



OF INDUSTRY

Altar

RIVER ROUGE, HENRY FORD'S FACTORY OF THE FUTURE

THE MOTOR CITY may have invented the idea of reinvention. The history of the car kingdom is a tale of one maker trumping the other, whether with a new model or a new manufacturing process. Or trumping themselves. No sooner had Henry Ford grabbed global acclaim with his assembly line, he was off erecting his industrial colossus, River Rouge, in the muddy flats south of the city. Today, the historic fabric at the Rouge, like much of iconic Detroit, is either going, gone, or out-of-date, the kiss of death for a car maker.



Above: Henry Ford and son Edsel. **Left:** Blast furnaces and hot gas stoves.

BY DAVID ANDREWS PHOTOGRAPHS BY JET LOWE



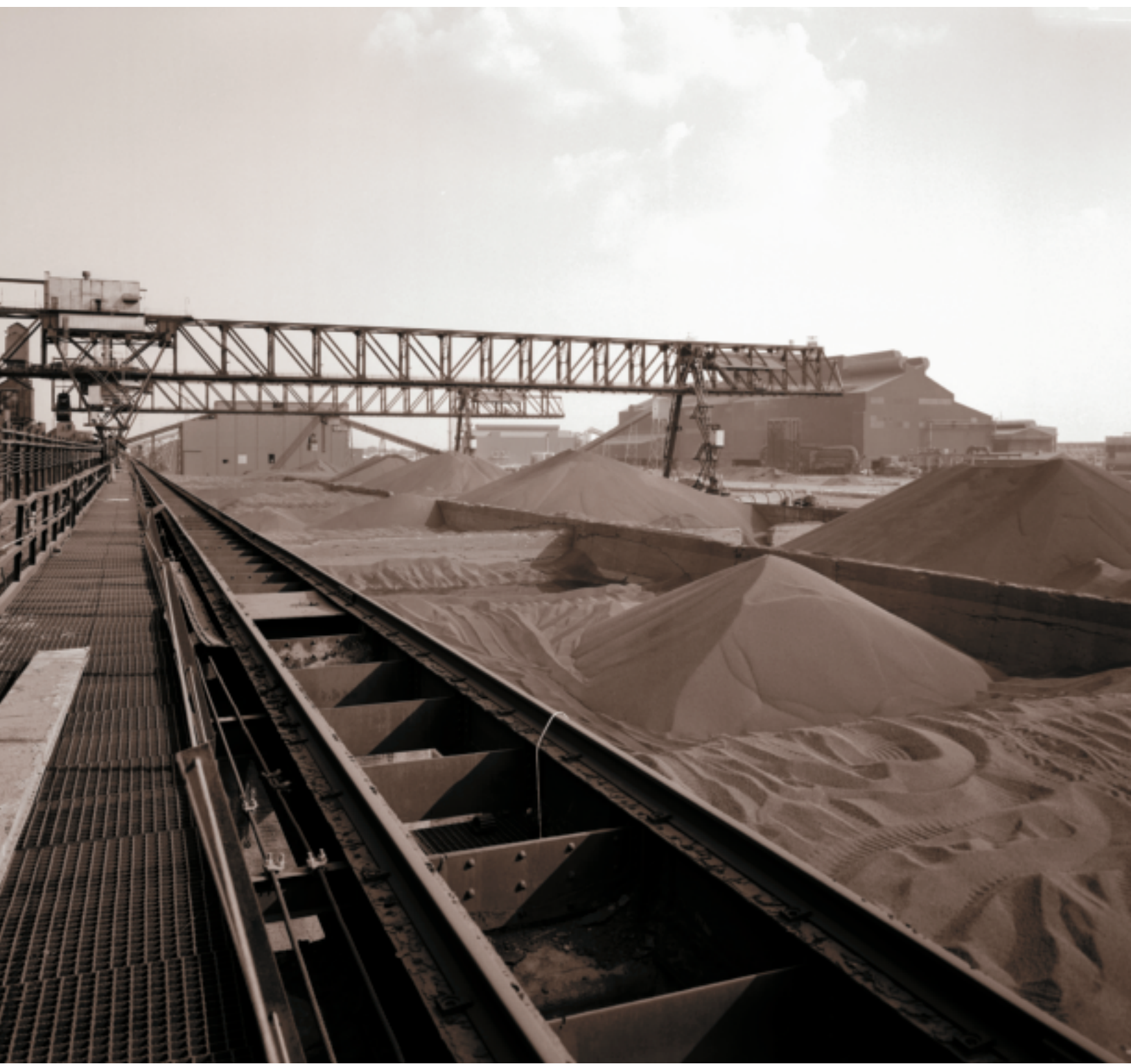
Auto historian Charlie Hyde bears witness to the fall. Under preservation mandates, he's called in to do the "grisly job" of recording a site on the eve of its demise. His face on the scene is often bad news for the built environment. "When I show up, the building's a goner," he says.

