Two

Lines

ELECTRIC LINES GLISTEN, especially at sunrise and sunset when the low-angled sun bounces from their high-tech metallic covering. Everywhere electric companies abandon the not-quite-waterproof black rubberized covering that protected cables since Edison's time. So even on an overcast day the explorer glances up at silvery wires, the great spider's web slung just above the national landscape.

Wood poles carry electric wires, and telephone and cable television lines too. Nothing screams more loudly of the still-developing-nation status of the United States than the creosote-treated poles, all slightly out of perpendicular, marching along almost every road as they once marched across the plains in the hoofprints of the Pony Express. Other nations, at

least in cities and suburbs, preferred steel pylons from the start, or snaked their cables underground in conduits, safe from lightning strikes, snowstorms, falling tree limbs, even errant motorists, and even now in Japan, Germany, and elsewhere, rural families expect that someday overhead wires will disappear beneath road surfaces. But not so in the United States, land of cheap timber, vast distances, and an easygoing willingness to accept the poles that warp and twist and finally rot. In the 1880s the first electricity-making companies grabbed telegraph and telephone technology and lit up cities, then small towns, then suburbs, always using wood to carry the spark.

Wood poles and copper wires paralleled railroad lines beginning in the 1840s. Telegraph technology kept trains from ramming each other. From one station to the next, the dot-dash-dot clicking of the telegraph key and sounder carried orders from the dispatcher, stopping one train, advancing another, sidetracking a third. The chattering of Morse code entranced all forward-looking Americans before the Civil War, for it announced messages moving as fast as light. No longer did vital news come by stagecoach or post rider. Now it arrived in a burst of chattering chirps, from a special sounder perched on a little shelf in the bay window of the small-town depot, a sounder adjacent to one reserved for railroad-train orders, a sounder eventually owned by a consortium of short-distance companies linked under the name of Western Union. News bulletins only interrupted the ordinary flow of private messages sent from one person to another, one company to another, but sometimes they interrupted the periodic dispatches sent by "wire service" reporters to newspaper editors. By the 1880s, telegraph operators often monitored several sounders, including one dedicated to play-by-play reports of sporting events or minute-by-minute news of ballot counting. Men and women desperate for up-to-date information gathered at the railroad station, sometimes in hotel lobbies, now and then at storefront telegraph offices for news of boxing matches, horse races, steamship sinkings, commodity- and stock-market fluctuations, war.

And around noon they drifted to telegraph offices for the time signal, the announcement of precise noon that flashed across the United States once each day, the single click of the telegraph sounder that enabled bankers and shoemakers to synchronize their watches with those of railroad conductors and engineers, to see how accurately their timepieces ticked, the single click that killed rural time, small-town time, personal time.

Inventors created gadgets to change clicks into instantaneous hard copy. Typewriter technology

merged with telegraph equipment to produce machines that not only sent messages along telegraph wires but received them as electric impulses and converted them to typewritten pages. Other inventors, despairing of teaching businessmen to type, created stylus-and-metal-plate gadgets that converted handwriting to electricity that simultaneously twitched pen-holding wands into duplicating—more or less—the handwriting from afar. Best known of all, ticker tape converted code into hard-copy records of stock- and commodity-market fluctuations, and the Teletype in newspaper backrooms transmitted dozens of stories that never saw newsprint. A century before the fax, telegraph wires carried millions of messages converted from paper to electricity to paper, and other millions sent from terminals to printers.

Yet always the message charged along wires supported on wood poles. By the 1880s, urban poles carried hundreds of wires each, dozens for train dispatching near great terminals and freight yards, but scores more for telegrams, the inexpensive but brusque daytime messages delivered by Western Union messengers on bicycles, the extremely cheap messages sent in the wee hours of the morning, the telegraph-company "night letter" hand-delivered after daybreak. Not until the great snowstorm of 1888 brought down thousands of poles did New York City mandate the

installation of underground tunnels for telegraph and other wires, creating one of the visual signatures of *city*. Real cities have underground wires, not lines strung atop unpainted wood poles, the poles that by 1900 carried telephone lines from house to house.

While telegraph poles marched mostly along railroad tracks, telephone poles marched—and staggered—along almost every street, almost every rural road. Until the merger of most local firms into the Bell System, many residential and small-town commercial streets had poles on both sides, since some families chose one voice-message provider while neighbors chose competitors. Away from Main Street, low-voltage telephone lines stretched away from poles to run from house to house, from barn to bridge to tree to barn, from fence post to fence post, the single telephone cable sometimes slung just beneath another wire, the lightning catcher linked every few hundred feet to wires grounding it to buried copper rods. But in suburbia, every sixty feet, every ninety feet, the distance depending on the thickness of the poles and the number of cables above, sprouted rough-hewn telephone poles slathered in creosote.

And in the very first years of the new century, street trees began to die. Telephone companies pruned the crowns of trees in order to prevent ice

storms from bending limbs into contact with lines and shorting them out, even breaking them. Near downtown areas, where poles carried wide cross-arms laced with cables, telephone companies pruned further and further, and in time began removing entire trees, especially those so heavily sheared that they died soon after surgery.

