American Social and Cultural History, 1865 to the present

Class 3

American Social and Cultural History

- The world we live in is largely the product of three revolutions that took place in the first three decades of the 20th century
  - Electricity Revolution
  - Automobile Revolution
  - Communications Media Revolution

Electricity

- The Electricity Revolution began with two inventions that allowed the generation of electricity:
  - The first was the battery – which converted the energy of chemical reactions into direct current electricity
  - This second was the dynamo – a magnet mounted on a spindle revolving past a stationary coil – that converted mechanical motion into electricity

Battery – The battery led to such communications devices as the telegraph, telephone, and radio.
Dynamo – This led to electric power for lighting, industrial power, and transportation

Electricity

- What got the Electricity Revolution really going was:
  - Invention of the electric motor and generator
  - Adoption of Alternating Current at 60 cycles per second at 120 volts as a standard
    - This took place after the so-called “current wars” over whether AC or DC would be the standard
      - AC won out because
        - » It could be easily stepped up to high voltage for long-distance transmission and then stepped down for use the home or factory while DC could not
        - » Nikola Tesla invented a polyphase induction motor that used AC and was as efficient as DC motors

Electricity

- The electricity revolution had four phases
  1. Electricity replaces steam and water power
  2. City street lighting with electricity replaces gas lighting
  3. Electricity in the home replaces gas and kerosene lighting
  4. The application of electric power to the factory which:
     - Enables the separation of factory and power supply
     - Permits the rationalization of the production process

Electricity

- Factory prior to electricity
  - Depended on water power or steam
    - Water power was free but restricted factory location, size, and layout
    - Steam allowed factories to locate away from streams but still restricted factory size and layout
  - Both types of power led to:
    - Multistory buildings
    - Power in the form of gears, shafts, pulleys, and belts
    - Factory layout tied to the power requirements of individual machines rather than the logical flow of the production process

Power - A factory's form of power determines its maximum size and possible locations. Prior to the steam engine, water wheels supplied the majority of all industrial energy in the United States.

Water power - Water power tied production to the banks of swiftly moving streams and required the construction of dams, channels, and spillways. Within the mill, power had to be transmitted by gears, belts, and pulleys, which lost power at literally every turn due to inevitable mechanical friction involved. In an economy based on such power transmission, the factory reached an absolute limit on its size beyond which inefficiencies were too great. The factory's form was also dictated by the need to minimize the distance between the flowing water and the work. Consequently, factory buildings were invariably multistoried structures placed as close to the water as possible, usually parallel to the stream. Thus water power, not the comfort or efficiency of the workers, determined the structure of early factories.

Steam power - Only in the 1870s did steam engines supplant water power as the chief energy source, not so much through a process of replacement of existing facilities as in new plant construction, particularly in the Middle West where the flat terrain made water power less feasible than in the East or Far West. Steam-driven mills could be built away from streams, but they still had systems of gears, shafts, pulleys, and leather belts to provide power to individual machines. Thus the factory layout was tied to the power requirements of individual machines – with the machines requiring greater power needing to be placed closer to the power source – and not to the sequential flow of the production process whereby input(s) were converted into finished product.

Electricity

- Initially, factory owners added electric-powered machines to the already-existing power system
  - It took a while for factory owners to realize that to gain the efficiency benefits of electricity, they had to restructure the whole work process
  - Often it made sense to continue to use the already-existing plants and machinery until they had reached the end of their useful service life
  - Thus, it was not until the 1910s-1920s that electricity began to have major impacts on factory productivity and output

Restructuring work process – You had a similar situation later on with the introduction of the computer into the factory and office. Initially, all the computer did was to enable inefficient work processes to work faster, but not more productively. Secretaries who typed the boss's letters on a typewriter would, if they made a typing error, simply white it out and type or ink in a correction. Once they got word processing, any error on a typewritten letter was a signal to redo the whole letter. Once the letter was redone, it was printed out and filed in paper form with the related incoming document – often in a central file outside the individual office - while the computer file copy was often deleted.
Factory productivity – By the 1910s-1920s, the elements that would enable electricity to revolutionize factory production had come together – low utility rates, reasonable prices for reliable electric motors and machinery, obsolescence and service life end of old plants and machinery, and, most importantly, an understanding of how a plant should be laid out so as to accommodate the sequential work flow by which the output product was manufactured.

Electricity

- The result – a new kind of factory based upon the following:
  - The subdivision of labor
  - The use of interchangeable parts
  - Single-function machines
  - Machines arranged according to the sequence of work
  - The continuously-moving belt or assembly line

None of the above processes was totally new, but the combination of the above processes and the enhancement of each process with electrically-powered machinery and tools was. In the words of David E. Nye *Electrifying America. Social meanings of a new technology,* "The assembly line synthesized ideas and practices that pre-existed it, and became more than the sum of these parts."

Subdivision of labor – This was an idea that dated back to Adam Smith's *Wealth of Nations* in 1776 but special purpose electrically-powered machines and tools enabled work to be divided into many small operations of nearly-equal duration

Interchangeable parts made by single-function machines – These ideas originated with the Springfield armory's process for producing small arms. But electric power allowed single-function machine tools to have reliably-standardized speeds of operation and consequently, higher accuracy and precision. The result was interchangeable parts that were easily interchangeable and relatively cheap to produce, and did not require subsequent effort on the part of a craftsman or machinist to make the separate parts fit easily together.

Machines arranged according to work sequence – Another idea that originated with arms production, but which Henry Ford further developed – the idea that machines should not be grouped by type (e.g., all punch presses together) but arranged according to the sequence of work needed to create the product (e.g., a lathe next to a drill press next to a milling machine.)80 Ford was able to rearrange production in this way because electrical machines could be put in any order on the shop floor. Furthermore, arms makers had not devised an automated system for moving parts from one stage of production to the next.

Continuously-moving assembly line – The idea for the assembly line came from slaughterhouses. Slaughterhouses used similar "disassembly" lines for much of the nineteenth century. Before 1900, flour mills, bakers, brewers, and cigarette companies operated continuous-process machinery, particularly in conjunction with ovens. Ford's managers knew several of these industries at first hand. Furthermore, during the 1890s Ford had seen Thomas Edison's iron-mining plant, where Thomas Robbins developed the rubber conveyor belt. Edison's automated machinery pulverized iron ore into tiny particles

Electricity

- In contrast to the old multi-story factory with its belts and shafts:
  - The New Factory was generally a sprawling one-story building with:
    - Plenty of room to move people and materials around
    - Electrically-operated machines, each with its own motor
    - A large number of electrical outlets so that special tools when needed could be plugged
- The new factory with its assembly lines:
  - Eliminated waste motion and production bottlenecks, thus speeding up production
  - Vastly increased productivity and output

What the assembly line did - In 1913 assembly of a Model T required just over twelve hours of labor; one year later it took one hour and thirty-three minutes, and similar savings were possible in manufacture of the individual parts as well. The assembly line allowed management to control the pace of the work, and it made monitoring individual worker performance easier. It also had unanticipated advantages. The assembly line "served to reduce work-in-process inventories in what had previously been a batch-process manufacturing arrangement, thereby realizing inventory economies. As the processes of mass production with fabricated metal became almost as continuous as those in flow-process industries, the amount of capital tied up in the floating inventory of half-assembled parts on the factory floor was greatly reduced. In the decades after World War II, Japanese auto manufacturers were able to perfect the parts inventory reduction process by “just-in-time” procedures that delivered needed parts to the relevant portions of the assembly line ‘just-in-time’ for them to be assembled.

Electricity

- Proved a boon to small machine shops
  - Electric presses, lathes, and polishers breathed new life into small machine shops, helping them stay competitive
    - Particularly in industries requiring many small batches of goods, such as printing
  - Small workshops and repair shops quickly adopted electric hand tools

Printing – Electrically-driven presses helped small printing operations that had been threatened with extinction because they could not compete with the steam-driven presses that only large companies could afford.