Recently the stars aligned to spotlight some of the surviving remains at the Rouge, which is undergoing an environment-friendly makeover. Motor Cities, the nascent national automobile heritage area, joined forces with the Historic American Engineering Record of the National Park Service. HAER historian Rich O'Connor, along with staff photographer Jet Lowe, documented the steel works—one of the last intact remnants—before the current owner upgraded the coke ovens.

The steel plant has its own story. In 1927, to show off the Rouge, Ford hired a hotshot artist, a painter, then making waves in photography. From his arrival at the complex, Charles Sheeler was smitten with the

"There's nothing more primal than the making of steel," says HAER lensman Jet Lowe, and that's probably what drew photographer Charles Sheeler to this very mill when Ford hired him to propagandize the Rouge in 1927—a project that made the artist's international reputation. **Above left:** 1935 Woody Station Wagon. **Above right:** Storage bins.

LEFT: PUBLICATIONS INTERNATIONAL LTD.



mill. “The forms of the plant had an authority of their own, severely functional,” say Allan Nevins and Frank Ernest Hill in *Ford: Expansion and Challenge, 1915-1933*. “The concrete oblong of the slip, the storage bins with their dark hills of coal or white hills of limestone, the sheer bulk of the foundry, the stacks of the blast furnaces and power house . . . the covered conveyors twisting like angular snakes from building to building—all gave a picture of designed power, at once strange and convincing.”

Sheeler made a monument of the mill, putting Ford’s industrial city on the world stage in one of the most stunning displays to date of

the new “machine aesthetic” (invited to do the same by the Soviets, he deferred to focus on the American scene).

The Rouge became the auto industry’s gem. And for good reason. Nevins and Hill paraphrase Ford publicists: “At eight o’clock on Monday morning, ore arriving in the slip was transferred [to] the Blast Furnace. At noon on Tuesday it was molten iron being poured into a foundry mold, and later that afternoon a finished motor travelling by trunk-line conveyor toward final assembly. Here is a conversion of raw material to cash in approximately 33 hours.” In as ore, out as auto, like clockwork. Almost.



Left: Coke cars. "Even if I tried, I couldn't make my photographs look like the 1920s and 1930s," says Lowe of working in the shadow of Charles Sheeler's masterful shots of the mill. "Back then, all the machinery was new and fresh, and there was an optimism about it, about what it would do for society. These days we have a more bewisened view. We know there will be unintended effects, no matter what the technology."

ASSEMBLING A LEGEND

"The making of a car begins in Minnesota, when miners gorge out a scoopful of iron ore from the red earth of the Mesabi Range," says *Ford at Fifty: 1903-1953*. "A railroad crew hauls the ore down to the shore of Lake Superior where it goes into the hold of the *Benson Ford*, one of the Ford ships that ply the Great Lakes from spring until the ice comes in late fall . . . on the dockside, crane operators move in to take possession . . . a crane scoops 15 tons in a single bite from the ship's hold and drops it into a storage bin."

The steel frame, the steel rail, the steel tool . . . steel was the stuff of the machine age. "Approximately 85 percent of the modern passenger automobile is steel," says *Ford at Fifty*. "The making of the steel for one car takes 1.93 tons of coal, 1.26 tons of scrap and 2.62 tons of ore and other raw materials."

In 1900, the auto industry was a ragtag bunch of sheds and shops; by 1914, say Nevins and Hill, "it had grown with the rage of Iowa corn." Henry Ford dominated the field, a folk hero with his Model T—the log cabin of the auto age—and the unheard-of paycheck of five dollars a day to toil on his assembly line.

