

Patch Burning

It is a biotic border that spans a continent, and it displays a continental sized roughness. In rude terms it traces the coarse shoreline between a sea of grass to the west and a land of mixed forests to the east, an edge sculpted into the ecological equivalent of bays, narrows, skerries, and estuaries, as climatic tides, the tectonic lurching of glaciers, and the sprawl of colonizing species have tugged and twisted, and here and there allowed grass or woods to mostly prevail. That textured shoreline holds a jumbled geography of incombustible wetlands and free-burning bottomlands, fire-flushed Barrens and fire-hardened forests, prairie peninsulas and prairie patches, oak mottes and woody copses, and landscapes latent with bits of them all, some extending over hundreds of miles.

It is a fractal frontier, patchy at every scale, with small patches within larger. And it is a frontier of fire, with each part checked or boosted by the ferocity and abundance of burning.

Cross Timbers

Even so, the Cross Timbers stand out. They proclaim a bold, woody headland, as distinctive as the White Cliffs of Dover, between the grassy sea that swells to the west and the humid forest that crowds the east. It is here that storm surges of fire, roaring over the long fetch of the Great Plains, whipped by the westerlies into whitecaps of flame, crash against the less combustible woods. The belt is long, stretching from the Edwards Plateau of Texas to the Flint Hills of Kansas; irregular and sinuous, roughly cruciform, historically varying from five to 30 miles wide, but at places spanning most of Oklahoma; and persistent, its 4.8 million hectares defying settlement's attempts to log, plow, graze, or burn it into oblivion. Instead, it continues in Oklahoma to thicken with stubborn oaks – blackjack, shin, live, and post.

The contours of the Cross Timbers roughly track soils, a divide between grass-promoting limestone and the oak-favored sandstone. But they also trace a kind of biotic dry line, jumping west to east from 26" of rainfall annually to 42". To the east, ahead of fronts, moisture surges up from the Gulf of Mexico and brings rainfall sufficient to sustain woodlands. To the west, weather systems draft air from the deserts of northern Mexico and west Texas; there is less moisture, and it promotes a regime suitable for shortgrass prairie that leaves its woods strung along streams as gallery forests. It is the middle ground, the belt of tallgrass prairies and implacable oaks, where the most vigorous fires meet the stiffest woods, a kind of tornado alley for flame. Only the most savage fire topkills the dominant trees; mostly the oaks freshly sprout, hydralike, into an enduring, oft-impenetrable thicket, a living seawall. Even the wildest fire surges break against it. Washington Irving famously described the outcome as a "cast iron" forest. He didn't mean the phrase as a compliment.

But he might have. The Cross Timbers endure, a patch of history as much as of geography. They remain the dominant ecotype of Oklahoma. And where they intercalate with prairie and city, they display the peculiar patch dynamics of a unique American fire regime. Each patch has its own internal regimes; but it is how they all link that defines combustion across the region today.

Prairie patch

For early explorers the association of fire and prairies was a given. Where you had one, you had the other, and precocious tourists like Irving expected to experience a sea of flame as much as swarms of bison. In fact, Irving's French-Canadian guide exclaimed that, if a fire did not conveniently present itself, he would set one.

The expansiveness of Barrens and of west-increasing grasslands in the form of prairie patches and peninsulas that spread into vast steppes both intrigued and baffled early Europeans, and it was no great leap from seeing how grass and fire associated to suggest that fire created the grasslands. Thomas Jefferson debated the issue with John Adams, and concluded that the practice of fire-hunting by the indigenes was a probable cause for the prairies.

Still, the debate flourished between those who sought an explanation in soils and climate, and those who thought the answer lay in fauna and fire. Aldo Leopold commented on the “immemorial warfare” between the oaks and grasses in the Wisconsin savanna. And in his magisterial global survey Carl Sauer noted that temperate grasslands everywhere were sites of level and unbroken terrain, swept by windy westerlies and fire; he thought the burning anthropogenic. Yet it still seems implausible to some observers that aboriginal humanity, outfitted with spears and torches, could have prompted such immense effects.

