

In 1907, when Edward Penfield painted this Manhattan scene, only 140,300 Americans had the inclination (and the money) to own a car. By 1920, auto registrations had jumped to eight million, one car for every 13 Americans.

The Automobile In America

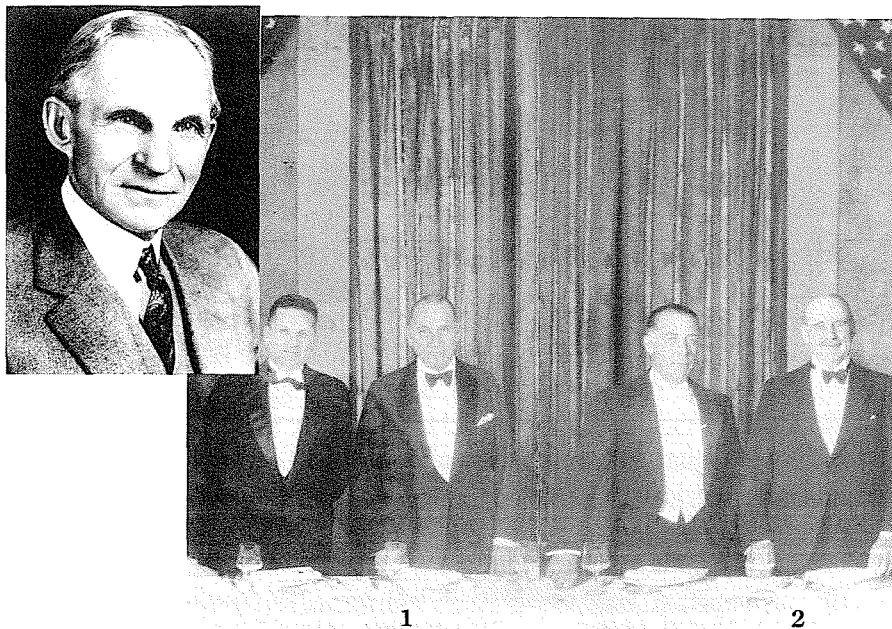
One hundred years ago, Germany's Carl Friedrich Benz patented an odd-looking three-wheeled vehicle powered by a tiny gasoline engine. Most scholars agree that the Benz was the world's first automobile with a workable internal-combustion engine. Henry Ford's Model T came 22 years later. Starting before the First World War, the automobile would transform the United States, spawning a giant industry based in Detroit and capturing the affections of Americans. What has the auto wrought? Suburbs and "ex-urbs," Sunday driving, "beltways" and shopping malls, jobs by the million, the family motor vacation, unprecedented individual mobility—in short, a way of life that has intrigued researchers and stunned foreign visitors. America's "car culture" encountered its first yellow light during the 1970s: sharply higher gasoline prices and a Japanese-led "import invasion." Today, those threats have receded, at least for the moment. Ahead lie the long-term prospects of more expensive fuel and stiffer competition in the world market. Here, we offer two reports on the Auto Age: a chronicle of the car and an analysis of the culture the car created.

THE INDUSTRY

by David L. Lewis

"The automobile industry stands for modern industry all over the globe," wrote management specialist Peter F. Drucker in 1972. "It is to the 20th century what the Lancashire cotton mills were to the early 19th century: the industry of industries."

In the United States, where cars probably matter more to people than they do anywhere else in the world, autos represent more than an industry. They are a part of the American self-image. From Henry Ford, the founding genius of the auto assembly line, to Charles

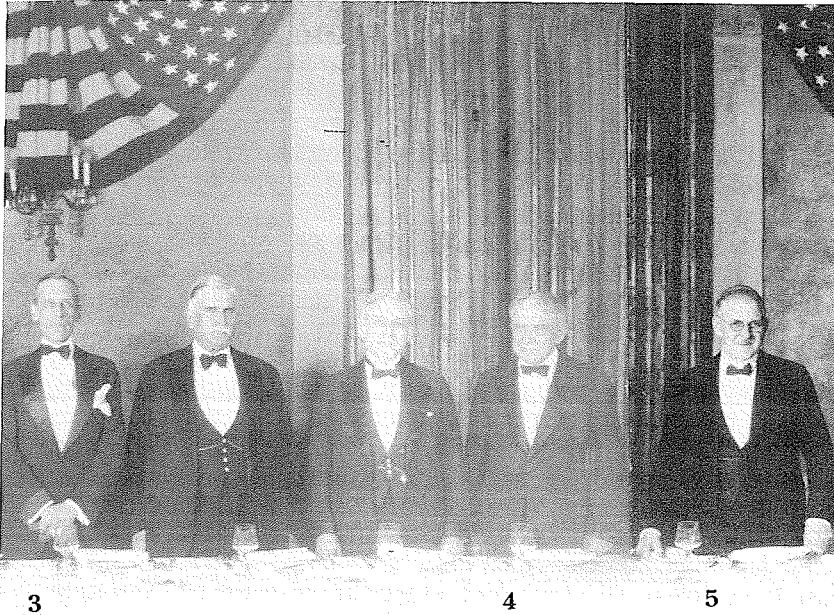


Henry Ford, at left, and a gathering of Detroit's business leaders at a 1929 banquet of the National Automobile Chamber of Commerce. They include (1)

("Engine Charlie") Wilson, the General Motors (GM) president turned U.S. secretary of defense during the Eisenhower years, to Lee Iacocca today, autodom has probably turned out more colorful executives than any other industry. Detroit's successes become symbols of national achievement; its blunders, like Ford's Edsel, metaphors for failure. In 1957, after the Soviet Union beat the United States into space with Sputnik, Defense Secretary Wilson assured the nation that a U.S. satellite would soon follow. "Yes," said Senate Majority Leader Lyndon B. Johnson, "and it will have a two-toned paint job and window washers."

In recent years, the U.S. auto enterprise has come under fire, its own shortcomings serving as symbolic evidence of all that ails industrial America. Even Henry Ford II (grandson of Henry), then

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Walter P. Chrysler, (2) Charles W. Nash, (3) Alfred P. Sloan, Jr., (4) William C. Durant, and (5) Ransom E. Olds.

chairman of the company that bears his name, worried in 1974 that "we may become a service nation one day because our manufacturers could not compete with foreigners." Ford may be right—Detroit and U.S. industry in general are facing an unprecedented challenge from Japanese and other foreign competitors. But few of Detroit's harshest critics recall that, except during the halcyon years of the 1950s and 1960s, the U.S. auto business has never been serene.

William C. Durant, the man who founded GM in 1908, lost control of the company in 1910, regained it six years later, lost it again, started a new, briefly successful car company (Durant Motors) in 1921, and died in 1947, his managerial talent reduced to running a bowling alley in Flint, Michigan. Henry Ford, who died the same year, meanwhile had allowed his company to decline. As *Fortune* reported, Ford's accounting system would have embarrassed "a country storekeeper." Even the formidable Japanese have had their problems. During the mid-1970s, Toyo Kogyo (Mazda) nearly went bankrupt when its innovative rotary engines proved to be too fuel-hungry for energy-conscious drivers.

Despite all the red ink, layoffs, and desperation in Detroit in recent years, the automobile industry remains by far the nation's

largest manufacturing enterprise. It directly employs some 1.2 million people, while the payrolls of auto dealers, service stations, and other related businesses are several times larger. All told, the industry provides jobs for one in every six American workers.

If the glory days of the 1950s and '60s will never be repeated, Detroit still is far from moribund. More likely, it will return to something like the hypercompetitive climate of its early days, when numerous "independents" competed with what are now the Big Three—GM, Ford, and Chrysler. (The sole surviving U.S. independent is American Motors.) Only instead of Willys-Overland, Crosley, Hudson, and Packard, the competitors will bear names like Toyota, Nissan, Mercedes, and Hyundai.

America's first gasoline-powered car was built not in Detroit, but in Springfield, Massachusetts. There, in 1893, Charles and Frank Duryea, two bicycle mechanics, assembled their first gasoline-powered horseless carriage. Three years later, Francis E. and Freeland O. Stanley began manufacturing steam-powered buggies—the famous Stanley Steamer—in the Boston suburb of Watertown. Most other Eastern carmakers followed the Stanleys into steam or worked, with some success, on electric vehicles—a strategic wrong turn. It was left to Midwesterners, especially those around Detroit, to achieve success with the internal-combustion engine.

A Car for the Multitude

Detroit was well placed. It was home to a number of capitalists whose families had amassed great wealth from Michigan copper, iron ore, and timber, and who were receptive to new investment opportunities. As it happened, Detroit was also the launching pad, along with Lansing, Michigan, for the industry's first high-volume producer of gasoline-powered cars, Ransom E. Olds, a young man who had already prospered by manufacturing gasoline engines. After he showed the way to high profits, producing 3,000 fast-selling "Merry Oldsmobiles" in 1903, Detroit was seized with automania, much as California's Silicon Valley would be swept by computer fever seven decades later. By 1905, Detroit was the nation's auto capital. "Detroit lives, moves and has her being from the motor car," enthused *Cycle and Automobile Trade Journal* in 1909. "People talk automobile at their business, at their luncheon, in their sleep. . . . Every mechanic is an inventor in his odd hours and Detroit makes more applications for patents than any other town of its size in the world."

At first, only the wealthy could afford cars: The average price was \$2,800 at a time when most workmen earned less than \$500 annually. Auto salesmen talked reliability rather than cost. One of the best tests of a car's stamina was the motor race. And it was here that Henry Ford, an ex-farmer who had become the chief engineer of

Detroit's Edison Illuminating Company, acquired his early reputation. In 1901, he beat Alexander Winton, the world-record holder for the mile (one minute, 6.8 seconds), driving a car of his own design at a Grosse Pointe racetrack. Twice, wealthy investors were impressed enough by Ford's designs to back him in creating a new company. Both efforts failed—as have some 2,500 other U.S. auto manufacturers over the years. Finally, in 1903, with new backers, he launched the Ford Motor Company in Dearborn, Michigan.

At that time, the industry consensus was that the future lay in luxury vehicles for the well-to-do. Ford had another idea. "I will build a motor car for the great multitude. It will be constructed of the best materials by the best men to be hired. . . . But it will be so low in price that no man making a good salary will be unable to own one—and enjoy with his family the blessings of . . . God's great open spaces."

