Up from the Ashes

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Unconcerned over their loss of technological leadership, American automobile manufacturers remained convinced well into the 1960s of their invulnerability to foreign competitors in the world as well as the U.S. market. In a classic reaffirmation of the American auto maker's long-standing advocacy of free trade, Henry Ford II on April 5, 1961, gave a speech in which he argued that the automobile industry, and industry in general, would stagnate without the fullest, freest international competition. He advocated "a strong and growing flow of trade, of capital, of technology throughout the free world." [1]

Tariff barriers on automobiles have tumbled from 1950 to the present. In 1950 tariffs on passenger cars ranged from 10 percent in the United States to 40 percent in Japan, with rates of 33⅓ percent in the U.K. and 35 percent in France, Germany, and Italy. A 1964 pact provided for free trade between the U.S. and Canada in motor vehicles and automotive equipment. The establishment of the European Economic Community (EEC) eliminated tariff barriers between the major auto-producing countries of Western Europe, except Sweden, after 1968 (1978 in the case of the U.K.) and imposed a common external tariff of 17.6 percent. By 1973 tariffs on passenger cars had dropped to 3 percent in the U.S., 6.4 percent in Japan, and 10.9 percent in the EEC countries; and by 1983 they had fallen slightly further to 2.8 percent in the U.S., 0 in Japan, and 10.5 percent in the EEC countries. However, substantial barriers to truly free trade in motor vehicles continue to exist in the form of differential local methods for taxing motor vehicles, local equipment requirements, and import quotas. The existing import quotas in the main have been imposed to prevent the further penetration of markets in the European auto-producing countries by the Japanese.

Big Three Expansion Abroad

In the decades following World War II, both Ford and GM greatly expanded their worldwide, and especially their European, operations. GM's overseas policy remained the acquisition abroad of wholly owned subsidiaries. Ford reverted to this policy in the immediate postwar period, buying out the shareholders in its European affiliates. By 1961 Ford-U.S. owned 100 percent of Ford-England and 99 or 100 percent of its other overseas subsidiaries. An International Division of the Ford Motor Company was formed in 1946 to coordinate Ford operations worldwide. Then in 1967 Ford of Europe, Incorporated, was formed, with headquarters in Brentwood, England, to integrate European development, production, and marketing. GM operations worldwide were coordinated through its Overseas Policy Group, and GM did not integrate its European operations at Opel in Germany and Vauxhall in the U.K. until 1979.

The Ford Motor Company remains the foremost multinational automobile producer in the world. Some 38 percent of total Ford sales in 1979 came from production facilities outside North America, with 25 percent coming from production in EEC countries. In comparison, only 19 percent of GM's production in 1979 came from its plants outside North America, with 12 percent coming from EEC countries. Within the European automobile industry, Ford and GM respectively held fifth and sixth place in 1979 among the ten companies with annual production of more than 100,000 units. And Ford's European operations were its most profitable. While Ford posted losses of EUA (European Unit of Account) 145 million and EUA 1.548 billion on its 1979 and 1980 U.S. operations, Ford-Europe reported profits of EUA 889 million and EUA 248 million. GM's European operations have been far less profitable. While GM sales worldwide exceeded Ford sales by 52 percent in 1979, they amounted to only 76 percent of Ford sales in the EEC countries. Like most other European automobile manufacturers, and in marked contrast to their American operations, Ford-Europe and GM-Europe both concentrated in the postwar decades on producing small, fuel-efficient cars.

Chrysler made a belated, ill-starred attempt to develop as a multinational company by mounting in the late 1950s and the 1960s an ambitious overseas expansion program. It began by importing Simca cars from France in 1957 and purchasing a controlling interest in Simca in 1958. By 1973 Chrysler owned 100 percent of Simca, Barrieros in Spain, and Rootes Motors, producer of the Hillman and the Humber, in the U.K. This gave Chrysler 7.3 percent of Western European output. Subsidiaries

were established in Australia and Japan. Assembly facilities were acquired in Argentina, Colombia, and Venezuela.

Simca and Rootes were both in financial trouble and in poor competitive positions in their respective national industries. The major problem was that both were too small vis-à-vis their competitors and could not achieve sufficient economies of scale. That was why they could be bought cheap. So Chrysler made the classic blunder of adding their weaknesses to its own. Chrysler-U.K. was losing so much money by 1975 that the parent company, in deep financial trouble itself, threatened to begin liquidation unless the British government agreed to a bailout. This first Chrysler bailout remains largely unknown in the United States. To save an estimated 25,000 jobs at Chrysler-U.K. and 25,000 more in related U.K. industries, the British government shared Chrysler losses of £72.5 million and provided or guaranteed the firm an additional £90 million in loans, on condition that Chrysler-U.K. be more closely integrated with Chrysler-France.

Despite the British bailout, and the claim of Chrysler-U.K. in 1976 that its financial position was viable, Chrysler-U.S. announced in August 1978 the sale of its European subsidiaries to Peugeot-Citroën (PSA), as part of a general retrenchment program. Peugeot-Citroën took over some £400 million of accumulated debt and paid Chrysler £230 million and 15.5 percent of Peugeot-Citroën stock. Chrysler-U.K. became Talbot, Limited. Chrysler sold its Latin American facilities the following year. Then in 1980 the Chrysler subsidiaries in Australia and Japan were sold to Mitsubishi for 15 percent of Mitsubishi stock and retention of a 35-percent interest in the Australian subsidiary. Thus ended Chrysler's brief history as a multinational. At present Chrysler has operations only in North America.

Ford and GM continue to be the only automobile manufacturers with operations on all continents. In contrast, the Japanese industry has been the least multinational in its operations and remains committed to carrying out all except token manufacturing in the home country. Consolidation of the automobile industry at the international level through mergers, the establishment of overseas subsidiaries, joint manufacturing ventures, and outsourcing of components has progressed so far that the term "multinational" no longer seems an adequate description of organizational reality. As John Rae remarks, "In recent years there have been marked indications that the automobile industry has been moving beyond the conventional multinational form into something that is as yet vaguely defined but can best be described as supranational."[2]

The Postwar Western European Industry

The increased activity of U.S.-based multinationals in Europe was overshadowed by the resurgence of the European automobile industry. German output increased from 306,064 units in 1950 to over 2.055 million units in 1960, as GM-owned Opel fell from first to third place in the German industry. During the same decade French output increased from 357,552 units to some 1.37 million units, Italian output from 127,847 units to 644,633 units. Although the British industry more than doubled its output from 783,672 units in 1950 to 1.81 million units in 1960, its relative position was declining. Germany surpassed the U.K. to become the second-largest automobile producer in the world in 1956. By 1970 the Japanese as well as the French had surpassed the British in output. By 1980 so had the Italians and the U.S.S.R.

The postwar European automobile industry has remained heavily an export industry, with the pattern of export trade being mainly within Europe. Considered as percentages of domestic production, from 1960 to 1982 for Germany, France, the U.K., and Italy, passenger car exports ranged from 33.2 percent in Italy to 47.6 percent in Germany in 1960, from 33.7 percent in Italy to 58.3 percent in Germany in 1982. Commercial vehicle exports ranged from 12.3 percent of domestic production in Italy to 49.3 percent in Germany in 1960, from 33.8 percent in the U.K. to 67.6 percent in Germany in 1982. These figures contrast sharply with exports accounting for a mere 2.2 percent in 1960 and 7 percent in 1982 of U.S. passenger car production, and only 18 percent in 1960 and 6.7 percent in 1982 of commercial vehicle production. The exports of EEC auto-producing countries have been increasingly destined for other EEC countries as the Japanese have penetrated the American and other external markets. By 1980 Japanese penetration left only France and Germany among the EEC countries with a favorable balance of automotive trade.

The Western European automobile industry was already a highly concentrated one in 1960: 98 percent of French production was accounted for by Renault, Citroën, Peugeot, and Simca; 96 percent of British production by the British Motor Company (BMC), Ford-England, Standard, Rootes, and Vauxhall; 87 percent of German production by Volkswagen, Opel, Mercedes-Benz, and Ford-Werke; and 85 percent of Italian production by Fiat and Alfa-Romeo. By 1979 the automobile industry in the EEC countries could be described as a "normal oligopoly." Peugeot-Citroën (PSA), the largest firm in 1979, accounted for 19 percent of the total EEC output of passenger cars. The four largest firms—PSA, Volkswagen, Renault, and Fiat—accounted for 61 percent. The ten firms

with annual production of more than 100,000 units—the aforementioned plus Ford-Europe, GM-Europe, British Leyland (BL), Mercedes-Benz, BMW (Bayerische Motoren Werke), and Alfa-Romeo—accounted for 99 percent of the total output, the remaining one percent of the market being shared by fourteen small independent producers.

Outside the EEC in Western Europe, Volvo and Saab-Scania in Sweden are the only important independent producers and together account for only about one percent of world production. Spain accounts for a little more than 3 percent. Through the Instituto Nacional de Industria (INI) the Spanish government holds a majority interest in the Sociedad de Automoviles de Turismo (SEAT), the largest producer, and controls two small commercial vehicle producers, ENASA and AISA. Ford has established a major subsidiary in Spain. GM has only a minuscule operation. The lion's share of Spanish production is accounted for by subsidiaries of EEC producers—primarily Fiat (which has invested in SEAT), Fasa-Renault, Talbot-Spain, and Citroën-Spain. Like GM, Mercedes-Benz and British Leyland have only token Spanish operations.

The Western European automobile producers are far less multinational enterprises than are Ford and GM. Among the Western European producers only Volkswagen, Fiat, and Volvo produce a significant proportion of their total output outside the parent country. The proportions for 1982 were Volkswagen and Fiat 28 percent and Volvo 30 percent. The bulk of manufacturing outside the parent country by EEC producers is accounted for by operations in Brazil, Spain, Mexico, and Argentina. With the exception that state-owned Renault had a controlling interest in American Motors until bought out by Chrysler in 1987, Volkswagen is the only European producer to manufacture cars in the United States.

The high degree of nationalization, on the one hand, and of family control, on the other, are striking features of the Western European industry. Renault, British Leyland, and Alfa-Romeo are entirely state-owned enterprises. Volkswagen is owned 20 percent by the federal government of West Germany and 20 percent by the state of Lower Saxony. The Peugeot family owns 49.5 percent of PSA stock. The Agnelli family holds a controlling interest of 29 percent of Fiat stock.