Electricity

- Electricity enabled small producers to outcompete larger producers that still used steam or water power
  - This helped newer textile mills in the South out-compete the older New England textile mills that still used steam and water power

In comparison with steam, electric power was cheaper. Typically, an electric motor cost one fifth as much to operate as a comparatively powered steam engine. “Typically, one large steam engine generated power, which was then transmitted by a maze of belting to individual machines throughout the factory. On average, two thirds of the power so generated was wasted in transmission.” To operate any one machine the whole plant had to be run. Whenever the main transmission belt had to be tightened, replaced, or repaired, the whole factory came to a halt. Such a concentrated waste of energy disappeared when individual electric motors attached to individual machines and tools were developed. Fires were significantly reduced (as well as resulting fire insurance costs) when coal-burning steam generators and chafing belts (both main transmission and secondary transmission belts) no longer created sparks.

Electricity

- Increased productivity and output
  - Created a new problem – how to sell all that could be produced
    - Led to large scale advertising and mass merchandising
    - Led to credit innovations, such as installment buying – especially for cars and consumer durables

The Selling Problem - Once selling all that could be produced became a problem, the manufacturers had to convince consumers to buy their products and also to define themselves by the goods they owned. To do this, advertisers and mass merchandisers had to overcome centuries-old Protestant values. Thrift, disciplined work, delayed gratification, and contentment with one's material lot had to be replaced with beliefs implicit in quickly acquired wealth, installment buying, immediate pleasure, and dissatisfaction with the goods one already owned, Guiltless discard of things that still worked or that could be fixed was necessary in the new calculus of consumption; otherwise the economy could not continue to expand. One result was a vast increase in the amount of expenditures for advertising. Advertising expenditures rose from $682,000,000 in 1914 to $1.4 billion in 1919 and nearly $3 billion in 1929.

Electricity

- Allowed for either higher wages, higher profits, or lower prices, or some combination of the three
  - In the 1920s (and later in the decades of the 1980s-2000s) it led to higher profits and lower prices which greatly impacted the socio-economic history of these decades
  - This led to an increasing maldistribution of wealth – the rich got richer while the income of workers and farmers in the 1920s and the middle class in later decades stagnated
    - In the 1920s, this led to conspicuous consumption and speculative bubbles

1920s - In the 1920s, the NBER index of Employee Output in Manufacturing (with 1958 as the base year =100) rose from 30.2 in 1919 to 52.0 in 1929, an increase of 72.2%. Meanwhile, the average weekly wage of employees in manufacturing rose from $21.44 a week in 1919 to $24.76 a week in 1929, an increase of 11.47% and the Consumer Price Index (CPI) for all items declined from 51.8 in 1919 to 51.3 in 1929, a decline of about 1%. Thus, most of the increase in productivity went into profits. The large-scale increase in profits in turn went into conspicuous consumption and to some extent into speculative bubbles that eventually crashed. In the 1920s, the speculative bubbles were Florida real estate and the stock market. In the past three decades, the speculative bubbles were in technology stocks and real estate.

Electricity

- The second phase of the Electricity Revolution was:
  - Lighting up the night urban landscape
    - Broadway becomes the Great White Way
    - Illumination of landmarks and other important locations becomes a characteristic of the city
    - At night, restaurants, hotels, department stores, and other businesses turn on the lights and the neon signs
    - Professional sporting and other events now take place "under the lights"

City Lights - Before 1900, most cities had only occasional lighting. Some cities had areas lit by oil and gas lamps. After 1900, streets began to be lighted with electricity -- first in the form of arc lights and then via incandescent lights. These street lights by their example paved the way for introduction of the electric light and electricity to businesses and households.

Great White Way - New York took an early lead as the most brightly lighted urban center, and by the 1890s Americans began to hear Broadway described as "the Great White Way," where huge electric signs made the night into day. This fame depended almost entirely upon illuminated advertising, the most conspicuous form of urban lighting. In the middle 1890s the first large electric sign appeared on Broadway. Fifty feet high and eighty feet wide, it used fifteen hundred lights.

Illumination of landmarks – Lighting underlined significant landmarks and literally highlighted important locations. By night the spectator could grasp the city as a simplified pattern. The major streets stood out in white bands of light, the tallest buildings shone against the sky, and other important structures such as bridges hung luminously in the air, outlined by strings of bulbs. The city center blazed its importance with a White Way, and the corporations erected electrical signs to proclaim their products and their importance.

Business lights - By the 1890s restaurants, hotels, and department stores regarded elaborate lighting as essential to competition. Their displays began to transform the city's visual organization and texture; if in the full glare of the sun it was drab, after dark it seemed close to the ideal. Many sensed this gradual redefinition of the city after dark. At the turn of the century, this urban electrification was still located at the pedestrian's level, either as street lighting or as advertising

Sporting events 'under the lights' – By the late-1930s and early-1940s, baseball and football games often take place at night since this usually increases attendance. People no longer have to take time off from work or school to attend a game. Sometimes, teams will schedule games at night to get an edge on the competition. In the early 1940s, Clark Griffith would schedule Washington Senators' baseball games at night to take advantage of the fact that his pitching staff had four knuckleball pitchers whose knuckleball pitches were especially hard to hit at night.

Electricity

- Some effects of a city bathed in light
  - City night life
    - People begin to go out on a large scale
  - Proliferation of Public amusements
    - Amusement parks, vaudeville houses, theaters, movie palaces, city baseball parks, dance halls, and kinetoscope peep shows
  - Change in the way people see public buildings
    - Idea that the true nature of a building is perceivable only after dark when it is illuminated

Night life - In the 1870s-1880s, 'night life' was still the preserve of a wealthy few. In 1869, average daily attendance at New York City theaters was 25,000. By 1910, the seating capacity of New York City playhouses and movie theaters was nearly 2,000,000. In 1870, San Francisco had two playhouses and one opera house. In 1912, San Francisco had five playhouses, 11 vaudeville houses, and 69 motion picture theaters.

Public amusements – As David Nassau in his *Going Out. The rise and fall of public amusements* notes, "The rise in public amusements depended upon advances in technology and upon the electrification of the metropolis. The lighting of the city was the *sine qua non* for the expansion of urban 'night life' in the late-19th --early-20th centuries. Incandescent lighting transformed the city from a dark and treacherous netherworld into a glittering, multi-colored wonderland. " The era of public amusements lasted from the latter-1890s until the end of World War II.

Perception of public buildings – As architectural historian Reyner Baynam in his *The Architecture of the Well-tempered Environment* noted, "The sheer abundance of light effectively reversed all established visual habits by which buildings were seen. For the first time, it was possible to conceive of buildings whose true nature could only be perceived after dark, when artificial light blazed throughout their structures."

Electricity

- Outdoor lighting paved the way for indoor lighting
  - Prior to electric indoor lighting, there was gas or kerosene lighting
    - Gas & kerosene lighting had disadvantages
  - Electric lighting was cleaner, brighter, safer, did not produce soot, and could not be blown out by wind
  - Electric lighting was first adopted in factories where clean air and visual acuity were important

Gas & kerosene lighting - Gas burned oxygen, produced odors and soot, and required gas jets that could ignite fires or, if snuffed out, release poisonous fumes and cause explosions. Gas fixtures had to be washed of black soot almost daily and the soot soiled wallpaper and fabrics. Gas-fueled houses were most functional, appealing, and safe if individual rooms could be shut off for airing out and minimizing drafts. Interiors decorated in deep reds, blues, greens, and browns were p
preferred for their capacity to conceal soot. Thus, Victorian home décor favored these darker colors.