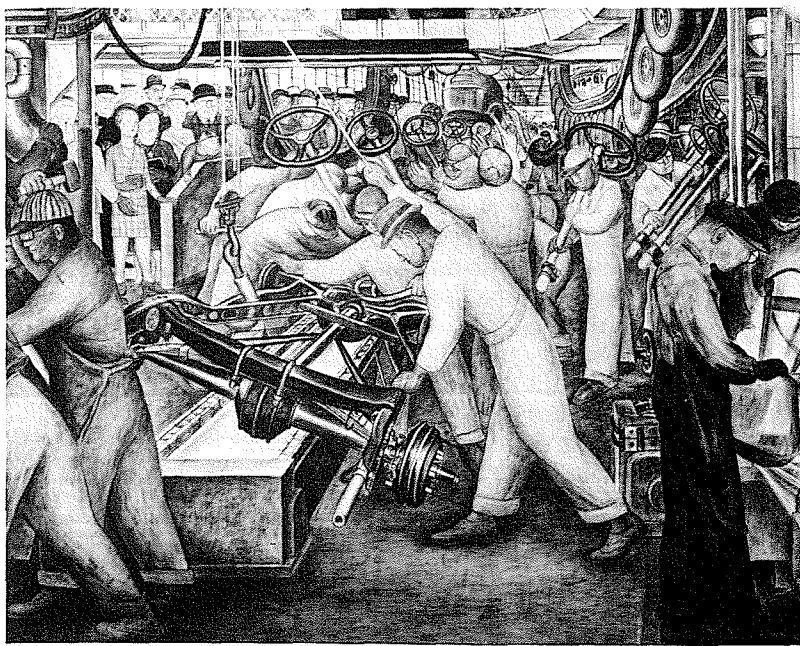
In 1908, after Ford had enjoyed considerable success with eight fairly conventional cars, the affordable and technologically advanced Model T (with a fully enclosed engine and transmission and a solid-cast cylinder block) made its debut. Sticker price for the touring car: \$850. The car was an immediate success. Then, in 1913, Ford opened his first moving assembly line at his new Highland Park plant. Production jumped, and costs dropped. The T's price fell to \$440 in 1914, to \$360 in 1916.

Not that other firms could not compete. General Motors, pieced together by Durant beginning in 1908 and including Buick, Olds, Cadillac, and a score of other companies, challenged Ford from the beginning. Chevrolet, then independent, and Willys-Overland were also strong competitors. Charles F. Kettering's self-starters, introduced in the 1912 Cadillac as an alternative to the hand crank, encouraged women and older folk to drive; the affordable closed car, pioneered by Hudson in 1920–21, made year-round driving practical.

Planned Obsolescence

Ford and GM epitomized two radically different approaches to manufacturing and marketing cars. Ford's strategy, reflecting the strong beliefs of its founder, was to sell a single plain but reliable automobile (the T) while using the proceeds from increasing labor productivity to cut prices steadily.

GM early on followed a different path. After the final departure of the flamboyant Durant in 1920, a methodical engineer named Alfred P. Sloan, Jr., shaped the company into a marketing-oriented colossus. GM, he declared, was in business "to make money, not just to make motor cars." Already, the company had offered installment loans to make it easier for customers to buy. Sloan pioneered the notion of offering many models, each targeted at a different class of buyer. As a company saying later put it, "Chevrolet is for the hoi



A Model A chassis at the end of the assembly line at Ford's River Rouge plant, depicted in 1933 by Diego Rivera. "The Rouge," covering 1,115 acres, was a completely integrated factory, even making its own steel.

polloi, Pontiac for the poor but proud, Oldsmobile for the comfortable but discreet, Buick for the striving, and Cadillac for the rich."

But Sloan's most important marketing innovation was the annual model change, or "planned obsolescence," as critics have called it. "The changes in new models," Sloan declared in 1922, "should be so novel and attractive as to create dissatisfaction with past models. . . . The laws of Paris dressmakers have come to be a factor in the automobile industry." Outdoing even the haute couture houses, the automakers surrounded the autumn debut of their new models with the suspense of a Hitchcock thriller and the hoopla of a circus.*

In time, even the Model T, like a prim spinster gussied up for her last fling, was offered in multiple colors. But the effort failed, and, in 1927, the Model A replaced the Tin Lizzie. Henry Ford expected it to rival the T in longevity, but after four years consumer interest waned. By then, GM's sales had outstripped Ford's, and Sloan's company has remained number one ever since.

*The autumn promotional blitz declined in importance after 1964, when Ford successfully introduced the Mustang in the spring. Cosmetic annual model changes continue, although they influence fewer car buyers than in the past.

As they expanded at home, U.S. automakers grew abroad. Within months of its founding in 1903, Ford began exporting cars and appointing dealers in Canada, Europe, and the Far East. By 1912, the Model T was rattling around every part of the world. Twenty Tin Lizzies were used in the construction of the Amur River Railroad in Siberia; in India, they bore 20 princes in a procession that included elephants, camels, and horses to celebrate King George V's arrival in Delhi. A Model T was driven 700 miles across the Gobi Desert to be delivered to the Tasha Lama of Urga; the French army used Ford's flivvers to pursue bandits in Morocco.

The Arsenal of Freedom

By 1923, Ford was selling more than eight percent of its total output abroad. To meet demand, between 1919 and 1926 the company opened seven assembly plants in Latin America, six more in Europe, plus one in Japan. (The latter plant kept assembling Fords from U.S.-made parts until World War II.) Ford of Canada sold cars in British possessions around the world. GM also expanded vigorously overseas, mostly through the acquisition of such firms as England's Vauxhall (1925) and Germany's Opel (1929).

Apart from the Model T, American-made cars never sold well overseas. Europe and South America were the chief potential markets, but almost all overseas trade was closed off by high tariff barriers beginning during the 1920s. Largely because of the longer driving distances in America, U.S. cars were bigger and heavier than foreign models, reducing their appeal in countries where governments imposed stiff taxes on gasoline and on large engines. Thus, Detroit never became a major *exporter*; instead it developed overseas subsidiaries, which built entirely different cars for foreign markets.

Another major characteristic of the modern U.S. auto industry, antagonism between management and labor, took shape during the 1930s. During its early years, Detroit avoided many of the labor problems, and almost all of the violence, that had plagued Chicago, Pittsburgh, and other major industrial centers. By custom, Detroit was (like the South today) "open shop." Its rapidly expanding, well-paid work force was union free. At first, the industry's biggest labor problem was turnover. In 1914, Henry Ford hit upon a radical solution: He more than doubled wages to an unheard-of \$5 a day, while reducing the length of the workday from nine to eight hours. Ford's act, described years later by the London *Economist* as "the most dramatic event in the history of wages," earned him many enemies among his fellow industrialists. But it solved Ford's turnover problem and helped keep the unions at bay.

In auto manufacturing, as elsewhere, management treated labor paternalistically at best—inspectors from Ford's Sociological Depart-

THE DETROIT COCOON

How did Detroit come to grief? Brock Yates, author of The Decline and Fall of the American Automobile Industry (1983), puts the blame on Detroit's unique corporate culture:

The auto moguls have reams of excuses for their woes: unfavorable currency markets, cheap overseas labor, a churlish union work force, and a penchant for recalling the words of the late GM design genius, Charles F. Kettering, who once said, "It isn't that we build such bad cars; it's that they are such lousy customers."

Sadly, this attitude prevails in Detroit to this day. While we read of Detroit's conversion to the new religion of quality and engineering, the fact remains that the major automobile companies of America are infested with old-line executives who believe that bigger is better, and that once America comes to its senses, it will shuck its fascination with "foreign junk" and once again embrace the whitewalled, vinyl-roofed, brocaded, "longer, lower, wider" land arks of yore.

The industry that once dominated world markets is run like a local business. Its environs stretch from Bloomfield Hills in the north to Grosse Pointe in the east to Dearborn in the west. Most of its inhabitants are natives of the Midwest who graduated from the University of Michigan, Michigan State, Purdue, or Ohio State, and whose adult lives have been spent squirming upward through the social strata built up in the trade. Nirvana is Bloomfield Hills, one of America's most affluent suburbs, where the moguls live together, play together, and dream together. "If they weren't isolated in Bloomfield Hills, driving their Cadillacs and Lincolns and Imperials," says one ex-auto executive, "they'd understand why imported cars sell so well."

The car men incessantly discuss how their relatives or close associates like or dislike the new models they are driving. Neither the cost nor the maintenance of these cars reflects the reality of owning and operating an automobile in America. Many of the cars have been obtained through special management buy/lease programs, or they belong to vast, painstakingly maintained corporate pools. The corporations discourage young executives from driving the cars of their competitors—or even renting them on business trips. It is as if the president of the United States were to judge commercial air travel based on his flights aboard Air Force One.

ment even visited the homes of workers to check on the character and habits of Ford employees. During the Depression years of the 1930s, President Franklin D. Roosevelt's New Deal and the Wagner Act made it easier to unionize workers. Still, it took a bitter 44-day sit-down strike at GM in 1937 before the first company signed a contract with the fledgling United Auto Workers (UAW) union. Fourteen union activists were wounded by GM security guards during the confrontation. A stubborn Henry Ford held out for four more years until, in a not uncharacteristic gesture, he signed the most generous

contract negotiated by the UAW up to that time (\$1.15 an hour), even agreeing to Detroit's first payroll "checkoff" for union dues.

The UAW's divide-and-conquer strategy, abetted by the automakers' fears of federal antitrust suits if they presented a united front, gave the UAW the upper hand for many years. The companies and the union settled into wary collaboration. As Harvard's William J. Abernathy and two colleagues observed in a recent study, "There was no genuinely cooperative relationship, only an armed truce." Over the years, both sides agreed to a proliferation of work rules, executives because the specifications made for more "scientific" management, labor because they provided protection against arbitrary actions by the bosses.

Labor's great victory came during the industry's most depressed decade. The automakers sold only 1.3 million vehicles in 1932, one-quarter of the number delivered in 1929. As the Depression progressed, six manufacturers perished. But Detroit began to revive during the late 1930s, as the pre-World War II arms build-up began. After Pearl Harbor, the city's "arsenal of freedom" turned out one-sixth of the nation's war materiel—tanks, bombers, even submarine nets and belt buckles. Detroit also stored up healthy profits to be used in the postwar reconversion to civilian production.

But for Detroit, as for such industries as steel and meatpacking, the war's end also brought a series of strikes, including a 113-day shutdown at GM. Walter Reuther, head of the UAW and "the ablest man in the industry," according to Charles Wilson, demanded a 30 percent wage hike after wartime wage controls were lifted, and settled for 16.4 percent. In 1948, GM made a fateful concession: the cost of living allowance, or COLA, which guaranteed that workers' wages would rise automatically in tandem with the inflation rate.