One reply is to note the difference between creating such landscapes and maintaining them. Surely, fire – that most interactive of biotechnologies – worked in close coupling with other factors; but everywhere it has been removed from the grasslands east of the 100th meridian, the scene has quickly overgrown with woody plants, and the further east, the more humid the climate, the more broken the land became with watercourses, the less effective lightning could be as a kindler and the more stubborn the resistances to fire spread.

These are, however, circumstances of physical geography: they portray a dynamic of competing physical forces, of wind, weather, fine fuels, and flame. In this conception the thick combustibles power fires that hurl against heat-resisting boles, and their relative strengths determine whether grass or tree prevails. But Jefferson’s speculation had another side, that the fires were set for hunting, which bonds fire to a more biological etiology. There was little tall about prairie that was grazed, and those sites were most grazed which grew where they had most recently burned, since they were more accessible and far richer in protein. The fast combustion of flame had to compete with the slow combustion of metabolizing bison, elk, pronghorn, prairie dogs, and grasshoppers.

In this scenario prairie patches had a dynamic of biological agents, within which the burning was embedded. In principle, this makes sense since fire, while not alive, is a creation of the living world. In practice, it meant that an intricate choreography of burning and grazing shaped the landscape. The outcome might well be characterized as fire ecology’s equivalent to physics’ three-body problem, an interaction void of any exact solution, with all the parts always mutually adjusting.

Fire explanations favor triangles, however. And this third factor Jefferson also identified: people. They completed the cycle by setting the fires. It had to be so. Especially as the proneness of landscapes to propagate fires splintered to the eastward, as land roughened, watercourses multiplied, and humidity thickened, only people could have set enough fires. Remove any part of this prairie fire triangle and the fire would go out.

The upshot is that those prairie patches were not only pyric landscapes: they were cultural landscapes. They remain so today.

The Flint Hills parallel and intercalate with the Cross Timbers, stretching from northern Oklahoma into southern Nebraska. As their name suggests, they were too rocky to be plowed, so became a site for ranching. Elsewhere prairie shattered either because it fractured along fissuring roads or was converted outright into fields and towns; sedentary settlement broke the power of fire to propagate. Relic patches remained in odd niches such as along the burned right-of-ways of railways or in places where terrain frustrated plow and grader, and the land remained in grass.

The prairie patch within Osage County claims the southernmost reach of the Flint Hills, and it has survived more or less intact precisely because it is both grazed and burned. The linkage is deliberate: it is burned to improve grazing, and because it is grazed it gets burned. Because it gets burned as part of an annual routine, the greater prairie patch displays a fire culture that has long

disappeared from America's vernacular landscapes. That tradition has kept fires that have elsewhere vanished.

These are working landscapes. Ranchers seek to maximize their economic return and use fire because it assists a pattern of raising cattle. The norm is to burn early in the spring to help kindle a burst of warm-season grasses. They burn it all – all of it, all at once, usually completing the task by mid-April. Then they double-stock with cattle, largely imported, and most of that herd purchased with borrowed money. The fire-catalyzed prairies rapidly transform black char into green fodder. The freshening grasslands become an open landscape feedlot. By mid-July the fattened cattle are shipped to traditional corn-stocked lots before dispatch to slaughterhouses. Relieved of intensive cropping, the grasses spring back and grow sufficiently to support another round of burning the following year.

The practice emerged out of 19th-century cattle drives in which landowners burned at prescribed dates, under contract, so that approaching herds had pasture when they arrived. That early burning also prevented wildfires. Revealingly, Oklahoma is among only two states that define fire legally within the concept of strict liability; there is no standard of negligence – if a fire escapes, regardless of reason, its setter is liable. (It's a code that permits easy access to fire, without the bother of permits and approved certification, and it works when embedded within a social matrix of burning.) What happens today is an updated version, and a textbook example of intensive ranching. The oddity is that open burning has persisted where, in most places, it has yielded to the enticements of industrial combustion. Fire has stayed on the land. A fire culture has endured.