Electric lighting – Electric lighting, which did not involve heavier capital investment than gas, proved cheaper to operate, especially when all factors, such as worker health and fire insurance, were included. !! Better light dramatically improved working conditions in print shops, textile mills, and other facilities where visual acuity and clean air were important. Its effects were indirect; it improved the work environment rather than the means of production.

Electricity

- Effects of electricity upon the home
  - In contrast to the Victorian home, newly-built homes with electricity had:
    - More open floor plans
    - Fewer doors
    - Light colors for walls and ceilings
    - Flexible placement of furniture and lamps, and
    - An increasing number of electrical appliances and devices using electricity

Wall colors and lamps - Victorian color schemes of dark reds, greens, and browns that once had hidden the soot from gas burners. A house with electricity could adopt lighter colors for walls and ceilings, making it much brighter than before. Electricity was also much more flexible as a lighting source, compared to gas. !! A gas burner could not be placed anywhere in a room, while an electric light could, making it easier to move furniture into new arrangements. Other factors influenced home design, but the nature of gas lighting was a check upon the bright, open, and flexible house plans that electric lights encouraged and which many home economists preferred

Electricity

- Consequences of Electric Indoor Lighting
  - Led to the redesign of the interior of the home
  - Made possible shift work
  - Ended the regime of night and day
  - Allowed people to make use of the evening hours before bedtime
    - One effect was that people read more
  - Dispersed the family within the house
    - The family no longer congregated around the hearth

Regime of night and day –In the words of Thomas Homer-Dixon in his *The Ingenuity Gap, ""*Not so long ago, our existence was strictly governed by the cycles of day and night. Candles and oil for lamps, if available at all, were expensive and carefully rationed. They could perhaps extend the day by an hour or two after sunset, but then economic prudence demanded that flames be extinguished and everyone go to sleep. Technologies for making cheap and abundant light have therefore been one of history's great liberators. They have opened up vast numbers of hours for work, family, and leisure activities; for invention and idleness; and for developing one's potential as a human being. … But there have been costs, many of them unanticipated. As light became easier to produce and far cheaper, we flooded our world with it. Not only are our houses ablaze -- so are our streets, parking lots, playing fields, highways, office buildings, factories, shopping malls, racetracks, and construction sites."

Evening hours – Thomas Homer-Dixon noted that one modern 100-watt incandescent light bulb running three hours per night produces 1,500,000 lumen hrs of light per year. At the beginning of the 19th century, this amount of light would have required 17,000 candles, and an average worker would have had to toil 1,000 hours to earn the money to buy the candles.

Reading – In their study of Muncie IN, the Lynds reported that the library loaned out eight times more books per inhabitant in 1925 than it had in 1890. In part, this reflected the electrification of many of the homes in Muncie, by this time.

Dispersal of the family within the house - Electricity had an equalizing effect; all spaces could be heated and lighted to the same degree and there were fewer cold rooms or dark corners pushing the family toward the hearth or kitchen stove where they had once automatically clustered. Because the electric light was not a form of fire, adults did not have to control or supervise its use, as even the youngest could turn a switch. Children could find light anywhere and no longer had to do homework together around a common table. Artificial light also erased such of the distinction between day and night, so that the timing as well as the location of activities varied more, and the coming of darkness no longer called a halt to much of the daily round. When the hearth ceased to be the center, domestic life spread out and lost both its focus and the rhythm imparted by alternating light and darkness. Furthermore, the conversation which had once been the hearth's distinguishing feature was interrupted and transected by the radio, phonograph, and telephone. !! In the later 1920s radio became a substitute hearth, clustering the family together to hear crackling reports from great distances, baseball games, and the latest music. Radio drew the family circle together to hear about the outside world; broadcasts both stimulated and silenced conversation. In the nineteenth century the lighted hearth and the oil lamp were the universal symbols of the home, providing a warm center for social life. Just as electrification spread out the city's population and made the factory's form more flexible, so too at the microcosmic level of the home it dispersed the family.

Electricity

- Once a home had electricity, a sequence of electricity-using products occurred:
  - Electric lights
  - Small appliances, such as electric irons, fans, toasters, and coffee makers
  - Vacuum cleaners
  - Entertainment media, such as radios & phonographs
  - Major appliances, such as washing machines, dishwashers, and later refrigerators

Lights – a General Electric manager called the electric light "the entering wedge" that made possible all further sales.
Irons – Unlike the previous hot stove iron, the electric iron did not require a nearby hot stove. Consequently, it could be used anywhere, saving fuel and keeping the house cooler in summer.

Electricity

Item	1900	1920	1930	1970
Washing Machine	<1%	8%	24%	70%
Icebox	18%	48%	40%	<1%
Refrigerator	<1%	<1%	8%	99%
Vacuum Cleaner	0	9%	30%	92%
Electric lights	3%	35%	68%	99%
Dishwasher	0	0	1%	25%
Telephone		35%	41%	91%

Electricity

- Another major consequence of electricity was the streetcar and the subway
  - The streetcar (which first appeared in 1888 in Richmond VA) took over the horse car lines and greatly expanded their scale
  - Streetcar systems spread like wild fire. By 1890, there were trolleys in 200 streetcar systems, with electric trolleys constituting 30% of all streetcars. By 1890, there were over 800 streetcar systems, with electricity powering nearly all urban railcars

Streetcars & horse cars – Streetcar lines developed out of old horse car lines or were built by groups of investors, particularly those speculating in real estate. Henry M. Whitney merged six streetcar companies to monopolize Boston public transit, and stimulated the sale of property he owned along a boulevard in adjoining Brookline, which had been too far away from the city center during horse car service.[13] The new electric lines operated on a much larger scale than the horse car lines they replaced. In most cities many small enterprises were combined into larger companies, where skilled managers rationalized the service. Those who absorbed existing horse car lines took the smallest risk, since a trade already existed, but they had to raise a good deal of capital for
a new roadbed, overhead wiring, electric cars, and a power house. Even assuming one had already acquired a right of way, in 1891 such a line required a large capital outlay, including $4,000 or more for each car. In addition to these financial requirements, electric traction proved to be far more complex than operating horse cars. Maintenance became a more important part of the business, and skilled electrical men had to be added to the work force. The greater speed of the trolley cars made scheduling more intricate, and the increase in traffic required more administrative coordination. As Alfred D. Chandler summarized, "Both operational and financial requirements thus caused mass transit in American cities to be operated by a small number of large enterprises. !! In most cities, urban transit was monopolized by a single enterprise."

Electricity

- Street railways not only operated in cities, they also stretched way out into the countryside and linked up with street railways from other cities
  - It was possible to travel from New York City to Chicago or Boston by trolley, just by transferring from one line to another.
- Streetcar lines radiated out from the center of the city like spokes on a wheel
  - This drew people into the center of the city, which thanks to the skyscrapers and department stores (plus restaurants and hotels attracted by the business that the skyscraper workers and department store shoppers brought) became centers of commerce and culture

Streetcars & railroads - The intercity electric offered more frequent service than the railroads, stopped in more places, and charged about 1.5 cents per mile, half the railroad rate. !! The nature of electric motors permitted rapid starts so that, compared to steam trains inter-urbans did not lose much time in picking up passengers. Even with frequent stops, they were able to maintain an average speed of fifteen to twenty miles per hour, and a few lines ran express cars much faster, so that service was almost indistinguishable from the railroad. Because electric cars could climb steeper grades and turn sharper corners than steam trains, they could at times traverse a shorter route or reach previously inaccessible towns. Inter-urbans did not smoke, and so were cleaner all year round, and open cars were possible in summer. This combination of a low price, accessibility, cleanliness, and speed eliminated the railroad as a competitor in many areas.
Vibrant central business districts - The central business district of large cities thrived during the time of the trolley, aided by the development of the steel-frame skyscraper -- made possible by the elevator, electric lighting, and the telephone. Unlike the railroads, the streetcars penetrated to the very heart of the city, radiating out from the center like spokes on a wheel, contributing greatly to the extraordinary prosperity and vitality of most urban cores between 1890-1950. Because the routes invariably led downtown, with only occasional cross-town or lateral lines, the practical effect was to make anyone using public transit rely on the central business district.