Tail Fins and Horsepower

For the next 20 years, however, auto executives were little troubled by increased labor costs; they could simply be passed on to the customers. The Korean War (1950–53) dampened production, but when it was over, America entered into a long upward curl of prosperity. People had money to spend; foreign competition did not amount to much. Cars, like their makers' profits, grew bigger, and also gaudier and more powerful. Adorned by chrome, three-tone paint jobs, and skyward-shooting fins, and propelled by engines of 200 or more horsepower, they reflected one side of America itself—rich, confident, somewhat lacking in good taste.

Styling, size, and horsepower moved the merchandise and made money. Nothing else seemed to matter. Fuel economy? Through the 1950s, gasoline prices ranged from 26 to 31 cents a gallon. Safety? When Ford, then headed by "whiz kid" Robert F. McNamara, pro-

moted its "lifeguard" features in 1955—deep-dish steering wheels, padded dashboards, and the first (optional) safety belts—customers yawned. The joke in Detroit was that "McNamara is selling safety and Chevy's selling cars." As for "economy" cars, Ford and GM planned such vehicles during the early postwar years but abandoned them. GM discovered that, chiefly because of its high investment in plant and equipment, the manufacturing cost of a small auto was only \$100 less than that of a standard-size Chevrolet. Between 1950 and 1954, Nash, Kaiser, Willys-Overland, and Hudson all brought out little cars—with disappointing results.*

Enter Ralph Nader

The result was America's first import invasion, led by the "Beetle," the ungainly but economical German Volkswagen (people's car), which sold for \$1,500 in 1955, versus \$1,728 for a stripped-down Chevrolet. By 1959, as the U.S. economy was recovering from the second brief "Eisenhower recession," imports had captured an unprecedented 10.1 percent of the U.S. new-car market. But in 1959, the Big Three struck back with new "compacts"—Chevrolet's Corvair, Ford's Falcon, Chrysler's Valiant/Dart. Foreign car sales shrank to about five percent of the U.S. market.

Detroit had one major advantage over its foreign competitors: It still made the best autos around. According to *Car and Driver* columnist Brock Yates, for example, the big high-compression, overhead valve V-8 engines and three-speed automatic transmissions that Detroit conceived during the 1940s and improved into the 1960s were the best the world had seen. (Most manufacturers, foreign and domestic, still use the basic American design for automatic transmissions.) "Since then," Yates charged in 1983, "American manufacturers have made a few laudable efforts in the area of high-tech. . . . In the main, Detroit spent the '60s and '70s immersed in an inane preoccupation with gadgetry."

For many years it did not matter. During the 1960s, the industry competed with itself, selling styling, options (e.g., air conditioning, power steering, whitewall tires), and horsepower. After imports began rising again during the mid-1960s, Detroit unveiled a new set of compacts—Ford's Maverick and Pinto, the Chevrolet Vega, and the American Motors Gremlin. But this time the anti-import strategy did not work. The Pinto and Vega, notes historian Robert Sobel, were "dismal failures, mechanically unsound and poorly constructed."

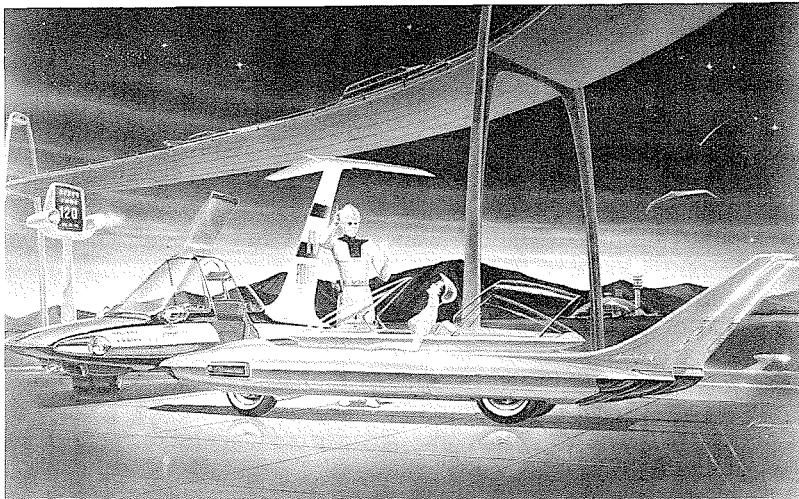
Yet these were the only small cars that Detroit had on hand

*The 1950s brought the final consolidation of the independents. Crosley closed its doors in 1950; Willys-Overland merged with Kaiser in 1953 and left the car business in 1957; Studebaker and Packard merged in 1954 and held on until 1967. Only American Motors, the product of a 1954 Nash-Hudson merger, remains, but is now 46 percent owned by Renault. Detroiters refer to it as "Franco-American."

when disaster struck: the 1973–74 OPEC oil price shock. Gasoline shortages appeared, rationing was discussed, and retail prices climbed from an average of 39 cents per gallon in 1973 to 53 cents a year later. Suddenly, Japan's inexpensive, fuel-stingy Toyotas, Datsuns, and Hondas looked attractive to American drivers. Even so, once the gas lines disappeared, it was business as usual again. Imports remained at an acceptable level—roughly 15 percent of the American market—and the automakers enjoyed healthy profits. Congress even helped keep alive the illusion that the old days could last forever by imposing price controls on domestic oil in 1976, thus reducing the rise of gasoline prices. The 1977 *Ward's Automotive Yearbook* summed up the results in a headline: "Market Prefers the Larger Cars."

Despite its outward health, the American auto industry was ailing. Detroit's once-impressive factories were aging; wages were growing faster than productivity, and both management and labor seemed complacent. So high was worker absenteeism on Mondays and Fridays that Ford and GM occasionally were forced to shut down entire plants for the day. To make matters worse, the automakers were under attack in Washington.

For years, the federal government had scrutinized the automakers for antitrust violations, but left the actual business of making cars to Detroit. That began to change after Ralph Nader, a Harvard-trained lawyer and freelance writer, published *Unsafe at Any Speed*



"Traffic Arrest in the Year 2000," a 1956 rendering of the car of the future. The shape of such "dream cars" has changed little over the years. However, the speed limit envisioned here is 120 m.p.h.

in 1965, alleging that GM executives had authorized the continued production of what they knew to be dangerously flawed cars (e.g., the Corvair). GM officials made the mistake of hiring private investigators to discredit Nader. Soon after the scandal aired in Capitol Hill hearings, Congress passed the U.S. National Traffic and Motor Vehicle Safety Act, which forced Detroit to add numerous safety features to its cars. Then, in 1970, Congress amended the Clean Air Act to require drastic reductions in motor vehicle exhaust emissions. In 1975, the lawmakers also mandated increased fuel economy.*

In the space of a decade, the Detroit manufacturers were forced to redesign their cars substantially. "Downsizing" increased fuel economy; catalytic converters cut noxious emissions; energy-absorbing bumpers enhanced safety. But as mileage, pollution control, and safety improved, quality remained static at best. By the reckoning of *Consumer Reports*, American and Japanese cars were roughly equal in reliability until 1972. Thereafter, consumers complained less about their Toyotas, Datsuns, and other Japanese cars, somewhat more about the Big Three's products. In 1977, the U.S. National Highway Traffic Safety Administration actually ordered the recall of more American-made cars than Detroit built that year.

Still, American cars continued to sell well. It took another crisis to make Detroit realize how serious its competition was.

The Price Gap

In 1979, after "the Shah left town," as Lee Iacocca put it, Iran's oil disappeared from the world market and gasoline prices jumped a second time—nearly doubling within a year. Small cars were in demand again, and again the industry had few "puddle jumpers" to sell. The Japanese did, and they quickly and almost effortlessly increased their share of the U.S. market from 12 to 21 percent, a gain that would have taken many years under more normal circumstances. Indeed, before the 1979 oil crisis, some 750,000 Japanese subcompacts were sitting on American docks, unwanted and unsold.

During the next few years, Detroit suffered unprecedented losses. In 1979, Chrysler nearly went bankrupt, saved by the federal government's \$1.5 billion loan guarantee, along with state loans and substantial concessions by the UAW and Chrysler's suppliers. The next year, Japan surpassed the United States to become the world's leading auto producer. In May 1981, with Congress threatening to pass protectionist legislation, the Reagan administration persuaded Prime Minister Suzuki Zenko to accept "voluntary" restraints on

*As detailed by a 1986 Brookings Institution study, the Japanese were helped by the fuel-efficiency rules because, unlike the American manufacturers, they did not need to overhaul their cars, quickly and at high cost, to increase mileage. And while Tokyo allowed its automakers to cooperate on research into ways to meet the new safety and emissions regulations, Washington warned the Big Three of antitrust action if they pooled their efforts. Even so, Japanese gains stemmed mostly from superior cars.

Japanese car exports to the United States. Deep recessions in 1980 and 1981-82 followed the oil price shock, dragging auto sales down to their lowest point in nearly two decades. In the carnage of the late 1970s and early 1980s, the automakers permanently shut down 10 major auto plants; some 115,000 blue-collar and 28,000 white-collar jobs have since disappeared, not counting the employment losses among Detroit's suppliers. (The United States has lost a total of 1.8 million jobs in manufacturing since 1979.)

By 1982, Detroit's Japanese competitors had also built up a considerable price advantage in the market for small cars. According to a 1982 National Academy of Engineering (NAE) study, Japan's offerings arrived in U.S. showrooms costing between \$750 and \$1,500 less than comparable American models.

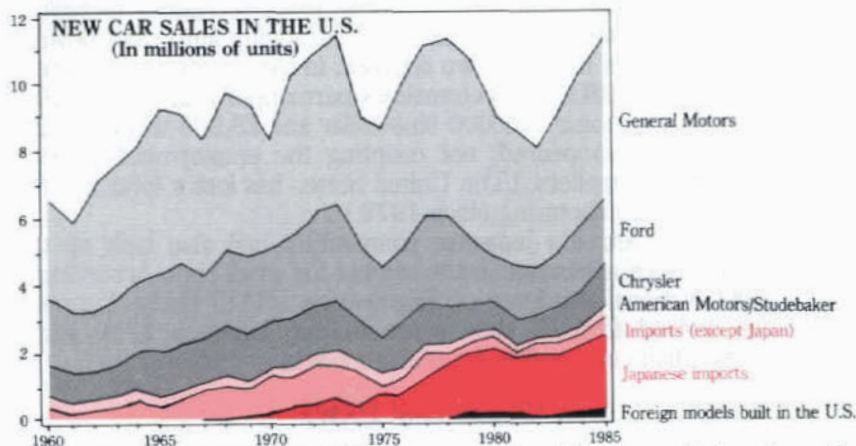
A 'Chastened' UAW?

Detroit's ills have been diagnosed by dozens of analysts (and not a few quacks). "None of the major [U.S.] producers sought to achieve a competitive advantage through superior manufacturing performance" after the 1960s, the NAE panel concluded.* "The basis of competition was located outside manufacturing—in marketing, styling, and the dealerships."