That fall, Ford's real estate agent drove down south of Detroit, through a flatland of pastures and truck farms, dotted with trees and clumps of cattails. He pulled up to a muddy stretch of floodplain along the Rouge River, desolate and inert. It wasn't near a navigable waterway (the Detroit River was three miles away); it wasn't close to a population center; it was nowhere. Yet here, in short order, would spring the vortex of an industrial empire, reaching from the depths of Michigan's mines to the jungles of Brazil, with plants in 33 countries, central in a saga of forests, fleets, aircraft factories, railroads, rubber plantations, mills, and mines.

"Boys, what is your idea of the best spot in the world to build a steel industry?" Ford asked a group of his engineers in 1915. "It's right here where we stand. Up in Northern Michigan and Minnesota are great iron ore deposits. Down in Kentucky and West Virginia are huge deposits of soft coal. Here we stand, half way between, with water transportation to our door. You will look the whole country over but you won't find a place that compares with this." Leather and glass, steel and iron—Ford had seen them all double in price. The complex would be his one-stop shop, hedge against surging costs.

He carved a canal, installed a boat slip for bulk carriers, and—thanks to a defense contract—got the Army Corps of Engineers to double the river's width and depth. Then he hired Albert Kahn, a top industrial architect whose glass-sheathed factories championed function and eschewed stylistic flourish.

Henry Ford had a fetish about following his own road, ignoring the other guy. When it came to the steel plant, he told his subordinates: "I want you to have in the back of your head right now, that we are not following [the] other steel plants at all. They are going to follow us." He mechanized with no mercy. "At Ford Steel, you didn't have these 'muckers around,' low-paid guys who shoveled stuff as in a regular mill," says Hyde. "Ford turned those jobs over to machines, with skilled workers doing the rest."

The steel plant evidenced Ford's penchant for the neat and clean. The heart of a mill—the open hearth—was an engine of dirt, smoke, heat, and slag, an ungodly place to work. The well-ventilated Ford plant boasted spotless walls and floors, with regularly painted furnaces and whitewashed ladles. Other steel owners came and jeered, then went back and did the same. Mills across the nation cleaned up their act.

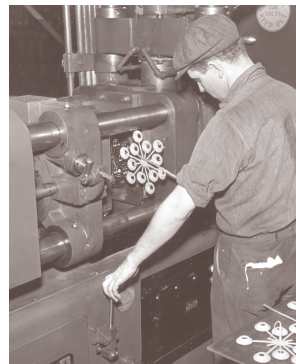
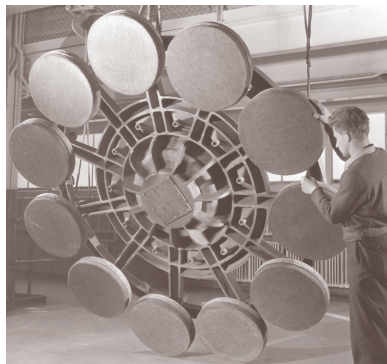
Ford also had a thing about waste. He recycled scrap with a vengeance, seeking markets for by-products as fuel additives, fertilizer, and the like. Surplus electricity was diverted elsewhere; blast furnace exhaust

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**—FORD AT FIFTY:
1903-1953**

BELOW RIGHT: HENRY FORD MUSEUM (2); PUBLICATIONS INTERNATIONAL LTD.

Right: Polishing wheels; using a molding machine to make bezels for window hand-crank; 1939 Deluxe Convertible Coupe.



**"I WANT YOU TO HAVE IN THE BACK OF YOUR HEAD RIGHT NOW, THAT WE ARE NOT FOLLOWING [THE] OTHER STEEL PLANTS AT ALL. THEY ARE GOING TO FOLLOW US."
—HENRY FORD TO HIS SUBORDINATES**

helped fuel powerplant boilers. "Not an ounce of metal or a degree of heat [was] unavoidably wasted," say Nevins and Hill. Meanwhile, efficiency experts ascertained every mechanic's fraction of labor, how to make every motion and how long it took.