Electricity

- Impact of street railways
  - Streetcars opened up new areas for real estate development
    - This allowed the middle classes to move out of the congested city center into the near suburbs
    - It also allowed workers to move to areas on the city periphery (such as Brooklyn & Queens), creating very cheap housing in such districts as Greenwich Village in New York, the Left Bank & Montparnasse in Paris, and Bloomsbury in London which in turn allowed artist colonies of bohemians to form and flourish in these districts

Streetcars & suburbia – After the Bronx received streetcar service, its population surged from 89,000 in 1890 to 201,000 in 1900.
Economic impacts of streetcars – Streetcars were also major employers. The more than 800 street railways employed several tens of thousands of workers.

Electricity

- Streetcars (and indoor lighting & elevators) made possible the development of the department store
- Streetcar systems created the amusement park
  - A 1907 census of electric railways found 467 such parks – visited by 50 million people
- Streetcars fostered day trips and interurban tourism
- Street railways were major purchasers of steel rails, copper wire, street cars, plate glass, and electricity
  - They also proved a boon to General Electric and Westinghouse

Streetcars & department stores – By channeling passenger traffic through the central business district, the electric streetcar and the spatial distribution of commercial activity contributed to the development of the department store. It was in the streetcar era that downtown department stores such as Wanamaker's, Macy's, Gimbel's, Hudson's, and Woodward & Lothrop's had their heyday. Before the streetcar, 19th century trends in retailing had been away from the general store toward more specialized shops, a process that mirrored the specialization of labor. Large retailers such as department stores became feasible only when the horse car or streetcar could deliver crowds to the central city.
Streetcars & amusement parks – The amusement park which began around 1890 and flourished until the 1940s was a product of the need and desire of streetcar companies to fill their trolleys on weekends, when many fewer people used them to commute to work. Consequently, streetcar companies built amusement parks at the end of the trolley line. These parks became magnets for families with young children but especially for young adults seeking escape from parental supervision. Most of the rides and events at these places were participatory, and they ranged from merry-go-rounds to Ferris wheels to roller coaster and other thrill rides. Amusement parks were places to see and be seen, but also places to go, do, compete, and meet people, especially young people; who might otherwise be inaccessible. The most famous amusement parks were Coney Island in Brooklyn, Nantasket Beach in Boston, and Glen Echo in Washington.

Electricity

- Streetcars and the Department Stores and Amusement Parks they fostered were all major advertisers
  - This proved a boon to the advertising agencies
- Along with retailing chains and mail-order businesses, department stores dominated merchandising after 1895
  - Together, all three erased the line between commodities and experience

Advertising – Department stores were major advertisers. In nearly every city, daily newspapers and department stores grew large together, mutually dependent upon each other. John Wanamaker is commonly credited with the invention of the full-page newspaper ad. To Wanamaker, advertising not only alerted people to new products or sales, but it also made what was going on in his stores part of the news and public consciousness.

Streetcars, department stores, & amusement parks - In the words of David Nye, "The streetcar and the institutions it fostered -- advertising, the department store and the amusement park -- were all instrumental in transforming the American populace into a mass society. Together they widened the separations among work, domestic life, and pleasure. Both department stores and amusement parks used advertising extensively, and provided agencies with important field information about the behavior of crowds. Between 1890 and 1930 the department store and the amusement park stood like two magnets at opposite ends of the streetcar lines. Both subverted the Victorian moral code, by providing stages for the enactment of fantasy, one by day, the other by night. Both erased the line between commodities and experience, and both offered purchases that were predictable and endlessly repeatable."

Electricity – A Note on Department Stores

- Department stores pioneered in the use of illuminated plate glass display windows
  - Plate glass display windows helped create a new culture of class

Plate glass windows - The new exterior plate glass environment with its window displays designed to single out specific goods [a concept pioneered by L. Frank Baum of The Wizard of Oz fame] began to change the way people related to goods. !! In the past, people shopped in the largely open-air town markets (or in Europe and elsewhere, market squares, halls, and bazaars) *{or in small dry goods and specialty shops}* in the midst of the goods themselves where they could touch, smell, and examine the goods all at once. But from the late 1890s, this form of shopping was superceded for many people by something quite different. To control both the flow and exhibition of goods; to protect them from pilfering hands, weather, and street grime; and to get the goods out of confinement, merchants resorted to show windows and glass-enclosed displays.

Plate glass & a new culture of class - Reliance on glass for display had several significant consequences. It contributed both to the formation of a new culture of class -- differentiating the affluent from the poorer buying public. From the late-1890s, uptown shopping became connected with glass and affluence, whereas downtown shopping remained linked with open-air stalls (which persisted well into the 1920s) for immigrants, the working poor, and bargain-hunters of all classes. !! Glass closed off smell and touch, while amplifying the visual -- thus intensifying the desire because you couldn't touch it.

Electricity – A Note on Department Stores

- Department stores pre-empted Santa Claus and made him a merchandiser of children's toys
  - Live Santa Clauses took up residence in toy departments during the Xmas shopping season
- Department stores pioneered in such innovations as:
  - Money-back guarantees
  - Lay-a-way
  - Department store charge cards – e.g Central Charge

Santa Claus - Before the mid-1890s, Santa Claus seems to have been an icon unattached to any single institution except the private bourgeois home. But when the large department stores began to overshadow retail districts, Santa Claus's status began to change. The department stores laid claim to Santa Claus and to the imagery of the Christmas holidays. Urban merchandising began to give substance and form to Christmas rituals. 'Live' Santa Clauses took up residence in children's toy departments. In the big urban department stores, Santa Claus sat on a lavishly decorated throne, attended by elves dressed in green and red.

Electricity – The Skyscraper

- Skyscraper dates back to the early-1880s with the so-called Chicago method of construction
  - Complete interior metal framing
  - Metal frame supports the entire load of the building
    - Building walls which formerly supported building loads serve merely as decoration, giving rise to plate glass windowing.
  - First skyscraper was the 10-story Chicago Home Life Building (construction of which began in 1883)

Metal framing & Building load – The building load would include the building structure load (roof, floors, wall, utilities), the live load on the floors (people, furniture, & equipment), and the wind load. A key factor was the development of steel which made it possible to have strong metal-frame construction – the reason being that steel was 40 times as stress resistant as stone and 10 times as strong as wood. Skyscrapers using metal-frame construction were largely a creation of the Chicago School of architects and engineers, but was taken up and perfected by New York architects.

Electricity – The Skyscraper

- Before the skyscraper became practical, several things had to come together
  - Interior steel framing
  - Indoor lighting
  - Workable electrically-powered elevators
  - Electrically-powered fans to provide ventilation and circulation of hot air during cold weather
  - Electrically-powered water pumps to provide indoor plumbing on upper floors

Elevators - Electrically-powered elevators (which by the 1890s could move 600 feet or roughly 50 floors a minute as opposed to steam-powered elevators which could move only 50 feet or roughly 4 floors a minute) along with electrically-powered fans and water pumps made possible the building of skyscrapers and high-rise apartments -- buildings previously impractical when getting to the top floors meant climbing multiple fights of stairs, when ventilation was poor, and when central heating and indoor plumbing on upper floors was not possible.