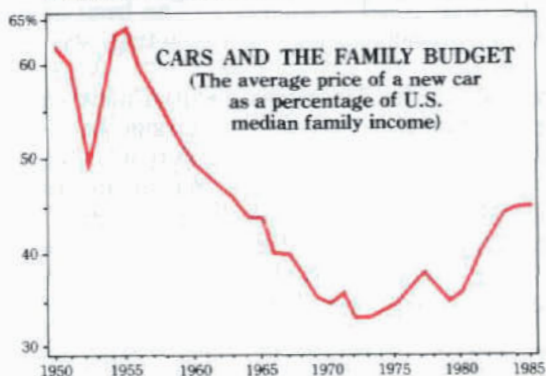
On the shop floor, meanwhile, the Americans endured multiple disadvantages. U.S. workers earned more in wages and fringe benefits (\$20 per hour versus \$12) than their Japanese counterparts, but produced less. Economist Martin L. Anderson of the Massachusetts Institute of Technology (MIT) reckons that during the early 1980s, the making of a typical American auto consumed a total of 175 hours of toil by management and labor, versus fewer than 100 hours for a Japanese car. Labor-management relations in U.S. industry were beset by arteriosclerosis: Most labor contracts contained roughly 150 pages of work rules. In Chrysler's Detroit Trim factory, *Fortune* reported in 1983, workers were not allowed to unplug a machine themselves; they had to call a plant electrician to do it.

But 1983 was also the year that the Big Three returned to profitability (together reporting earnings of \$6 billion), helped by the Japanese quotas and a reviving U.S. economy. In retrospect, the turnaround began even when the future seemed darkest, with the introduction of successful new made-in-America small cars after 1979: Chrysler's K-cars, Ford's Escort/Lynx (now the top-selling car in the world, ahead of the Chevrolet Cavalier and the Volkswagen

*One of Japan's great advantages in manufacturing is the "just in time," or *kanban*, production system, which reduces inventories and costs by carefully spacing deliveries of car parts to the shop floor. Ironically, the system was pioneered by Henry Ford but abandoned during the 1930s, a victim of the Great Depression and UAW work rules. And Japan's vaunted worker "quality circles" were the inspiration of an American business consultant, W. Edwards Deming, whose likeness appears on Japan's top award for industrial excellence.

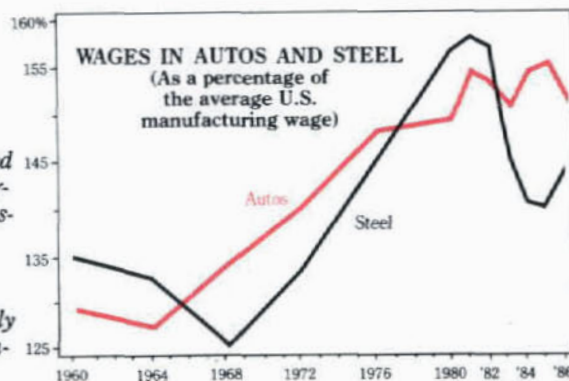


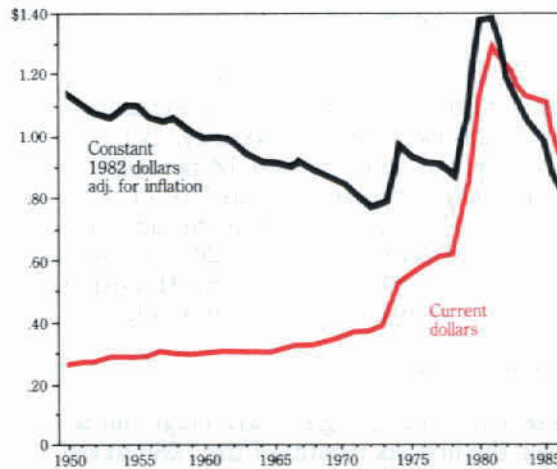
Imports sell best when the U.S. economy is sluggish. A new factor: Annual output of foreign cars assembled in America may reach 1.4 million by 1990.
Data for years prior to 1970 are new car registrations. Import categories include "captive" imports, built overseas but sold through U.S. manufacturers. Some overlap may occur. Studebaker through 1967 only.



Car prices began rising faster than incomes during the "stagflation" of the 1970s. Since 1981, Japan's "voluntary" export quotas have eased pressures to keep prices down. Detroit's cars now sell for an average of \$11,629; imports, \$12,556.

Auto and steel workers traditionally have earned more than their counterparts elsewhere in industry. The average 1986 U.S. manufacturing wage is \$9.72 an hour, or roughly what assembly workers in U.S. electronics plants earn.



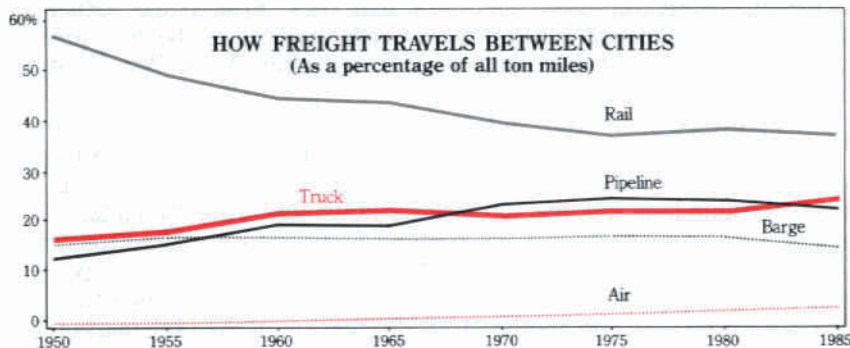
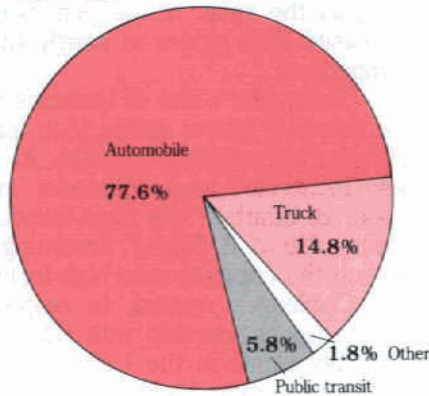


THE COST OF GASOLINE
(Per gallon)

Do rising gasoline prices influence motorists? Not much. In 1982, with prices near an all-time high, they drove their cars an average of 9,553 miles, some 400 fewer than in 1970. Americans now travel 1.3 trillion miles by car annually.

HOW AMERICANS GOT TO WORK, 1983

Commuting by car increases every year. Most specialists predict a further decline of mass transit as Americans, by choice or necessity, take to their autos.



Contrary to popular perception, railroads remain the nation's leading haulers of freight. Overall, moving freight is a \$259 billion-a-year industry.

Sources: Motor Vehicle Manufacturers Association of the United States, U.S. Bureau of the Census, Automobile Association of America, U.S. Department of Labor, Energy Information Administration, Transportation Policy Associates.

Golf) and GM's X-cars (Citation, Phoenix, Omega, Skylark). The Big Three began investing heavily, spending \$65 billion on new equipment and designs between 1979 and 1983. And, in 1982, the UAW, then led by Douglas Fraser, signed new labor contracts, exchanging wage and fringe—"givebacks" for increased job security. Between 1981 and 1983, labor productivity in autos jumped 18 percent. "A chastened UAW is now a convert to Japanese methods," reports the *Economist*. Obsolete work rules are being jettisoned as the union and the companies experiment with Japanese-style "Quality of Work Life" programs and the introduction of new technology. At Detroit Trim, workers can now pull plugs without an electrician's help.

Old Lessons

Moreover, the Japanese have lost one great advantage: unbalanced exchange rates. During the first six months of the 1986 model year, as the value of the yen increased, the Japanese automakers increased their prices at nearly three times the rate of their U.S. competitors.

Today, the worst of Detroit's problems probably can be seen in the rearview mirror rather than through the windshield. Even ailing Chrysler has returned to health, its savior and chairman, Lee Iacocca, now mentioned as a contender for the U.S. presidency. At GM, Roger B. Smith—"the most innovative GM chairman since the legendary Alfred P. Sloan," according to the *Wall Street Journal*—is leading the company into high-technology engineering.

Challenges remain. In response to U.S. import restrictions, Toyota (in partnership with GM), Honda, and Nissan have opened assembly plants in the United States, using mostly Japanese-made parts, employing highly paid American workers, and apparently achieving nearly the same efficiency that they do at home. Other foreign companies will surely follow. (Volkswagen was the first foreign maker to establish a plant on U.S. soil after World War II, at New Stanton, Pennsylvania, in 1978.)

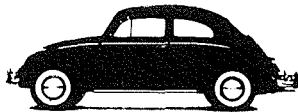
To prosper, the U.S. automakers increasingly must resort to "offshore sourcing"—buying parts and completed cars in low-wage countries such as Mexico, South Korea, and Taiwan. And it is an open question how well the automakers would fare if the "voluntary" quotas on Japanese vehicles (currently 2.3 million) were lifted today. In Detroit, some analysts estimate that, as foreign competitors open more assembly plants in the United States during the next few years, the Big Three may lose another 10 to 20 percent of the U.S. market, reducing their share to as low as 55 percent.

But they are fighting back. Costs are down. Largely as a result of improved management and the UAW's more flexible approach, the quality of U.S.-built cars is rising. Ford, generally considered De-

troit's current leader in the quality contest, reports that its customers' complaints about their new cars have dropped by 60 percent since 1980. Detroit still lags behind Japan in cost and perhaps in quality, but if it can continue to close the gap, it should be well positioned for the next phase of automotive competition: the race toward robotics and computer-integrated manufacturing. Here, the huge U.S. companies (GM and Ford rank first and second, respectively, among the world's automakers), with their vast financial resources, may enjoy an advantage. With their heavy investments in recent years, they are beginning to exploit it.

As a result of the new emphasis on quality cars and high-technology manufacturing, a 1984 MIT study concluded, "the shift to low-wage locations will not occur on the scale once expected." New jobs will be created in electronics, plastics, and Detroit's other supplier industries, but automation will mean the loss of more highly paid blue-collar jobs in the Big Three's plants. Like steel, textiles, and rubber, Detroit is being downsized. Manufacturing, the nation's number one employer as recently as 1979, now ranks third, behind wholesale and retail trade and "services."

But automobiles remain America's showcase industry. Alfred P. Sloan, Jr., once said of Henry Ford: "The old master failed to master change." By relearning some of the old master's lessons about building cars that are affordable and reliable, Detroit may once again show the way for the rest of American manufacturing.



