would transform the current into pulses of magnetic force
    - These pulses would act on another set of tuned reeds to reproduce the original sound

Telephone

- Creation of the Bell Telephone system
  - Hubbard was excited by Bell's invention
    - Opposed Western Union because it was a monopoly & favored a U.S. Postal Telegraph Company
    - Organized the Bell Telephone Company in July 1878
    - Persuaded Theodore N. Vail to run the company
  - Bell Telephone won a suit against a Western Union-sponsored competitor

Telephone

- Notes about the Bell Telephone System
  - Bell Telephone would manufacture the phones & license them to local phone companies
  - This meant that Bell:
    - Could for its first 16 years dictate, via its license agreements, both common technologies and the cost of local phone service
    - Due to its technical standardization, could begin long-distance phone service
  - Bell created Bell Labs to solve the technical problems that beset long-distance service

Telephone

- Early leaders of Bell saw the telephone as simply a “talking telegraph”
  - Assumed the telephone would be used just like the telegraph and by the same types of users
- This had three effects
  - Led independent phone companies to take advantage by providing services that Bell didn’t
  - Slowed down the pace of telephone adoption
  - Brought Bell to near bankruptcy, leading to its takeover in 1907 by Morgan banking interests and the stabilization of AT&T under Theodore Vail

Telephone

- Bell/ATT Timeline - 1
  - 1878 - First commercial switchboard established in New Haven, CT
  - 1880 – Local telephone companies reorganized as the American Bell Telephone Company
  - 1880 – First telephone numbers
  - 1880 – First pay telephone
  - 1885 – Name changed to American Telephone & Telegraph Company
  - 1893 – With the expiration of Bell's patents, independent phone companies enter the business
    - By 1902, there were 9,000 such companies

Telephone

- Bell/ATT Timeline -– 2
  - 1915 – First transcontinental telephone call
  - 1919 – First rotary dial telephone
  - 1922 - AT&T opens WEAF, the first commercial radio station in New York.
  - 1925 - AT&T establishes Bell Telephone Laboratories Inc. as its research and development subsidiary.
  - 1927 - AT&T begins transatlantic telephone service
  - 1934 – AT&T inaugurates trans-pacific phone service

Telephone

- Bell/ATT Timeline -– 3
  - 1941 – First non-experimental laying of coaxial cable
  - 1946 – Beginning of mobile phone service
  - 1947 - Bell Labs invents the transistor
  - 1951 - First customer dialing of long-distance calls
  - 1956 - First transatlantic telephone cable
  - 1962 - First telephone satellite - Telstar

Telephone

- Bell/ATT Timeline -– 4
  - 1963 – First touchtone phone
  - 1968 - AT&T introduces 911 as a nationwide emergency number
  - 1970 - First customer dialing of international telephone calls
  - 1971 - Researchers at Bell Labs create the Unix computer operating system
  - 1977 – Installation of the first fiber optic cable

Telephone

- Bell/ATT Timeline -– 5
  - 1983 – AT&T opens the first commercial cellular telephone service in Chicago
  - 1984 - Dissolution of AT&T and creation of the Baby Bells
  - 1988 - First transatlantic fiber optic cable
  - 1996 - Telecommunications Act of 1996

Telephone

- Telephone vs Telegraph
  - Telephone permitted voice communication as opposed to Morse Code
  - Telephone communication was synchronous and dialogic whereas the telegraph was asynchronous
  - Telegraph left a written record – the telegram – whereas the telephone did not
  - Telegraph required an intermediary – the telegraph operator – while the telephone within a local exchange did not

Telephone

- Effects of the Telephone
  - It replaced the telegraph in the performance of many of its functions, particular its coordination and communication functions
  - Its technical problems led to the creation of Bell Labs – from which many innovations and discoveries flowed
  - Its linking of different exchanges created the first virtually universal network
    - A network that no longer required people to be at a fixed point to access the communication system

Telephone

- Effects of the Telephone – 2
  - Telephone poles and wires changed the suburban and rural landscape
  - Made obsolete the Victorian practice of card leaving
    - Led to people calling before coming over for a visit
  - Led to large-scale solicitation by businesses and charities who started calling people at home

Telephone

- Effects of the Telephone - 3
  - Sped the commercial adoption of the typewriter
    - The need to create memos or records of phone conversations helped increase the need for typists
  - Fosters sociable conversation, gossip, and chit-chat
    - Thus teen-age girls are the biggest users of the phone
  - Fostered the development of subsequent communication technologies

Post Office & Mail

- Before the Civil War, delivering mail was by far the largest activity of the Federal Government
- It employed more people than the peacetime armed forces and more than the rest of the civilian bureaucracy
- Small communities demanded and got post offices because mail was not delivered to homes and had to be picked up at the post office

Post Office & Mail

- Post office fostered transportation improvements
  - Contracts for carrying mail went to stagecoach lines, steamboats, and the railroads
- Early mail consisted mostly of printed material, overwhelmingly newspapers
  - Letter writing did not start to become popular until the 1850s

Post Office & Mail

- Key Dates in Post Office History
  - 1847- Congress adopts adhesive postage stamps for mail
  - 1850 – Standard size envelopes
  - 1851 – Congress cut the postage rate to 3 cents (prepaid) per oz
  - 1853 – Stamped Envelopes
  - 1855 – Congress makes postage stamps mandatory

Post Office & Mail

- Key Dated in Post Office History – 2
  - 1863 – Free home delivery in large northern cities
  - 1873 – Postcards
  - 1874 – Post Office began charging publications by the pound rather than the piece, with newspapers paying 2 cents per lb & magazines 3 cents per lb
  - 1885 – Congress cut the above second-class rates to 1 cent per lb

Post Office & Mail

- Key Dates in Post Office History -3
  - 1896 – Special Delivery
  - 1897 – Rural Free Delivery
  - 1911 – Parcel Post
  - 1917 – Air Mail Delivery

Typewriter

- Invented by Christopher Sholes
  - Christopher Sholes:
    - Developed a workable typewriter in 1867,
    - Drew in some co-inventors to improve the device
    - Found a manufacturer in small-arms maker Remington
  - 1874 – First Remington typewriter
  - 1876 - Exhibited at the 1876 Centennial Exposition in Philadelphia
  - 1878 - Remington Model 2 typewriter – the manual typewriter as we remember it

Typewriter

- Initially marketed to authors, lawyers, clergymen, and court reporters
  - Court reporters were the first major adopters of the typewriter
- Businessmen saw its commercial potential to speed up correspondence
  - The typewriter found large-scale popularity in the business office, then spread to government, and finally to individual authors and students

Typewriter

- Effects of the Typewriter
  - Created a demand for typists and stenographers
    - Feminized the clerical work force
      - Impacted upon female fashion
      - This opened up a new niche for women, but also confined them to a subservient status
  - Led people to start composing documents on the typewriter

Typewriter

- Effects of the Typewriter – 2
  - Revolutionized the Office
    - Produced text that was more legible than handwriting
    - With carbon paper, produced multiple copies of the same document
      - Revolutionized office filing
      - Multiplied the quantity of office records
      - Created the typewritten form
    - Changed the furniture of the office
    - Divided correspondence into official (typed) and personal (handwritten)