Electricity – The Skyscraper

- Skyscrapers became popular as corporate headquarters
  - They allowed for concentration of HQ employees at a single site
  - In New York and many other cities, the skyscraper name advertised the corporate owner
    - E.g. the Western Union, Metropolitan Life & Woolworth buildings in New York & the John Hancock in Boston & the Sears Tower in Chicago
  - Many corporate skyscrapers were also tourist attractions – a fact that brought added corporate revenue

Electricity – Toys

- Electricity revolutionized the toy industry
  - Many children's toys now require batteries or the ability to plug into an electrical outlet
  - Before 1890, there were almost no manufactured toys for children
    - After 1900, toy manufacturing boomed.
    - Educational toys emerged
  - The major electrically-powered toys were the Lionel and American Flyer toy trains
    - The toy train with its accessories was a miniature world

Toy manufacturing - From 1905 to 1920, output in the American toy industry increased 1300%. Among the educational toys developed in this time frame were erector sets, painting kits, spelling boards, doll houses, and dolls with lifelike limbs, hair, and eyelashes.
Lionel trains – The Lionel and American Flyer train offered boys (of any age) a complete miniature world , with toy stations, telegraph poles, signal systems, villages of metal houses, and terrain through which the train could run. Many of the freight cars had operating features, such as the cattle car from which miniature cattle circulated from the car onto a platform and back or the logging car that dumped logs into a container. Toy trains enjoyed a special vogue from the 1920s until the 1950s when they, like the railroads they imitated, went into a decline.

Electricity – Gender Roles

- Electricity and the appliances its spawned:
  - Subjected middle-class women to a cascade of rising expectations
    - Electrical conveniences made individual household tasks easier, but their number, frequency, and complexity increased
    - Displaced some tasks from men and children to the wife
    - Displaced some tasks from commercial providers back to the housewife

Rising expectations - Women were exhorted to prepare more varied meals, vacuum the house more often, maintain a large wardrobe, do laundry more frequently, and spend more time with the children.

Displacement from men & children – Before the vacuum cleaner, men and children had to drag rugs outside and beat it to shake off the dust and dirt – a task done only a few times a year. After the vacuum cleaner, the wife was expected to vacuum clean the rug once a week.

Displacement from commercial providers – During the Victorian period, washing clothes was a laborious activity which involved fetching water and fuel, building a fire, boiling the clothes, scrubbing them, rinsing them, wringing them out and hanging them up to dry. A common alternative was either hiring a washer woman to come one day a week to do the laundry or to send clothing out to a commercial laundry. After the electric washing machine, washing laundry came back into the home. While laundry was less backbreaking, it tended to be done more often.

Electricity – Gender Roles

- Blurred traditional sex roles by eroding the lines between separate spheres for men and women
  - Electricity allowed the restructuring of jobs so that they could be performed by untrained but literate workers.
    - This made it easier for women to enter the workforce
  - Electrical appliances made it possible for unmarried men to live alone
    - Thus bachelors now longer had to live in boardinghouses where there was a women to do the cooking, cleaning, and laundry for the male residents

Electricity

- Played major roles in both the Automotive Revolution and the Communications Revolution
  - Both the auto and the new 20th century communications media depended upon electricity for both their operation and their construction
  - Thus the Electricity Revolution was the prerequisite for the other two

Automobile

- Origins of the Automobile
  - 1876 – Nicholas Otto invented the Otto internal combustion engine – the direct ancestor of all current automotive engines
  - 1883 – Gottlieb Daimler and Wilhelm Maybach develop an engine powerful enough to operate a motor vehicle
  - 1883 – Karl Benz developed an electrical ignition system
  - Early 1890s - Daimler and Benz begin production of autos in Germany

35

Otto engine -In 1876, Nicholas Otto, a German inventor, invented the Otto internal combustion engine -- the direct ancestor of all current automotive engines. The Otto engine was a 4-stroke piston engine that drew in an air-fuel mixture on the first stroke, compressed the mixture on the second stroke, ignited the mixture on the third stroke to produce power, and expelled the spent gasses on the fourth stroke before repeating the cycle

Daimler & Maybach -

Automobile

- Origins of the Automobile – 2
  - 1893 – First American ‘horseless carriage’ – produced by Charles E. % J. Frank Duryea of Springfield MA
  - 1899 – By then, roughly 30 companies were making automobiles and between them had made 2,500
  - 1908 – Henry Ford starts making automobiles

36

Automobile

- Some Notes about the early auto industry
  - There were 2 ways of making cars with two very different potential markets
    - Craftsman approach – a team of skilled mechanics and carpenters who make one car at a time according to purchaser specifications
      - End product is a luxury auto aimed at people wealthy enough to have their own horse and carriage. E.g. Rolls Royce, Mercedes-Benz
    - Mass Production approach – use of mass production and standardized parts
      - End product is a uniform car for a mass market. E.g. Ford Motel T

37

Automobile

- Some Notes about the early auto industry – 2
  - There was a competition between 3 different modes of power
    - The internal combustion engine
    - The steam engine – Stanley Steamer
    - Battery-powered car
  - The early auto industry was extremely competitive
    - By 1908, some 515 firms entered the auto market
      - Half, however, had already failed.
      - By 1928, the Big Three controlled 80% of the market

38

Internal combustion engine - Of the three general engine systems available to propel these vehicles, the gas-powered, internal combustion engine seemed the least promising because it required a very complex transmission, was expensive and noisy, and had the psychological disadvantage, as one contemporary manufacturer explained, of forcing people to "sit over an explosion.“

Stanley steamer - The Stanley Steamer auto was technically and economically on a par with the internal combustion engine auto. The Stanley Steamer was quieter, produced a smoother ride, and handled more easily. Its high pressure, however, produced serious maintenance difficulties. In addition, the Steamer needed to replenish its water supply every 30 miles -- a problem compounded by public ordinances prohibiting water troughs by the roadside that were enacted to prevent the spread of hoof-and-mouth disease among cattle. Signs indicated, in fact, that the steam-powered vehicle would dominate the market, since it ran more cleanly and quietly and proved more powerful than the other two. Yet, due to a "historical accident“, the steam-driven automobile suddenly declined in popularity and the gasoline engine became the industry standard.

Battery - The electric car, on the other hand, had none of these problems, but its battery prevented it from operating at high speeds and over long distances.

Automobile

- Henry Ford was the first manufacturer to mass produce a standardized auto using interchangeable parts
  - He did this by combining the following to produce the moving assembly line
    - Subdivision of labor
    - Interchangeable parts
    - Single-function machines
    - Sequential ordering of machines
    - Moving belt or line

39

Factory electrification was the necessary precondition before these elements could be improved individually and then welded together into a new form of production. The assembly line eliminated waste motion and bottlenecks in production, and accelerated productivity by far more than 100 percent. In 1913 assembly of a Model T required just over twelve hours of labor; one year later it took one hour and thirty-three minutes, and similar savings were possible in manufacture of the individual parts as well. The assembly line allowed management to control the pace of the work, and it made monitoring individual worker performance easier. The resulting cost savings allowed Ford to reduce the price of a Model T from $850 in 1908 to $290 in 1924, although the overall cost of living had doubled in the interim.

Automobile

- Henry in many respects followed a very enlightened labor policy
  - In 1914, Ford raised the daily wage to $5.00 at a time when a Model T cost $360.00
    - Ford felt that his workers should be able to buy the cars they made
  - He also hired large numbers of immigrants and African-Americans, disabled persons, and ex-convicts
- But he could not abide labor unions and was very much an anti-semite

40

Ford hired large numbers of Eastern and Southern European immigrants, large numbers of African-Americans (by 1923, some 5,000 black men worked for Ford -- more than for any other corporate employer), some 9,000 disabled persons, and even substantial numbers of ex-convicts; but not workers with either radical political beliefs or interest in labor unions

Automobile

- Henry Ford believed in selling basic transportation and opposed model changes on principle
  - But by the 1920s, America had changed and General Motors took advantage of this
- General Motors, beginning in 1923, focused on styling and style changes.
  - GM was the first company to offer installment financing and trade-up brands

41

Ford's failure - By the 1920s, America itself had changed: the people who **Ford** imagined would buy his car, the people who bought it in their millions - the modest farmers the new suburbanites — now wanted something different. Nothing could compete with the Model T on price and utility, but the Chevrolet could compete in looks — and did. A Ford executive later confessed that personal experience taught him that styling was a prime consideration in many women's minds-and here Ford began to lose out. The Model T's success was its own undoing: unchanged and unchanging, it rode on into obsolescence.