THE AUTOMOBILE AGE

— The Horse he is a mild beast
And lets you pat his head,
But the Motor is a wild beast
And butts you till you're dead.

—Anonymous

When cars began appearing in great numbers on the nation's country roads and city streets during the first decades of the 20th century, many Americans shared the sentiments in this fond ode to the horse. Before long, however, they saw the automobile as the means to a brighter future for all citizens of the Republic.

By 1913, *Scribner's Magazine* was predicting that cars would bring "greater liberty, greater fruitfulness of time and effort, brighter glimpses of the wide and beautiful world," and "more health and happiness. . . . Thank God we live in the era of the motor car!"

More than any other people, Americans would embrace the automobile. Not just transportation, it became for many a status symbol, an alter ego, a key to personal autonomy. Cars crept into song ("Nothin' outrun my V-8 Ford," Chuck Berry boasted during the 1950s), television ("My Mother the Car"), and literature (*On the Road*, *The Great Gatsby*). More important, cars and the roads that carried them shaped the face of the nation by allowing a growing urban population to spread out into ever more dispersed suburbs and neighborhoods, to live and work and buy and relax. No other society has reaped so many benefits from the automobile, and none stands to learn so clearly what its eventual costs may be.

The steam engine (1800) was technology's first gift to the American traveler, and railroads opened up the West. In 1869, the tracks of the Central and Union Pacific lines joined at Promontory, Utah, linking the opposite shores of a 3,000-mile continent for the first time. Until then, San Francisco had been a full month away from New York by rail and stagecoach, up to five months away by wagon train from Missouri, and six months away by windjammer around the Horn from East Coast ports. Now the trip took only a few days.

The Iron Horse moved goods and people across a big country. In 1884, with four railroad lines crossing the prairie, more than 800,000 head of cattle left Dodge City and Abilene for the markets of Chicago and the East. San Francisco importers sent Oriental silks to Chicago in two days; bankers in Omaha, Nebraska, dined on Pacific salmon. In 1867, the Pullman Car Company introduced the popular sleeping car, ending many uncomfortable nights for businessmen



"Gridlock" before the auto? Electric trolleys, horse-drawn carriages and wagons, and pedestrians caused this 1909 traffic jam at the corner of Randolph and Dearborn in Chicago. Not a single car is in evidence.

traveling from Boston to Washington or Atlanta to Baltimore.

However, the horse remained the prime mover in short-haul transportation. In 1884, the same year that Dodge City's beef cattle moved east by rail, Americans employed more than 15.4 million draft horses. In cities and towns, horse-drawn wagons or carriages variously hauled freight from rail depots into city business districts, met passengers at the train station, delivered beer barrels to taverns and ice or milk to households, took ladies and gentlemen to the opera, and transported the two tons of coal needed to warm an average Pennsylvania house in winter. Blacksmiths, numbering 220,000 in 1900, according to the U.S. Bureau of the Census, were essential craftsmen in every community.

In the countryside, horsepower (or footpower) provided the chief means of everyday locomotion. In 1890, over half the nation's people (65 percent) still lived in rural areas. The greatest burden of rural life before the car, reminisced popular author Edward R. Eastman in 1927, was "the curse of isolation and loneliness." *The Farm Woman's Problems*, a pamphlet published by the U.S. Department of Agriculture, reported that the average rural family lived three miles from church, five miles from market, six miles from school, and 14 miles from a hospital—long distances by horse and wagon.

In the days before the truck, farmers often flourished or went broke according to their proximity to railroads. Those fortunate enough to live within 10 miles of a rail junction—and thus, a town—could earn hard cash selling their crops or livestock after long wagon trips along dusty or muddy roads, often nearly impassable. Farmers less well situated eked out a bare subsistence or joined their fellow migrants in the growing industrial cities of the North.

Across the nation as a whole, the rural population grew. But while immigrants from Scandinavia, Germany, and other European nations moved into farmlands, particularly in the Midwest, from 1860 to 1900 America's urban population quadrupled. "We cannot all live in cities, yet nearly all seem determined to do so," said New York journalist Horace Greeley during the late 1860s. Families jammed themselves into New York's tinderbox tenements, or Philadelphia's equally grim three-story wooden row houses, smirched with soot.

Rosary Beads

These slums, graphically depicted by journalist Jacob A. Riis, novelist Theodore Dreiser, and other naturalistic writers of the day, became tense ethnic warrens of new immigrants and native-born Americans from the farms, linked only by poverty and a common need to live within walking distance of their jobs at steel mills, slaughterhouses, and textile plants. Factories were also crowded together, bound to the waterways and rail lines at the cities' core.

The electric trolley, introduced in Richmond, Virginia, in 1888, and operating in most major cities by 1900, helped break up some of these urban amalgams. (Boston opened the first subway in America in 1897, but underground systems were not extensive even in New York until the 1920s.) Many blue-collar workers moved into older middle-class neighborhoods encircling the inner city, sorting themselves out by income levels and ethnicity.

However, trolleys did not end the demand for animal transportation. Hay remained a major cash crop for farmers on the outskirts of cities. About 15,000 dead draft horses were removed from New York City's streets every year, killed by heat and sheer exhaustion. Horse-drawn traffic created its own pollution. In 1890, according to historian James J. Flink, horses deposited an estimated 2.5 million pounds of manure and 60,000 gallons of urine on the streets every day in New York City alone. "Street dust" (dried dung) inflamed residents' nasal passages and lungs and turned to a syrupy mess when it rained. The flies that bred on the ever-present manure heaps, as medical authorities warned, carried 30 communicable diseases.

Not surprisingly, many wealthy city dwellers became commuters long before the coming of the car—especially in the heavily industrial Northeast. Only they could afford the time and expense in-

volved in commuting by railroad. Starting in midcentury, like rosary beads on a string, suburbs appeared in discrete formations along the rail corridors. (As early as 1848, Boston was served by 118 commuter trains a day.) Meanwhile, the new trolleys enabled middle-class families to undertake short-distance commuting, at a cost of 10 to 20 cents per day. "Streetcar suburbs" (such as Boston's Roxbury and Dorchester) often gave the growing American metropolis a new star-shaped outline, extending some 10 miles from its center.

The tremendously popular trolleys snarled already chaotic city traffic. Privately owned and operated, they ran along duplicate competing routes, frequently broke down, and were always crowded. During the early 1900s, newspaper editorials described trolley commuters hanging "like smoked hams" from the straps, or "packed like sardines with perspiration for oil."

The automobile was expected to change everything.

"Imagine a healthier race of working men toiling in cheerful and sanitary factories," wrote the New York *Independent* in 1904, who would "in the late afternoon, glide away in their own comfortable vehicles to their little farms or houses in the country or by the sea 20 or 30 miles distant!" Americans equated greater mobility with greater justice and liberty. The car would satisfy two great American hankerings: allowing ordinary folk to dwell in Arcadia while permitting more freedom of movement. Forward motion—personal, economic, social, moral—was what the nation was all about. "Passage, immediate passage!" cried Walt Whitman in 1892. "Have we not stood here like trees in the ground long enough?"

Out of the Mud

Even so, rural Americans despised cars at first. Wealthy big-city "autoneers" explored the countryside in noisy "touring" cars prone to breakdowns and flat tires, laden with *Scientific American's* recommended equipment (calfskin trousers, mask and goggles, oilskins, medicines, a six-shooter), plus a 32-piece Hammacher Schlemmer tool kit, 30 spare parts, and various indispensable guidebooks. The new vehicles spooked farmers' horses, ran over chickens, and raised clouds of dust that settled on laundry lines. Farmers retaliated: In Gloversville, New York, one tried to horsewhip a passing motorist; Mitchell, South Dakota, banned cars altogether.

City dwellers proved more receptive, although the first cars were rightly described as "toys of the rich." In 1900, only 8,000 cars were registered in the United States. Then came the great equalizer: Henry Ford's sturdy, reliable, affordable Model T. By 1914, six years after its introduction, it cost \$440, about half the original price and nearly \$500 less than its nearest reliable competitor. The car was now within the means even of Ford's own assembly line workers. By

1927, when prosperity reigned and one Model T rolled off the assembly line every 10 seconds and cost a mere \$290, one in every five Americans owned a car.

The masses could at last afford to travel, but there were few good roads. Owing to the growth of railroads after 1830, and, to a lesser extent, of canals such as the Erie (completed in 1825), an early 19th-century boom in turnpike construction had abruptly ended, leaving America with the worst roads of any Western nation.

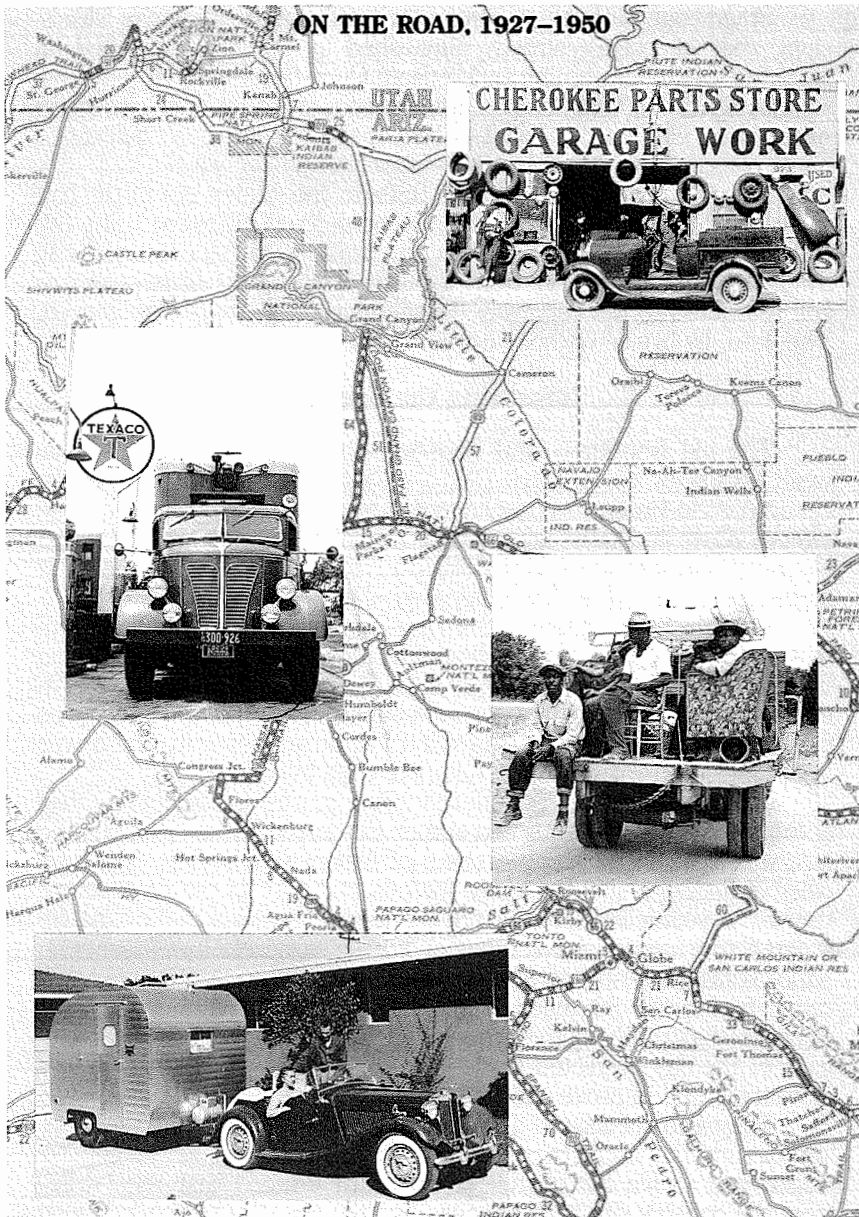
The first census of U.S. roads, carried out by the U.S. Department of Agriculture in 1904, revealed that of 2,151,570 miles of highway, only seven percent were surfaced (with stone, macadam, gravel, sand, brick, even wooden planks); the remaining 93 percent were plain dirt. At around the same time, a "Good Roads" campaign, launched during the 1880s by the League of American Wheelmen (a group of wealthy Newport, Rhode Island, bicycle enthusiasts), began to gather support from the car contingent, especially the fledgling American Automobile Association (AAA). Railroad executives now saw the advantage of building feeder routes from farming areas to their depots. They sponsored "Good Roads" trains staffed with specialists from the Department of Agriculture's Office of Road Inquiry, who spread the gospel ("Lift our people out of the mud") and unwittingly hastened the railroads' decline.