Electricity companies soon decimated the national urban and suburban street tree population, precipitating by 1920 a nationwide uproar. Once alternating-current electricity flowed along cables hung above the telephone lines, street trees had to be lopped far back, or even removed wholesale, lest their branches touch the cables and short-circuit the electricity directly to the ground, igniting the tree and electrocuting any bystanders.

Electricity transmission created the trolley car and its larger, swifter, rural cousin, the interurban electric car. Almost silent, extremely inexpensive to build, and operating along roadway tracks vastly less expensive to install than private right-of-way railroad tracks, the slithery electric car swept everywhere across the nation after the 1890s, drawing its power from its trolley pole gliding under a bare electric wire strung from telephone poles. Heavy wire sometimes required poles on both sides of the road, each pair holding a heavy support wire itself carrying at right

angles the trolley power line snaking above the tracks. Less-traveled trolley lines made do with trolley wires suspended over track and roadway on enormous brackets jutting out under the ordinary electricity wires, but placed above the less-hazardous telephone lines. On curves especially, trolley companies erected mazes of supply, support, and pull-off wires, the whole arrangement that made up what everyone knew as *overhead electric catenary* and threw weblike shadows over dirt roads and brick streets.

Two kinds of electricity coexisted fitfully atop the poles. Telephone and trolley wires carried direct-current electricity, cheap to produce, extremely constant—*clean* in the jargon of 1900—but difficult to send over long distances. As early as the first continental telegraph line that replaced the Pony Express, electrical engineers knew about voltage drop and understood that the wire west of St. Louis would have to be as thick as a man's thigh to get the Morse code spark across the Rockies. Instead they invented recharging units that strengthened the spark. Electricity companies abandoned direct current almost at once and provided alternating electricity to businesses and homes, the harder-to-manufacture, "noisy," but cheap-to-transmit sixty-cycle-a-second kind that, by 1905, up-to-date citizens knew as *juice*. And instead of recharging units, the electricity com-

panies installed transformers, immense cylinders placed out of harm's way atop the poles. Essentially electricity pumps, transformers simply transform electricity, either pumping it up to race farther along the line, or pumping it down every few houses to the 110-volt/220-volt standard each family uses for lighting and for high-current appliances, mostly stoves, water heaters, and clothes dryers. Telephone lines required junction boxes here and there, but transformers soon hung everywhere, the cylindrical fruit of the electric tree, the enduring memorial of a technological battle fought between Edison, Westinghouse, and other inventors who disagreed about the relative merits of direct current and alternating current.

And they hummed. Alternating current hums. People with acute hearing know when the electricity fails even if they see no lights blink off, hear no appliances stop dead. In an instant the quiet home goes silent. In the wee hours of the morning, a power failure wakes some people because the background hum ends abruptly. Members of symphony orchestras loathe the hum as the background noise they always hear, especially when reading sheet music, in what others consider silence, but few other occupational groups give it much notice. By contrast, housewives, in the first years of the century, feared that electricity leaked from any outlet lacking a plugged-in lamp, and

worried that leaking, humming electricity caused headache and cancer. Long after the direct-current-powered trolley car glided past, its trolley wheel sparking just enough to leave an odor of ozone scenting the air, its eerie echo endured, the almost imperceptible humming of the adjacent wires and transformers carrying alternating current, the wires explorers still call *live*.

Live wires leak. Explorers scrutinizing a wood utility pole often find a thick copper wire leading down the pole to an even thicker copper rod pounded into the earth. The wires ground the poles and wires during lightning strikes and help keep transformers from exploding dominolike down whole streets, one after another as the immense jolt races through the system to the earth. Late in the 1880s, water-supply and gas-supply companies discovered that electricity leaking from trolley car lines followed water and gas pipes for miles toward the powerhouse dynamos. The rogue electricity, called *stray electricity* by its angry discoverers, destroyed iron and steel piping in the process researchers quickly christened *electrolysis*, and when pipes finally burst, often leaked into subterranean electric and telephone lines too. Lawsuits and legislation combined to force street railway companies to ground their wires and rails as perfectly as possible, but even now the explorer sniffing the dawn

air wonders about the whiff of natural gas. Has electrolysis destroyed a gas-main connection?

Maybe. Risk-taking explorers who push against the orange plastic temporary fencing surrounding a deep hole dug in the street, who amble up to the half-fenced hole and stare down into the gloom, discover the never-mentioned reason for the cordons put around holes. No utility company wants close inspection of its unearthed hardware. The gas company especially worries about the public seeing corroded mains and pipes, and water-supply workers struggle hard to keep inquisitors from seeing rusted mains and brittle shut-off valves. But the explorer who ventures out on a hot summer afternoon, who sniffs the ozone of an approaching thunderstorm and goes for a walk, quickly sees the stunning impact of potential lightning. Construction crews quit work early, pull steel plates over the holes, get away from faulty grounds. Every time a gas-company maintenance crew cuts a gas main, its employees clamp a metal bridge to the pipe, and cut beneath the bridge, on the off chance that electrical service in some house or office or factory is grounded to a gas pipe, not a water main. Without the bridge, a spark might jump across the cut and ignite the gas. And even with it, a lightning strike can follow a gas main to its weakest point. Electricity hums and leaks and goes places no one intends.

