History of Communications Media

Class 4

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What We Will Cover Today

- Telephone
  - Finish up the Effects of the Telephone
- Still Photography
  - Daguerreotype to Colodion Glass Plate
  - Roll film from Eastman to 35mm
  - Digital Photography
- Typewriter
  - What Christopher Scholes & Remington Wrought

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

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

Effects of the Telephone - 4

- Led to such ancillary inventions as the telephone booth, the telephone book, and the public pay telephone
- Replaced to some extent the red-light district with the call girl
- Gave organized crime the technology needed to tap into the lucrative but illegal market for off-track betting on the horses

Telephone 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 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 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 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 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

Bell on the Telephone

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Early Edison Wall Phone

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19th Century Phone Call

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1920s Candlestick Phone

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1950s Style Phone

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Push Button Phone

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Photography

The Film Era

Photography – Definition

- **Photography** is the process, activity and art of creating still pictures by recording radiation (normally visible light) on a sensitive medium, such as a film, or an electronic sensor. Light patterns reflected or emitted from objects activate a sensitive chemical or electronic sensor during a timed exposure, usually through a photographic lens in a device known as a camera that also stores the resulting information chemically or electronically.

Photography

- Photography is based to some extent on an optical illusion
  - The human eye sees a vast range of greys and colors but if the individual items of grey or color are small enough, it blends the distinct elements into a continuous tone
  - At the microscopic level, developed black & white film consists of either black or white film grains (or pixels in the case of digital photographs) but they are so small that the eye sees them as a continuous tone

Photography - 2

- At the microscopic level, developed color film consists of the black or white film grains, but they are within three different dye layers – normally cyan, magenta, and yellow. When white light is reflected off or passed through the film, each layer subtracts from the white light to produce what we see as continuous tone colors

Photography – Some Notes - 1

- The photograph freezes an image of reality in time
  - While people age in real life, the people in the photographic image do not age
  - Thus the photograph did for visual information and space what the manuscript and printed text did for verbal information and time
- "A picture shows us something about the world. A story tells us something about the world."

Photography – Some Notes - 2

- Visual images depict and organize objects in space
  - Describing space –whether it be a landscape, a street scene, or a person's features – takes a considerable amount of words, but only one picture
- Verbal information in the form of a Narrative or Story places and organizes people and objects in time
  - This is especially true in the genres of the novel, the history, and the movie which all have a beginning or starting point, a middle, and an end
- Media that lack images (such as the novel and radio) must use words (and one's imagination) to provide a spatial context

Photography – Some Notes - 3

- Photographs imply transparency – that they don't lie, that they are a window on a part of the world
  - One reason is that the photographer does not impose himself between us and the content in the way that the artist does in a painting
- Photographs (along with MOPIC film and video) focus attention on a subject or event
  - What is photographed or recorded is seen to exist
  - What is NOT photographed or recorded is often not noticed
- Photographs, like art, however, are composed
  - What is shown in the photograph depends on several factors
  - What is not shown often can affect the context in which the photograph is interpreted
  - The caption affects perception of the content and provides vital contextual information

Captions

- Caption - short text message that appears with the image and clarifies its import.
  - Identifies the subject(s) of the photograph
    - Who and/or What
  - Add vital context to a photograph
    - Who took the photo
    - When, Where, and sometimes How and Why
    - If relevant, what happened before and after the photo was shot and/or what is not in the picture
  - Can draw attention to something in the image that is not obvious, such as the presence of someone or something in the background that gives the photograph added meaning or relevance
  - Permits or facilitates retrieval of individual photographs from a large collection of photographs

Photographic Genres

- Photography has given rise to a whole host of different genres
  - Examples
    - Snapshot
    - News photograph
    - Advertisement
    - Montage
    - Portrait
    - Still Life

Photography – Origins

- Camera obscura
- Johann Schultz - discovered that a silver and chalk mixture darkens under exposure to light (1724).
- Thomas Wedgwood - first recorded images (1800)
- Joseph Nicephore Niepce –first photograph (1825)
  - Used bitumen and required an 8-hour exposure
  - Invented photoengraving
  - Partner of Louis Daguerre

Louis Daguerre

- Louis Daguerre – invented daguerreotype
  - Daguerre was a panorama painter and theatrical designer
  - Announced the daguerreotype system in 1839
- Daguerreotype – a photograph in which the image is exposed onto a silver mirror coated with silver halide particles
  - The first commercially practical photographic process
    - Exposures of 15 minutes
  - The polaroid of its day – capable of only a single image