Killing Off the Steamboats

In 1916, President Woodrow Wilson signed a \$75 million Federal Aid Road Act to improve rural post roads, the first in a long series of federal subsidies encouraging America's shift to the car. President Warren G. Harding followed with the Federal Highway Act of 1921, a limited program that provided 50-50 matching grants to the states for road construction. Sparsely populated Western states with low tax revenues hit upon the gasoline excise tax as a way to raise highway construction funds. By 1930, all 48 states were collecting gasoline taxes—commonly three or four cents per gallon—to build and maintain what was now a patchy nationwide web of two-lane concrete highways.

All earlier forms of transportation suffered from the new competition, noted historian Samuel Eliot Morison. Livery stables went bankrupt; so did carriage and wagon factories, blacksmiths, harness makers, and every other trade that fed the horse economy. Hayfields reverted to brush and forest. About the only commercial enterprises that still used horses after the early 1920s were funeral parlors; it was considered undignified for the dead to be hustled to the grave in a big, shiny car.*

*Today, at drive-in establishments such as the Frank Givens Funeral Home in Detroit, open past midnight, mourners can drive up to a viewing window and exit into traffic in less than 30 seconds.



Before the interstates: Model A Ford at an Atlanta, Georgia, garage (1936); a truck stops for fuel on U.S. Route 1 near Washington, D.C. (1940); migrant workers near Bridgeton, N.J. (1942); a couple going on vacation in an MG, trailer in tow (1950); Arizona map (1927) shows two-lane highways.

Steamboat, flatboat, and freighter traffic on the Ohio, the Mississippi, and the canals, already diminished by the railroads, died "a lingering death," according to Morison. Once-flourishing river towns, such as Marietta, Ohio, and Salem, Oregon, faded with the decline in waterborne commerce. Trucks could move freight more quickly to more places. The automobile revolution was under way.

Americans now think of the 1950s as the golden era of the car. In reality, most of its powerful socioeconomic effects were being felt well before World War II. Trains and trolleys had encouraged city dwellers to migrate away from the urban core, but settlement was still restricted to the relatively densely populated areas they served. The auto, by breaking those bonds, opened a new suburban frontier.

Improving the Species

The old frontier—rural America—changed radically. Farmers were no longer so isolated. Doctors could make more house calls, children rode buses to consolidated schools, teenagers went to the picture show and farm wives went shopping in town. By 1926, 93 percent of Iowa farmers owned cars, a typical proportion in Corn Belt states, at a time when few possessed electricity or telephones.

Automobiles expanded the rural family's range of social contacts. However, the new relationships may have been weaker than those formed in horse-and-buggy days. As sociologist James M. Williams observed in 1931, "Instead of coming to stay the afternoon, the farmer's family is out for a long ride to some adjacent city and drives into a friend's yard for a few minutes; then away they go."

Not all relationships suffered. One of the automobile's chief accomplishments, as editor and author Frederick Lewis Allen pointed out, was to crack that cornerstone of American morality, "the difficulty of finding a suitable locale for misconduct." In the days before the car, a young farmer's search for female companionship was restricted to a range of five miles or so—a world of church suppers, parlor sofas, hovering parents, pesky siblings. The car extended that range to 10, 20, 50 miles or more, and the less inhibited quickly discovered its utility as the proverbial "bedroom on wheels." Sociologists of the day predicted that increased mobility would lead to less inbreeding and improve the American species.

They also speculated that the automobile, by reducing the isolation of rural life, might stem the trek to the cities and, as the popular slogan ran, "save the farm." Henry Ford insisted that the "drift" from the country would be checked by "the cheap automobile," good roads, and the small-town "moving picture theater."

In *The Devil Wagon in God's Country* (1979), historian Michael L. Berger noted that the automobile did not save the family farm. However, along with its offspring, the truck and the tractor, it

changed the nature of urban migration and may have slowed the exodus to the big cities.* The new automobile economy enabled farm families to make extra money close to home—working in gas stations, roadside stands and restaurants, gift shops, country inns, even renting out their yards to touring “autocampers” for \$1 a night.

Cars also acted as a catalyst in the development of small and medium-sized towns (10–25,000), where rural families increasingly moved to take jobs as salespeople (in dime stores, dress shops) or as laborers (stocking feed stores, loading lumber). The population of America’s rural villages and towns grew by 3.6 million between 1920 and 1930, while the farm population shrank by 1.2 million.

In the big cities during the 1920s, automobile traffic quickly replaced horse traffic, managing to create just as much congestion. Indeed, the *Literary Digest* fretted in 1924 that citizens were thinking more about a place to park than about the League of Nations. The chairman of Atlanta’s City Planning Committee pronounced its traffic “well-nigh unbearable,” and the New Orleans commissioner of public safety announced in 1927 that “millions of dollars” in retail trade had been lost because of “inadequate provisions for traffic regulation.”

The Flight to Autopia

The cities remained unpleasant for reasons that had little to do with car traffic—overcrowding, lack of open space, slums, crime, filth, noise. Many Americans shared Henry Ford’s philosophy. “We shall solve the urban problem,” he proclaimed, “by leaving the city.”

Across the nation, elected officials and planning specialists abetted the great exodus. Under the direction of urban planner Robert Moses, New York State built the first lavishly landscaped roads for passenger cars only: the Bronx River (1921), the Hutchinson River (1928), the Saw Mill River (1929), and the Cross County (1931) parkways, linking New York City to the new suburbs and parks of Westchester County.

In other cities as well, there were new escape routes: Philadelphia’s Ben Franklin Bridge (1926), the San Francisco Bay Bridge (1936) and the Golden Gate Bridge (1937). At the same time, telephones, electric lights, refrigerators, and public water and sewer systems came to suburbia, loosening the city’s hold over amenity-seekers. The early Auto Age vision of a little house with a garden could be realized—among all but the working class. The population of elegant Grosse Pointe, Michigan, grew by 725 percent during the 1920s; Beverly Hills expanded by a remarkable 2,485 percent. Many middle-class suburbs, such as Kansas City’s Country Club District and Baltimore’s Roland Park, sprang up in corn fields and pastures.

*The first crude tractors had been built about 1902. In 1910, tractor production reached 4,000 a year; by 1920, it had passed 200,000 a year.

MIND READING IN THE MOTOR CITY

"We are in the business of giving the public what it wants," declared General Motors executive Harlow Curtice as the 1950s dawned, "and not telling it what it *should* want."

For decades, Detroit has spent a great deal of time and money trying to find out what kinds of cars Americans *do* want. In the early days of the industry, customers had few choices to make. Henry Ford offered them the Model T in any color they liked, he said, "as long as it was black." The rise of "bent metal," multiple hues, tail fins, and other ephemera followed GM's creation of its Art and Color section in 1927 under the famed designer, Harley Earl. Cars, announced his GM colleague, Vincent Kaptur, Jr., should signify "status, power, fun, glamour, and freedom."

Advertising campaigns targeted every possible kind of consumer. There were cars for women, for status-seekers, for the practical-minded. In 1937, Nash introduced what came to be called "the young man's car," equipped with a fold-down bed for roadside trysts.

Even so, the automakers knew precious little about consumers' tastes and preferences apart from what their sales figures told them. In an effort to cover all the bases, they offered a growing array of styles, engines, and accessories. In 1965, a Yale physicist counted all the options available from Chevrolet and concluded that there were more permutations of the Chevrolet than there were atoms in the universe.

One of the first cars to be built with the aid of the new "science" of market research—demographic studies, opinion surveys, "focus" groups—was the Ford Mustang. "The normal procedure in Detroit was to build a car and then try to identify its buyers," wrote Lee Iacocca, who created the Mustang when he was a Ford vice president. "But we were in a position to move in the opposite direction—and tailor a new product for a hungry new market." The Mustang was meticulously designed for the first adults of the baby-boom generation. Iacocca and his aides even learned from market research that 42 percent of college students wanted bucket seats. The car, billed as "a new breed of horse" and introduced in the spring of 1964, was an immediate hit. The company sold 418,812 Mustangs within a year. One young woman, appar-

Over the next decades, the federal government and the states contributed to this "suburban sprawl" in several important ways, notably by financing highways, insuring private home mortgages, and making the interest on mortgages tax-deductible, a particularly powerful subsidy. No other industrialized nation offered its citizens so many inducements to leave the cities.

The Depression slowed the growth of suburbanization. However, it did not shake America's faith in cars. During the grim 1930s, private automobile registration decreased only 10 percent, from 26.5 million to 23.9 million, in a nation of 131 million (by 1940). President Franklin D. Roosevelt's Civil Works Administration put thousands of

ently overwrought, wrote to Ford that "Mustang is as exciting as sex."