That is the good news. The bad news is that the simplifying logic of industrial capital has applied its typical reductionism and transmuted fire from an agent of historical diversity into one of contemporary homogeneity. The system succeeds in bolstering the production of Black Angus and Hereford, but it works against the proliferation of the indigenous forbs, Horned Lark, and Lesser Prairie Chicken. Tallgrass prairie, too, has its temporal patterns. It sprouts, ages, promotes and stifles, yearly altering its structure and composition. It has its pioneer species and its old growth. Across landscapes it displays a mosaic of patches. The cornucopia of patches encourages a proliferation of niches and niche-specialist mammals, birds, and insects.

So, too, modern science has tended to parallel the logic of modern production, and often views the economy of nature as it does the economics of commodities. Range science has isolated and studied precisely those critical components that have boosted the conversion of prairie grass into saleable meat. It scrutinizes each part of the prairie separately – that's what putatively grants it status as positive knowledge. It knows something of what grazing does; it knows something of how fire behaves; but until recently it has not sought to put grazing and fire together organically, which has left its Enlightenment-derived epistemology ignorant of what hominids on grasslands have known since the days of *Australopithecus*. The two processes don't act separately: they act together.

America's largest patch of protected prairie resides where the Flint Hills poke southward into Osage County. In 1989 The Nature Conservancy purchased the 29,000 acre Barnard Ranch, converted it into the Tallgrass Prairie Preserve, gradually added another 10,100 acres, and began the tricky process of regenerating something like presettlement prairie out of grazing-sated ranchland. They burned, they tore down fences, and they introduced bison. The preserve's bison could now free-range over some 24,000 acres. Its fires, however, they herded into a patchwork of biotic corrals.

Managers recognized that saturation spring burning might work for cattle, but it would wipe out everything that needed cover, nest sites, and the prairie equivalent of old growth. So they burn on a highly variable rhythm, set by the availability of fuels, which results from a ménage à trios between bison, burning, and land – a “messy” landscape, as the Preserve's manager, Bob Hamilton, puts it. Moreover, the burns vary by season. Some 40% of the land burns in the

spring, another 40% in the fall, and the remaining 20% in the summer. The land becomes a palimpsest of patches. There are patches for prairie chickens, patches for grasshopper sparrow, patches for invertebrates, and patches for bison. The patches are not fixed – there are no inscribed blocks fired with metronomic rigor. The burns occur when fuel is adequate.

There are many features of the landscape that attract and repel bison, and without fences to hold them, the bison have a lot of choice where to feed. But fire trumps them all.

Overwhelmingly, as hunters have known for eons, grazers go to the fresh fodder springing up after burns. Greening tallgrass gets cropped as soon as it surfaces, leaving the appearance of a mown lawn. So rich in protein is the grass that the older stems, yellow and waving in the wind nearby, are ignored. Nor must managers put out supplementary feeds to help the stock survive winter. The medley of burned patches keeps fresh fodder on the land year-round; and bison gorge on the low forbs – traditionally dismissed as weeds – that flourish amid the mix of grasses. By mostly avoiding last year's burns, bison allow the tough grass to remain, and by the third year – its old growth phase – it is actively shunned. These are the fuels for the fast combustion of free-burning fire. The outcome is a rhythm of fallowing, a kind of swidden, intermediated by free-ranging fauna. So, too, the other creatures – the ecological specialists – can thrive. Greater Prairie Chickens can no more live in old-growth prairie than grizzly bears can in old-growth forest.