European governments also commonly intervene in the market to restructure competitive conditions when this appears to be in their national self-interest. In addition to nationalizing Renault after World War II, for example, the French government in 1974 bailed out Michelin's automobile holdings (Citroën, Panhard et Levassor, and Berliet), then in 1976 played a leading role in the acquisition of Berliet by Renault and the takeover of Citroën by Peugeot. The Japanese penetration of European markets has been thwarted by import quotas of 2,300 Japanese cars annu-

ally in Italy, 3 percent of new registrations in France, and 11 percent of new registrations in Great Britain. Furthermore, primarily because of great discrepancies in the rates of the value-added-tax and the imposition of special national surcharges, the EEC is still a far cry from being a "common market." These trade barriers meant that in 1980 the pretax sticker prices of Common Market cars varied up to 80 percent among EEC countries. Thus, neither in its pattern of ownership nor in its practice in the market does the Western European automobile industry conform to American conceptions of how free enterprise should operate in a free market.

The MIT Report points out that whereas the North American industry by the early 1950s concentrated on producing in the largest possible volume a standardized product, the all-purpose road cruiser, "the Europeans fashioned domestically produced products for very different national market conditions, which were due to the wide variations in consumer incomes, vehicle taxes, and geography among the European countries.... In addition, the numerous European manufacturers were pursuing many different technical solutions to the differing design requirements." Consequently, technological innovation flourished in the European automobile industry while it stagnated in the American industry. The Europeans offered a wide variety of engines, including diesels; rear-mounted/rear-wheel-drive and front-mounted/front-wheel-drive, cars; and numerous suspension systems and body types. "Once the tariff walls in Europe began to come down in the late 1950s and early 1960s" the MIT Report continues, "the diversity of the European automobile industry became its greatest strength. When each manufacturer could sell its specialized products in all the markets of Europe, adequate scale to capture full production economies was suddenly available.... Real prices to consumers fell, demand surged upward, and the European industry advanced to the forefront of world motor vehicle manufacturing." [3]

Thus, the Europeans led technologically in all segments of the world automobile market, as exemplified by the Mercedes-Benz and the Jaguar at one extreme and the Volkswagen at the other. Nevertheless, as Jean-Jacques Chanaron points out, it was the small, fuel-efficient European "people's cars" that became "the spearhead of the expansion strategies and the primary reason for the growth and leadership of some of the major European manufacturers. These included Volkswagen (Beetle), Renault (4CV), Citroën (2CV), Fiat (500 and 600), and the British Motor Corporation (Mini)." [4]

With the diffusion of such "people's cars," automobile cultures rapidly developed in the advanced capitalist nations of Western Europe and in Japan. The proportion of world registrations accounted for by the United

States declined dramatically from 76 percent of the total passenger cars and 51 percent of the trucks and buses in 1950 to only 38 percent of each by 1980, and continues to decline. In 1980 the United States continued to lead in the ratio of motor vehicles to population, with one motor vehicle for every 1.4 persons, followed closely, as in 1927, by Canada (1:1.8), New Zealand (1:1.8), and Australia (1:1.9). But the gap between these early leaders in the development of automobile cultures and the advanced capitalist nations of Europe and Japan had almost closed. Among the Western European capitalist nations the ratios were 1:2.4 in France, the Federal Republic of Germany, and Switzerland; 1:2.7 in Sweden; 1:2.8 in Belgium; 1:2.9 in Italy and Norway; 1:3 in Austria and the Netherlands; 1:3.1 in Denmark; 1:3.2 in the United Kingdom; 1:3.4 in Finland; and 1:4.1 in Ireland and Spain. Greece and Portugal were anomalies, with ratios of 1:7.3 and 1:8.2. Although the Japanese automobile culture began to develop only in the early 1960s, by 1980 Japan had a ratio of one motor vehicle for every three persons.

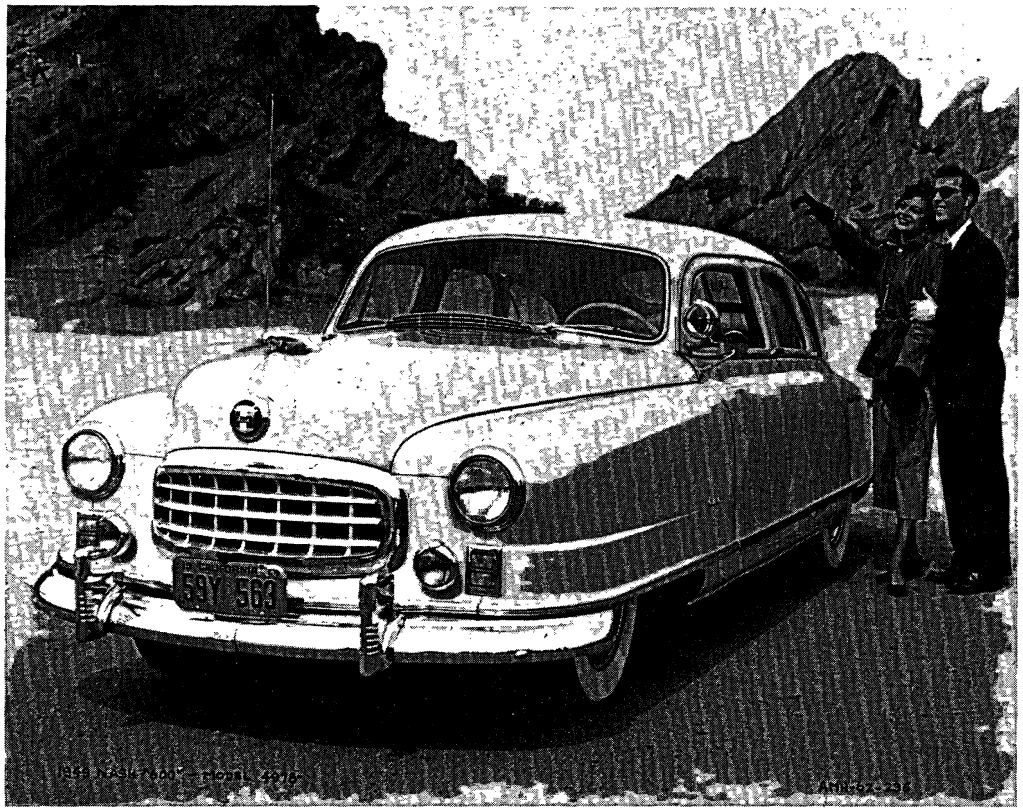
Will There Always Be an England?

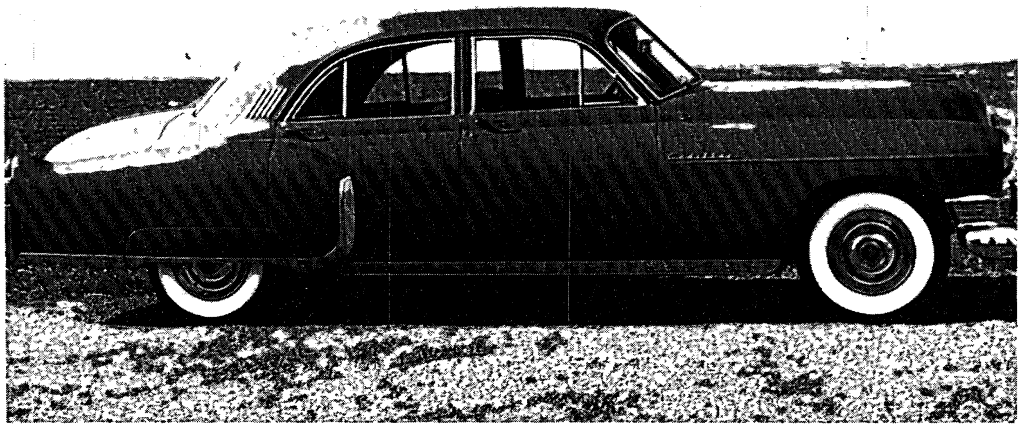
The United Kingdom appeared to have the best chance to develop a European automobile culture at the end of the war. At the beginning of postwar expansion the British industry ranked second after the American in world motor vehicle production. Britain's market position declined progressively, however, in the 1960s and deteriorated rapidly after 1975. By 1982 the U.K. had dropped to seventh place in world motor vehicle production, behind Italy, the U.S.S.R., France, West Germany, the United States, and Japan. In commercial vehicle production the U.K. ranked sixth, after the U.S.S.R.; in passenger car production, eighth, after Spain, as well as the U.S.S.R. and Italy. State-controlled Lada in the U.S.S.R. alone produced some 800,000 passenger cars in 1982, versus 405,000 produced by nationalized British Leyland. Return on capital from 1967 to 1971 for the British automobile industry was only 3.5 percent, compared with 12.4 percent for the West German industry.

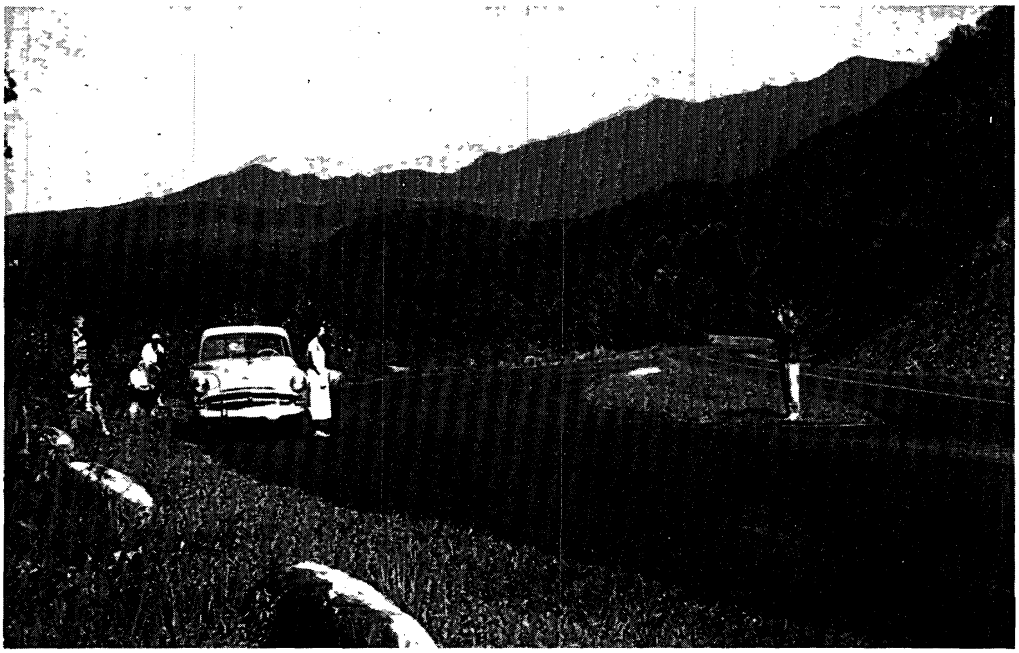
The British industry's historic problems of poor labor productivity and insufficient rationalization were exacerbated after the war by excessive, unwise, vacillating government regulation. With Continental automobile plants in ashes and the U.S. industry unable to fill domestic—much less world—demand, the Labour government attempted to use England's automobile industry as a "leading sector" in an export drive intended to reduce balance-of-payments difficulties and to relieve pressure on the pound. The Society of Motor Manufacturers and Traders (SMMT)