Today, the automakers and their consultants have a fairly clear picture of who buys what and why. According to the researchers' findings, some stereotypes about cars and their owners are confirmed while others crumble.

"Yuppies" (young urban professionals), for example, do favor imported Swedish Saabs. Surveys show that more Saab buyers are college-educated (75 percent) than any other group of car purchasers. Volvos and Volkswagens are also popular among the highly educated. (Black yuppies, or "Buppies," also favor Saabs, along with the Cadillac Allanté and the sleek Ford Taurus.) Cadillac buyers are older (57, on average) and Jaguar devotees earn more (\$108,700 annually) than any other brands' buyers. On the other hand, men are making fewer and fewer decisions about what cars to drive home from the showroom. Women chose only about 15 percent of the cars sold during the early 1960s, according to Ford researcher Ray Windecker, but 42 percent in 1985. Their choices are now worth some \$46 billion annually to Detroit.

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According to the "psychographics" devised by a consulting firm, J. D. Power & Associates, women tend to be "comfort seekers" and "autophobes," preferring luxury vehicles, foreign or domestic, or large, "safe" cars such as the Chevrolet Caprice.

One of the most interesting trends of recent years is the rise in sales of small trucks and vans, up from some 1.7 million in 1980 to 3.6 million units last year. Again, the market researchers have an explanation. Many of the buyers are young "upscale" office workers in search of that *macho* feeling. Ford's Windecker discovered that 70 percent of the purchasers of his company's light trucks used them only for recreation or commuting to work.

The market researchers have also provided Detroit with some good news. Domestic makers, for example, dominate the small truck business. More important, as the "greying of America" proceeds, is that nine out of 10 new car buyers aged 55 or over do not choose Toyotas or Datsuns but stick with GM, Ford, Chrysler, or American Motors. Oversize instrument panels, wide-opening doors, and the reassuring big-car "feel" of the domestic products are among the reasons why.

jobless Americans to work, building, among other things, some 500,000 miles of roads, at a cost of \$4 billion. Sociologists Robert and Helen Lynd revisited "Middletown" (Muncie, Indiana) and reported: "If the word auto was writ large across Middletown's life in 1925, this was even more apparent in 1935... Car ownership stands to them for a large share of the 'American Dream'; they cling to it as they cling to their self-respect."

Popular attitudes were summed up in a joke about a man who claimed his family was starving: "If you don't believe it," said the man, "I'll drive you over to our place and you can see for yourself." As Will Rogers remarked, America was the only country that could

go to the poorhouse on wheels.

The much-publicized 1939-40 New York World's Fair raised the nation's hopes that the worst of the Depression was over. And GM's "Futurama" exhibit, by far the fair's most popular attraction, suggested that cars and highways would be the key to that brighter future. A total of five million people rode Futurama's "carry-go-round" chairs along an "automatically illuminated Motorway of 1960." They gaped at futuristic cars speeding into a huge, high-rise city bisected by green spaces, grand boulevards, and raised sidewalks. (It looked a lot like today's Houston.) "As the spectator circles high above the city," said Futurama's announcer, "he is able to compare the congested, badly planned areas of the 1930s with the well-organized districts of the newer city."

Paved with Good Intentions

The announcer did not exaggerate the urban muddle of the moment. In fact, the Depression slowdown caused many officials to underestimate the traffic problems that would emerge after World War II. City planners and politicians had failed to develop adequate public transportation systems during the 1920s, when cities could still afford them, and when demand was still strong. Most trolleys, buses, and subways remained in the hands of private entrepreneurs; during the 1930s, many ran in the red. As they tumbled into bankruptcy, city governments were forced to step in.* Many planners threw up their hands. Chicago's Angus S. Hibbard proposed to bar shipping from the Chicago River and pave it over to make the Loop accessible by car from three sides.

The answer everywhere, as Futurama suggested, seemed to be, More roads! More cars! At a 1940 ceremony to dedicate the nation's first "limited access" freeway, California's public works director proudly explained that freeways would not permit "string towns" or "ribbon cities" to develop as they had along the old-fashioned state highways, with their stoplights, roadside hot dog stands, motels, and gas stations. No one had yet seen exit ramp sprawl.

After World War II, the United States's revived prosperity permitted the full flowering of America's Auto Age. In Western Europe, by contrast, the car culture was still in its infancy. The Europeans, less affluent than the Americans even before the war, owned far fewer autos, and their postwar governments were unwilling to divert scarce funds to superhighways. They stood aside and watched as Americans leaped ahead, all but the poor now able to buy new or secondhand cars.

Auto registrations increased from 28 million in 1946 to 40 mil-

*By 1963, virtually all U.S. urban mass transit was operated at a loss. By 1967, 58 percent of all transit passengers were carried by publicly owned companies; by 1975, the figure was 90 percent.

lion by 1950, when there was one car on the road for every three households. Not surprisingly, the suburbs of New York recorded a 117 percent gain in population during the baby-boom era (1945-64). The population of downtown Detroit fell by nearly 20 percent, while that of its suburbs almost doubled.

Critics often described the renewed suburban migration that began during the 1950s as "white flight" from the Southern blacks who streamed into Northern and Midwestern cities and school systems during and after the war. (In 1910, 73 percent of the black population lived in rural areas; by 1960, 73 percent lived in cities.) But many whites probably left for the same reasons a new black middle class would follow them two decades later: Affluence gave them the means to trade urban crime and congestion for suburban amenities; cars and highways allowed them to commute to work.

The shift to the suburbs was speeded by the crowning achievement of the Auto Age, President Dwight D. Eisenhower's 1956 Interstate Highway Act. The proposed 41,000-mile, \$27 billion interstate system would become the world's largest public works program since the pyramids.* It would link all regions of the country, connect 42 state capitals, and occupy two million acres of land. (The Portland Cement Association calculated that the concrete alone would build six sidewalks to the moon.) Eisenhower hoped the new toll-free four- and six-lane superhighways would accomplish several goals: provide vital defense routes in case of war, reverse a post-Korean War economic downturn, and accommodate more passenger cars in peacetime, which to his mind meant "greater convenience . . . greater happiness, and greater standards of living."

First Doubts

In Washington, the measure was pushed by a formidable coalition: highway builders, steelmakers, state and local governments, organized labor, motorists' organizations, farm groups, the auto companies. There was little opposition. To finance the interstates, Congress earmarked taxes on gasoline, auto parts, and tires, as well as fees on trucks and other heavy vehicles, for a special Highway Trust Fund. Eisenhower raised the federal share of road construction costs from 50 to 90 percent. But Congress did not vote a penny in federal funds for interstate repairs until 1976.

The interstates, combined with new state toll roads and metropolitan "beltway" systems (the first was the Boston area's Route 128, completed in 1957), not only enabled drivers to go faster. They also accelerated social and economic change: People moved farther from the central cities; towns and businesses served by the new highways flourished, while those bypassed declined or failed to grow.

*The authorized mileage later increased to 42,500. Construction costs so far have totaled \$108 billion.

But even as the first miles of the interstates were being paved, many Americans were having their first serious doubts about the automobile. The initial anxieties were over safety. Ralph Nader targeted Detroit in his 1965 best seller, *Unsafe at Any Speed*. "For over half a century," he declared, "the automobile has brought death, injury, and the most inestimable sorrow and deprivation to millions of people." Noting, for example, that a Cadillac El Dorado at normal cruising speeds took the length of a football field to come to a full stop, he indicted Detroit for building dangerous cars. He also helped make pollution a national issue, publicizing earlier research by California biologist Arlie ("Dr. Smog") Haagen-Smit, which linked air pollution and its ill effects to auto emissions.

Rocky's Magic Show

During the late 1960s, a time of generalized dissatisfaction and cultural upheaval, intellectuals and activists often decried the car as a curse, rather than a blessing—a source of pollution, a symbol of materialistic capitalism, a threat to the environment. For the first time, Washington also acknowledged the car's drawbacks; Congress imposed stiff safety and pollution regulations for cars.*

Highways, too, suddenly began to look more pernicious. When Nader's book appeared, Lady Bird Johnson, wife of the 36th president, was lobbying for the antibillboard Highway Beautification Act of 1965, and local activists in many areas were trying to block proposed urban expressways. The new roads, many of them interstates, were cutting through black neighborhoods in city after city, displacing thousands of residents and destroying established communities. "White roads through black bedrooms," as critics called them, were cited as one factor in the riots that erupted in urban ghettos. Governor George Romney of Michigan, former head of American Motors, blamed downtown freeway construction for contributing to the unrest that provoked Detroit's bloody 1967 riot.

The highway builders soon found themselves in unexpected difficulties. In Ossining, New York, virtually all of the residents threatened with displacement by Governor Nelson Rockefeller's proposed Hudson River Expressway were black. On the first night of public hearings in 1968, the local National Association for the Advancement of Colored People handed out large, circus-like posters: "Welcome to Rocky's Magic Road Show... See Gov. Rockefeller make 1,000 BLACK PEOPLE DISAPPEAR." The expressway plan died.

The last hurrah was Westway, the 4.2 mile interstate that New York City officials proposed in 1970 for Manhattan's West Side. The estimated construction cost: \$300 million per mile. Local oppo-

*Emission controls (1970), safety bumpers (early 1970s), and structural requirements for roofs, frames, and other parts (mid-1970s) were imposed. In 1974 came the 55 m.p.h. speed limit.

nents—mostly whites—promptly made Westway a chronic sore point in local politics, meanwhile tying up the project in endless litigation on environmental issues. (In 1985, after its predicted cost had doubled, Westway was finally laid to rest when a federal court ruled that the project would take the lives of too many of the Hudson River's striped bass.)

Facing lawsuits by environmentalists and others, a dozen big cities, including Atlanta, Denver, and Philadelphia, scaled down urban freeway plans during the 1960s and '70s; Boston and San Francisco scrapped them altogether. In 1974, at President Nixon's behest, Congress even tapped the once-sacrosanct Highway Trust Fund to provide subsidies for urban mass transit.

Foes of the automobile voiced a certain I-told-you-so satisfaction during the oil crises of 1973 and 1979. (Others reacted angrily, as when a Cadillac owner crashed a gas line in Hollywood, California, waving a gun while he filled his tank.) It was for many Americans a shock to see how dependent they had become on the automobile. Not only *wouldn't* they give up their cars—they *couldn't*.