This is how the basics had evolved over millions of years. What aboriginal Americans did was to expand vastly the range of this dynamic and then to hold it against climatic pressures that sought to contract it. Their burning defined the ecoregion. What ranchers then did was what farmers have done with wheat and foresters with loblolly pine: they simplified, homogenized, and maximized for a single purpose. What the newcomers at places like Tallgrass Prairie Preserve are trying to do is to reverse, or more properly modernize, that process so that the land can recover and retain its historic character and enriched biodiversity. In time, it is possible that ranchers may emulate the researchers and introduce patch burning into their commercial landscapes. Experiments suggest that, amid those patches, ecology and economics may find a common cause.

What they all share is a recognition that prairie must burn. Where they differ is their preferences for what creatures will live on that burned land. What matters on this score is not whether the prairie burns but how. The seasonal smoke that billows upward signals the character of that chosen regime.

Oil patch

At Osage County, however, the fire regime also extends downward. The sandstone strata that, warping upward to the surface, underwrites the Cross Timbers soils serves as below-surface reservoirs for petroleum. For a while, during the 1920s and 1930s, the region was America's primary producer of oil. Pumpjacks still dot the landscape like the acacias of an industrial savanna. The bison herds on Tallgrass Prairie Preserve wander past them as they would scattered copses.

Few places display so dramatic a link between the two grand realms of combustion that define the modern Earth. The free-burning flames that recycle prairie must operate within a larger matrix of closed combustion that defines how Americans live on their land. It makes sense to reclassify the bioregion as a pyroregion, with living hydrocarbons on the surface and lithic ones below. Here, primordial geologic landscapes are exhumed, brought to the surface, and burned. People travel over the Preserve on roads bulldozed and graded by internal-combustion machines; a parallel network of pipes carries fuel to the pumps, and transports oil and gas from them to storage tanks, while powerlines span the horizon. The spring cattle drives arrive by diesel truck

and locomotive. Residents – managers, tourists, researchers – seasonally trek to the site by automobile and rely on natural gas and electricity from oil-fueled power plants to provide the energy they need to run the place. They even burn with diesel-and-gas-fueled drip torches dragged from ATV quads.

Contradiction or paradox – the reality is that the preservation of wild lands is something industrial societies do, and they reinstate them by the pyrotechnologies that prevail at the time. As roads and plowed fields broke up the range for free-burning fire during settlement times, so the grids of industrial combustion are allowing for their reinstatement, the regeneration of a patch-burned landscape. The resulting scene is a hybrid. History, too, has its patch burns.

Those pumpjacks and powerlines get airbrushed out of most images. What visitors and donors want is a simulacrum of the lost prairie, now recovered. What is less appreciated, and less forgivable, is the way that people get airbrushed out of fire science. If fire ecology failed to bond flame and bison, it has failed far more miserably in bonding the animating flames to people. Yet people carried the torch that made the complex work. They still do. Some are managers; some are researchers; some, fire's accidental tourists littering roadsides with embers.

The reasons for eliding humans out of the prehistoric prairie is understandable within a national creation story that speaks of a wilderness America colonized by a civilized Europe; it is myth, and myth sings its own truth. It is less understandable for a science of ecology that purports to explain a natural world for which myth is not a prime mover. Yet until recently that is exactly what fire ecology has done: it has systematically stripped fire-powered biotas of their keystone species, the sole creature who has held a species monopoly over fire. Nature didn't burn patches. People did.

Imagine a prairie in which bison graze preferentially on burned patches – and could themselves kindle the patches they wanted. Could anyone seriously erase that practice from a description? At least with prairies, now shrunk to a nano-niche of their historic dimensions, the case for restoring fire is clear, and there is really no option other than for people to do it. But its significance is ignored. It's as though people do it now much as scientists do it on experimental plots, as a surrogate for what might happen "naturally." The presumption is that the ideal system could evolve ultimately so that people would vanish from it.