The mechanical devices dazzled even the experts. It was a wonderland of conveyors, with belts, buckets, spirals, rollers, "scenic railways," "merry-go-rounds," pendulums, and overhead monorails.

"The Ford organization as embodied in the Rouge unquestionably took a great stride forward as compared with any of its rivals," say Nevins and Hill. "None so completely controlled and related the basic elements of production. None effected a concentration of manufacturing which permitted so great an integration of related activities, along with notable economies in manufacturing. None achieved the same degree of mechanization, or quite matched the modernity of the tooling."

An army of 75,000 toiled in the plant; 5,000 did nothing but keep it clean, every month going through 86 tons of soap and 8,000 mops and brooms.

A COMPLETE UNIT OF POWER

"Now that the Rouge was complete as an industrial unit of power, it quickly took on a character as a place to work," say Nevins and Hill. "One would gladly write that its bold planning and fine mechanization, its large, well-lighted, clean and efficiently ventilated structures were matched by a happy spirit among its officials and workers. Unfortunately, the reverse became true."

Ford's goal was to take "drudgery off flesh and blood and lay it on steel and motors." Now, work's essence, for many, was pressing buttons and shifting levers, not lifting loads. Parts came waist high, no bending. Safety was the by-word, fumes banished.

The sparkle contrasted starkly with the mood. Those above lost contact with those below, often



Right: Making fiber for tires. Woven cotton, dipped in molten rubber, is run through rollers to fuse and flatten the two materials.



HENRY FORD MUSEUM



Above: Building for pulverizing coal. "When it comes to steel, there's a lot of stuff that's been around since before World War II," says Lowe. "For a long time companies were squeezing blood from a turnip, not reinvesting in their technologies. It's such a huge investment to begin with, often there was no reason."



Left: A blast furnace [background] looms over what Lowe calls "a 10-ton bowl of liquid slag on wheels" [lower left]. "You want to get out of the way when you see one of these guys coming at you," he says. Lowe's anthropomorphic forms, as seen here, often resemble actors in a play. "In the '20s, '30s, and '40s, technology was seen as an extension of our bodies. And that was a lot of their charm and their power. Modern steel is not as photographically friendly; the structures don't reveal as much about what they're doing."

“THE FORD ORGANIZATION AS EMBODIED IN THE ROUGE UNQUESTIONABLY TOOK A GREAT STRIDE FORWARD AS COMPARED WITH ANY OF ITS RIVALS. NONE SO COMPLETELY CONTROLLED AND RELATED THE BASIC ELEMENTS OF PRODUCTION . . . NONE ACHIEVED THE SAME DEGREE OF MECHANIZATION, OR QUITE MATCHED THE MODERNITY OF THE TOOLING.”
—ALLAN NEVINS AND FRANK ERNEST HILL, FORD: EXPANSION AND CHALLENGE, 1915-1933

alienated by the immensity and power of the place. The sense was shared at all levels. Henry Ford planned to phase out Highland Park (the Model T plant downtown) and shift work to the Rouge. With the move, Rouge officials weeded out Highland supervisors and their subordinates. Charles Sorensen, a top dog at the Rouge, said “We want to fire every Model T son-of-a-bitch.” The car, now in its third decade in the 1920s, was becoming scornful to the forward-minded. Sorensen would say “That’s a Model T idea” or “That’s Model T thinking.” An associate, reminding Sorensen of his own role in the auto’s rise, was soon gone too.

Those who survived had to be made over, says one. “It was hard-boiled policy at Highland Park, but it didn’t compare with the intensity that was at the Rouge. Everybody was on edge. They ran around in circles and didn’t know what they were doing. Physically everybody was going like a steam engine but not so much mentally . . . The more a man ran around the better he was [but] you didn’t know when somebody was going to come along and clip you one and knock your feet from under you.” Senior officials had desks in the open factory—no offices—junior officials were prohibited from sharing their problems. “Forditis” infected the masses too, its symptoms, said one official, “a nervous stomach and all parts of your body breaking down.”