1949 Ford Model B-A. The revitalization of the Ford Motor Company under Henry Ford II was evidenced by the 100-horsepower 1949 Model B-A, the first new postwar Ford car. Ford surpassed Chrysler to regain second place in the industry as sales doubled with introduction of the Model B-A. Its "envelope body" eliminated conventional fenders as well as running boards to set a styling trend still in evidence. Its independent, coil-spring Hydra Coil front suspension initiated the marshmallow ride and poor handling that characterized American-made cars until the 1980s. (Courtesy Henry Ford Museum and Greenfield Village)

1949 Nash Custom Line Ambassador Series 60. Nash cars after 1941 featured unitary body and chassis construction, which gave them a greater rigidity-to-weight ratio and hence made them safer than competing Big Three models. The 1949 Airflyte series, the first totally redesigned postwar Nash car line, looked like inverted bathtubs but had significantly lower drag coefficients, and thus better fuel economy, than the Big Three models. The Custom Line Ambassador shown here had a 121-inch wheelbase and a six-cylinder, 112-horsepower engine. Despite the functional utility of Nash cars, sales declined as the postwar seller's market evaporated. In 1954 Nash merged with Hudson to form American Motors, the only American manufacturer to emphasize the small car in the 1950s. (Courtesy American Motors)





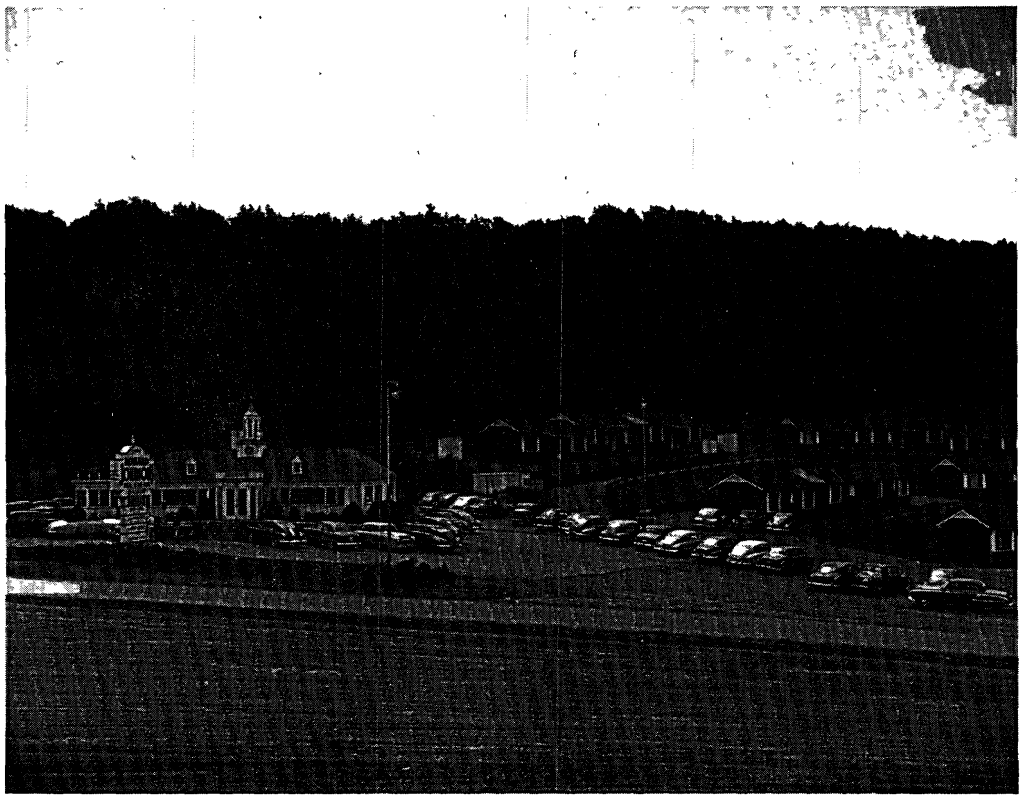


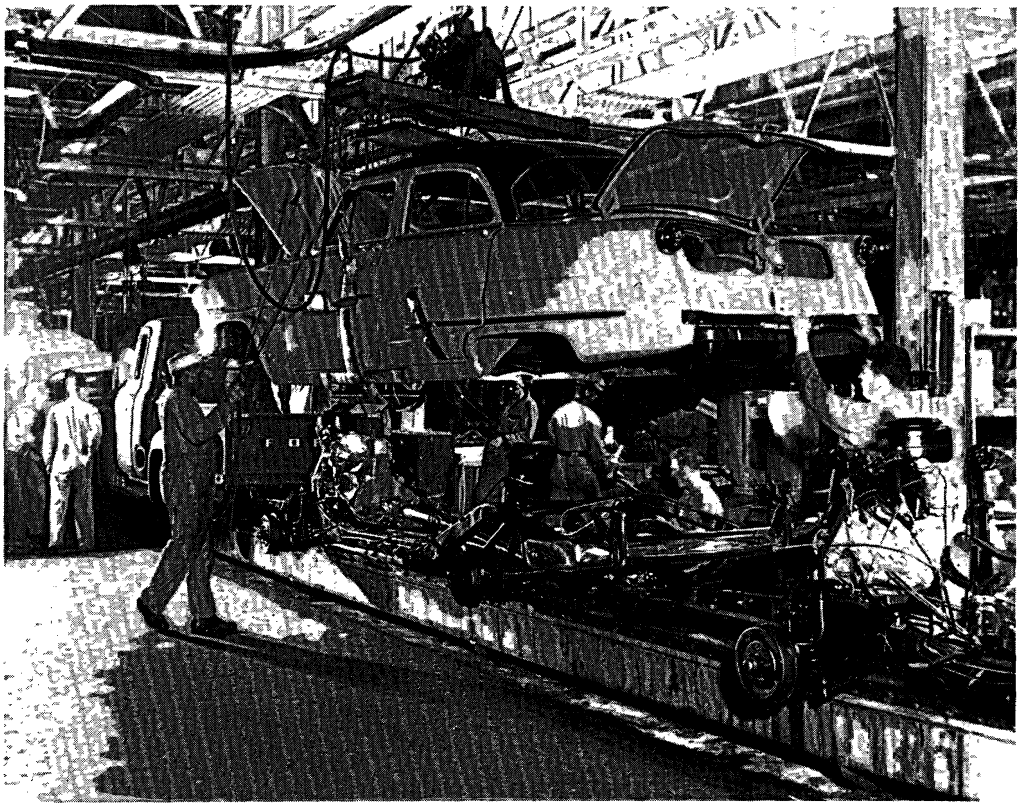
1949 Cadillac Fleetwood 60 Special. The 1949 Cadillac introduced the first postwar GM styling changes and featured nonfunctional tail fins inspired by the Lockheed P-38 fighter plane. This 133-inch-wheelbase Fleetwood 60 Special additionally featured larger doors, hydraulic window lifts, and nonfunctional chrome slashes on its rear roof pillar. It was powered by the so-called Kettering engine, the major new postwar engine development, announced in a 1947 technical paper. This V-8, overhead-valve engine operating at a 7:51 compression ratio with high-octane gas gave the 1949 Cadillac 160 horsepower on 331 cubic inches of displacement. Nothing about the engine was revolutionary. Its historic importance is that it engendered a postwar horsepower race that lasted into the mid-1970s. (Courtesy General Motors)

Great Smokies family snapshot, 1951. With general prosperity and rising working-class incomes and leisure, tourism became central to the American economy in the post–World War II period. (Courtesy Smithsonian Institution and National Archives)

The first Holiday Inn Hotel Courts, Memphis, Tennessee, 1952. Struck by the lack of comfortable, low-priced accommodations on a 1951 family vacation trip, Kemmons Wilson joined forces with prefabricated-home builder Wallace E. Johnson to pioneer the motel chain. They franchised their Holiday Inn trade name, logo, national advertising, and national referral system to local investors who agreed to erect and maintain motels according to Holiday Inn standards of design and service. Hotel corporations owning their own properties followed them into the motel business in the mid-1950s. (Courtesy Holiday Inns, Inc.)

Howard Johnson's restaurant and adjacent Skyline Motor Court, Waynesboro, Virginia, 1951. In the 1930s Howard Johnson perfected the concept of the family roadside restaurant chain. His easily identifiable restaurants offered both full-meal service and fast-food counters with standardized menus and attractive atmospheres. Following the lead of Holiday Inns, in 1953 Johnson began franchising the motels that had sprung up adjacent to his restaurants to capitalize on the visual association and proximity. After passage of the 1956 Interstate Highway Act, the logos of national motel-restaurant chains became a familiar greeting to tourists at freeway interchanges across the United States. (Courtesy National Archives)