In places – the Tallgrass Prairie Preserve among them – the role of humans as the Earth's signature fire creatures is accepted, or at least finessed. The land needs fire in particular patterns; managers do it. Elsewhere, the argument is trickier, and acceptance comes only spasmodically, particularly where some aboriginal or pre-European presence is mandatory for political reasons. Nowhere, however, has fire science sought to grapple with the link between humanity kindling fires on quasi-natural landscapes and humanity rerouting its firepower through industrial combustion. Yet they overlie each other historically as fully as the burning prairies and the subterranean landscapes of Osage County do geographically. What is missing is the dynamic link between them.

What is missing is people. People set the overwhelming majority of fires in the past, and they set them today. The further east the prairie patch extends, the more it depends on humans to do the kindling. And that is no less true historically: the further back, the more prominent the role of human firebrands. Prairie managers have come to grips with this fact, pragmatically, if not philosophically. Fire science has not.

Fire ecology has not only yanked from its research agenda the most vital of fire agents, but it has missed the most critical transition since *Homo* seized the planetary firestick from lightning. The oil patch testifies to a radical reformation of Earthly fire. The switch to fossil-fuel combustion as a source of firepower did not merely add another combustion realm; it began competing with the others. By technological substitution and outright suppression, typically by the instruments of its own contrivance, it has swept anthropogenic fire from the landscapes of

most industrialized nations and, for a long time, it sought to extinguish all naturally ignited fires even in nature reserves. Later, when fire's catalytic – indispensable – role became apparent in such places, advanced nations have yielded more room to lightning fire, even as they have intensified their determination to prevent and swat out human ignitions. Yet this extraordinary pyric transition is nowhere in the dominion of fire science.

Why? Surely, one reason is that science studies “nature,” and cultural landscapes are, by definition, not natural. But another is that no discipline of fire science exists to provide a strong-nuclear force by which to hold the endlessly varied manifestations of fire around a common conceptual core. (The only fire department on a university campus is the one that sends an emergency vehicle when an alarm sounds.) Mostly, fire science can't cope with humanity – can't (or won't) see that the causal and narrative arc that unites fires today is people. They posit that fire ecology begins with wild-and-free natural burns, and dismiss industrial combustion as technology and engineering, not nature. Industrial fire has no ecological significance, save perhaps that its emissions are helping besmudge the atmosphere with greenhouse gases. There is no perceptual link between the two realms of combustion, a failure of imagination so massive it casts the entire enterprise of fire ecology into question.

At Tallgrass Prairie Preserve, however, the two worlds coexist in the same field of vision. Pumpjack and bison, grass and oil, flame whipping in the wind like whitecaps and diesel-fueled pistons pounding without pause – they all converge, and they demand a full-spectrum appreciation of fire's contemporary ecology. Those pumpjacks are the outcrops of industrial fire's deep ecology. Humanity's shift in fire practices has indeed unbalanced climate, but it has also destabilized whole biotas, now being rapidly remade by the means and to the purposes of modernity, and it has further unhinged landscapes by altering the fire regimes with which those ecosystems had long come into accommodation. One common presence stands behind all these manifestations - humanity as a fire agent.

Tallgrass Prairie Preserve runs on both combustions; it requires gasoline as much as fallowed grass, and it accepts both as a practical necessity. Fire science has yet to catch on – or to catch up.

Woody patch

The road to understanding is there; in fact, there are roads all over the place, many paved with asphalt from the oil patch and all populated with a mechanical menagerie of petroleum-respiring machines more far-ranging than the prairie chicken and more prone to mass into herds than bison. Those roads converge ultimately on cities, and together, roads and machines, constrain the prairie and its flame.

They chop up the indigenous geography into awkward new patches; they alter the rhythms that long characterized the seasonal migration of prairie denizens; they replace anthropogenic burning with internal combustion and its byproducts. Against prairie they both push and pull. They push, by constraining the breadth and capacity of prairie to carry free-burning flame. By roading and plowing, they break up the continuities that, paradoxically, had allowed for the ceaseless churn of patch burning and grazing. They pull, by powering two woody sprawls that are taking over more and more of the extant grasslands. One is a spread of trees, particularly exotics like the eastern red cedar; the other is an expansion of wood-framed or at least wood-stuffed buildings. Each, in its way, is replacing grass with woods. Both are the expressions of a civilization propelled by industrial combustion.