As the 1920s wore on, the happy days of Henry Ford, friend of the worker, came to a close. From 1914 to 1918, say Nevins and Hill, the company had “made an intelligent effort to achieve amity, brotherhood and prosperity within the Ford gates.” Foremen were forbidden to fire by fiat. The pay envelope was plump, the plant safety tops. A global object lesson, Ford hired people with disabilities and put thousands of African Americans on the rolls. His Sociological Department (though despised by many for paternalism) helped the down-on-their-luck and eased immigrants into the American way of life. This in contrast to the “individualistic, aggressive, and ruthless corporation activities in most areas of the nation’s economy,” say Nevins and Hill.

With the postwar downturn, wages fell and with them the gospel of goodwill. The Progressive Era was over, the country’s mood hardened by the war. Henry Ford was older, and changing. Harry Bennett took charge of “the Service Department,” a comer “characterized as a hatchet man, spy, sleuth, gangster, thug, satrap, captain of the palace guard, Henry Ford’s personal man, Henry Ford’s commander-in-chief, and Ford’s Rasputin,” says David Lewis in *100 Years of Ford: A Centennial Celebration of the Ford Motor Company*. Bennett employed a “collection of thugs and spies and intimidators whose only job was to keep the union out of the plant,” says Hyde, including police fired for misconduct, ex-convicts, former boxers and football players.

Jonathan Norton Leonard, quoted in Stephen Meyer’s *The Five Dollar Day*, sums up the scene: “No one who works for Ford is safe from spies—from superintendents on down to the poor creature who must clean a certain number of toilets an hour . . . An anonymous letter accusing a man of stealing Ford parts is enough to bring him before the Service Department. He is forced to sign a ‘Permission for Search,’ which allows Ford detectives to ransack his home, turn out his poor possessions in hopes of finding a Ford incandescent lamp or a generator armature. There are spies to watch these in turn.”

Another worker said, “During the lunch hour men shout at the top of their voices about the baseball scores lest they be suspected of talking unionism. Workers seen talking together are taken off the assembly line and fired. Every man suspected of union sympathies is immediately discharged, usually under the framed-up charge of ‘starting a fight,’ in which he often gets terribly beaten up.” No whistling, no humming, no talking back, no taking an extra minute break. One worker was fired for smiling.

The company evolved from “a benign monarchy to a despotic empire,” say Byron Olsen, Joseph P. Cabadas, and Joe Cabadas in *The American Auto Factory*, with no independent stockholders to keep the machine in

Motor Cities automobile national heritage area

VIRTUAL SYNONYMS for the auto industry, cities like Detroit, Lansing, Flint, and Pontiac may not make a conventional list of tourist stops. But as the epicenter of a phenomenon that changed the world, they contain an unparalleled wealth of heritage, a fact recognized when Congress created the Motor Cities Automobile National Heritage Area. **NINE DISTRICTS** preserve and commemorate the history, each offering museums, historic sites,

interpretive centers, and educational activities as part of a larger plan to revitalize long-decaying urban fabric. **THE REGION** THAT “put the world on wheels” has been called the Silicon Valley of the early 20th century, a center of innovation that saw the assembly line perfected and shaped the social landscape as the birthplace of the labor movement and creator of a new middle class. The impact of car manufacture ranges

from design inspirations, to environmental and safety issues, to the immigration experience and civil rights. Visitors can see historic auto plants and car collections, among other things. A list of 11 most-endangered places, compiled by Motor Cities, includes pre-1940 gas stations and Flint’s Delphi West plant, site of a seminal Depression-era sit-down strike. **TO ENHANCE THE AREA**, Congress has authorized up to \$1 million a year, aimed at

fostering partnerships with state and local governments and private groups. **MOTOR CITIES IS MANAGED** by the nonprofit Automobile National Heritage Area Partnership in collaboration with the National Park Service. Founding partners include Daimler-Chrysler, Ford Motor Company, General Motors, and the United Auto Workers. **FOR MORE INFORMATION**, go to **Motor Cities on the web** at www.autoheritage.org.



“NO ONE WHO WORKS FOR FORD IS SAFE FROM SPIES— FROM SUPERINTENDENTS ON DOWN TO THE POOR CREATURE WHO MUST CLEAN A CERTAIN NUMBER OF TOILETS AN HOUR.”
—JONATHAN NORTON LEONARD, QUOTED IN *THE FIVE DOLLAR DAY*



check. Meanwhile, the auto industry’s unemployment—and ongoing drive to de-skill the workforce—drew little attention in the go-go ’20s, when most images of labor focused on the wonders of mechanization.