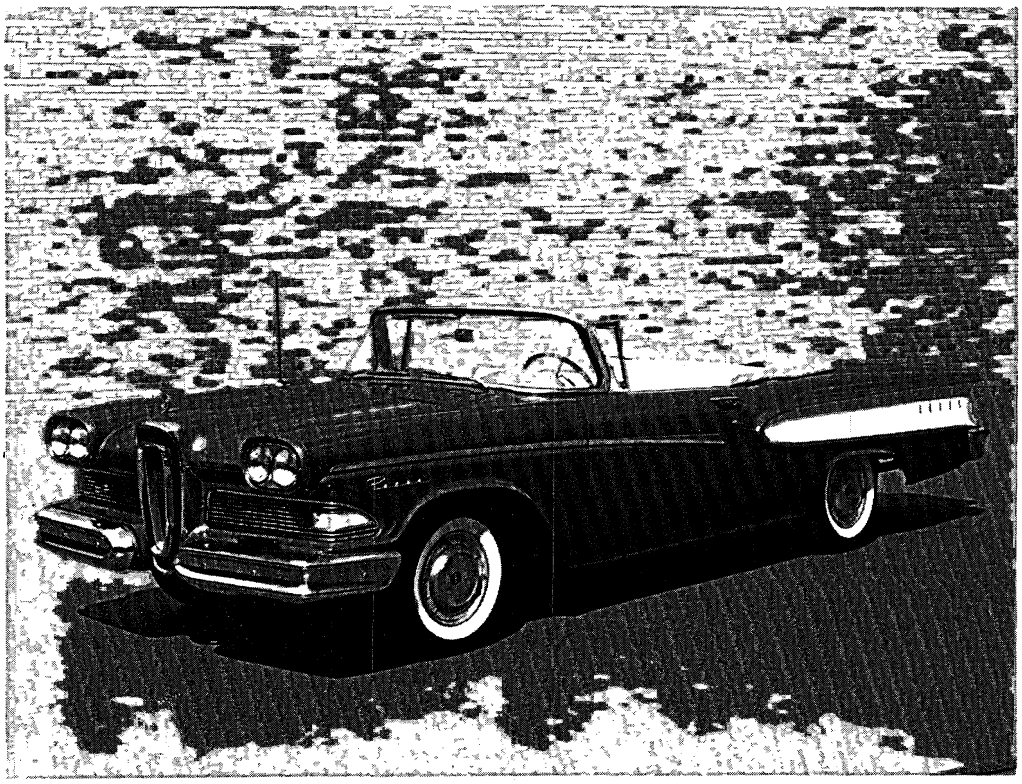


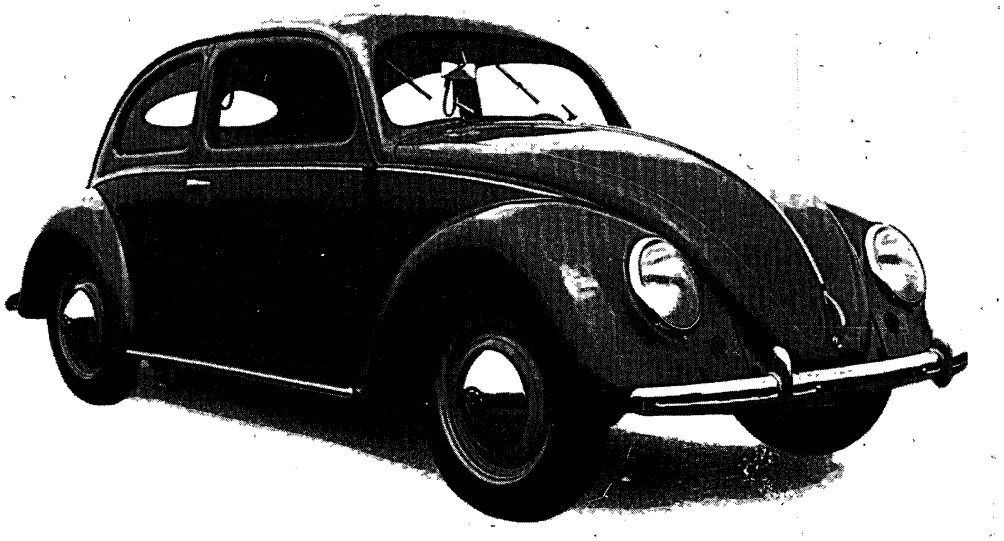


1953-model Ford cars and pickup trucks being assembled on the same line at the Ford River Rouge plant. While cars became increasingly complex and varied within model runs as Fordism was intensified by Sloanism, assembly-line technology remained essentially unchanged at the River Rouge from production of the Model A. Because specialized automatic machinery could only be used profitably for the manufacture of mechanical components that remained relatively unchanged, the need for large amounts of dehumanizing semiskilled labor had grown and the pace of work in the body plant and in final assembly had intensified since the early 1930s. (Courtesy Ford Motor Company)

Opposite, bottom: 1958 Edsel Pacer convertible. After nine years of planning and one of the biggest promotion campaigns in history, the Ford Motor Company introduced the Edsel as "entirely new to the industry" on September 4, 1957. The announced first-year sales goal of 200,000 units evaporated as consumer tastes shifted to smaller cars in the 1958 recession, and only 63,000 Edsels were sold in the 1958 model year. The chrome- and gadget-bedecked Edsel featured a distinctive horse-collar grille and a push-button automatic transmission control centered in the steering wheel hub. The car was withdrawn from production in 1960, and the name Edsel became a synonym for "loser." The model shown was a double loser, for the popularity of convertibles waned as air conditioning came to be considered essential equipment on standard-size cars in the 1960s. (Courtesy Ford Motor Company)

1957 Chrysler New Yorker. After decades of stodgy styling, Chrysler attempted to beat GM at its own game with the "Forward Look" of the 1957 Chrysler models. This 4,330-pound, 126-inch-wheelbase New Yorker had the largest engine available in a 1957 production car: with a 9.25:1 compression ratio, the New Yorker Series V-8 overhead-valve engine developed 325 horsepower at 4,600 rpm on 392 cubic inches of displacement. Safety hazards of the New Yorker's styling included the pillarless hardtop, the wraparound windshield, and excessive rear overhang resulting from exaggerated nonfunctional tail fins. The car's only advanced technical feature was torsion-bar suspension, which had been introduced in 1938 in Ferdinand Porsche's Volkswagen prototype. (Courtesy Chrysler Historical Collection)

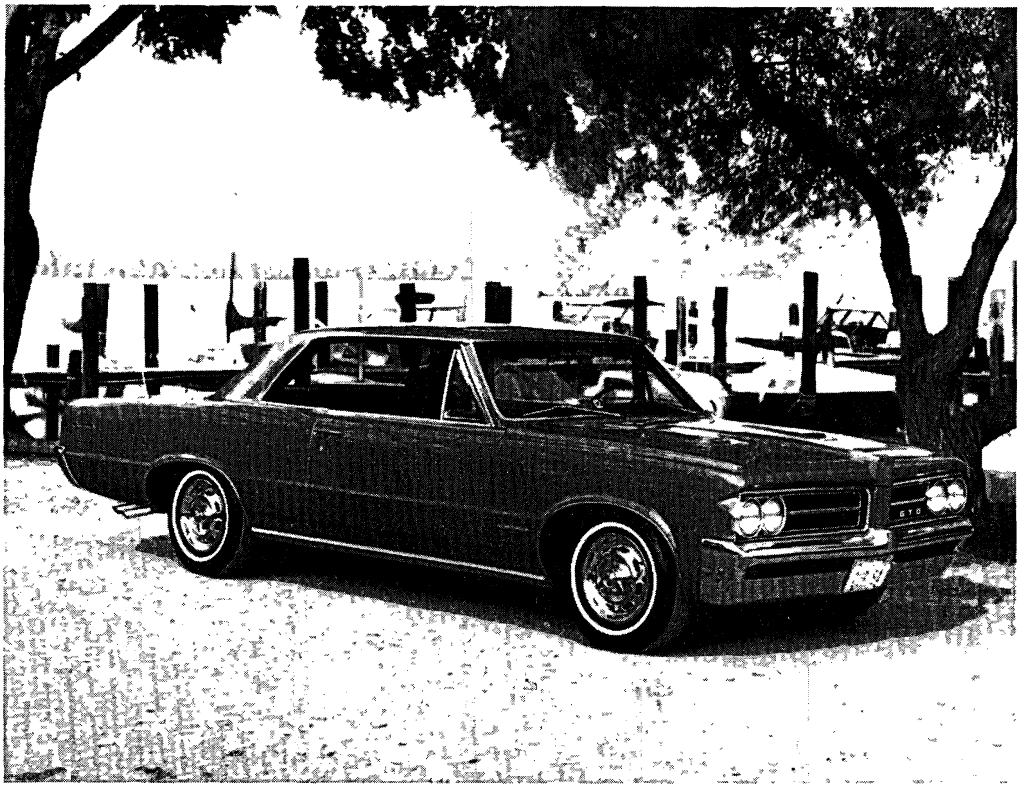


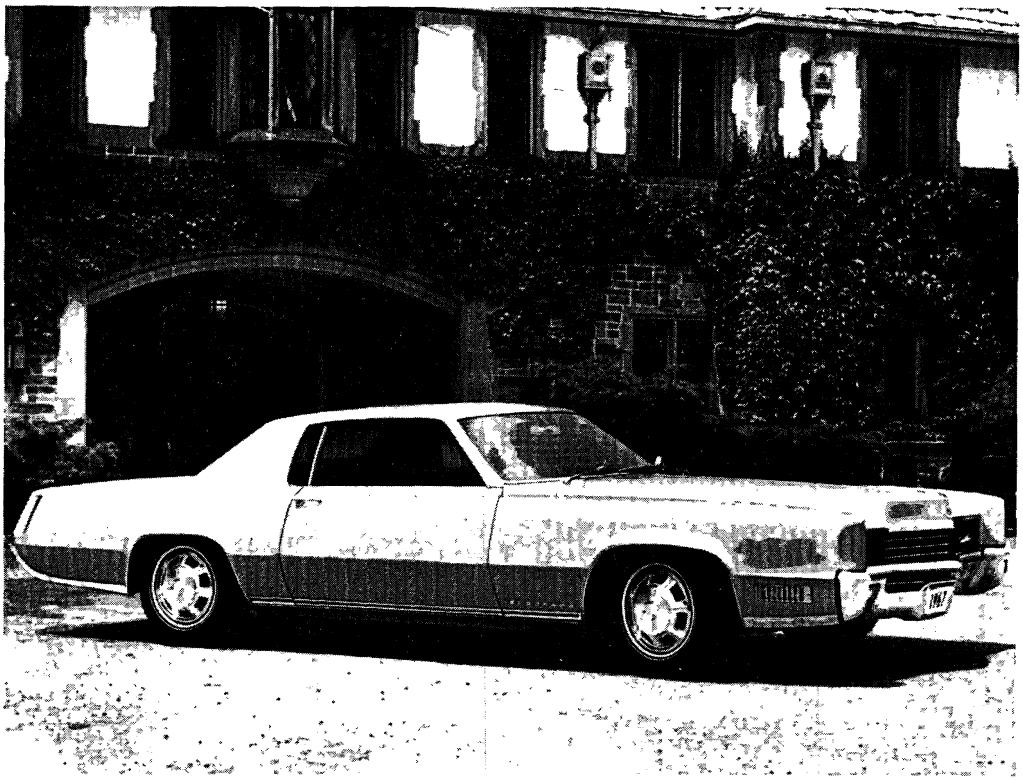


1949 Volkswagen Export Model. The 1938 Volkswagen prototype was a four-cylinder, 25-horsepower, closed-body car capable of carrying four persons in comfort at a cruising speed of 60 mph and fuel consumption of 33 mpg. Several military versions saw service during World War II, and civilian production began at the war's end. With the introduction of the improved Export Model in 1949, Beetles began to be exported to the United Kingdom, British Commonwealth countries, and the United States. Although the basic Beetle design was retained, some 2,000 mechanical and stylistic improvements had been incorporated by the mid-1960s, and horsepower was progressively raised to as high as 60 bhp in the 1971 Super Beetle. On February 17, 1972, the Beetle surpassed the Model T to become the best-selling car of all time. (Courtesy Volkswagen of America, Inc.)