Explorers know the electric hum. When they walk or pedal along residential streets at daybreak, only the call of birds masks it. Let the birds fall silent, and the hum comes and goes with the hum of tires on smooth pavement. But here and there the hum grows louder.

Chain-link fences capped with razor wire keep explorers away from the immense outdoor transformers that punctuate so many residential neighborhoods. Along some leafy street, surrounded by houses, sits a quarter acre of steel and copper transformers painted green or black, a dozen gray cabinets securely locked and decorated with bright yellow warning stickers, perhaps a pole or two, always one fitted with bright lights. Little substations hum louder than overhead electric lines and transformers, but do they leak electricity through the ground only or through the air as well? Now and then an explorer walks two blocks from home, stands in front of the substation, and pulls out a pocket compass. The needle flickers, swings about, often points anywhere but north, unless north lies beyond the chain-link fence.

Explorers of ordinary space carry pocket compasses to detect magnetic fields. They play the adolescent "let's find electricity" game of the first years of the century, holding the compass as they pass red-brick buildings, stand atop urban manhole covers, walk past suburban substations. Explorers discover

the ubiquitous, unsigned presence of high-voltage, high-amperage electricity everywhere and remember their high school physics lesson. A well-grounded person standing below an energy source, say a barefoot pedestrian standing atop a concrete sidewalk below a streetlight, becomes an electricity conductor exactly as an electric capacitor functions. Sometimes, if the power source is strong enough and the explorer is well enough grounded, the explorer can almost feel the charge, say when the explorer pushes onto a power line right-of-way.

At right angles to local distribution wires run the long-distance, high-tension, high-voltage electric lines, the immense cables held aloft on metal pylons or at the end of their long runs, atop the tallest of wooden poles. Motorists driving under such lines notice only a momentary crackle of their radios and don't realize that the crackle is static caused by stray electricity. Explorers know better. They hear the hum, sometimes feel the static on their skin, feel their skin hair rise as the lightning storm swings across the lines above them.

High-tension lines run along dedicated rights-of-way either owned or leased by electricity companies. The great swaths plunge through any kind of built fabric, even cities, but where property values are very high the pylons stand higher, raising the juice-filled

cables a hundred feet above shopping-mall parking lots, around factories, alongside interstate highways. Elsewhere the swaths cut lower but wider through suburban neighborhoods, through forest and farmland, across parks. Nothing tall, nothing *that might fall across,* stands near the high-tension wires, and nothing more than stubby, *nothing that might reach up,* stands beneath them. While the electricity companies permit farmers to raise crops beneath the high-tension wires, while they understand that the wires might safely cross a parking lot, every few years the companies chop down trees rising along the right-of-way and even cut the brush. Nothing must grow tall enough to carry some storm-induced spark between the high-voltage line and the ground. Nothing must ground out the electricity already straining at its confining cables. Nothing must mask the inspector's gaze down the right-of-way.

Power line rights-of-way are unnoticed—perhaps *unrealized* is a better word, because only to explorers are the rights-of-way real—highways lacing the whole country, the routes intrepid and trespassing explorers follow to shortcut across country. Landowners erect signs and fences, but the explorer knows that every right-of-way includes a dirt track for maintenance vehicles, a dirt track often deliberately camouflaged where it intersects any motor vehicle road, a dirt

track gated against motor vehicles but accessible to any explorer willing to look for it along the road shoulder and willing to risk trespassing a bit. The early-morning explorer trespassing along the electric right-of-way discovers how much wild animals depend on the alternate highway system, how even large species like deer move along the power company routes between wilderness and state parks and privately owned clumps of forest. Only where the rights-of-way cross a paved or dirt road do power companies let the brush and trees grow higher, partly to keep motorists from noticing the supposed ugliness of the right-of-way itself, partly to keep secret its easiest access points. But that high-growing brush often shelters raccoons and coyotes, even elk and moose and bear waiting to cross the line of cars intersecting their route, and the explorer who slows down, approaches from downwind, and looks *in* at the leafy gloom often sees the eyes watching back.

Other rights-of-way resemble the high-voltage one. Natural gas and crude-oil pipelines run across much of the South and the West and snake far into the North, always far less visible to the speeding motorist because the pipes lie buried. But trees stand cleared from them too lest roots disturb the pipes, and always a dirt track, often much less noticeable than electricity company ones because much less frequently used, runs amid the weeds. From Louisiana and Texas and Oklahoma north, east, and west run the pipeline rights-of-way, sometimes merging with the electricity rights-of-way and reaching into the most distant states, leading the explorer as secretly as any coyote deeper and deeper into the woods, across farmland, through suburbs, on and on.

