Outline

- the technology improves
- popularization of photography
- documenting the growth of America
- gigantic undertakings (around the world)
- the industrial aesthetic
- scientific uses of photography
- documenting the social scene
- the Great Depression and the Dust Bowl
- profile: photographers of the Farm Security Administration

- still to come: photojournalism, modern art photography...
The technology improves

- **1878** dry-plate photography (Richard Maddox, Charles Bennett)
  - hardened gelatin-silver bromide
  - exposure time under one second
  - plates could be stored, separating shooting from processing

- **1885** paper roll film (Arthur Melhuish, George Eastman)
  - gelatin coated onto paper (or film)
  - exposures under 1/10 second
  - multiple pictures without fiddling

- **1880s** shutters (many people)
  - needed as films became more sensitive
  - focal plane (roller blind), leaf (diaphragm)
The Kodak Camera

- 1888  Kodak camera No. 1
  - fixed-focus, single shutter speed (1/100 sec?)
  - 100 shots per roll, then mail the camera back for reloading
  - “You press the button, we do the rest”
  - $25 for the camera, $10 per roll to process
  - contribution was not a single invention, but a system
Edison’s lighting system

- 1880  patent for incandescent light bulb
- 1882  first lighting system, New York City

- system components
  - central generating station
  - underground conductors
  - usage meter
  - wiring and plugs
  - sockets and fixtures
  - fuses to prevent overloading

- misjudged one component
  - direct current versus alternating current

Thomas Edison (1847-1931)
Related technologies

- **1870s**
  - German chemistry / dye / drug industries: new processes and compounds, purity, standardization

- **1880**
  - Flash photography (using flash powder)

- **1890**
  - Platinum paper printing (matte but with a deep black)

- **1873**
  - Screen-based halftone printing for mass publication

First photograph printed using halftoning (you have to see it in person)
Screen-based halftoning
(simulated in Photoshop)

✧ since a printing press can only print black or white (no grays), goal is to convert tones into dots of varying size

now largely replaced with digital halftoning
Later technologies

1. 1850s  telephoto lenses (Petzval Portrait Lens)
2. 1890s  anastigmatic lenses - corrects for all aberrations
3. 1925  35mm camera (Leica I)
4. 1932  photoelectric meter
5. 1930s  zoom lenses for cinema (Cooke Vario 40-120mm)
6. 1960s  zoom lenses for still cameras
7. 1981  autofocus SLR (Pentax ME-F)
Digital photography

- 1994  mass-market digital camera (Apple QuickTake)
- 1992  digital SLR (Nikon-Kodak DCS 200)
- 1990  Photoshop 1.0
Popularization of photography

- before George Eastman, photographers were skilled, photographs were posed, and images were “crafted”
- the Kodak camera was cheap, portable, and easy to use
- photography became casual, spontaneous, and popular
- concentrated on documenting everyday life
- word “snapshot” invented by Herschel
- privacy became an issue (it still is)
- women started taking pictures - so subjects changed

Walter Benjamin, The Work of Art in the Age of Mechanical Reproduction (1935)
Documenting the growth of America

Dome of the U.S. capitol, photographer unknown, 1857

Dome of the U.S. capitol, view in 1906

(Archives)
Documenting the growth of America

Washington Monument, photographer unknown, 1876

view in 1884
The push west

Oklahoma, photographer unknown, 1893
The end of the frontier

Opening the Cherokee Strip, W.A. Flower, 1893
Photography as proof of achievement

First powered flight, Wright Brothers, Kitty Hawk, 1903

© Marc Levoy
Industry and commerce

Waterfront at St. Louis, photographer unknown, 1909
Gigantic undertakings

Brooklyn Bridge, 1881

after completion (mid-1880s)
Gigantic undertakings

Statue of Liberty in Bartholdi’s Parisian workshop, 1882?
Gigantic undertakings
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Gustave Eiffel, The Eiffel Tower, 1889
Some projects were almost too gigantic

Panama Canal, Miraflores Locks, photographed by Ernest Hallen, 1913
The ship Lord Templeton traverses the Panama Canal’s Culebra Cut, 1915
The bark Passat in heavy seas while rounding Cape Horn, photographed by Capt. H. Piening
Aerial photography

- from balloons
- from tall buildings
- from airplanes
- from space

James Wallace Black, Boston from the Air, 1860

(Rosenblum)
Berenice Abbott,
New York at Night, 1933
Tall buildings

Chrysler Building, 1930
William van Alen, architect

Margaret Bourke-White atop the Chrysler Building
Tall buildings

Chrysler Building, 1930
William van Alen, architect

Burj Khalifa, Dubai, 2010
tallest structure in world (2717’)

© Marc Levoy
The industrial aesthetic in photography

Charles Sheeler,
Ford Plant, Detroit,
1927

(Newhall)
The industrial aesthetic in photography

(Charles Sheeler, The Upper Deck, 1929)
Lewis Hine,
Powerhouse Mechanic,
1925
Margaret Bourke-White, Fort Peck Dam, 1936
Scientific uses of photography

- aerial photography
- freezing motion
- the birth of cinematography
In a galloping horse, are all four hooves in the air at once?