Indeed, the popularity of the suburbs, and after them the "exurbs" (the suburban fringe and beyond), continued apace—among both homeowners and businesses. President Jimmy Carter summoned Americans to respond to the energy crisis with "the moral



A uniquely American creation: the drive-in church. In 1972, the faithful gather for a sermon at the Reverend Robert Schuller's "22-acre shopping center for Jesus Christ" in Garden Grove, Calif.

equivalent of war." But commuters and business travelers simply bought more fuel-efficient cars and resigned themselves to paying more than 50 cents a gallon, versus 37 cents in 1970. (By early 1980, the price had reached an unprecedented \$1.60 a gallon.) While cities lost 4.6 percent of their populations from 1970 to 1977, the suburbs grew by 12 percent. Lured by cheaper land and lower taxes, more than 170 *Fortune* 500 companies moved their offices or factories out of the troubled cities.*

By the mid-1980s, the suburbs were no longer simply residential "bedroom communities" with backyards and two-car garages. Across the nation, these counties surrounding central cities had been turning into self-sufficient *ad hoc* urban complexes ("minicities" or "urban villages" in sociological jargon), linked by beltways (the new Main Streets), sustained by innumerable clusters of new office buildings and industrial parks (the new workplaces), and by some 20,000 shopping malls (the new downtowns). A resident of the emerging "doughnut metropolis" never needed to set foot in the central city. As the *Atlantic* recently noted, 27 million Americans commuted from one suburb to another in 1980; only half that number traveled from suburbs to downtown business districts. Today, the political pressure in many metropolitan areas is not for new roads into the cities, but for "outer" beltways and cross-suburb expressways to serve local workers, corporate employers, and the trucking industry.

A Nation Driven?

"The automobile," observes historian James A. Dunn, Jr., of Rutgers, "has done just about as much as it could do to shape U.S. urban and suburban environments." With 130 million cars, 40 million trucks and buses, and nearly 3.9 million miles of roads, the United States seems wedded to the car. The tremendous dispersion of a growing population and its changing economy could only have been accomplished with the car—and only by the car can it be sustained.

In Western Europe, governments continue to curb the auto's influence by levying heavy taxes on gasoline and vehicles, skimping (by U.S. standards) on highway construction, and channeling new housing development into densely populated areas served by subways, trains, trams, and buses. There are costs to this strategy, too. For example, European officials are reluctant to reveal the total subsidies for their nationalized railroads, but, according to a 1979 estimate by the U.S. Department of Transportation, as much as 60 percent of their operating costs (as in Great Britain) are subsidized.

*Another development, as a 1978 Congressional Research Service report noted, was a "buckshot" migration pattern to rural areas entirely dependent on automobiles and highways, especially in the West and Southwest. The nation's rural population increased by 21 percent during the 1970s. Towns of 10-25,000 inhabitants grew 10 percent, due partly to an influx of retirees.

Amtrak, a perennial target of federal budget cutters, receives some \$600 million annually from Washington, roughly 40 percent of the passenger railroad's budget.

But many of the costs of America's dependence on the car are often shrugged off: traffic jams, accidents, air pollution, long-distance commuting, the "Los Angeles-ization" of suburbia. Competition from shopping malls has sapped the vitality of Main Streets everywhere. Ridership on public transportation—buses, subways, trains—continues to decline. Seven states (New Hampshire, Maine, Wyoming, Oklahoma, South Dakota, Hawaii, and Alaska) are virtually without passenger train service; business travelers must rely on airlines and rented cars; thousands of individual communities are linked to the rest of the nation only by television, telephone, and ribbons of asphalt and concrete. The annual cost of extending and maintaining the nation's aging roads and highways reached some \$46.5 billion in 1986, up \$14.7 billion since 1980. And every new highway eventually seems to generate new traffic congestion.

The ultimate "hidden cost" may be America's continuing dependence on massive imports of petroleum, and its underlying vulnerability to the whims of foreign oil ministers. Barring a breakthrough in the technology of the internal-combustion engine, the car culture promises to cost a great deal more at some time in the future. Yet Americans are unlikely to shrink at the price. Practical necessity aside, as Frederick Lewis Allen wrote in 1952, any American "who has been humbled by poverty, or by his insignificance in the business order, or by his racial status, or by any other circumstance that might demean him in his own eyes, gains a sense of authority when he slides behind the wheel of an automobile and it leaps forward at his bidding, ready to take him wherever he may personally please."

The car is no longer so uncomplicated a symbol of freedom. Yet the symbol has not lost its appeal. A nostalgic mood is much in evidence, as *Life's* March 1986 pictorial essay, "Car Love: Fifty Years of Cars," or novels like *The Last Convertible* (1978), attest. These backward glances also tell us something about the future: Although cars still represent freedoms beloved by Americans, they no longer promise to create *new* ways of working or living. Once the dream of a better future, the automobile has in some ways become a throwback to our imaginary past. But it is very much with us.

BACKGROUND BOOKS

THE AUTOMOBILE IN AMERICA

"Business is never as healthy as when, like a chicken, it must do a certain amount of scratching for what it gets," declared Henry Ford in **My Life and Work**, with Samuel Crowther (Doubleday, 1922; Arno, 1973). "Money chasing," he added, "is not business."

Such down-to-earth pronouncements, published over the years in newspapers and magazines, and aired on radio, made Ford an American folk hero.

As a result of the industry's stunning growth (General Motors passed the \$1 billion sales mark in 1926), Detroit and its entrepreneurs during the Jazz Age were to manufacturing what New York City, with its Yankees, Dodgers, and Giants, was to baseball.

Americans admired the automakers, and they loved their cars. In **Americans on the Road: From Autocamp to Motel, Nineteen Ten to Nineteen Forty-Five** (MIT, 1979), Warren J. Belasco quotes an early enthusiast: "He who runs by rail but makes an acquaintance; he who runs by road makes a friend—or sometimes an enemy; he at least gets intimate."

Despite his dark side (he dabbled in anti-Semitism), Ford, the visionary tinkerer who was wont to pick up a hitchhiker and give him a job, remains the most compelling automaker of them all. "It was useless to try to understand Henry Ford," wrote Charles E. ("Cast Iron Charlie") Sorensen in **My Forty Years with Ford** (Collier, 1962). "One had to *sense* him."

Like virtually all of Ford's colleagues and biographers, Sorensen did not recall him fondly. The inventor was autocratic, capricious, sometimes cruel, often vain. "After the name of Henry Ford became a household word," Sorensen recollected, "men in Ford Motor Company who might temporarily get more publicity than he did aroused his jealousy. One

by one they were purged."

Sorensen, ever dutiful, carried out many of the purges himself. For dirtier jobs—strikebreaking, intelligence-gathering, and all-around "fixing"—Ford employed the infamous Harry Bennett, notes Robert Lacey in his lively saga, **Ford: The Men and the Machine** (Little, Brown, 1986). Bennett, a gregarious, pistol-packing ex-sailor, directed Ford's so-called Service Department, a strong-arm force of 3,000 men.

The rise of William C. Durant, the soft-spoken salesman from Flint, Michigan, who parlayed a modest carriage business into General Motors, is chronicled by historian Bernard A. Weisberger in **The Dream Maker: William C. Durant, Founder of General Motors** (Little, Brown, 1979).

Ford and Durant were inspired men, but neither possessed much managerial talent. As their backyard creations grew into vast corporations, the early entrepreneurs were replaced by a new generation of "team players."

At GM, Durant was succeeded by Alfred P. Sloan, Jr., who was to become the ultimate "organization man."

Sloan realized, as he wrote in **Adventures of a White-Collar Man**, with Boyden Sparkes (Books for Libraries, 1941; Doubleday, 1970), that "in an institution as big as General Motors ... any plan that involved too great a concentration of problems upon a limited number of executives would limit initiative, would involve delay, would increase expense, and would reduce efficiency." Sloan's solution: divide the corporation into dozens of subunits, each headed by a single executive. His greatest legacy may be the corporate organization chart.

Even so, Detroit has continued to produce colorful executives. Best known today is Chrysler's Lee Iacocca, whose rags-to-riches yarn, **Iacocca: An Auto-**

biography, with William Novak (Bantam, 1984, cloth; 1986, paper), became a phenomenal best seller.

J. Patrick Wright's **On a Clear Day You Can See General Motors** (Wright, 1979, cloth; Avon, 1980, paper) profiles John Z. DeLorean, the brilliant ex-GM executive who founded his own car company in 1975 and later ran afoul of the law. Scathingly critical of GM's bureaucracy, DeLorean argued that the company had abandoned Alfred P. Sloan's ideal of decentralization. All power flowed from the isolated 14th floor of GM's Detroit headquarters: "For the most part, a top executive by the time he works his way through the system is a carbon copy of his predecessors. If the men in place cannot do the job, there is no reason to believe that their handpicked successors can."

To executives on the 14th floor, the chief ogre was Walter P. Reuther, the tough-minded head of the United Auto Workers (UAW) between 1946 and 1970. An anti-Communist Social Democrat, he rarely missed a chance to rain scorn on "the bosses." Yet, he proved one of organized labor's most farsighted leaders, urging the Big Three to build small cars and cut prices during the late 1940s, and accepting the industry's need to introduce new technology on the assembly line. He is the central character in his brother Victor's memoir, **The Brothers Reuther and the Story of the UAW** (Houghton, 1976).

The Company and the Union (Vintage, 1974) is journalist William Serrin's engaging history of the UAW's costly strike against GM in 1970. The two sides could have averted the walkout, says Serrin, but the UAW's leadership needed a strike to prove its zeal to the rank and file. Management and labor,

Serrin argues, "are victims of the relationship they have fashioned."

Distrust has not ended in Detroit. In **Car Wars: The Untold Story** (Dutton, 1984), one of the best recent books on Detroit's travails, historian Robert Sobel cites a 1983 survey of employee attitudes in several industrialized nations. More than their counterparts overseas (including those in Japan), U.S. factory hands professed a commitment to the work ethic. But only nine percent believed that their hard work would be rewarded with higher pay; in Japan, 93 percent of the employees did.

However, Sobel and most other scholars are reasonably hopeful about Detroit's prospects. Assessing the social and economic impact of **The Car Culture** (MIT, 1975), historian James J. Flink of the University of California, Irvine, disagrees. The wasteful "patterns of growth and development" spawned by the automobile and the cost of keeping gas tanks filled will doom "the age of automobility."

For another view of Detroit's future, see **The Reckoning** (Morrow, 1986), an artful collage that contrasts the industry and its leaders in the United States with Japan, by David Halberstam, the author of *The Best and the Brightest*. "In just 25 years," financier Felix Rohatyn told him, "we have gone from the American century to the American crisis." But one senior Chrysler executive added that the Japanese cost advantage could be eliminated if U.S. companies could "do a car right the first time."

Tokyo is worried, too. Already, the Japanese are looking over their shoulders—not at Detroit, but at such rising South Korean carmakers as Hyundai and Samsung. To the South Koreans, the Japanese are "the lazy Asians."