Daguerreotype
by Louis Daguerre

William Henry Fox Talbot

- William Henry Fox Talbot – invented the calotype or talbotype
  - Calotype was a photographic system that:
    - Used salted paper coated with silver iodide or silver chloride that was developed with gallic acid and fixed with potassium bromide
    - Produced both a photographic negative and any desired number of positive prints

Wet Collodion Process - 1

- Invented in 1850 by Frederick Scott Archer and Gustave Le Grey
- Wet plate process that required the photographer to coat the glass plate, expose it, and develop it within 10 minutes
- Required a portable photographic studio
- Created a glass negative from which any number of positive paper prints could be made

Wet Collodion Process - 2

- It was a relatively inexpensive process in comparison with the daguerreotype
- Produced better positive prints than Talbot's paper calotype negatives
- Reduced exposure time to seconds
- Matthew Brady used this process
- Dominated photography until the invention of dry photographic plates and roll film

Wet Collodion Process - 3

- The wet collodion process was used with other supports as well as glass plates
  - Tintypes used metal
  - Ambrotypes used glass plates coated with a black varnish on one side to produce a positive photographic image
    - Wet collodion version of the daguerreotype

Post Office – Washington DC

Monitor

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Little Round Top

Richmond – 1865

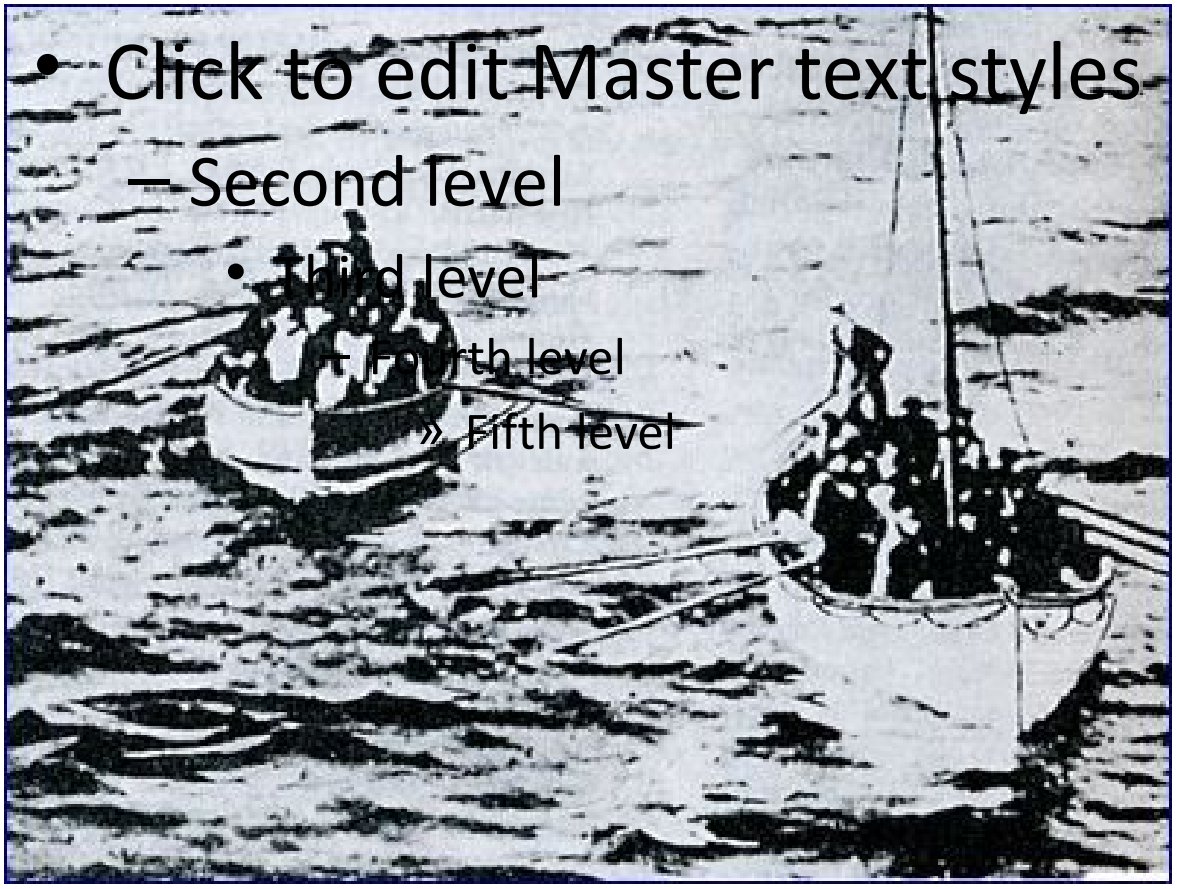
George Eastman

- Developed a practical photographic process that used dry plates coated with a gelatin emulsion that contained silver bromide
- Developed a coating machine to produce uniform quality gelatin emulsion dry plates
- Invented photographic roll film
- Invented a camera that used the roll film he developed
- Introduced the Kodak Brownie camera for $1

Effects of Eastman's Innovations

- Changed photography from an endeavor practiced by a few professional photographers to an endeavor practiced by nearly everyone
- Gelatin emulsions made possible shutter speeds as fast as 1/50th of a second
  - Made possible the news photographer and the war photographer who could now photograph people without requiring them to pose
- Roll film made possible the development of motion pictures

Famous Amateur Photograph



Newspaper Photography

- In the early-1890s, it became commercially feasible to incorporate photographs in large newspaper editions. This was because of Halftone printing.