Opposite, bottom: 1965 Ford Mustang hardtop. Capitalizing on the youth market for small, sporty cars that had been made evident by the popularity of the Corvair Monza Club Coupe, in April 1964 Ford introduced the first "pony car," the 1965 Mustang. The 108-inch-wheelbase Mustang used the Falcon chassis and many Falcon components. Its base price was only $2,368, but buyers ordered the car loaded with an average $1,000 worth of options. Engines up to a 289-cubic-inch, 271-horsepower V-8 were available. During its first year on the market the Mustang set a new world sales record of over 418,000 units. But Mustang sales plummeted to only 150,000 units in 1970 as, according to Lee Iacocca, the car grew in all relevant dimensions to resemble a fat pig more than a sleek horse. (Courtesy Ford Motor Company)

Top: 1964 Chevrolet Corvair Monza Club Coupe. Increasing penetration of the American market by the Volkswagen and other small imports led the Big Three to introduce the first generation of "compact cars" in the 1960 model year. The Ford Falcon and the Plymouth Valiant were scaled-down versions of conventional American standard-size cars, but the 108-inch-wheelbase Chevrolet Corvair featured fully independent suspension and a novel rear-mounted, aluminum, air-cooled, horizontally opposed six-cylinder engine. The omission of a $15 stabilizing bar to cut costs resulted in the Corvair's tendency to oversteer, and the 1960–1963 Corvair consequently became a focus of Ralph Nader's safety crusade. Although the problem was corrected in the 1964 model year and eliminated in the redesigned 1965 Corvair, the car's reputation was by then irreparably damaged. The sporty Monza Club Coupe, with bucket seats, four-speed manual transmission, and floor-mounted stick shift, was the best-selling Corvair model. (Courtesy General Motors)

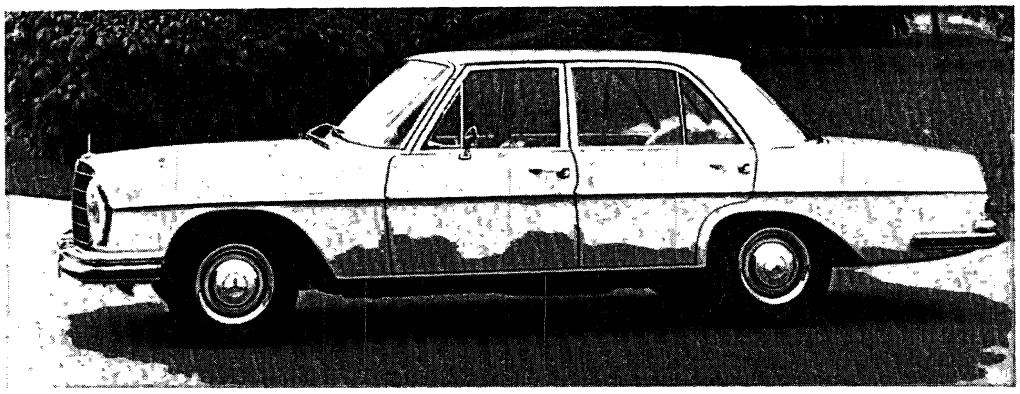




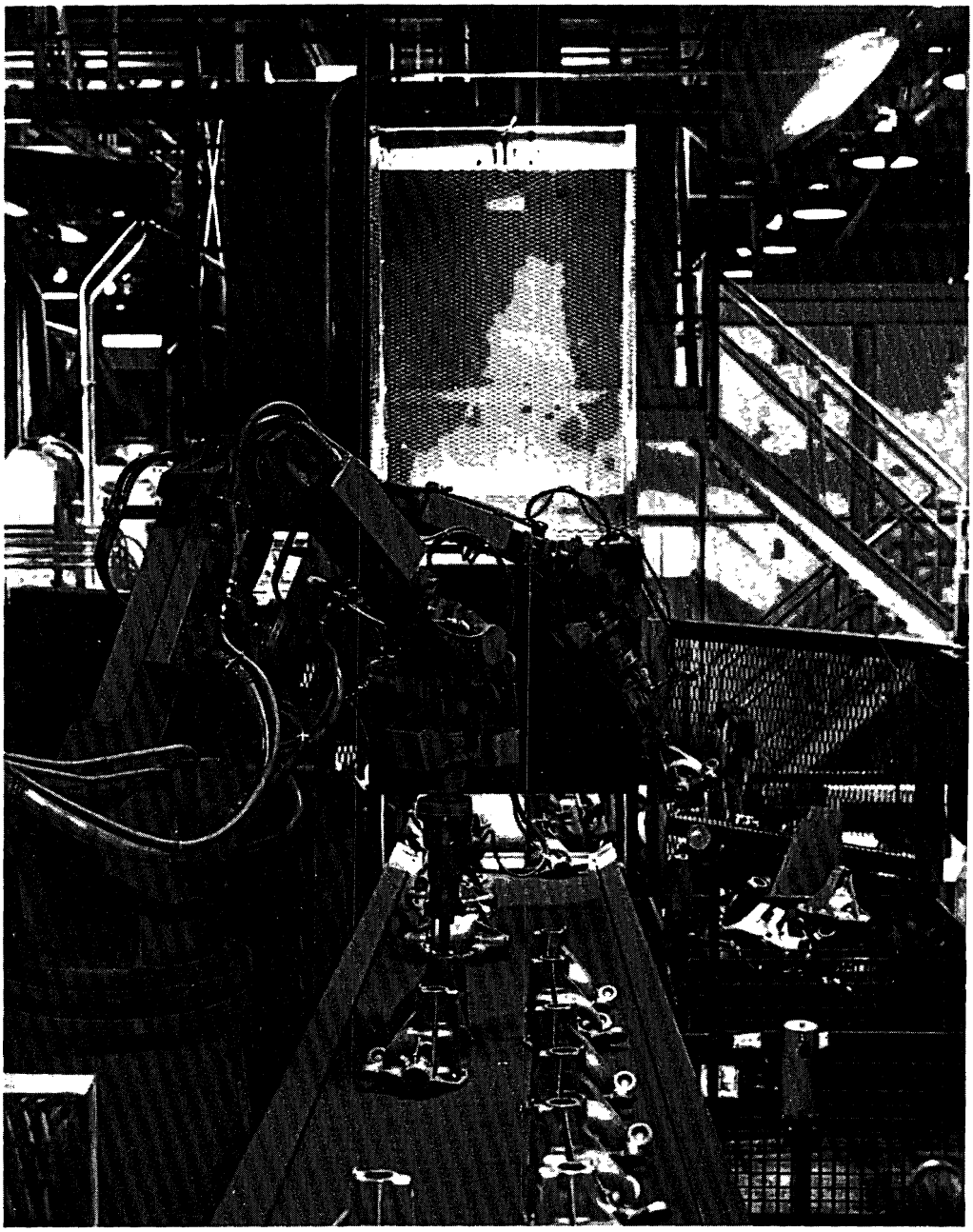
Opposite, top: 1964 Pontiac GTO. The first generation of American compacts left a strange legacy in the high-performance "muscle cars" developed in the mid-1960s to appeal to the youth market. Illegal drag racing by youths on Detroit's Woodward Avenue inspired John DeLorean at Pontiac to fill a niche in the market by stuffing an enormous 389-cubic-inch, 325-horsepower V-8 engine into a stripped-down Tempest compact, characterized by *Road Test* magazine as the "worst all-around handling car available to the American public." Stealing a designation from Ferrari, DeLorean named the car the GTO. The Ford Torino Cobra, the Mercury Eliminator, and the Plymouth Road Runner soon followed. (Courtesy General Motors)

Opposite, bottom: 1967 Cadillac Fleetwood Eldorado. Shorter and lower than other Cadillac models, the 120-inch-wheelbase, 340-horsepower 1967 Fleetwood Eldorado was the first car in the world to combine front-wheel drive, variable-ratio steering, and automatic level control as standard equipment. This advanced technology incongruously was matched with a soggy suspension system, outdated bias-ply tires, and inadequate hydraulic drum brakes on all four wheels. The Eldorado was the only 1967 Cadillac model to offer front disc brakes as an option. For a premium base price of $6,277, the Eldorado had a top speed of 109 mph; but at the 70- to 80-mph cruising speeds then prevailing, it got only 10 mpg and took more than the length of a football field to come to a stop. Nevertheless, the Eldorado was one of the most popular personal luxury cars of its day. (Courtesy General Motors)

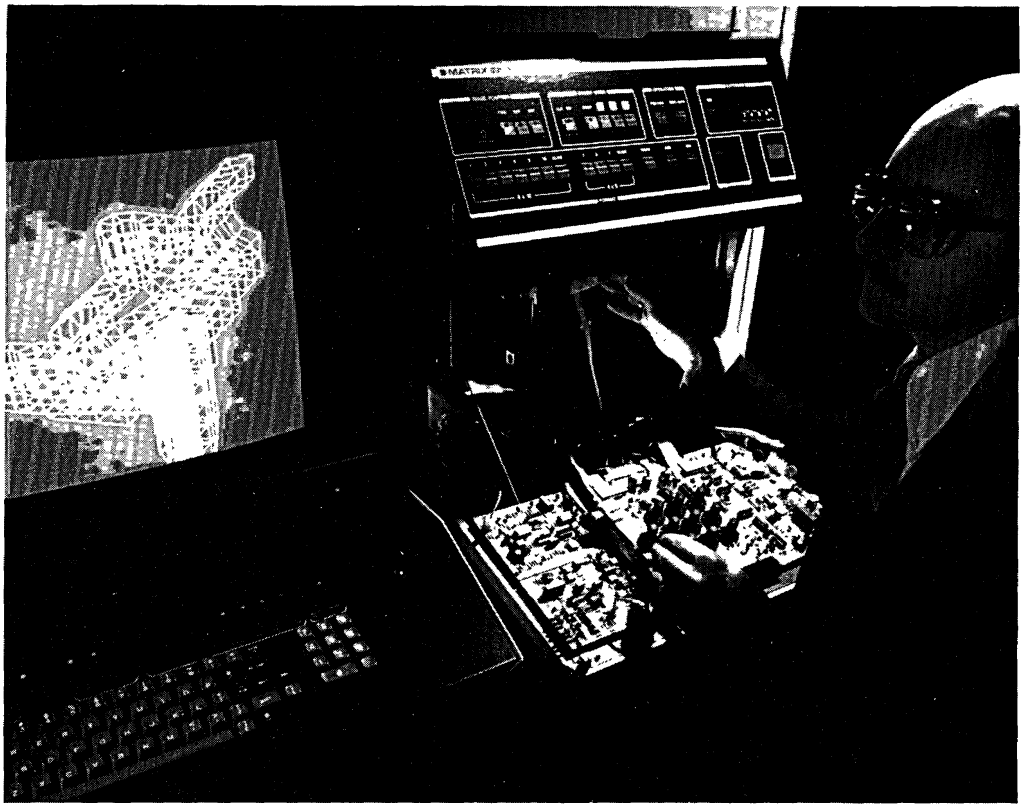
1967 Mercedes-Benz 250SE Sedan. Postwar German leadership in automotive technology was evidenced not only by Volkswagen at the bottom of the market but by Mercedes-Benz at the top. This sedan featured fuel injection, four-wheel disc brakes, fully independent suspension, steel-belted radial tires, and unitary body construction. Its passenger compartment was built rigidly to prevent collapse in a rollover and was protected by a front end designed to crush to absorb energy in a collision. It was about a thousand pounds lighter and 20 inches shorter than a contemporary Cadillac, and gave about twice the gas mileage. In addition to being a generation ahead of American production cars technologically, the Mercedes-Benz was vastly superior in manufacturing quality, and its classic styling was intended to remain appealing for decades rather than for just a few years. (Courtesy Mercedes-Benz of North America)