Electricity rights-of-way and some pipeline rights-of-way run as rivers flow in deltas. To explore upstream means to notice diverging lines, to watch the cables grow thicker, steel pylons replace wood poles, then the pylons grow taller. Finally, miles and states away, the walking or bicycling explorer crests a hill and sees ahead the cooling towers of the power plant or the immense maze of pylons and transformers beside the hydroelectric dam or finds some refinery lit up against the night. Under the wires, surrounded by the hum, atop the throbbing gas, the explorer eats lunch or dinner, grins in satisfaction at finding a dining place impossibly remote from the imaginations of most people, at the end of a shortcut between highways, perhaps, or a route that opens on thousands of backyards and unshaded windows.

Cable television offers no such route, no such vista. Cable television companies send long-distance signals by satellite and so lack long-distance lines, but their short-distance cables cling everywhere to

poles originally intended only for electricity and telephone cables. Low down on the poles, the television company cables dangle from second-thought brackets, droop from pole to pole, pole to house. Unlike its well-heeled, public utility counterparts, cable television hangs in limbo, still not recovered from wiring the nation in a decade, often unable to upgrade its network, dependent on a system of coaxial cables thicker than telephone lines and more fragile. And now its counterparts need more room on every pole.

So why not look at every pole along a short residential street, along a half mile of rural road? Why not explore by looking upward, just for a few minutes? Most people, especially those walking or running or bicycling for physical exercise, tend to look where they are going. The explorer looks ahead too, of course, but also sideways and backward, assimilating a wide field of landscape indeed. But explorers who discover so much in the 360-degree circle they scan know too how much lies downward, often almost under their feet, and they scrutinize everything from pavement types to wildflowers. And the canniest explorers look up too, up at clouds and sky and birds, up at airplanes, up at utility poles, and in looking up they descry something of the complexity of the high. They spot advertising blimps, and kites long snared in trees; they marvel at the television an-

tennae lingering from decades ago and notice the decrepitude of so many domestic and industrial chimney tops. They see not only the changing number of cross-arms and cable types atop utility poles but the growing numbers and shapes of cables. With a bit of practice, and a bit of noticing what sort of utility line worker repairs what sorts of wires, they differentiate between neighborhoods newly rewired and streets on the margins of electrical modernization. Explorers see The Internet against the sky and watch the demand for electricity and communication services change the face of every street.

Rising demands for electricity, especially for air-conditioning in the South, and for telephone service, especially additional lines for fax machines and computer modems, prompt electricity and phone companies to upgrade services, to squabble over every pole, every route. Wood cross-arms vanish as new-style brackets carry the far thicker, metal-sheathed cables that increase electricity capacity ten times over and decrease the number of transformers, but that require taller poles and massive street-tree trimming to eliminate the greater chance of accidental grounding. But lower cross-arms carried telephone lines, and so the phone companies devise thicker, bundled cables suspended from heavy metal brackets, and here and there along the road erect green-painted switching boxes to

save pole space. Everything aloft is higher up, so every "drop," every connection between pole and structure, is reangled, and more trees are trimmed, until suddenly the explorer realizes that the street trees are gone, that more cables, and thicker cables, run along the road, and that new cables begin to appear, especially the wave-of-the-future fiber-optic ones often sheathed in corrugated orange plastic.

Electricity, phone, and cable television companies alone are not responsible for the death of street trees, for the transformation of street and road vistas. Springtime explorers see another reason, at least in the North. Salting roads to melt snow and ice poisons roadside vegetation, sometimes quickly, sometimes slowly. The salt that kills maples and oaks rewards halophyte species like poison ivy, but in the end it eliminates the canopy of overhead greenery that scatters sunlight and shades pavement. Explorers sniff another killer. At dawn, they now and then get a whiff of leaking gas, know that somewhere under their feet or their spoked wheels a gas main lies ever so slightly fractured. At daybreak, when the air is still, the odor is barely discernible. An hour later, as the first breezes rise and the first unleaded-gas automobiles roll, their exhaust sometimes smelling like escaping gas and their motion roiling the air along the roads, only a rare child waiting for a school bus may

smell the gas. But the gas permeating the soil chokes trees, especially mature trees struggling against the sun-heated soil beneath the asphalt, the all-night streetlight illumination, the spray of salt every winter. So the dawn-chasing explorer weaves from side to side, sniffing, looking, figuring out under which side of the pavement the gas line lies buried, evaluating the health of street trees, then looking ahead at the poles and wires no longer masked by leaves but starkly screaming the webbing.

And the explorer notices something else. Expensive new houses, expensive new subdivisions stand miles away from high-voltage electric lines. Since the late 1980s, real estate developers have known that wealthy people who can choose where to live will not live near high-voltage power lines for fear of cancer. The explorer probing carefully along the rights-of-way discovers what is not there. No rich people live in new houses near power lines, and rich people fight the routing of new electric lines, especially long-distance electric lines, anywhere near their homes. And they fight the reactivation of railroad lines too.