- Halftone printing uses dots that vary in either size or spacing to create the optical illusion of a smooth tone photograph
  - Thus the halftone print of a black & white photograph that we see as containing a range of continuous tone shades of grey will consist of black and white dots that are so small that we perceive them as a continuous tone

Newspaper Photography - 2

- Before half-tone printing, photographs had to be transcribed into line engravings
  - This meant that newspapers and magazines had very few illustrations and virtually no photographs
- Half-tone printing led to a new brand of newspapers using halftone illustrations based on photographs in place of woodcuts based on drawings
  - Newspapers begin to employ photographers as well as (and often instead of) artists
  - Newspaper and magazine began to contain pictures and photographs

Effects of Photography - 1

- Along with color lithography and halftone printing, it allowed the cheap reproduction of all kinds of images
  - Any photograph or any painting could now be readily converted into an attractive half-tone illustration. This was a boon to advertisers, businesses, and home decorators
- Changed the concept of what constituted Art
  - Art was no longer an imitation of external objects; it was now the external manifestation of the artist's self-expressive creativity

Effects of Photography - 2

- Pushed pictorial art into depictions that were impressionistic, abstract, and non-representational
- Created a new art form – the photograph
- Along with offset color lithography, helped make artist-signed lithographic copies of his original work a major element in both the art market and the modern art museum

Effects of Photography - 3

- Became a major tool of news reporting (including war reporting), crime investigation, and scientific research
- Led to the tabloid newspaper
- Along with the telegraph and the railroad, the photograph created the ‘star’ and the celebrity
- Turned the world into a “museum of known objects”

35mm Still Cameras

- The fact that film companies were producing large quantities of 35mm film stock led to the development of 35mm cameras
- In 1934, Kodak introduced single daylight-loading 35mm film cassettes
  - This cassette could be used in all 35mm still cameras, including the German Leica and Zeiss Ikon Contax cameras
- In 1935, Kodak introduced the Kodak Retina 35mm camera. Also in 1935, the Argus camera came onto the market