TROUBLE DOWN THE LINE

“At the start of the 1933 production season, workers spent 14-hour days in some plants but barely cleared enough in piece-work wages for lunch and trolley fare,” says Steve Babson in *Working Detroit*. Unions, weak before the stock market crash, splintered; most ignored unskilled workers and African Americans, the latter often relegated to janitor jobs and dangerous foundry work (Henry Ford employed 10,000 African Americans in the ’20s).

The company’s leader was blinded by his single-minded vision. In 1928, he finally rolled out a replacement for the Model T—the Model A—and a V-8 in 1932, both to fanfare and sales spikes. Yet he frowned on the mere mention of rivals. Ford opposed anything that GM or Chrysler did first, even as the two pounced on any advance, and did it one better. If it weren’t for his son Edsel, a champion of styling, the competition’s new streamlined look would have trounced the Fords. To cope, the car maker did what the others did.

“All of the automotive companies, including Ford, were accused of wrecking the health of their employees by the speed-up and the stretch-out [assigning more machines to each man] and then dismissing these prematurely aged hands as unfit,” say Nevins and Hill in *Ford: Decline and Rebirth, 1933-1962*. One worker, Theodore Mallon, said that “they would fire the men with high-paying jobs and hire them back at a lower salary if they were willing.”

In 1932, a hunger march broke into a bloody battle at the Rouge gates, with four shot dead, twenty wounded, and police and fireman injured by bricks, stones, and clubs. The Roosevelt administration made it easier for unions to organize as the Depression continued to take its toll.

The situation came to a head on May 26, 1937, when the Service Department set upon leafleters from the United Auto Workers. One of the UAW leaders, Walter Reuther, recalls: “The men picked me up about eight different times and threw me down on my back on the concrete . . . kick[ing] me in the face, head, and other parts of my body . . . Finally, they threw me down the stairs [and] drove me to the outside of the fence, about a block of slugging and beating and hurling me before them.” Photos of the “Battle of the Rouge Overpass” flashed across the country, galvanizing the labor movement. Bennett insisted that his department had no part; when *Time* ran the pictures, Ford canceled its ads.

Left: “These are the bottle cars that receive the molten steel—like cows in reverse—to be made into ingots or sheet elsewhere on the site,” says Lowe. “In a modern plant, you might go straight to the final product in a system called continuous processing.”

Lowe seeks to capture a site’s mood as well as substance, even when—as with the Rouge—remnants like this plant are all that’s left. “I try to create an artifact for people to look at later on, to read things into it that maybe we wouldn’t now—in the same way that Sheeler’s work shows the underlying premises of his day. Where I’m on the same page as Sheeler, Margaret Bourke-White, and other photographers of their time is a fascination with ‘the thing itself.’ That’s what great photography is about.”

“PEOPLE BEMOAN THE FAILURE OF PRESERVATION IN DETROIT, AND IT’S NOT JUST THE AUTO PLANTS . . . IT’S THE ATTITUDE WE HAVE TOWARDS OUR CARS. YOU BUY IT NEW, KEEP IT A COUPLE YEARS, AND GET RID OF IT. IT’S OBSOLETE. YOU GET ANOTHER ONE.”
—AUTO HISTORIAN CHARLIE HYDE

Right: Blast pipe. “Rust is time, evidence of time passing,” says Lowe. The plant’s patina—which lent an elegiac air to the shoot—has even subsumed the air cleaning equipment of later eras. What’s past is prologue, Lowe says. “In some ways, these pictures are meditations on what we’re doing on this planet.”

The next four years witnessed a see-saw campaign with the UAW; the Service Department grew to 3,000, the world’s largest private secret-service force, said the *New York Times*. Henry Ford, recovering from two strokes, retired from daily affairs; Bennett eclipsed Edsel to become de-facto chief.