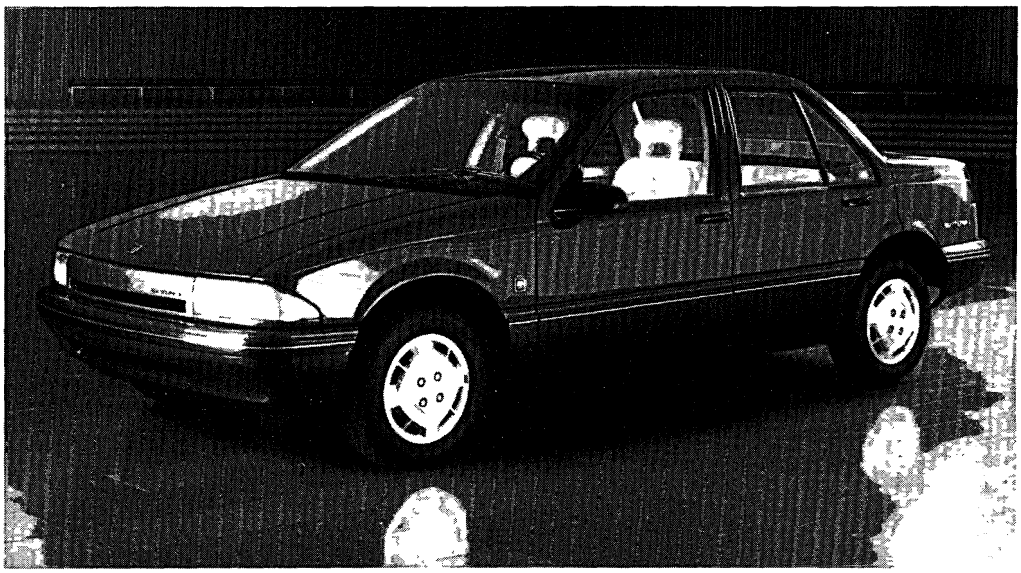


1981 Ford Escort three-door hatchback. At a development cost of $3 billion that involved worldwide design and engineering expertise, in 1980 Ford introduced the high-technology Escort. Its components are outsourced from seventeen countries, and it is assembled in five. Since 1981 the Escort has been the best-selling car in the world, and its design features have become standard for small cars. The 94-inch-wheelbase, 2,080-pound Escort utilizes unitized construction. Until mid-1985 its standard power plant was a 1.6-liter, four-cylinder, transverse-mounted engine with front-wheel drive through a transaxle. Standard equipment included rack-and-pinion steering, self-adjusting front disc brakes, and four-wheel independent suspension with MacPherson struts on the front wheels. The 1981–1985 Escort with 1.6-liter engine had an EPA fuel economy rating of 27/44 mpg, unsurpassed by any car in its class. (Courtesy Ford Motor Company)



Robots with Consight computer vision system sorting and transferring rear-end differential housings at GM St. Catherines, Ontario, foundry. Until very recently, robots could be programmed to perform only a few repetitive operations and were primarily used in welding, which they do more precisely than can human operators. The microprocessor and new computer vision systems now give robots the ability to handle complex materials, select and distribute parts, and discriminate in the performance of tasks in much the same way as can a human being. This has revolutionary implications for automobile manufacturing: it permits economies of scale to be realized on much smaller model runs, lowers labor costs, and improves manufacturing quality. By the year 2000 flexible robotics is expected to eliminate 37 percent of the jobs in automobile production. (Courtesy General Motors)





Opposite, top: Ford engineer using a computer to design a component. Traditional engineering know-how and cut-and-try methods are being abandoned in favor of computer-aided engineering (CAE) and computer-aided design (CAD) to complement computer-aided manufacturing (CAM). Here a Ford engineer designs a component on a computer programmed for the stresses to which the component will be subjected. Weak points show in color, and the computer aids in redesign. The boundaries between CAE, CAD, and CAM are disappearing to create computer-integrated manufacturing (CIM). (Courtesy Ford Motor Company)

Opposite, bottom: Prototype of GM Saturn. In 1985 GM formed the Saturn Corporation to build a small car in the United States that will be cost-competitive with imports. The prototype front-wheel-drive Saturn is smaller and 600 pounds lighter than current GM subcompacts. Initial production is expected to be 250,000 units a year, turned out by 3,000 workers on a two-shift operation, an unprecedented labor productivity rate of 83 cars annually per worker. A tradition-shattering contract with the UAW provides that Saturn workers will be paid annual salaries rather than hourly wages and that 80 percent of them will be guaranteed lifelong employment. (Courtesy General Motors)

Interchange of U.S. Highway 101 and State Route 92, San Mateo, California. The American highway network is the most costly public-works construction effort in human history and the most important visible symbol of the transformation of the American landscape by automobility. (Courtesy California Department of Transportation)

was informed at its 1946 dinner by the president of the Board of Trade, Harold Wilson, of a new policy requiring that the motor industry export 50 percent of production; this was later raised to all output not essential for home demand. Compliance was enforced by a government threat to cut off supplies of essential raw materials from newly nationalized industries—especially steel, which was in short supply. Then, after the outbreak of the Korean War in 1950 and to meet NATO commitments, a higher priority in steel allocation was given to rearmament—including new military vehicles—than to automotive exports. In general, actual exports fell short of the annually set targets. Tying steel allocations to export quotas was continued by the Conservatives until in 1952 the steel shortage was declared over and export quotas were abandoned.

The historic problem of the British motor industry was that too many producers made too many models at too high a cost. To compound the priority given to rearmament in steel allocation, quotas were allocated to automobile manufacturers without regard to their efficiency. This kept the marginal producers in business while artificially constraining the output of the more efficient firms. For the latter this meant excess plant capacity and smaller than justified model runs, which in turn raised unit costs and discouraged plant modernization.

British cars were ill designed for American and Commonwealth driving conditions, so they tended to give poor service and prove unreliable abroad. Because so many British models were competing in world markets, there was not sufficient sales penetration by any given model to warrant the establishment of an adequate parts and service network. Parts manufacture was further discouraged because parts did not count in the manufacturers' export quotas. Inferior dealerships resulted from the haste with which dealers were recruited to boost export sales. "Inevitably the reputation of British cars declined," writes Peter Dunnett, "and the long-run demand for the British products decreased." [5]

The British bid for the export trade evaporated when the postwar seller's market ended with the termination of the Korean War in 1953. By then the French, German, and Italian automobile industries, with Marshall Plan aid to build modern factories, and new fuel-efficient models, were outproducing and underselling the British in world markets. To encourage the production of larger-engine cars more suitable for the export market, in 1947 taxation based on the RAC horsepower rating was abandoned in favor first of a tax on engine capacity, then of a flat-rate license duty of £10 per annum. The result was that British cars came to fall between two stools: in the U.S. market they were priced too high to lure enough buyers away from large American-made cars; in Europe they

were too expensive to buy and operate relative to the small, efficient new Fiats, Renaults, and Volkswagen Beetles.

The British industry shifted its emphasis to the home market, only to discover that "excess demand" there was far smaller than had been anticipated. Home demand continued to be kept low by government policies. The purchase tax on new cars in 1947 was an exorbitant 33⅓ percent on cars selling for less than £1,000 and 66⅔ percent on the few cars selling for more than that. In 1950 the purchase tax was 50 percent on all cars. From then to 1979 it varied from a high of 60 percent in 1955 to a low of 17 percent value-added tax (VAT) in 1973—even the latter rate being prohibitive by American standards. The terms of installment sales for new cars varied from a high of 50 percent down and 24 months to pay in February 1956 to a low of 20 percent down and 36 months in January 1961.

The private passenger car was still considered a luxury by the British government. But as the railways declined, recognition came that road transport was becoming dominant and that roads would have to be improved. Road expenditures tripled during the 1960s, and express highway mileage increased from 75 miles to 750 miles. Still, in 1970 Great Britain, with 63.8 motor vehicles per mile, had the most congested roads in the world.

Neither the government nor management has yet been able to overcome the antiquated craft union structure and premodern attitudes of workers that prevail in British automobile plants. In contrast with the American pattern of triennial negotiations with the UAW-CIO, British automobile manufacturers must negotiate with twenty-two craft unions. Power in these unions is widely diffused down to the level of the shop stewards, and union officials lack the ability to maintain discipline among or to represent their workers. Work stoppages called by shop stewards for minor grievances are commonplace. In 1977, for example, British Leyland had over 700 work stoppages, including a toolmaker's strike over pay differentials that idled 20,000 workers for a month and cost the failing firm £150 million. The large number of work stoppages crippled productivity and raised costs. The British trade unions opposed the introduction of new technology that eliminated jobs while raising worker productivity. As a consequence, in 1974 the value added to manufacture per employee was only £2,129 at British Leyland, £2,560 at Vauxhall. £2,765 at Chrysler-U.K., and £3,901 at Ford-England, in contrast with £4,767 at Volkswagen, £4,883 at Ford-Werke, £7,966 at Ford-U.S., and £8,600 at GM-U.S. Compounding these already severe labor problems, in the late 1950s the British government adopted a regional policy that provided incentives to the automobile industry to locate new plants in areas of high unemploy-

ment. The industry consequently created tens of thousands of jobs in Scotland and Wales, at the great cost of increasing inefficiency by moving away from suppliers of raw materials and parts, who remained located in the Midlands.

Long-overdue rationalization began with the 1952 merger of Morris (which included MG, Wolseley, and Riley) and Austin, the two largest firms, to form the British Motor Company (BMC). The government approved the merger as being in the public interest. It was expected to lower production costs through achieving economies of scale and to strengthen the British-owned sector of the U.K. motor industry in relation to Ford-England and Vauxhall.