GM's success strategy - While Ford was pushing the limits of standardization and assembly-line production, General Motors was pursuing a strategy that allowed it to pass Ford in total sales, and to secure for itself the top position in the American car industry. In 1921, General Motors had only 12% of the car market vs. Ford's 60%. GM, however, began offering installment financing in 1921 and was the first auto company to do so. GM also catered to the rising new generation's increasing affluence by offering trade-up brands from the original Chevrolet to Pontiac to Oldsmobile to Buick to Cadillac. Under the leadership of Alfred Sloan, GM developed marketing practices that reshaped the industry. One of these was the enshrinement of styling as the prime means of attracting buyers. Following the establishment in 1927 of the Art and Color Section (later the Styling Section) headed by Harley Earl, GM products became industry style leaders. The basic engineering of their products differed little from that of their rivals, but the gospel of longer/lower/wider helped to solidify GM's status as the world's biggest car manufacturer. The importance of styling was reinforced by GM's invention of the annual model year. Every September a group of "all-new" GM cars would make their much-publicized appearance, presumably sowing discontent among millions of drivers whose own cars had sunk deeper into obsolescence. GM also made good use of the clear status hierarchy of its products. Customers might begin their automotive careers with Chevrolets, but future financial success allowed the purchase of something even better from the GM stable--an Oldsmobile, a Buick, or even a Cadillac for those who had reached the pinnacle of success. To be sure, few people had the financial resources to cover the purchase price of even a new Chevrolet, but GM made sure that this did not remain an obstacle. Whereas Henry Ford expected payment in full from his customers, GM created the General Motors Acceptance Corporation (GMAC) to facilitate buying a car on credit. A major financial institution in its own right, GMAC initiated millions of GM customers into the delights of making payments for cars that had grown old and tired long before they had been paid off. Changing models every year had its drawbacks – increased costs, pressure on production facilities, the unpredictability of consumer reactions to a new style change, and the need to educate dealers, salesmen, and mechanics about new models and features. But

Automobile – Replacing the Horse

- It replaced horse carriages, stagecoaches, and the horse-drawn plough as well as the horses that pulled them
  - In 1900, there were 20,400,000 horses in the U.S.
    - 17.0 million used for pulling ploughs
    - 3.4 million used for urban transport in U.S. cities
  - The carrying capacity of these horses was equal to 75% of that of all U.S. railroads

42

Impact of horses - The average horse ate about 39 lbs of food a day or 5 tons a year. It took 25% of all U.S. farmland or 93 million acres to grow the necessary feed. Each horse produced about 12,000 lbs of manure a year (about 33 lbs per day) and 400 gallons of urine a year (over a gallon a day). When fodder for mules was added in, a third of the U.S. cropland in 1900 went to producing food for animals. Since much of this ended up on city and town streets, the change from the horse to the automobile was greeted as a great blessing for public health and cleanliness.

Stagecoach – One of the casualties of the automobile was the Abbot-Downing Company of Concord NH, manufacturers of the famous Concord Stage, which went out of business in 1927 after trying unsuccessfully to build trucks. At a time when brands were rare, the Concord coach was as recognizable as the Colt revolver, the McCormick reaper, and the Singer sewing machine.

Automobile – Replacing the Horse

- As the auto and tractor replaced draft animals, more an more agricultural land went to producing food for humans
  - Result: Massive agricultural surpluses and a consequent decline in rural income
- As the auto increased the mobility of farm families, the rural stores and banks they had patronized now faced competition from larger enterprises in larger nearby towns

43

Autos and Highways

- Autos led to:
  - The Good Roads Movement
    - As autos became popular, people became aware that the nation's roads were not equipped to handle motor vehicle traffic
  - The American Automobile Association

44

The Good Roads Movement - As the 19th century ended, the Federal Office of Road Inquiry [created in 1893, and renamed the Office of Public Roads in 1905] plus bicyclists, motorists, and auto manufacturers had formed a loosely-organized 'good roads movement.' This was supported by leaders in the railroad industry who felt that better thoroughfares would benefit the railroads. Good roads would end a situation in which shippers deluged the rails with freight during dry seasons, but shipped little during rainy or bad weather seasons. Since railroads could not afford to keep surplus cars just for peak times, backlogs resulted. Consequently, customers, unable to ship goods in a timely fashion, became irate. Thus, good roads leading to every depot would even out the flow of freight, and enable the railroads to get by with fewer cars. Good roads would also increase a railroad line's freight market radius, and carrying the bulky and heavy road materials needed to build the new highways would generate new business. It was not until too late that the railroads realized that they were creating the groundwork for a competitive freight carrier -- the trucking industry

AAA - In 1899, 30 companies made more than 2,500 cars a year. While the auto appealed to a moneyed elite, it initially under-whelmed the the average citizen. !! Its relative speed and noise scared horses, stirred up clouds of dust, and damaged primitive roads. This led states to tax these 'conveyances of the rich,' to fine owners of broken-down vehicles for obstructing traffic, to require that cars be preceded by a flag bearer to warn others of the motorist's approach, and to mandate that drivers be licensed and cars registered (with separate license plates for each state). These legislative attacks plus a desire for better roads led members of several auto clubs attending an auto show in Chicago in 1902 to found the Automobile Association of America (later the American Automobile Association) (AAA). Eventually, aggressive AAA membership drives would bring in millions of members and make the organization a major political force in American life. By providing towing and emergency road service (as well as TripTick maps that included lists of AAA-recommended restaurants and motels for travelers), AAA made most American drivers AAA members.

Autos and Highways

- Federally-financed highways
  - Federal Road Aid Act of 1916 provided for matching Federal-state funds for highway construction.
    - This led to the construction of the U.S. routes in the 1920s and 1930s -- the famous US1, US40, and US66
  - Interstate Highway System
    - The Clay Commission in 1954 concluded that an interstate highway system would be "vital as a civil defense measure" and "essential to national defense." The result was the recommendation that the 44,000 mile system be constructed
    - This led to the Federal Highway Act of 1956, with the Federal Government supplying 90% of the financing

45

Federally-financed highways - It provided up to $25,000,000 a year to states under a formula based half on population and half on RFD route mileage. It encouraged states to set up state highway departments. It provided for matching Federal-state funds. It allowed the Federal Government to set standards, but gave control of the program to the states. Its passage was the result of an alliance of Federal and state highway engineers, elected public officials, auto manufacturers & dealers, motor clubs, industries and businesses dependent on the automobile, and organizations such as the American Automobile Association (AAA), American Road Makers (ARM), American Road Builders Association (ARBA), American Association of State Highway Officials (AASHO), and the National Auto Chambers of Commerce (NACC). In 1921, Congress declared as a national policy that smooth surface roads would link every county seat and major city in the nation, but Congress allowed the states to choose the routes and provided matching funds.

