

The Ghosts in the Machines

Why does the industrial landscape seem so alien and forbidding?

By Brian Hayes

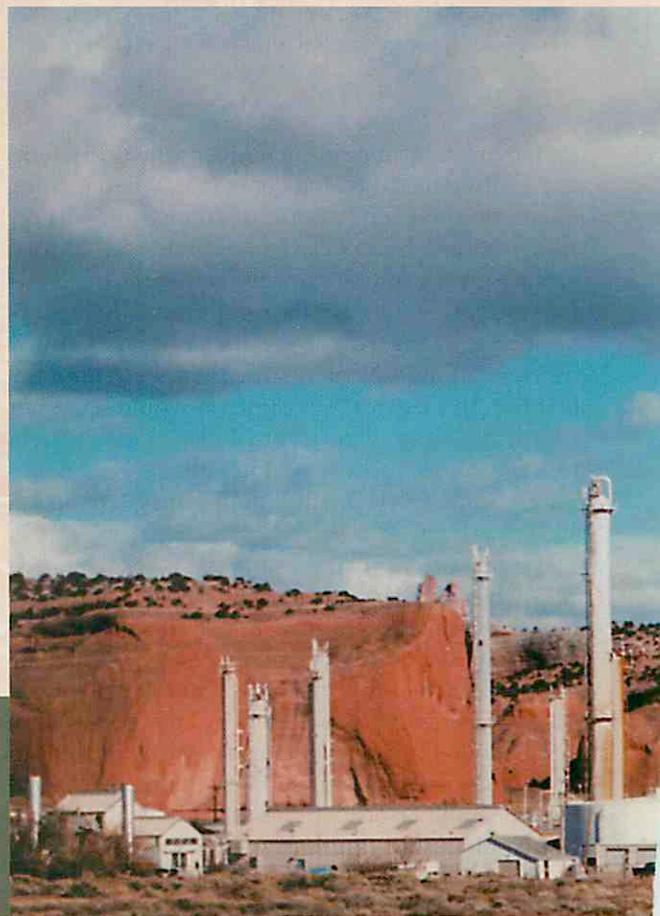
One winter afternoon a few years ago I was standing by a highway outside Gallup, New Mexico, admiring the scenery. The vista before me was a classic of the American West: red sandstone buttes rising from a valley floor, made redder still by the setting sun. It was the kind of landscape we all know from films and paintings and postcards. But this particular vista had something more. In front of the cliffs—and in fact rising to greater heights—were several cylindrical spires that I recognized as petroleum distilling columns, the kind of equipment that dominates the skyline of oil refineries. Off to one side were dozens of gleaming white storage tanks, some of them spherical, some lozenge shaped. The towers and tanks belonged to a plant for converting liquefied petroleum gas into propane and other products.

Many viewers of this scene would consider the industrial hardware in the foreground to be an intrusion, a distraction, perhaps even a desecration of the landscape. But it was the propane plant, rather than the scenic buttes, that had induced me to pull off the interstate and pull out my camera. For the past twenty years I have made a project of documenting the industrial artifacts that are so much a part of the modern landscape—from the most mundane bits of infrastructure (fire hydrants, manhole covers, traffic stoplights, utility poles) to those titanic installations that transform the terrain (landfills, mines, power plants, steel mills). Often I find myself making a pilgrimage to places that other

people go out of their way to avoid, and I struggle to get an unobstructed photograph of the very things that everyone else tries to crop out of the frame.

At Gallup, I found the propane works interesting and worth a stop, but even I had to ask: *Why here?* The man-made elements of the scene—the cylinders and spheres and other simple geometric shapes—seemed to clash with the softer natural landforms, as irreconcilable as stripes and plaid. Couldn't they have

Wingate Fractionator Plant, outside Gallup, New Mexico, is a facility owned by the ConocoPhillips Company for processing liquefied petroleum gas. The plant lies near routes that reflect centuries of human travel by foot, covered wagon, stagecoach, railroad, and automobile. To the modern eye, however, the placement against the natural landscape appears jarring. The photograph was made by the author.