The results of the Austin-Morris merger were disappointing. BMC did introduce models featuring unitary body construction and pioneered in bringing out a small front-wheel-drive car in the BMC Mini. But the central problems of standardization and integration never were resolved. "At the time of the merger, BMC produced thirteen different engines and twenty-three different body styles," Dunnett observes. "To be effective in exploiting potential economies of scale the new company required a considerable reorganization: a reorganization that was never truly effected.... BMC continued to try to meet every segment of the market with a wide range of models. Consequently, the overall effect of [the government] competitions policy [which encouraged merger] on conduct during this period was fairly limited."[6] Indeed, the effect seems to have been negative. Despite merger, the share of the British market commanded jointly by Austin and Morris declined from 40.1 percent in 1947 to 36.5 percent by 1960, while Ford-England's share increased from 15.4 percent to 30 percent. In 1960 the combined share of the British market held by Ford-England, GM's Vauxhall, and Chrysler-U.K., all wholly American-owned subsidiaries, was 51.3 percent.

There were still too many producers for the size of the market. Rationalization proceeded further. British Motor Holdings (BMH) was formed in 1965 by the addition to BMC of Jaguar, which had acquired BSA (formerly Daimler) in 1960. Then in 1968, with a loan of £25 million from the Industrial Reorganization Corporation, the British-owned sector of the U.K. automobile industry was further consolidated by the merger of BMH and the Leyland Motor Corporation, a truck and bus manufacturer that had acquired Standard Triumph International in 1961 and Rover in 1965. The merged firm was called British Leyland Motor Corporation (BLMC).

"BLMC was doomed for trouble since it consisted of an accumulation of many outdated plants, too broad a product line and a poorly coordinated marketing network," sums up a recent report to the Commis-

sioners of the European Communities. "Although BLMC was the fifth largest automobile producer in the world at that time, it was not an economically viable operation: it produced twice as many models as did GM but produced only one-fifth of its output.... Productivity was abysmally low.... Chronic labor problems added fuel to the dismal performance." A government-commissioned document, the Ryder Report, estimated in 1975 that it would cost £1.3 billion to save BLMC. The National Enterprise Board (NEB) provided £350 million for reorganization and improvement under the Ryder plan from 1975 to 1977; and the NEB and the Ministry of Industry provided £450 million more for further reorganization and improvement from 1978 to 1980. The name of the firm was changed to British Leyland (BL) in 1975, and the NEB acquired 99.1 percent of its stock.

In 1979 BL still produced 14 models, versus 5 each for Ford-Europe and Volkswagen, and its labor productivity was 3.9 motor vehicles produced per employee, versus 11.1 per employee for Ford-Europe and 10.6 per employee for Volkswagen. From 1970 to 1979 BL's share of the British market declined from 38.4 percent to 19.7 percent, 9 points behind Ford-England, while imports increased their share of the British market from 14.3 percent to 56.3 percent. The report to the Commissioners of the European Communities concludes, "To all practical purposes, BL is no longer a major producer, and there are only slight chances for revival." [7]

From 1970 to 1982 British motor vehicle production continued to decline, from 2,098,000 units to 1,156,000 units. Of the four major producers—BL, Ford-England, Talbot, and Vauxhall—Ford-England has been the only one to make money. Pretax profits from 1975 to 1979, for example, averaged 9.5 percent for Ford, a marginal 1 percent for Vauxhall, and losses of −1.6 percent for BL and −3.2 percent for Chrysler/Talbot. For 1975–1979 Ford-England made profits of £1.007 billion, while BL lost £258 million. Despite massive government intervention to save the British segment, by the late 1970s "the structure of the U.K. motor industry was characterized ... by one inefficient British company, BL, three multinational companies, all of which have become increasingly integrated with their European operations, and an ever increasing number of import offerings." [8] It is probable that the British motor industry, except as a components supplier, will not survive into the twenty-first century.

Superbug

At the end of World War II, the only advanced capitalist country with less promise of becoming a leading motor vehicle producer than war-

devastated Germany was Japan. And no car was deemed by the automotive experts of the day to be less suitable for export to world markets than Ferdinand Porsche's ugly duckling.

By 11 P.M. on April 10, 1945, a decision had been reached not to defend Hitler's "Strength-Through-Joy Car" factory and workers' city against the approaching American army. Two thirds of the plant had been destroyed by Allied bombing, although the two giant turbine generators that supplied the electricity and heat for the plant and town had somehow survived. After their SS guards fled and the rabble of "home guards" disbanded, the Polish, Russian, French, Belgian, and Dutch slave laborers turned to destroying what remained of the factory they had kept in production and to looting the homes of its executives. *Time* reported that "every telephone had been torn from the walls, every typewriter had been sledgehammered to junk, every file and record had been scattered and burned."[9] They tore through the contents of a freight train at the local railroad station and got roaring drunk on liberated schnapps. Joined in the pillage by local Germans, they threatened to burn down the town. The chief engineer of the plant was unsuccessful in a late-night attempt to persuade the American forces at nearby Fallersleben to protect the town by immediately occupying it. On the morning of April 11, however, the Catholic chaplain of the German army's punitive battalion attached to the plant and the French priest who had ministered to the slave laborers convinced a young American lieutenant that protection was needed for the U.S.-born children of the German-American engineers that Porsche had recruited. Later that day American tanks rolled into the town. Order was quickly restored.

The Americans were replaced during the summer of 1945 by a unit of the Royal Electrical and Mechanical Engineers. A repair shop for British army vehicles was set up in the plant, which was scheduled for dismantling. Major Ivan Hirst was placed in charge. The British renamed the town Wolfsburg, after the ancient castle and surrounding estate that "Strength-Through-Joy Car City" had displaced. The few German workers who remained in the plant cleaned up debris and began to bring back and put into working order machinery that had been dispersed before the surrender. The one surviving press was used to complete two demonstration cars, and the workers began to turn out hand-tooled Kübelwagens and Schwimmwagens for the British occupation forces. The British troops had become familiar with the military versions of the VW in Africa and thought highly of them. Wolfsburg was jammed with displaced persons. The Russian zone lay five miles to the east. Raw materials to build cars and food for the workers were both in short supply. Completed cars were bartered for both. The work force increased from 450 in April to 6,033

by the end of 1945 and to 7,951 by August 1946. The ten-thousandth Volkswagen, which the car was now called, rolled off the assembly line in October 1946.

One of the first production VWs was sent back to England by the military with the suggestion that the Wolfsburg plant be taken over as part of the British war reparations. The military found the car rugged, and a team from the British Society of Motor Manufacturers and Traders at the war's end had reported favorably on the car to British Military Intelligence. Nevertheless, the automotive experts back home were not impressed in 1946. A commission headed by automotive manufacturer Sir William [later Lord] Rootes examined Volkswagenwerk. The Rootes Commission predicted that it would collapse within two years and that even if the Germans did get the car into production, "it would mean no undue economic competition on the world market against British products." "The vehicle does meet the fundamental technical requirements of a motorcar," the commission reported; but "as regards performance and design it is quite unattractive to the average motorcar buyer. It is too ugly and too noisy.... [A] type of car like this will remain popular for two or three years, if that. To build the car commercially would be a completely uneconomic enterprise." [10]

The Ford Motor Company was then offered Volkswagenwerk—free of charge. Sir Patrick Hennessy, the head of Ford's European operations, opposed the acquisition, because he feared making the Ford German subsidiaries too strong relative to Ford-England. At a conference held in Cologne, Germany, in March 1948 for discussion of the proposition, Henry Ford II reportedly asked the opinion of Ford president Ernest R. Breech, who responded, "Mr. Ford, I don't think what we are being offered here is worth a damn!" [11]

Two months before the Ford rejection, the British Military Government had appointed Heinz Nordoff general manager of Volkswagenwerk. Nordoff had graduated in 1927 with a degree in mechanical engineering from the Berlin-Charlottenburg Technische Hochschule. He began his automotive career writing service manuals for Opel. Within a year he was put in charge of customer service at Opel, then sent to Detroit to learn GM marketing and production techniques. In 1936 he became a member of the Opel board of directors. In 1942 he became head of the Opel truck factory near Brandenburg, which was producing 4,000 units a month for the Nazi war effort. After the war, with his plant in the Soviet occupation zone, he settled first in the American zone at Ruesselsheim, then in the British zone at Hamburg, where he took a job managing a small automobile repair shop. His career at Opel was ended, because the U.S. Military Government had decreed that persons who had served in executive

capacities for the Nazis could only work as manual laborers in the American zone. The offer to run Volkswagenwerk thus came as a golden opportunity. As a former Opel man, Nordoff had despised the "repulsive Porsche invention," but as an automotive engineer he soon recognized the Beetle as "an extraordinarily amazing automobile with a special personality [and] unlimited possibilities." He dedicated himself to his job at Wolfsburg with a new enthusiasm. In 1950 he stated, "It is my life's aim to make this plant into the greatest car factory in Europe." [12]

Nordoff changed the sign outside the plant from "Wolfsburg Motor Works" to "Volkswagenwerk" on the day he took over. On April 8, 1949, Volkswagen GmbH was formally turned over to the West German authorities by the British Military Government. Until legal ownership could be established, Volkswagen was run under a trusteeship of the federal government of West Germany that delegated control of the Wolfsburg factory to the state of Lower Saxony. The German Labor Front, which had controlled it under the Nazis, had been declared a criminal organization. The federal government and the state of Lower Saxony continued to contest ownership.

Output rose from 312 cars daily in 1950 to over 1,000 by 1955, as the Wolfsburg plant was modernized, and huge new plants were opened at Hanover and Kassel. To complement the Beetle, commercial vehicles, light trucks, and the VW Microbus were introduced in March 1950; and the Karmann Ghia, a VW chassis with a sports car body designed by Ghia of Turin, Italy, was brought out in 1955. On March 9, 1960, Nordoff announced in a speech in Switzerland that up to that date, despite all attempts to raise productivity, Volkswagen never had been able to meet the demand for its cars and trucks. In 1960 VW produced 865,858 motor vehicles, 42 percent of the total German output. The phenomenal postwar German economic recovery was in large part fueled by the Volkswagen success story.

Beetles were brought back from Germany by servicemen completing their tours of duty. An "Export Model" was introduced in 1949, and in the early 1950s cars began to be exported by Wolfsburg to the United Kingdom, British Commonwealth countries, and the United States. The Beetle had to overcome strong anti-German sentiment and aspersions in the press as "Hitler's car." An American cartoon portrayed the Beetle with a machine gun sticking out of its windshield. Some 75 percent of the Beetles arriving in the U.K. were damaged by vandals while awaiting delivery.