Kodak Retina 1 Camera

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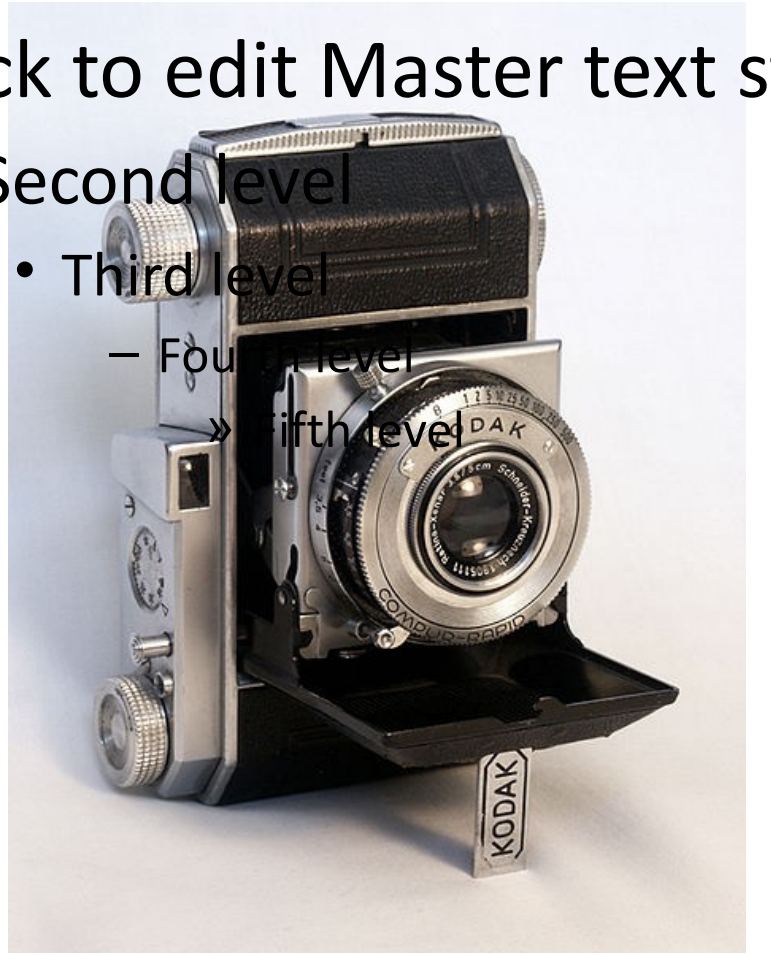

Argus Camera

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Fuji 35mm Film Cassette

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Notes about the 35mm Camera

- Became a favorite of both professional and amateur photographers
  - The camera was small, compact, easily portable, and rugged enough to be used in the field
  - 35mm cameras like the Leica and Kodak Retinas had a sufficiently high shutter speed and low focal length to lens aperture ratio (f-stop) to photograph moving objects without blurring and to take pictures in poor light

Impact of the 35mm Camera

- Led to the popularization of the candid snapshot in which the subject is not aware of being photographed
- Permitted “concealed” and “secret” photography since the camera was small enough to be hidden in one’s clothes or in a room and yet still be able to take pictures
- Led to the creation of a large body of skilled photographers who were not professionals but definitely beyond the casual shooter with a box camera
  - Could use the 35mm camera to create a variety of special picture effects

Impact of the 35mm Camera - 2

- Since the processing of black & white film was a fairly simple process that could be done in a small dark room, it made the dark room part of many a house
  - There, one could process the film and then make prints and enlargements from the negative(s)

Kodachrome

- Kodachrome, introduced in 1935, was the first successfully mass-marketed color film
  - It produced a positive color slide
  - It used a subtractive color process with layers of magenta, cyan, and yellow
  - Because of its complex processing requirements, it was sold process paid until 1954
  - It won the admiration of both professionals and amateurs because of its vivid colors and its long-term archival stability
  - It's production run lasted for 74 years

Impact of Kodachrome

- Popularized color vis-à-vis black & white photography
- Created an ancillary demand for slide projectors and screens for viewing
- Led to the ritual of the photographer subjecting family, relatives, and friends to the slide show
  - With the subject generally being the recent wedding, birth, graduation, or family vacation

More General Impacts - 1

- Led to the visual documenting of persons and events that previously went undocumented
- Created a treasure trove of material for future historians and producers
  - People and institutions now only left paper records in the form of documents now left photos as well permitting us to see what people and objects looked like

More General Impacts - 2

- Since film freezes images in time, it draws very visible contrasts between the then (when the film was shot) and the now (when it was viewed)
  - This may have had some effect on how people viewed history
    - If events did not leave a visual record, then the events either did not happen or had relatively little significance in comparison with those event that left a visual record
    - History is less a logical continuous developmental flow and more a dichotomous succession of events

Digital Photography

Electronic Cameras

- Definition
  - Digital Camera = a camera that takes still photographs or video or both by recording digital images via an electronic image sensor
- Not all electronic cameras are digital cameras
  - The digital electronic camera was preceded by analog electronic cameras, but these never caught on except for some use by the military and some newspapers
- While starting out as discrete products, digital camera capabilities have been incorporated into cellphones and other devices, including telescopes