EVERYWHERE THROUGHOUT THE COUNTRY, the scrutinizing walker or bicyclist finds the derelict railroad rights-of-way memorializing the post-1920 victory of

the automobile. Usually only the roadbed remains, an almost perfectly level embankment of gravel topped with cinders and crushed stone snaking its way through woods, across swamps, behind the backs of stores. Grown up in mature trees or still open in scrubby plants like sweet fern, the roadbed often displays a haphazard footpath, what colonial French explorers called a *trace*, a mere line of footprints. Children and teenagers make the railroad-bed footpath and thereby know the secrets of railroad making. Civil engineers laid out almost level routes short-cutting across country, because they worked not only under the difficulties of making steel wheels grab steel rails but under the orders of corporations far more powerful than any municipality or county building dirt roads. Only where the footpath intersects paved roads does it vanish behind the camouflage that deflects the attention of motorists, especially police officers reluctant to abandon patrol cars and follow the trace.

Any contemporary explorer who deserts the paved road for the roadbed footpath moves into a time tunnel. Overarched by mature trees that shade the right-of-way, bordered by dense woods and tall, thick brush, the roadbed winds unseen and unnoticed even by its abutters, forgotten by entire populations. Everything within the leafy corridor, or within

the grassy corridor separating pastures and arable fields, once crackled with the highest tech of all, however, and here and there the explorer of ruins discerns the remnants of technology decayed.

At either side march the fence posts carrying the barbed wire or netlike woven wire railroad companies used to defend their property against trespass. Often the wire endures, maintained by homeowners and farmers and factory owners as a sort of decrepit boundary smothered in bittersweet and other climbing vines, but more often it lies buried in leaves, long free of the wood or metal stakes tipped drunkenly along the frontier between traditional rural or small-town or suburban landscape and railroad corridor space. The fences remind the explorer that between the two derelict fences surged something demanding defense, the iron horse that behaved unlike any creature of God. But what sort of defense? Did it need defending against errant cows, or did abutters demand to be fenced from it?

Such questions weave into a thousand others. Exploring a long-abandoned railroad route means deciphering if not exactly following a ribbon of argument. Questions and surmises and sometimes answers diminish to whispers perhaps, but sometimes explode before the explorer who realizes that as the railroad bed is now, so someday might be the

high-speed highway. So well built were most railroads that everyone considered them *permanent ways*, the term by which they are legally known sometimes in Europe, often in Africa and Asia. The gentle undulation of the roadbed, the sinuosity of the curves around hills, the massive culverts carrying insignificant streams beneath the ballast—all imply an implacable, indomitable engineering. And the explorer who looks carefully, who pushes away vines from the hewn-stone blocks, who squats down and squints along the dead-level, perfectly straight roadbed streaking into the overgrown vegetation a half mile ahead, realizes that something not visible made the railroad corridor a ruin. The permanent way turned out to be impermanent indeed, but so well built that it endures without maintenance. The explorer scrutinizing a contemporary abandoned railroad corridor walks across the abyss of time so few people bridge, and confronts the everlasting solidity of Egyptian pyramids and Inca roads.

When the railroad ruled America, even small children knew it ruled by physical size and technological supremacy, not merely because its corporate owners and stockholders controlled state legislators and members of Congress. After the Civil War, the locomotives grew ever more massive, towering over anything but trees and two-story buildings, and the

trains grew longer and longer, until by World War I mile-long freight trains crept along the rails, which were shared by ninety-mile-an-hour express passenger trains composed of a few Pullman cars each eighty feet in length. Long before small towns and farmhouses boasted electric light, the nighttime passenger train advertised its incandescent brightness, and while farmers heated kitchens with wood and bathed in tin tubs, Pullman passengers swept past warmed by steam heat and luxuriating in hot showers.

On cold winter nights the throaty roar of the steam whistle echoed for miles along valleys and across prairies, and the brilliant locomotive headlights stitched the countryside like so many lighted needles poking the darkness. Humid summer nights made the whistles sound almost mournful and kept the smell of coal smoke lingering long after the slow freight or air-conditioned passenger train had become only a pair of red lights twinkling miles off or a faint throbbing sound finally overwhelmed by crickets or silence.

Every freight train rolled emblazoned with boxcars labeled for places as mysterious or mundane as Bangor & Aroostook, Moscow, Camden, & St. Augustine, Illinois Central Gulf, the Milwaukee Road, and Atchison, Topeka, and Santa Fe, or they carried

names less easy to find in schoolroom atlases, names like Cotton Belt, Nickel Plate Road, Old Colony, Southern Pacific, and Grand Trunk Western. Every mail train rolled like lightning, never stopping at small towns but instead flinging out a sack of first-class mail even as a pistol-packing railway post office clerk leaned from an open door and swung the hook that grabbed and pulled in the sack of mail hanging from a crane by the depot platform. Every passenger train—from the local puffing asthmatically from small town to small town to the transcontinental express roaring from city to city without pause—offered the spectacle of escape into the metropolitan corridor, into modernity.

And the lines of trains rolled in a corridor of their own. Steel rails, each forty feet long, lay spiked atop creosoted wood ties themselves set twelve inches apart atop crushed stone or cinder ballast. Beside the track marched the telegraph poles carrying the telegraph and signal wires along which train-control messages flashed, and here and there a signal mast rose to carry the red, amber, and green lights that directed engineers. Decade after decade, railroad companies improved corridor technology, sometimes shifting quickly, say from kerosene to electric lighting of signal lamps, sometimes moving reluctantly from stone-block culverts to concrete-and-steel ones.