The company’s labor record led to the loss of a \$10 million defense contract, and the Supreme Court upheld a National Labor Relations Board decision ordering the company to reinstate those illegally fired. A wave of strikes and melees—Bennett pitted loyal African-American workers against white union supporters—threatened to invoke the National Guard. Finally, in 1941, Henry Ford capitulated—and was stunned when his workers voted the union in. So Ford trumped the other companies, giving UAW the best contract in the business.

Edsel Ford died of stomach cancer in 1943; his son, Henry Ford II, took over, to lead the company into a new era. One of his first moves was firing Harry Bennett.

Many Rouge functions were moved out of Detroit, ostensibly to decentralize in the face of a Soviet nuclear attack. Hyde posits a different view. “The Ford union was known as the most left-leaning, with a lot of communists. Some argue that the downsizing was to weaken the local, which had 120,000 members, more than many national unions.”

THE NEW GLORY DAYS?

Today, the company—led by William Clay Ford, Jr., the first of the clan at the top in two generations—charts innovation in the sense of the car maker’s glory days.

“Ford Motor Company is doing a terrific thing, spending billions of dollars to modernize the Rouge,” says Hyde. “I applaud them for not abandoning Detroit to build new plants in Mexico. At one point they were thinking about padlocking the gates and walking away, leaving this seething environmental disaster. Instead, they’ve come up with something that’s ahead of the curve in terms of design innovations with the environment in mind.”

Rain off the roofs flushes “lovely things like arsenic and chrome”—which inhabit the soil—into the groundwater, says Hyde. So the new assembly plant has grass on top. Sod, an insulator, saves on heat and air conditioning, while absorbing the rain and carbon dioxide, re-released as oxygen.

Yet, while Ford is “greening the Rouge,” as the plan is called, “the company has paid no attention to the historic buildings,” Hyde says. “One of the reasons HAER focused on the steel mill, aside from documenting before the upgrade, is that Ford didn’t want someone turning a lens on what was being demolished”—like Building B, witness to the creation of the Model A and the Mustang.

“The story is told,” says Hyde, “that in the mid-’60s Ford was beginning to demolish its Highland Park factory. Eleanor Clay Ford—a major stockholder and mother of then-CEO Henry Ford II—drove by one day and was appalled. She called her son and said, ‘You need to stop that immediately.’ Thanks to her, we still have the building that housed the first assembly line.”

However, interest in preserving auto plants is “really non-existent,” Hyde says. “In the last 20 years pretty much all of the original generation has been demolished or is in serious decay. A whole lot has gone by the wayside, often not documented, because the city figures if they demolish without using

federal funds, they don’t have to.” He’s a realist about it. “Ford is no less sensitive than the other companies. To be fair, preservation is a tough sell. Many historic buildings are four stories, or six. That kind of factory is not used by the auto industry anymore. They want to be on one floor. And, frankly, Ford does do a better job of preserving their history than either of the other two, through their archives. In re-creating the company, you can do much better with Ford.” Still, can file cabinets capture an American monument’s sense of place?

“People bemoan the failure of preservation in Detroit, and it’s not just the auto plants,” says Hyde. “In Boston or New York, loft developers would be lined up for the buildings that this city takes for taxes. It’s the attitude we have towards our cars. You buy it new, keep it a couple years, and get rid of it. It’s obsolete. You get another one.”

Meanwhile, the region sprawls with the ruins of the auto age, saved from the wrecking ball by the economic doldrums. For now.

For more information, contact Richard O’Connor or Jet Lowe, National Park Service, Historic American Engineering Record, 1849 C St., NW, Washington, DC 20240-0001, richard_o’connor@nps.gov or jet_lowe@nps.gov. Contact Charlie Hyde at Wayne State University, Department of History, Detroit, MI 48202, c.k.hyde@wayne.edu. The HAER archive is online at memory.loc.gov/ammem/hhhtml/hhhome.html. For more on Charles Sheeler, go to www.artchive.com/artchive/S/sheeler.html.



Far left: Sandwiching a layer of polyvinyl resin between sheets of glass. “Cleanliness is paramount at this stage,” says Ford Bryan in *River Rouge: Pictured in Its Prime*, “where a bit of lint or dandruff can result in a visible defect in the final product.”

Near left: 1939 Pickup.

HENRY FORD MUSEUM; PUBLICATIONS INTERNATIONAL LTD.