Interstate Highway System - In 1954, President Dwight D. Eisenhower asked GEN Lucius Clay, military governor of Germany during the Berlin Airlift, and the commission he headed to recommend a highway system to "fit America's military and civilian defense to the economy." Both Eisenhower and Clay had been impressed with how quickly Germany during WWII had been able to move troops around on the autobahns and felt that America needed an autobahn-type system. They also believed that at least 70 million Americans would need to be evacuated from likely target areas if a threat of nuclear war with the Soviet Union arose, let alone an actual attack. Only an autobahn-type system would be capable of quickly evacuating 70 million people with reasonable speed. *{Of course where they would evacuate to and how they would be cared for after evacuation was not considered by the Clay Commission}.* The Clay Commision included Stephen Bechtel of the giant engineering company, William Roberts, president of Allis-Chalmers, the earth-moving equipment corporation, David Beck, president of the Teamsters Union, and Francis duPont, head of the Bureau of Public Roads whose family was the largest shareholder in GM.

Effects of the Interstate Highway System

- Cloverleaf interchanges became the sites of new malls and industrial parks
- Suburban and exurban development was spurred by the enabling of workers to commute from further distances
- Travelers' desire for familiarity in unfamiliar surroundings when one turned off an Interstate led to the growth of franchised restaurants (like McDonald's) and chain motels (like Holiday Inn)

46

Thus, to use Washington as an example, I-66 allowed suburbs to spread to the outer reaches of Fairfax County and out into Loudoun County. I-95 made Fredericksburg part of the Washington commuting area, and allowed the Baltimore and Washington suburbs to meet at Laurel and Columbia. I-70 made Gaithersburg and Frederick part of the Washington commuting area.

Automobile – Traffic Jams and Parking

- Initially, many politicians and urban planners felt the car would solve the problem of urban congestion
  - Cars could use all of a city's streets instead of just a few and cars could pass each other
  - But even in the 1920s, it became obvious that these predictions were wrong. The result:
    - Limited access expressways
    - Gradual abandonment of the central city

47

Limited access roads - Because traffic soon clogged even wide thoroughfare streets, traffic engineers soon proposed 'express' streets with no stoplight or intersections and limited access. !! "William K. Vanderbilt's Long Island Motor Parkway (1906-1911) was the world's first thoroughfare restricted solely to the automobile, and especially designed for its needs. Made of innovative concrete, it featured open speeds, bridges and tunnels to separate it from local cross traffic, and limited access through its own toll gates. Even more significant was Westchester County's bucolic and meandering Bronx River Parkway, begun in 1906 and completed in 1923. There, the com-plete separation of crossing traffic from the parkway was accomplished cheaply. Because the park roadway ran through a valley, it could be bridged by crossing roads without massive earthwork. The result was an enormous aesthetic success. Running sixteen miles from Bruckner Bou-levard in the Bronx alongside the New York Central tracks to White Plains, the beautifully landscaped road stimulated automobile commut-ing from Scarsdale, Mount Vemon, Bronxville, and New Rochelle. Within ten years, the New York area also witnessed the construction of the Hutchinson River Parkway (1928), the Saw Mill River Parkway (1929), and the Cross County Parkway (1931). The Henry Hudson Parkway, the first inner-city freeway (there was a toll across the bridge to the Bronx, however) to have limited access, no grade crossings, and service stations of its own, was begun along the West Side of Manhattan in 1934.

Autos and Social Inventions

- By its very existence, the automobile led to the following innovations - 1
  - Installment purchases
  - Used car markets
  - Camping & picnicking
    - Auto campgrounds
    - Private campgrounds

48

Installment purchases - Cars were relatively expensive so that families had a hard time coming up with the money to buy cars. Manufacturers wanted to make money so they collaborated with bankers and factions of society that held capital to find a way to sell more autos—thus the birth of installment payments or credit – an innovation pioneered by GM.

Used cars - The sale of new shiny autos posed a new issue: What do we do all these used cars when we persuade families to buy new cars and upgrade their previous models? So, a new industry evolved: *Used Car Sales* or what we today called *Previously Owned.*

Camping & picnicking – During the period 1900-1920, several hundred thousand families toured the countryside, camping each night in a different spot along the road, sleeping in cars or tents, cooking their meals over campfires. Two factors accounted for this. First, the early absence of roadside motels and restaurants. Second, a turn-of-the-century revolt against late Victorian institutions which was an offshoot of the 19th century romantic reaction against industrial capitalism -- a nostalgia for local color, community, roots, family cohesiveness, contact with nature, spirituality, and individuality. In Europe, this nostalgia produced powerful collectivist movements; but in America, the resilience of the political system and the existence of new channels of escape led to different consequences. "Thus, among the ironies surrounding the car culture, perhaps the strangest is this: early on, the automobile industry became the backbone of modern industrial capitalism, yet it was born in a spirit of rebellion against that system.

Auto campgrounds - As time went on, towns and municipalities established auto campsites. There was a twofold motive. First, roadside camping led to littering, trespassing, and property theft of flowers, fruit, and other property. Second, town merchants wanted to cash in on the new tourist trade. Since tourists were assumed to be prosperous middle class consumers, they hoped a small investment in camp facilities would produce good business for local stores. Thus, the auto camp was part of the process by which individualized 'drifter tourism' -- gypsying -- became institutionalized 'mass tourism.'

Private campgrounds – Municipal campgrounds began to find themselves in a bind. In order to attract tourists, they had to upgrade their facilities. By the mid-1920s, this meant

Autos and Social Inventions

- By its very existence, the automobile led to the following innovations – 2
  - Gasoline stations
  - Drive-in restaurants
    - Fast-food franchise restaurants
  - Motels and Motor Hotels
  - Gasoline credit cards
  - Traffic police & State highway patrols
  - Parking meters

49

Gasoline stations - In 1905, Sylvanus F. Bower invented a gasoline pump which automatically measured outflow. Thereafter, the gasoline station went through phases of development:
Phase I - Until 1920, such an assembly consisted of a single pump outside a retail store which was primarily engaged in other busi-nesses and which provided precious few services for the motorist.
Phase 2 - Between 1920 and 1950, service stations entered into a second phase and became, as a group, one of the most widespread kinds of commer-cial buildings in the United States. Providing under one roof all the functions of gasoline distribution and normal automotive maintenance, these full-service structures were often built in the form of little colonial houses, Greek temples, Chinese pagodas, and Art Deco palaces.
Phase 3 - After 1935 the, gasoline station evolved again, this time into a more homogeneous entity that was standardized across the entire country and that reflected the mass-marketing techniques of billion-dollar oil companies. Whatever the prod-uct or design, the stations tended to be operated by a single entrepreneur.
Phase 4 – This phase began in the 1970s, with the slow demise of the traditional service-station businessman. New gasoline outlets were of two types. The first was the ***super station***, often owned and operated by the oil companies themselves. Most featured a combination of self-service and full-service pumping consoles, as well as fully equipped "car care centers." Service areas were separated from the pumping sections so that the two functions would not interfere with each other. Mechanics never broke off work to sell gas. The more pervasive second type might be termed the "***mini-mart station***." The operators of such establishments have now gone full circle since the early twentieth century. Typically, they know nothing about automobiles and expect the customers themselves to pump the gasoline. Thus, "the Texaco man who wears the star" has given way to the teenager who sells six-packs, bags of ice, and already-prepared sandwiches.
Drive-in restaurants – With the auto came the notion of grabbing something to eat on the road and the realization that there was money to be made in selling motorists food. What differentiated roadside restaurants was the presence of a parking area for the cars along with garish signs or restaurant architecture that could stick out and grab the motorist's attention. The auto thus encouraged not only a geographic separation between buildings to permit parking, but also a bold and flamboyant architecture. One outgrowth of the drive-in restaurant was the fast-food franchise restaurant – the first of which was the White Tower hamburger chain which began in the 1920s and became somewhat of a model for McDonald's and other fast-food franchise chains.
Motels - In the mid-dle of the 19th century, every town and city with aspirations to larger size, had to have a hotel. Whether such structures were grand palaces or jerry-built shacks, they were

Autos and Social Inventions

- By its very existence, the automobile led to the following innovations – 3
  - Drive-in movies
  - Shopping centers
  - Malls
  - Parking lots
  - Traffic courts
  - Automobile tags
  - Driver's Licenses