- collaborative effort; Stanford suggested using trigger wires
- experiments spanned 1872-1878, in Palo Alto & Sacramento, with an interruption in 1874 when Muybridge was tried for the murder of his wife’s lover
Public demonstration, June 19, 1878

“The Horse in Motion” by Eadweard Muybridge.
Public demonstration, June 19, 1878

(Click to see a larger view of this image from the Library of Congress.)
Thomas Eakins

History of a Jump, 1884

The Agnew Clinic, 1889
Etienne Jules Marey

Falling Cat,
1880s
The birth of cinematography

- Muybridge’s images could be viewed using a Zoopraxiscope (invented by him)
The birth of cinematography

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- first practical unlimited-duration recording technology was Edison’s 1893 Kinetograph (with William Dickson)
  - perforated 35mm-wide strip of celluloid film
  - intermittent pull-down at 30 frames per second
- looped, backlit filmstrip displayed to individual viewers using Edison’s Kinetoscope
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- Concurrent work by Lumière brothers in France

(wikipedia) workers leaving the Lumière factory
Documentating the social scene

- photography recognized early as a force for social change
- social conscience initially awakened by seeing inequity in Europe’s colonial possessions: Egypt, Cuba, Africa, India, etc.
- government-funded projects undertaken to document ethnic groups and their living conditions, for lectures or pamphlets
- expanded to include the economic hardship in Europe and American brought about by industrialization
- given impetus by late 19th century moral reform movements, many of them religious in origin

- before paper film, photographs were carefully posed, so they seldom represented real living or working conditions
- ability to influence public opinion needed the power of the printing press, not individual prints hanging in an art gallery
Recording non-European cultures

(Rosenblum)

Marie Cabannis, Syrian Bedouin Women, 1870
Showing the success of relief programs

(Rosenblum)

Raja Lala Deen Dayal, famine relief program in Aurangabad, 1899
Showing the success of relief programs

(Rosenblum)

Raja Lala Deen Dayal, famine relief program in Aurangabad, 1899
Advertising social programs at home

(Rosenblum)

unknown photographer, 1875
The Progressive era

- transition from religious charity to social agitation
- gradual realization that urban poverty arose from economic laws, not the moral inadequacy of slumdwellers
- seminal work was Jacob Riis’s 1890 book “How the Other Half Lives”, about the tenements of New York
Venturing into the slums

(Rosenblum)

Jacob Riis,
Bandit’s Roost,
New York, 1888

© Marc Levoy
Immigrant ghettos

(Rosenblum)

Jacob Riis, Five Cents Lodging, 1889
Sarah and Jacob Chesler

S.S. Rijndam
Child labor

Lewis Hine, Breaker Boys, 1911

(Archives)
The Great Depression

- causes included an uncontrolled stock market, unstable banking system, inequitable distribution of income, and agricultural collapse caused by excessive production and misuse of marginal farmland

- milestone was the October 1929 stock market crash, but the market didn’t bottom out until 1933

- marked by bank failures, high unemployment, labor unrest, and agricultural hardship, exacerbated by draught in the early 1930s
Soup kitchens and breadlines
Rural poverty

Margaret Bourke-White, Two Women, Lansdale, Arkansas, 1936

(Rosenblum)
The Dust Bowl prequel: settlement on the High Plains

- 1870s - cattle drives from Texas to the transcontinental railroad

a chuckwagon, S. Dakota, 1887
The Dust Bowl
prequel: settlement on the High Plains

- 1870s - cattle drives from Texas to the transcontinental railroad
- 1880s - American Bison (Buffalo) hunted nearly to extinction

buffalo stampede, 1917
buffalo skulls, 1870
range of the American Bison
The Dust Bowl
prequel: settlement on the High Plains

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Edward Curtis,
The Vanishing Race, 1904

range of the Commanches prior to 1850

(Rosenblum)
Commanche warriors, photographer unknown, 1874
The Dust Bowl prequel: settlement on the High Plains

- **1870s** - cattle drives from Texas to the transcontinental railroad
- **1880s** - American Bison (Buffalo) hunted nearly to extinction
- **1890s** - Indian wars end, Commanches confined to reservations
- **1900s** - settlers encouraged to plow and plant
  - “sodbusters”
  - “Rain will follow the plow”

![sod house, 1901](image)
The Dust Bowl

- deep plowing by new, gasoline-powered tractors stripped the land of its protective, deep-rooted grasses
- nutrient-hungry cotton planted on draught-prone land

Dorothea Lange, Tractored Out, 1938
The Dust Bowl

Black Sunday, April 14, 1935
The Dust Bowl

Dodge City, Kansas
April 14, 1935
The Great American Desert

[Map showing groundwater depletion]
Abandoned farmhouse, Kansas

(Laurie Winslow)
Winslow farm, Dalton, Kansas

(Laurie Winslow)
Farm Security Administration

- created by Franklin Roosevelt in 1935 as the Resettlement Administration, to combat rural poverty
- under Roy Stryker, photographers were hired to record the agricultural disaster unfolding on the High Plains, to help justify multiple, expensive relief programs
  - Walker Evans
  - Arthur Rothstein
  - Dorothea Lange, and 8 others
- related effort
  - Margaret Bourke-White
FSA photographs

Walker Evans,
Wife of a Cotton Sharecropper,
1936

(Newhall)
“Descendants of former slaves of the Pettway Plantation. They are still living under primitive conditions there. Meat in sacks hangs from tree limbs to be cured.”
Arthur Rothstein, Dust Storm, 1937
“Living in a trailer in an open field. No sanitation, no water. They came from Amarillo, Texas.”

Dorothea Lange, Migrant Family, 1940
Dorothea Lange, Migrant Family, 1936
Slide credits

- Fredo Durand