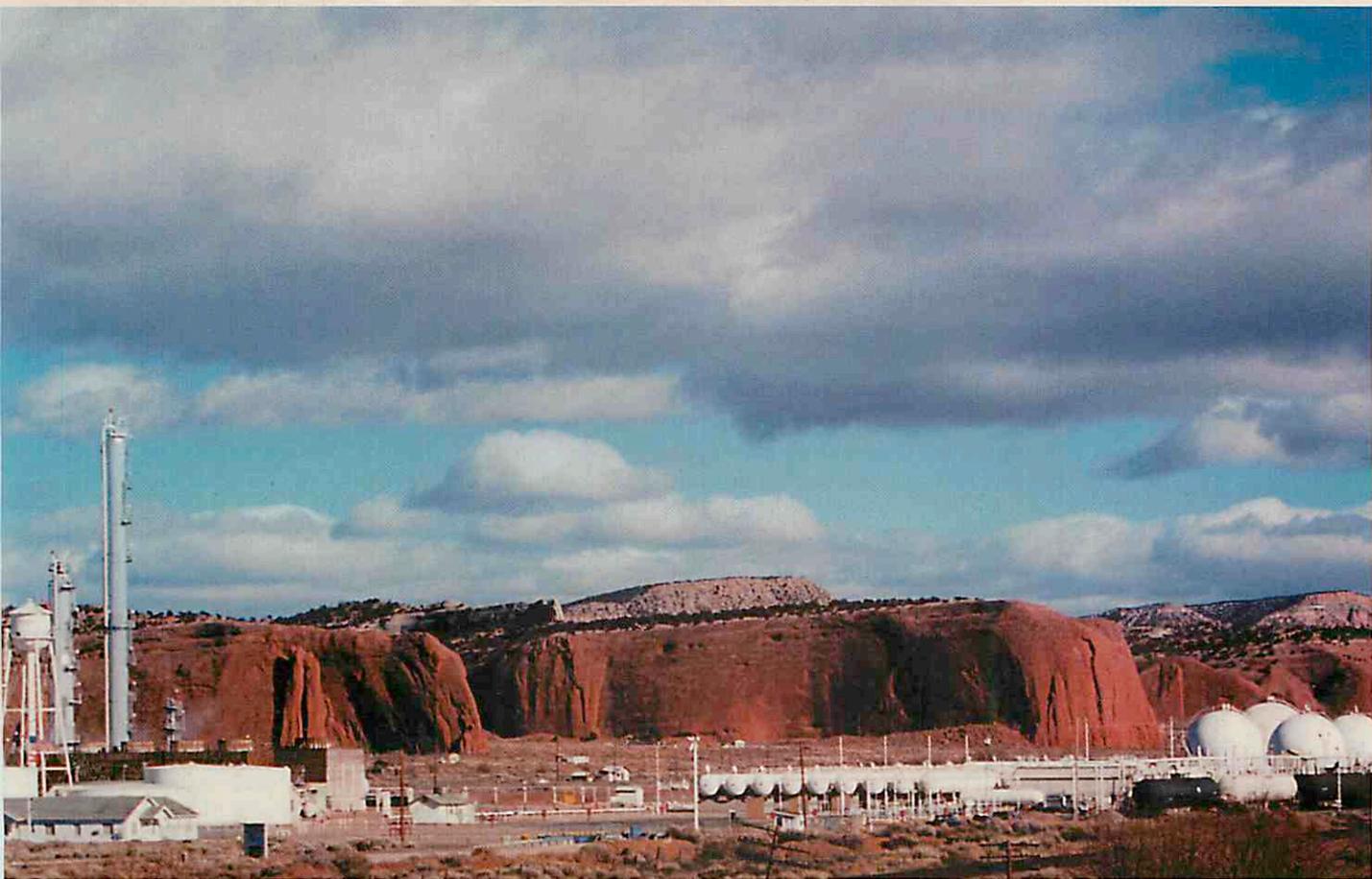
found a better place to put all that? History may provide a partial answer. The plant, at the terminus of a pipeline that originates ninety miles to the northeast, appears to have been located for convenient access to major east-west routes over which the gas products can be distributed—the railroad and Interstate 40. Before the highway and railroad were built, a stage-coach line followed the same route, which crosses the Continental Divide. Running parallel, thirty miles to the south, is the scenic road, State Highway 53, also known as the Ancient Way. That route follows a trail that, centuries before the arrival of Europeans, connected the pueblos of the Zuni and Acoma peoples. In other words, this landscape has been put to human use for a very long time. Still, the petrochemical gear seems to fall into another category, not just more conspicuous than earlier signs of human habitation, but also more menacing.

The clash of values goes beyond aesthetics. After all, everyone knows that nature is good and good for you, whereas industry is ugly, evil, and dangerous. The mention of nature brings to mind majestic landscapes: the Grand Canyon, Yellowstone, Yosemite. The mention of industrial technology brings to mind a long list of disasters: Love Canal, Three Mile Is-

land, Bhopal, Chernobyl. In the presence of nature we hold our breath in hushed reverence; in the presence of industry we hold our nose.