50

Drive-in movies - Like the hotels, the downtown movie theaters and old vaudeville houses also faced a challenge from the automobile. In 1933 Richard M. Hollinshead set up a l6-mm projector in front of his garage in Riverton, New Jersey, and then settled down to watch a movie. Recognizing a nation addicted to the motorcar when he saw one, Hollinshead and Willis Smith opened the world's first drive-in movie in a forty-car parking lot in Camden on June 6, 1933. The idea never caught on in Europe, but by 1958 more than four thousand outdoor screens dot-ted the American landscape. Because drive-ins offered bargain-basement prices and double or triple bills, the theaters tended to favor movies that were either second-run or second-rate. Horror films and teenage romance were the order of the night, as *Beach Blanket Bingo* or *Invasion of the Body Snatchers* typified the offerings. Drive-in movies proved especially popular with two very diverse groups – one was parents with small children who could go to a movie without having to pay a babysitter, letting the kids sleep in the backseat of the station wagon while the parents watched the movies; the other was teen-agers who found the "passion pit" a very appealing place for a date. Pundits often commented that there was a better show in the cars than on the screen.[19] In the 1960s and 1970s the drive-in movie began to slip in popularity. Rising fuel costs and a season that lasted only six months contributed to the problem, but skyrocketing land values were the main factor. When drive-ins initially opened, they were mostly in the hinterlands. As subdivisions and shopping centers edged closer, it became more profitable to sell the land. Thus, by 1983, the more than 4,000 drive-ins of 1958 had dwindled to 2,935. What finally finished off the drive-in movie was the VCR.

Shopping centers & malls - Large-scale retailing, long associated with central business districts, be-gan moving away from the urban cores between the world wars. The first experiments to capture the growing suburban retail markets were made by major department stores in New York and Chicago in the 1920s, with Robert E. Wood, Sears's vice president in charge of factories and retail stores, as the leader of the movement. !! Another threat to the primacy of the central business district was the "string street" or "shopping strip," which emerged in the 1920s and which were designed to serve vehicular rather than pedestrian traffic. These bypass roads encouraged city dwellers with cars to patronize businesses on the outskirts of town. Sears's big stores were initially isolated from

Creating the Auto Suburbs

- Autos created the modern auto-dependent suburbs
  - Prior to the auto, the city consisted of a commercial hub surrounded by residences within walking distance followed by development of businesses and residences radiating out from the central hub like spokes from a wheel, with the railroad and the horse-car and then the trolley lines providing the spokes

51

Why the 19th century city had its characteristic features - The densely concentrated U.S. cities of the 19th Century, with their industries, stores, and offices crowded together toward the middle, were a short-lived phenomena brought on by the fact that interurban transportation -- that between cities via railroad and steamship -- was better than intra-urban transportation -- that within cities via horse cars and omnibuses.

Picturing the 19th century city - To picture the 19th century city development, look at Washington's Metro. Metro Center, Gallery Place, and L'Enfant Plaza are like hubs from which three of the systems' subway lines radiate – all like spokes from the center of a wheel. The problem with this wheel-spokes arrangement is that to go from Rockville to Silver Spring, or Vienna to Wheaton, one has to travel through downtown DC, and in the case of Vienna to Wheaton travel, one has to transfer from the orange to the red line. To go from Vienna to National Airport, one has to go to Rosslyn and transfer from the orange line to the blue line.

Creating the Auto Suburbs

- Creating the modern suburb - 1
  - The auto's ability to move laterally or perpendicularly to fixed trolley track opened up land for settlement that was previously too remote
    - This meant that vacant land between the transportation corridors could be platted and sold for home and business sites
  - The auto released potential home buyers and renters from the necessity of living close to a bus or trolley line

52

Auto-dependent suburbs - The auto allowed residential and business development to fill in areas between the spokes and to expand development beyond the end of the trolley or subway line

In addition to the daily flow of traffic into the city, automobiles made possible lateral and perpendicular movement throughout the outlying districts -- something streetcars could not do. Often, this cross-current movement superseded commuting into the downtown area. In Los Angeles, for example, the number of people entering the downtown between 1923 and 1931 declined by 24 percent despite a population boom in the metropolitan area. But the most important point was that the reorganization of urban space made these crosscurrents of movement not only more possible but more necessary as well. Goods which families had purchased in old downtown shopping districts now had to be purchased at stores scattered throughout the suburbs. Many employees had to drive to decentralized workplaces, or from decentralized residences to the CBD

Creating the Auto Suburbs

- Creating the modern suburb – 2
  - As the central business district (CBD) was transformed from a shopping district to a skyscraper district of government and corporate headquarters
    - The skyrocketing rents, downtown traffic snarls, and inadequate parking forced small retail businesses out and they relocated elsewhere, usually to the suburbs
    - Eventually, the auto (and decline of public transportation) encouraged government and corporate offices to relocate from the CBD to industrial parks in the suburbs

53

Creating the Auto Suburbs

- Creating the modern suburb – 3
  - What set the modern suburb off from what existed previously was
    - Dependency on the auto not only for commuting to work but also for shopping
    - Relatively low density and larger average lot size due to cheaper land prices
  - With the modern suburb and the auto eventually came the centerless city and commuting from suburb to suburb

54

Low density and land prices in the suburbs - Because the motor vehicle opened up much more land than was possible with public transportation, the price of a square foot of real estate was lower in areas accessible only to cars than in neighborhoods served by good streetcar systems.!! With more developable land available at cheaper prices, the average size of a building lot rose from about three thousand square feet in streetcar suburbs to about five thousand square feet in automobile suburbs. Res-idential densities moved in the opposite direction from about twenty thousand per square mile in trolley-based areas to about half that in areas based solely on the motorcar. In fact, the residential density of a neigh-borhood today is largely a function of the type of transportation system that accompanied its early development

Centerless city - The automobile led to the centerless city -- a collection of suburbs with no obvious central city -- starting with Orange and Santa Clara counties, but eventually spreading to the East as industries, businesses, and offices migrated from central cities to suburban industrial parks and mega-malls.

Creating the Auto Suburbs

- Social Effects of the Modern Suburb
  - In the city, life often took place on the sidewalk and the front porch or front steps; in the suburbs it took place in the family-oriented (and often fenced-in) backyard
  - Instead of congregating at a trolley or bus stop to commute to work, people now commuted individually in their cars
  - Instead of meeting neighbors at nearby stores that one walked to, suburbanites did their shopping at malls they drove to

55

In the words of Kenneth T. Jackson's *Crabgrass Frontier. The suburbanization of the United States*. "There are few places as desolate and lonely as a suburban street on a hot afternoon."

Creating the Auto Suburbs

- Social Effects of the Modern Suburb – 2
  - Because of differential land prices and zoning regulations, different suburbs became stratified by housing size and price, and thus by socio-economic status
  - As suburban residents became more car-dependent, the number of cars increased while road construction and public transportation lagged. The result: increased traffic congestion not only in the city but also in the suburbs

56

Residential stratification - Since the auto-dependent suburbs had their greatest growth from the postwar-1940s to the early-1960s (the era of the baby boom), early suburban growth, thanks to restrictive covenants and refusals to sell to Blacks and other minorities, was almost all White and Middle- and Upper-Middle-class. As the White Middle-class abandoned the central city, the central city residential areas became the province of poor white and ghetto Blacks. This exacerbated racial tensions that eventually exploded in the riots of the 1960s.

Car-dependency – In an era where mom stayed home with the kids and dad could take public transportation to work, a family car would easily meet the family's needs. As mom went to work, as dad needed a car to drive to work, and as teenage children needed a car of their own to work, shop, or go to school, the number of cars in the suburbs exploded.