History

- The first digital camera was built in 1975 by Steven Sasson, an Eastman Kodak engineer.
  - Used the new solid-state CCD image sensor chip developed by Fairchild Semiconductor in 1973
  - Weighed 8 lbs
  - Recorded black & white images to a cassette tape
  - Had a resolution of 10,000 pixels and took 23 seconds to record an image
  - Was a technical prototype never intended for production

History - 2

- 1988 – Creation of the first JPEG standard
- 1988 – First true digital camera – the Fuji DS-1P
- 1990 - First commercially available digital camera, the 1990 Dycam Model I.
- 1991 - Kodak marketed the DCS-100
- 1995 – First camera with a liquid crystal display on the back – Casio QV-10

History - 3

- 1995 – First digital camera to record video clips – Ricoh RDC-1
- 1997 – First megapixel camera for consumers
- 2000 – Average price falls to $450 and 10 million are shipped
- 2002 – World shipments of digital cameras surpass that of
- 2004 – Average price falls to $280 and 60 million are shipped

How a Digital Camera Works

- Camera lens focuses light onto a Charge-coupled Device (CCD)
- The CCD acts as an optical sensor
  - CCD is divided into a grid of millions of separate cells or pixels that are sensitive to light
  - CCD cells convert incoming photons into an electric charge
  - When battery voltage is applied, the CCDS transfers the charges from each pixel to a register which reads out the electric charge and converts it to a digital value

How a Digital Camera Works - 2

- The digital image (with its digital values for each pixel) is stored on a SDHC card and is available for viewing on the camera's LCD or for download to a computer, viewer, or external storage device

Film vs Digital

- CCDs are potentially much more light sensitive than photographic film
  - This led astronomers to replace film plates with CCDs to photograph the light from distant galaxies

Film vs Digital

- In contrast to Film cameras, Digital cameras
  - Allow the display of images on a screen immediately after viewing
  - Can store hundreds or even thousands of images on a SDHC card
  - Allow the deleting of images to free storage space
  - Allow for the incorporation of caption and capture data into the image file
    - Many digital cameras record GPS and date/time recording data
  - Make possible the near-real-time dissemination of images to off-site viewers and users

Effects of the Digital Camera

- Converted the camera into an input peripheral to the PC
- Destroyed the entire infrastructure of the film camera industry
  - Film manufacturing – Kodak has discontinued the manufacture of 35mm still film
  - Photographic (silver bromide) paper manufacturing
  - Photographic processing labs
  - Lab equipment manufacturers

Effects of the Digital Camera - 2

- Made Sony and Canon competitors to Kodak
- Drove Kodak, Polaroid, and Fuji to near bankruptcy
- Greatly facilitated the manipulation and forgery of imagery
  - Surfaced issues of photographic veracity, authenticity, and fakery
- Revolutionized newspaper reporting and combat camera operations

Canon Digital Camera

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Kodak Digital Camera

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The Typewriter

What Christopher Scholes &
Remington Wrought

Definition

- Typewriter = a mechanical or electromechanical device with lots of keys that, when pressed, cause ink to be printed on a medium, usually paper.
- Typewriter = a machine for writing in characters similar to those produced by printer's type by means of keyboard-operated types striking a ribbon to transfer ink or carbon impressions onto the paper

Typewriter - 1

- 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 - 2

- 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

Effects of the Typewriter - 1

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

Effects of the Typewriter - 3

- Revolutionized the Office (cont)
  - Changed the furniture of the office
    - The roll top desk with pigeonholes gave way to the modern “Efficiency Desk” (created in 1915 for the Equitable Life Assurance Company) which was a flat-top table containing 4 or 7 shallow drawers underneath
  - Divided correspondence into official (typed) and personal (handwritten

Effects of the Typewriter - 4

- Created a demand for carbon paper
  - Allowed the typewriter to create an attractive original and several acceptable copies
- Led to the development of vertical file cabinets to store (and facilitate the retrieval of) documents and case files created by the typewriter and carbon paper

Effects of the Typewriter - 5

- Led manufacturers of consumer machinery to establish distribution and repair networks
  - As an early piece of machinery often in need of repair, the typewriter created the need for a distribution network to provide instruction, repair, service, and technical assistance functions
- Impacted on how individuals were recruited into, and trained for, the legal profession
  - Reading law in a law office was replaced by law school as a means of educating and recruiting lawyers

Remington Typewriter

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Early Typewriter

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underwood
FIVE

Typewriter

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