It was not always thus. A few centuries ago, nature was often portrayed as savage, hostile, and cruel. Mountains and forests were barriers, not refuges. The lights of civilization were a comforting sight. We took our charter from the book of Genesis, which grants mankind dominion over the beasts, and we felt it was both our entitlement and our duty to tame the wilderness, fell the trees, plow the land, dam the rivers. In the most extreme version of this ideology, everything on the planet was put here explicitly for human use. At the opposite extreme, today, the Earth-first faction urges us to treat the entire planet according to the campsite ethic: carry out what you carry in, and leave no trace of your passage.

The crossover between those two sensibilities seems to have come sometime in the nineteenth century, when millions of people were leaving behind a rural life for jobs in factories, mills, and mines. That was the epoch when Henry David Thoreau decamped to Walden Pond (but couldn't escape the locomotive's whistle), and when John Muir became a

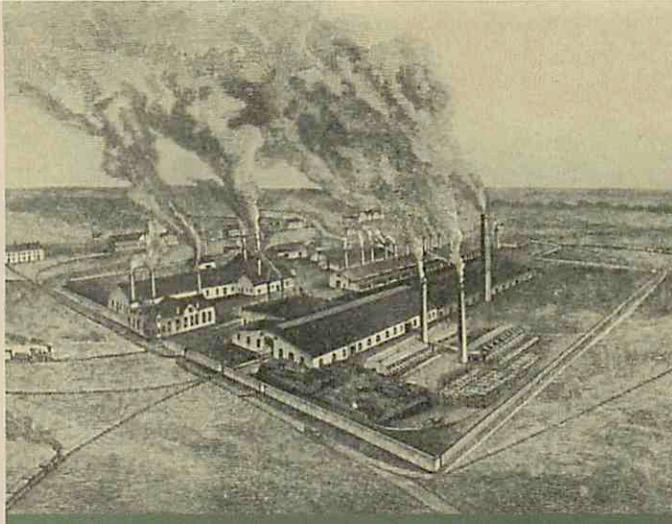


voice crying out for the wilderness. At the same time, however, others were still celebrating rather than lamenting the conquest of nature. In 1887 the American writer William Makepeace Thayer published an exuberant travel guide, *Marvels of the New West*, whose title page promises “marvels of nature, marvels of race, marvels of enterprise, marvels of mining, marvels of

stock-raising, and marvels of agriculture.” Five of those six marvels refer to products of human activity (the “marvels of race” are archaeological relics). Even the chapter on marvels of nature bears a strong human imprint. The engravings that illuminate those pages show canyons, peaks, and craggy rock formations, but there is very often a railroad line running through the middle of it all.

The modern resolution of those conflicting impulses is a curious one. Obviously we live in a world where technology has triumphed, where most citizens spend the better part of their days interacting with machines: automobiles, computers, televisions, automated bank tellers, self-service gas pumps. Even those who go out to seek the wilderness are likely to take along a cell phone and a GPS receiver.

And yet there has never been more wariness of industrial development and more skepticism about its benefits. There’s so much to worry about: antibiotics, hormones, and pesticides in the food supply; declining fisheries; genetically modified crops and livestock; greenhouse gases and global warming; mad cow disease; mercury and sulfur emissions from coal-fired power plants; the accumulating radioactive wastes from nuclear power; the slash-and-burn destruction of tropical rainforests. We fear that our own wastes will overwhelm us. We complain that automobiles are choking our cities, and their exhaust fumes are choking us—but, we suspect, if the petroleum to fuel all those SUVs runs out, the practical consequences will be even more dire. All in all, the values people hold—or claim to hold—are closer to those of Thoreau and Muir than to the industrial boosterism of William Thayer. Yet the high-tech world is the one we choose with our dollars and our actions.



*Smelter in Argo, Colorado, for recovering gold and silver, is portrayed in this engraving, published in William Makepeace Thayer's 1887 travel guide, *Marvels of the New West*. The guide reflected the exuberant aesthetic sensibilities of a growing nation, extolling the products of human activity—including agriculture, mining, and railroad construction—as much as the natural landscapes that made up their backdrop.*

In the middle of my long journey through the industrial landscape, I made a discovery that may help to explain a little about this strange ambivalence toward technology and industry. I had an epiphany in a parking lot.