Always the corridor exemplified the triumph of engineering over topography, darkness, especially weather, for inside the two fences trains ran on time even in snowstorms and gales, or at least passengers expected them to do so. Time outside the corridor fences might be seasonal or cyclical or vague, but along the elevated rails it ticked away as standard time, zoned time, railroad time. Paying passengers entered corridor technology and corridor time through the street doors of great urban terminals and small-town depots, but only when they boarded the milk train or the local passenger or the 5:34 commuter did they give themselves wholly to railroad technology and railroad time, depending for their safe arrival on signals looming far ahead and expecting to arrive on time no matter what.

So magnetic did the railroad prove that soon whole cities, whole counties rearranged themselves, if indeed the railroad did not precede almost everything else homesteaders built, as it did across much of the Great West. The explorer weaving along the grown-up right-of-way discerns how roads and hamlets and factories focus still on the long-gone tracks, how suburbs orient themselves toward the ballast, how on clear winter days hilltop mansions look down now on the trainless, trackless ribbon of plant-studded ballast.

Far out in the countryside of large estates and hobby farms, the bicyclist probing the right-of-way realizes that once long-distance commuter trains connected the opulent country homes with cities and great factory districts. And the walker glancing down at the ballast occasionally discerns a wider swath of cinders or a ten-foot-wide pavement of shrub-blanketed brick, and knows that where trees now stand a tiny station stood. And the bicyclist can crouch low over the handlebars, shift down and down, and probe the half-foot-wide path that leads at right angles from the brick-paved platform into the brush, uphill, suddenly onto a near-silent residential street lined with gated driveways. Or the walker emerges thoughtfully from the woods or fields and finds a tiny industrial park of grain elevators, machinery dealers, warehouses, wood-frame or redbrick factories, every structure marked by that certain sign of railroad influence, the walled-up loading doors four feet above grade level, too high for trucks but the perfect height for boxcar floors. Or the explorer walking or biking crests a hill in winter when the fallen leaves offer a wide view and sees stretched out a sinuous redbrick industrial landscape now crosshatched by paved roads but definitely following its long-gone armature of steel rails.

What too many educated Americans dismiss as

suburban sprawl if they pause to consider it at all, what makes no immediate sense to the motorists driving post–World War II highways, the discovering, almost bushwhacking explorer immersed in corridor shadows realizes as impeccable landscape order now cluttered, indeed obscured with modern junk.

Now and then stepping gingerly over a few creosoted ties somehow left behind to rot imperceptibly over the decades, once in a while rolling over a massive, permanent culvert standing strong against spring freshets, more rarely seeing the poison-ivy-covered signal mast staring eyeless into the woods behind, the contemporary explorer strains to see ahead through the brush, into the past. Bridges remain as well, sometimes wood trestles secure in creosote and so isolated that no arson-minded vandals know of them, and here and there an interlocking tower, the blocky, two-story building that contained the foolproof signaling mechanisms railroad companies installed at junctions to prevent train collisions. At immense intervals the explorer finds a water tower or water plug, whose spout locomotive crews jerked down in a brief operation that produced the term *jerkwater town* for hamlets lacking any other reason for a train to stop.

Rusted and toppled, broken windowed and half burned, always dilapidated but somehow enduring in its nineteenth-century built-forever corporate capital-

ist way, the abandoned railroad corridor rewards any explorer at all intrigued by industrial archaeology, linear ecology, historical geography, and it rewards any explorer anxious to shortcut well-used highways, to probe the gently graded routes around which the contemporary built environment still nestles.

And so sometimes the explorer emerges from cinders and sumac into a parking lot, perhaps, and finds ahead the roadbed groomed and even asphalt paved, made into a bicycle path by "rails to trails" folks anxious to get bicyclists, especially young bicyclists, off busy streets, and to provide smooth walking for the elderly and for parents pushing strollers. And at first the four-foot-wide bike path strikes the bicyclist explorer as really rather pleasant, easy to ride, demanding no careful attention, presenting no dangerous interruptions. The bicyclist leans over the handlebars and begins churning, cranking faster and faster, flashing around the first gentle curve, sprinting along the tangent, leaning into another curve, thinking of the Tour de France, then surprising three young mothers with four children on tricycles and two more in strollers. The children scatter. The cyclist brakes, chooses the brush, crashes down the old railroad embankment. Above, the mothers berate. Bike paths are not for speed but for enjoyment, for the very young, the strolling old, they shout.

For the serious bicyclist, for the tandem-bicycle riders cruising at fifty miles an hour, bike paths produce trouble, filled with slow-moving obstacles, training-wheel bikes, half-balanced bicyclists, bemused bird-watchers, headphone-wearing teenagers oblivious to the silent machine racing up behind. So the federal government issues guidelines now. Wherever federal money builds a bike path—or *bikeway* as some documents now phrase it—there the pavement will be eight feet wide, with open shoulders, and even secure fences, an accommodation to the bicycle era bureaucrats foresee already this side of the horizon.