Animosity turned to admiration and affection as the rugged, economical little car proved itself in the world's toughest endurance trials. "In the mid-1950s, Australian racing enthusiasts watched in amazement (and

amusement) as the Beetle for the first time entered the field against cars twice the power (and twice its price)," relates Walter Henry Nelson. "The trials, often referred to as the world's severest tests of cars and drivers, covered thousands of miles of Australia's unmade roads, led through the torrid north and over the wet tortuous mountain roads of the southern Great Divide." [13] Beetles scored impressively in the 1955 Redex Trial (1st and 2d); the 1956 Mobilgas Trial (1st, 3d, 4th, and 6th); the 1957 Ampol Trial (1st and 2d); and the 1958 Mobilgas Trial (1st, 2d, 4th, 5th, and 6th). In the 10,738-mile 1957 Mobilgas Rally twenty of the fifty-two cars to finish were Beetles, and six of them took first places. Beetles took the first four places in their class in the 1958 Kenya Coronation Safari Rally, the toughest automobile rally in Africa, in which only half of all competitors even finished. Out of thirty-two starters, seven out of the ten cars to finish the 1958 African Endurance Championship were Beetles, which won the first four places. Out of thirty-four starters in the 1959 Congo Marathon, seven out of the ten cars to finish were again Beetles, which won the first three places. A Beetle won the 3,000-mile 1962 East African Safari, in which only forty-seven of the one hundred and four starters finished.

Horsepower was gradually increased, from an initial 25 hp to as high as 60 hp in the 1971 Super Beetle. The 1953 model achieved an average fuel consumption of 37.7 miles per gallon; the 1,584-cc engine of the Super Beetle still averaged 27.4 mpg. The Beetle was built so tight that a window often had to be cracked before the driver could slam its door shut. The sheet of steel protecting the car's undercarriage made it virtually watertight: there are records of Beetles floating for miles after being carried off in floods. Air cooling solved the problems of freezing and hard starting in winter and of overheating in summer. The low-revving, short-stroke engine meant lower piston speeds, which lengthened engine life and permitted (with the 1,300-cc engine) a top cruising speed of up to 75 mph to be maintained for hours. Rear mounting of the engine gave the car improved traction in mud, sand, and snow. It could climb a 43-degree incline in first gear loaded with four passengers and luggage, or accelerate in 23 seconds from 0 to 60 mph in third gear. Four coats of paint were meticulously applied electrostatically and baked on, and no bare metal was left exposed on any part of the car. One out of every ten employees at Wolfsburg was an inspector; and instead of spot checking, every car was inspected on 115 check points plus finish and interior. All this for a fully equipped car with a base price in the late 1950s of about $1,500! The British automobile magazine *Autocar* concluded that "without question, [the VW Beetle] has no superiors in any price bracket on quality, reliability, and after-sales service." [14]

Volkswagen policy was "service before sales." Overseas dealers were

carefully selected. Each was required to maintain a complete inventory of over eight thousand parts. A dealer's allotment of cars was increased only as his service potential grew to accommodate all Volkswagens needing service in his sales area. In 1957 Volkswagen already had 350 dealerships to service the 64,803 Beetles and 14,721 other Volkswagen vehicles registered in the United States.

The issue of ownership was settled on May 9, 1960, when Volkswagenwerk was made a public company. The federal government and the state of Lower Saxony each retained 20 percent of the VW stock. The remaining 60 percent was placed on the market by the West German parliament on June 30, 1960, and was soon 84-percent oversubscribed. The terms of the stock sale provided that shares could be bought only by persons of middle income or below. One third of the subscribers received three shares each of the 3.6 million available; two thirds received two shares each. Of 65,000 Volkswagenwerk employees, only 1,000, who failed to qualify because of their high income bracket, failed to buy stock. This gave Volkswagen the highest proportion of employee shareholders of any major corporation in the world.

By 1954 Volkswagenwerk had become the fourth-largest automobile manufacturer in the world, after only Detroit's Big Three. In 1953 Volkswagen do Brazil was formed. It became the largest automobile manufacturer in Latin America and the largest German-owned overseas enterprise. After four years of assembling knocked-down units from Germany, Volkswagen do Brazil began to turn out Beetles with 100 percent local content. Volkswagen de Mexico began assembling Beetles in 1954 with 60 percent local content, increased to 71 percent by 1979, and to 100 percent after that. A joint venture with the VW Australian distributors was launched in 1957 to make Beetles with 100 percent Australian content for the South Pacific market. Volkswagen of Melbourne suspended all except assembly operations in 1967 and was sold to Nissan in 1975. Smaller plants were established in South Africa and in Nicaragua.

To develop the lucrative North American market and supply it with Beetles, Volkswagen of Canada was formed in 1952, and Volkswagen of America in 1955, with headquarters first in New York City, then in Englewood Cliffs, New Jersey, near the Newark port of entry. Volkswagen sales in the United States reached a record 569,292 units in 1968, and by 1970 Americans had bought over 4 million VW Beetles and other models.

Like the rear-engined Corvair, the Beetle became a casualty of Ralph Nader's safety crusade. Even more important, by the early 1970s rising German labor costs, competition from American compacts, devaluation of the dollar, and stiffer import levies left the Beetle overpriced in the Amer-

ican market. By the first quarter of 1974 the port-of-entry price of a Super Beetle without options or accessories had climbed to $2,849, as opposed to a basic price of $2,442 for a Ford Pinto. By then, too, the Beetle was facing stiff competition from Japanese models. Volkswagenwerk was losing $100 on every car shipped to the United States by 1976, and its share of the U.S. market had eroded to 2.5 percent.

To meet these greatly changed competitive conditions, the decision was reached in 1976 to begin manufacturing in the United States, with 75 percent local content, VW's new model, the Rabbit (called the Golf in Europe). The Rabbit, introduced in 1974, was an advanced design that deserves credit as the first "world car"—a car designed for world markets and produced from components sourced worldwide. Volkswagen Manufacturing of America (VMOA) acquired a plant site for assembly from Chrysler at Westmoreland, near New Stanton, Pennsylvania, and a stamping plant to turn out body panels from AMC at South Charleston, West Virginia. By 1980 the German-controlled Westmoreland plant was turning out 1,050 cars a day. VMOA surpassed French-controlled American Motors to become the fourth-ranking "American" producer of motor vehicles.

The German automobile industry was further rationalized as well by the German expansion and diversification of Volkswagenwerk in the late 1960s. Arrangements were worked out with Mercedes-Benz to share research and development costs. A controlling interest in Audi was acquired in 1965 and in NSU in 1969. They were merged to form Audi NSU Auto Union. In 1969, too, Volkswagen combined forces with independent Porsche of Stuttgart as VW-Porsche to produce the popular rear-engine, air-cooled Porsche 914 sports car.

Although the basic Beetle body style and mechanical features remained unchanged, stylistic refinements as well as technological improvements were progressively incorporated. The 1949 Export Model already was a vastly improved car over the VW38 Porsche prototype. By the mid-1960s over two thousand improvements had been incorporated. It is therefore a mistake to think of the Beetle as a static model until it was outmoded, as a brief survey of some of the more important improvements demonstrates.

Stylistically, the 1958 model featured a rear window 95 percent larger, a front windshield 17 percent larger, windshield wipers that swept a 35-percent larger area, and a reshaped engine lid. The front seats were recontoured to be more comfortable in the 1960 model year. Windshield area was increased another 19.5 percent in 1965, and doors and window pillars were made slimmer. In the 1971 Super Beetle a redesigned front hood and a changed suspension system increased the luggage area by

85 percent. A curved windshield to further increase visibility appeared in the 1973 model. Over the life of the Beetle, ventilation, heating, and other features contributing to passenger comfort were vastly improved.

Mechanically, as noted, a progressive increase in horsepower improved performance. Changes in the suspension system improved cornering and handling: an anti-roll bar was added in 1960, the shock absorbers and the spacing between the front torsion bars were improved in 1966, and the 1971 Super Beetle sported MacPherson strut suspension. In the 1961 model, synchromesh was added to the first gear. The following year the steering mechanism was changed from worm and nut to worm and roller, improving both steering and wear. Independent dual braking became available on some 1968 models, front disc brakes on the 1967 1500 Cabriolet and the 1971 Super Beetle. A semiautomatic transmission became available as an option on the 1968 1500 model. Fuel injection became an option on the 1975 Super Beetle. Safety features and pollution control devices were incorporated as mandated by law in the United States.

On February 17, 1972, when Beetle number 15,007,034 rolled off the assembly line, the Beetle surpassed the Model T to become the best-selling car of all time. World production had peaked in 1971 at 1,291,612 units. German production had peaked two years before at 1,076,897 units, then progressively declined to only 33,239 units in 1977 as assembly lines were switched over to newer Volkswagen models. German production was halted on January 19, 1978, and the Beetle was withdrawn from the American market. It is still being manufactured of 100 percent local content in Pueblo, Mexico, where the 20-millionth Beetle rolled off the assembly line on May 15, 1981.

About two thirds of the over 20 million Beetles ever produced remain in use around the globe, making this vehicle, in Jonathan Wood's words, "perhaps the most remarkable as well as the most enduring passenger car the world has ever known." [15]

On November 20, 1987, Volkswagen announced that it was closing its Westmoreland plant and ending production in the United States. Sales of American-produced Volkswagen passenger cars had slipped from 177,118 units in 1980 to only 53,629 for the first ten months of 1987. Japanese competition was blamed for the decline.

Japan as Number One

17

In the mid-1970s Volkswagen was surpassed as the major foreign-car exporter to the United States, first by Toyota, then by Nissan. By 1978 Honda's American sales too exceeded Volkswagen's. Twenty years before, Japan's entire annual production had been fewer than 100,000 passenger cars. As has been noted, in worldwide production Japan passed Germany to rank second in 1967 and passed the United States to take first place in 1980.

"Given its limited resources, Japan has dealt more successfully with more of the basic problems of postindustrial society than any other country," writes Ezra F. Vogel. "It is in this sense ... that the Japanese are number one." He is correct in his contention that this "Japanese success [has] had less to do with traditional character traits than with specific organizational structures, policy programs, and conscious planning." But his 1979 analysis was outdated by the mid-1980s, if only because it was predicated on a weak dollar in relation to the yen. More important, at least for the automobile industry, he is wrong in his unsupportable assertions that "the effort to explain these Japanese successes as a result of cheap labor is out-of-date, for by 1978 with devaluation of the dollar, Japanese wages were slightly higher than those of in the United States" and that "the modernity of technology used in Japanese manufacturing had edged past the United States by 1973." He is also wrong in claiming that decision making in Japanese firms characteristically proceeds from the "bottom up" rather than from the "top down," that there is "much authority concentrated on low levels," and that "the morale of young workers in their thirties tends to be very high." On all of these counts, the evidence is that the opposite is true.[1]