I was visiting a railroad facility known as a hump yard. The basic function of the place is much like that of a post office sorting room, but the scale is a good deal larger be-

cause the items being sorted are not letters but 150-ton freight cars. Trains from various cities converge on the yard, where the cars are separated and reshuffled into new trains, which then depart for other destinations. Engines push a long line of cars slowly up a hill, ascending at a walking pace. At the crest of the “hump,” the cars are uncoupled one by one and allowed to roll down into a “bowl,” where many tracks fan out to the left and right [see photograph on opposite page]. A series of switch points directs each car to whatever track holds the correct outgoing train.

The hump yard I visited was a big place, a hub of the national rail network, covering hundreds of acres of land. When I drove through the entrance gate, I wasn’t surprised to find a parking lot with space for at least 200 cars. But the lot was empty except for a dozen cars and pickup trucks huddled near the entrance to the main building. The superintendent who was showing me around soon explained. At one time, he said, the yard employed a large number of brakemen, who rode along on each of the freight cars to control the speed as the cars rolled downhill. There were also switch operators, who steered the cars onto the right tracks. And inside the building was a roomful of clerks, who handled the paperwork that accompanied every freight car on its trip across the country.

All those workers are gone now. The role of the brakemen has been taken over by mechanical “retarders,” rail devices that control the speed of a passing car by squeezing the flanges of the wheels. The motion of the cars is measured by a radar gun much like the one that police use to catch speeders; a computer then adjusts the retarders accordingly. Computers also control the switches that guide the cars to the right tracks. And the paperwork, too, is a thing

of the past; like most other business transactions today, freight manifests are handled by electronic communication. The room that used to house the clerks is as empty as the parking lot.

What struck me that morning was just how lonely a place the industrial landscape has become. It's not just railroad freight yards. I found the same haunting depopulation almost everywhere I looked. On the docks of a cargo port, gangs of longshoremen used to swarm over a ship to load or unload it; now most of the work is done by one artful crane operator, perched high overhead, placing 60,000-pound containers in a ship's hold or on a dock at the rate of two a minute. Where miners used to toil underground, drilling and blasting, the earth is now ripped open by gargantuan shovels and draglines; these machines, too, are controlled by one worker in a high glass booth. Telephone switching centers, once filled with the voices of hundreds of operators, are silent, dark, and deserted. On the plains of Kansas a solitary farmer in the cab of a magnificent tractor plows and plants a thousand acres of land.

Fifty years ago "automation" was a hot topic, a subject for academic studies, newspaper editorials, congressional hearings, and presidential commissions. The prospect of replacing human labor with machines seemed at once attractive and forbidding. According to one view, automation would liberate us from drudgery, giving people the time and economic freedom to cultivate higher callings; we would

become a society of poets and scholars at leisure. The other side asked: If our jobs are taken by sleepless machines, how shall we live?

At the time these competing visions of the future were being vigorously debated, most people probably believed neither of them. The idea that automation might either displace or liberate some large fraction of the workforce was one of those world's-fair fantasies that would always remain just beyond the horizon, like the car that drives itself.

Now automation is a reality, even though the word itself is seldom spoken anymore, and the debate over its threats and promises has faded from memory. Entire categories of jobs have all but disappeared. Elevator operators, typesetters, and airplane navigators have followed milkmaids and lamplighters into oblivion. It has all happened with remarkably little fuss. The marauding Luddites of nineteenth-century England smashed the power looms that threatened their livelihood, but the recently displaced bank tellers have not been sabotaging ATMs. Neither the utopian nor the dystopian vision of an automated future has quite come to pass. We have not yet become a nation of poets and scholars, but neither are there vast armies of the dispossessed and unemployed roaming the streets begging for bread. Perhaps we don't yet know

Hump yard in Linwood, North Carolina, is a facility for sorting freight cars to make up trains. Such yards once employed hundreds of workers; today most of the work is done electronically and automatically, supervised by a small crew in a control tower. The photograph was made by the author.



all the social and economic consequences of automation, or of the related trends designated by the current buzzwords “outsourcing” and “globalization.”

But one effect is clear: the depopulation of the industrial landscape has made it seem an otherworldly place, disconnected from our everyday lives.

Farms, mines, factories, mills, and ports were not always such lonely places. Millions labored there. Today, in contrast, most of us do our work in offices, stores, restaurants, hospitals, or classrooms. Only 8



Toyota automobile manufacturing plant near Georgetown, Kentucky, is situated outside the town and far from any large city. Such out-of-sight, out-of-mind locations are typical of many manufacturing sites today. The aerial photograph was provided by Toyota Motor Manufacturing, Kentucky, Inc.

percent of U.S. jobs are classified as “production occupations,” a category that takes in everything from assembly-line workers and machinists to nuclear reactor operators. (The category doesn’t include farmers, but they have almost fallen off the charts anyway, making up less than one-half of 1 percent of all workers.) Few Americans of the younger generation have ever seen the inside of a coal mine or a steel mill.