But the explorer brushing past the sumac and chokecherry trees now and then emerges into brighter daylight and spies ahead the cast-iron four-legged bumper or the pile of gravel or tossed railroad ties, which marks the end of active track. Sunshine pours in among the trees pruned away from the precious rails, and usually a switchstand signal or two mark the run-around track that permits locomotives to change ends of trains. Where the railroad ends rewards attention in the last days of the twentieth century. The explorer emerging from the past finds the weeds kept more or less at bay, perhaps by burning, perhaps by herbicide, and finds the steel rails gleaming dully in the sun. Nothing particularly high-tech reveals itself immediately, but nothing much of dere-

liction either. Often a track or two lies abandoned, sometimes with sapling trees grown up between the ties, and usually the telegraph poles stand bereft of wires. But grease glistens on the movable parts of the switchpoints, and bits of steel cable welded between the rail joints set the explorer to thinking. An aluminum-painted or stainless steel electrical box stands near the tracks, heavy cables snaking from it to the rails, and perhaps away to the nearest electric line. The empty freight cars standing on the spur track dwarf eighteen-wheel trucks, and beneath the names of long-merged railroad companies carry bar-code signs like those on supermarket items. The end of the line drowses in the autumn sun while the explorer stretches, then eats lunch. End of the line or head of the track?

Here between past and future, in the present of warm sunlight lingering from summer, swatting away the yellowjacket investigating the precious can of Coca-Cola just pulled from its insulating pack and opened to quench a thirst as strong as any the soft drink quenched in the 1880s heyday of the railroad, looking around with casual but deliberate awareness while unwrapping the sandwich or opening the sprouts, sitting in utterly ordinary, utterly out-of-the-way space routinely traversed only by ranging dogs, the explorer realizes again the necessity to explore,

the rewards of exploring, the whole magic meaning of personal discovery.

THE EXPLORER GLANCES away from the rails curving past the old warehouse, the half-empty factory, vanishing past the long-demolished station and water tank. The explorer glances back toward the woods, the right-of-way marked only by the trace of footprints and bicycle tires. And the explorer sees the flash of fluorescent orange, sets down lunch and walks to the surveyor stake driven into the ragweed-covered cinders, reads the numbers inked on its side, sees another a hundred yards nearer the woods, and wonders about something considered, something planned, something not yet in the newspapers. After lunch the explorer walks very indirectly, counting stakes, roughly measuring paces back to the old main track, the still slightly elevated track railroaders called "the high iron." In the midst of weeds and abandonment, the explorer studies the alignment of stakes.

Anyone who explores abandoned railroad routes discerns among the nineteenth-century ruins the first indications of the next railroad age. Only railroad executives and real estate speculators, and sometimes razor-sharp state and county planners, know what

computer simulations indicated as early as the 1980s, when energy-crisis-era research begun a decade earlier began to coalesce into a vision of metropolitan areas no longer dependent on private automobiles but remarkably like many in Europe and Asia. In the first years of federal deregulation, when the first massive tremors shook the trucking industry, railroad executives began rediscovering the profitability of carrying passengers. Railroad routes are valuable not only to animals wandering from woods to swamps to woods and to a handful of explorers walking or bicycling along them, but to railroad companies and public transit authorities. They know that long before the first passenger boards the first train running on restored rails, savvy real estate speculators will have made fortunes, the prospect of which sways the votes of politicians asked to restore railroad service.

Everyone exploring abandoned rights-of-way within fifty miles of any city considered major in 1920 rides in commuter country, in the borderlands of suburb and countryside. Sometimes the walker or bicyclist sees the granite or concrete mile marker left behind at railroad abandonment, and instantly realizes that the nearest urban downtown is far nearer *by rail* than by state or interstate highway. Sometimes the walker or bicyclist pauses to adjust shoelaces or toe clips or brake cables, and looks up suddenly

aware that the railroad distance is a distance without traffic jams, with a guaranteed schedule between depot and terminal. So the walker moves past some local historical society building or past some grim-visaged nineteenth-century public library, then turns around and enters to find some commuter-train timetable from 1932 or 1956. Fingers running down the columns listing departure times and miles and names of stations, the explorer does a quick mental calculation or two and appreciates seventy-mile-an-hour service along a shorter route than any contemporary highway. And next Saturday the explorer walks or pedals farther and farther down the abandoned right-of-way, detouring around the missing bridge, wondering about long-demolished stations and the one converted into a liquor store, pushing toward the city and finding cities along the route.

Ordinary exploration, probing around commonplace areas with nothing special to guide the mind, now and then leads the explorer into libraries and archives and gasoline stations and hairstyling salons and other repositories of information that shape the rest of the walk or bike ride. Now and then the explorer discovers the quiet pleasure of using information sources not at the outset, not as some AAA Triptik to guide the whole trip, but as the prizes in some ongoing scavenger hunt.

The explorer probing metropolitan railroad rights-of-way sees around the curve of time to the biggest transformation of the United States built environment since the suburbanization that followed the interstate highway building of the 1950s and 1960s. The abandoned rights-of-way will certainly carry passengers from the farthest suburbs, the borderlands or exurbs or whatever their designation, *toward* the cities in which commuter trains terminated in the 1920s, but most passengers will leave the morning train in the satellite cities that now ring most large, older cities, the satellite cities in which so many office parks appeared in the 1970s. Only several decades ago at the edge of urban traffic jams but now extremely jammed themselves, the satellite cities offer land values substantially lower than those of central cities. They also offer nascent public-transit systems, usually bus-based systems, easily shaped and reshaped (unlike subways) to access existing and planned office parks. Often the explorer finds the right-of-way approaching satellite cities to be an active freight railroad, or at least so blocked by fences and parking lots as to be nearly impassable, even on a Sunday morning when trespass proves easiest. And the explorer turning away from it to prowl parallel streets and alleys realizes what so many motorists—and so many writers about the future of great cities—

simply miss. White-collar jobs still cluster around long-vanished railroad stations, but now long-vanished stations in satellite cities, not the long-gone terminals in once-great downtowns.

Where will they park, these railroad commuters of the immediate future? The explorer knows, for the explorer probing the rights-of-way far out from the satellite cities knows that small-town and suburban depots had very few parking spaces in the 1930s, simply because men expected to walk to stations or have their wives drop them off and pick them up. And now wives commute to work too. So tiny parking lots wreathed around charming hamlet and suburb-village depots cannot begin to accommodate the motorists arriving to board the two-story passenger trains of the future. The lots—and the stations—must be away from the old way-station commercial clusters. The lots and stations must stand where the explorer finds derelict industrial buildings or wooded land long abandoned, sites near highway access, sites showing the brush cutting of surveyors if not orange-painted stakes, sites sometimes bounded by the holes left from stakes pulled up by careful real estate developers who know how easily fluorescent orange grabs the eye of explorers focused on birds or blueberries.

Where the new lots and stations go will determine the siting of the new commercial loci, the hubs

of short-distance bus lines perhaps, but certainly the sites of grocery stores, drugstores, dry cleaners, coffee shops, minimalls. And already deep-pocket real estate investors buy the sites, the places motorists never see, the places computer simulations find only after crunching census statistics, driving times, and highway routes into a stew of 1920s railroad schedule information. And already some people move away from the nodes-to-come, the transportation hubs of the next decades.

Already a handful of specialists know as certain what most Americans dismiss as daydream but the explorer knows as potential: The railroad will come again, and it will retrace its tracks. And just as real estate developers will not build expensive houses within a mile or so of high-voltage electric transmission towers, so they now avoid buying or building new homes near abandoned railroad rights-of-way, even rights-of-way more than a mile distant. They know the future of railroading is an electric-powered one dependent on overhead catenary like that stretching along the Amtrak main line between Washington, D.C., and New Haven, Connecticut, and about to extend to Boston, like that planned to cross much of Utah over Union Pacific tracks.

Catenary changes everything about living near a track. To be sure, electric locomotives are near silent,

but the electric-powered trains run far faster and may well produce more vibration. Moreover, electric-powered trains stop and start more quickly, and so can be scheduled more frequently. Catenary demands a wide swath be cut along the track, for it and the rails must be protected against falling tree limbs. Catenary transmission poles rise above treetops, so that the railroad route is not lost in the greenery that camouflages most abandoned rights-of-way, but is obtrusive indeed even in long-distance, down-the-valley views. Catenary carries the high-voltage electricity that worries so many health-conscious people, including those wealthy enough to move far from it. But more than anything else, catenary-supported passenger railroads attract everything human to the railroad corridor, bringing not only increased commercial development but increased highway traffic, then demands for zoning changes. And as some real estate developers avoid any disused railroad corridor no matter how overgrown, other speculators arrive to invest in the next land boom.

Paused for a moment, looking around with a bit more care than usual, the explorer realizes that long ago people, baggage, freight, and the mail traveled together and stopped at the same stations. How fast did a letter move in the days when dozens of trains swept along main line tracks, when clerks sorted the

mail in every car of the railway post office? Has the mail slowed down since steam locomotive days? Did the Post Office once offer same-day delivery of ordinary letters? What is a public highway if not the way of the letter carrier? The explorer pauses, sees the mailbox sited by the side of the road, not the track, and wonders who knows the answers.

Three

Mail

ONCE THE POST Office knew public from private space. Not long ago, a public way welcomed a letter carrier, either a carrier walking from house to house, leather bag slung over shoulder, or, after the turn of the century, a rural carrier offering the new rural free delivery (RFD) to every farmer who had erected a metal box atop a post. Always country folk endured a different standard than city people, however. Anywhere the urban or town letter carrier strode, the mail strode in majesty from sidewalk onto front walk, up front stairs, across porch boards to the mailbox screwed beside front doors. The letter carrier risked all sorts of dangers on the public sidewalk, but once onto private property the letter carrier risked tripping over abandoned roller skates, stumbling over toy sol-