The changing geography of industry has added to the sense of isolation. Industrial districts were once planted in the heart of the city—or else the city grew up around them. The automobile assembly plants in Detroit, the flour mills in Minneapolis, and the stockyards in Chicago were all urban institutions. The steel mills of Pittsburgh and Cleveland were surrounded by the homes of the people who worked there. New York City’s garment district was in the middle of one of the most densely populated neighborhoods on the continent.

Today, by mutual consent, industries get as far away from people as they can. The “industrial park,” a term whose linguistic oddity has worn off over the years, is explicitly designed to buffer factories and warehouses from residential areas. Or consider the new generation of automobile manufacturing plants, such as Toyota’s immense factory near Georgetown, Kentucky: they are miles out in the countryside, off by themselves, with only a few farms for neighbors. Baltimore’s Inner Harbor is another instructive example: The wharves of the neighborhood were once the economic engine that drove the rest of the city. The area is still a moneymaker, but the wharves have been replaced by hotels, restaurants, a convention hall, a ball park, and an aquarium. Baltimore remains a major port, but the ships unload in newly built facilities situated miles from the Inner Harbor.

It’s a familiar refrain: people want electricity but no power lines, gasoline but no refineries, cell-phone service but not the cell-phone antenna tower. I once spoke with the aggrieved and exasperated operator of a stone quarry. When he began digging his pit, it was on the distant outskirts of a city, but it had since been engulfed by suburban development. Nearby homeowners wanted to shut down the quarry because of the noise, the dust, and the truck traffic. The owner objected that he was there first, indeed that stone from his quarry had built the foundations of the houses. The new residents’ intolerance was unfair and irrational, he complained.

The manager of a garbage-burning incinerator told me that the acronym NIMBY, for “not in my back yard,” has been superseded by the more extravagant terms BANANA (“build absolutely nothing anywhere near anybody”) and NOPE (“not on planet Earth”). Needless to say, there is another side to the argument, starting with the principle that people should have a voice in the decisions that shape their own environment. On a local scale, decisions about where to build landfills, sewage plants, and highways are a severe test of the democratic process. More often than not, the nastier bits of infrastructure wind up on the poorer side of town. The same thing can happen on a national or global scale, when richer cities or countries find ways to export their wastes and other problems.

As industry retreats to the margins of society, queasiness about technology is fueled in part by people’s isolation from the means of production. Because the mills and factories and power plants are places we never enter, they begin to seem alien, exotic, mysterious—and often sinister. We don’t know what goes on behind the chain-link fence of a refinery or a smelter or a paper mill, or what comes out

of the smokestacks, and therefore we suspect the worst. The owners of the plant—and often the workers, too—feel besieged by a hostile and uncomprehending public; they respond by closing the gates and building the fences higher. Their secrecy, naturally, tends to confirm public suspicion that they must have something to hide. And maybe they do. It is a spiral of distrust and animosity.

Perhaps there is still some hope of reconciliation, but it will take a while. Not all industrial artifacts evoke fear or disgust. Lighthouses, for instance, have a certain romance about them, and Dutch windmills are considered highly picturesque. Tugboats have inspired cheerful children's books. Railroads have their rail fans, who prowl the freight yards like paparazzi. Some of the old water-powered mills along New England's rivers, where generations of workers toiled for paltry wages, have been turned into upscale restaurants and shops. Quaker Oats mills and silos in Akron, Ohio, have been converted into a hotel. A former steel mill in Duisburg, Germany, has been

converted into a new kind of industrial park—one where children play among the ruins of blast furnaces.

Those examples suggest that fondness and quaintness come with age—or better yet, with obsolescence. Hence that propane plant outside Gallup may look rather different to future generations. In fifty years—or maybe it will take 150 years—we'll be looking back on the brief but glorious age of petroleum in the same way we now look back with both horror and nostalgia on the age of whale oil. Those towers and tanks beneath the red rock buttes will be lovingly restored as historical artifacts; the buttes would look bereft without them. □

This article was adapted from Brian Hayes's forthcoming book, Infrastructure: A Field Guide to the Industrial Landscape. Copyright ©2005 by Brian Hayes, and used with the permission of the publisher, W.W. Norton & Company, Inc.

Steel mill, once the locus of humming industrial activity, now lies shuttered in Bethlehem, Pennsylvania. People may someday view such industrial infrastructure as picturesque, as they do the windmills and lighthouses of yesteryear. The photograph was taken by William Thomas Cain.