Like other invasives, eastern red cedar (*Juniperus virginiana*) perturbs the fire regimes of the landscapes it occupies, and like the others it can seize those sites because they have already been perturbed. It is, to the Great Plains, what cheat grass is to the Great Basin. But unlike cheat

grass, which propagates amid promiscuous burning, red cedar roots where fire has lapsed. Once established, it is difficult to ignite, but when it does catch, it burns with a longer and more sustained ferocity, the prairie equivalent of a crown fire.

In its seedling stage it sits in grassy thickets like a plum in a pudding: a fire of even average intensity can easily strip and kill it. A flaming front can engulf the entire tree. Whether such fires sweep a field depends on how closely cropped the grasses are, and whether or not a fire gets set. As it grows cedar lifts more of its canopy above the grass, and, equally to the point, the transient flames from the understory grasses no longer hold long enough to kindle the more stubborn needles. The lower skirt of the cedar may burn or scorch but the bulk remains, now partly immunized against another surface fire. The infection spreads exponentially – a spot here and there of cedar, then a dappled landscape speckled with young trees, and suddenly a forest. At this stage there is insufficient grass to carry a continuous front of fire: the landscape has flipped into an alternative stable state, like cheat grass in Nevada, alang-alang in Sumatra, or linden in central Europe.

Only the most intense fire can dislodge those new woods. That requires ample kindling in the form of grass, perhaps after a season of unusual rains and lessened grazing. It requires winds like a cyclone to allow flames to lengthen and leap from one blazing tree to another. And it demands a precisely timed ignition. In the realm of industrial landscapes that combination of cards is as rare as a full house, and as residents cluster into cities and remake the rural countryside into exurbs, they perversely welcome cedar as a windbreak, as a shielding screen for privacy, and simply as a tree, which holds its own totemic values.

Deliberately and indifferently, the eastern tallgrass prairies are becoming thickets of eastern red cedar. Grass fires become less frequent, and when they come, they are mixed and savage - a prairie fire on woody steroids.

Then there is the city. Here lies the social complement to the laissez-faire conversion of grass to semi-feral woods: the deliberate construction of wood-framed houses or wood-stuffed residences. The two processes are linked, as city and cedar merge into a collective complex of wood. It is a composite that eerily echoes the sinuous geographic scrawl of the Cross Timbers, its contours sculpted by the peculiar edge ecology of internal combustion. Cedar and city are resequentering the carbon released by the oil patch into a massive woody patch.

The town as suburban sprawl is as much a product of an industrial economy of fire as the exotic cedar with which it congregates: it has laid down a new matrix for burning in which lines of fire track corridors of travel, and fields of fire, such places of concentrated burning as power plants and residences burning heating oil. Vestiges of open burning endure; Oklahoma has in general tolerated private firing though it is unforgiving of failure. But more and more, an industrial regime has absorbed and confined open flame. For those who grow up in a city, burning houses are something that happens on television, and open burning belongs beyond the urban fringe.

Or did. The areas bounded by a Greater Cross Timbers region have, over the past decade, added fire-destroyed houses to tornado-destroyed ones. The scene is bizarre, as though the tallgrass prairie had never been settled, or was being unsettled, and Oklahoma had morphed into California, and Midwest City and Choctaw had begun to channel Malibu and Lake Arrowhead. People behaved not as they historically had, when they had survived and tamed prairie fires, but as they saw on TV screens today; fleeing, standing stupidly on combustible roofs with garden hoses, jabbering into cell phones and Blackberries. They turned, as they must, to the implements of industrial fire, from autos to fire engines, in order to flee or fight.

A specter that society had thought long banished, maybe extinct, returned. It was like watching the revival of pandemic tuberculosis or the emergence of a drug-resistant staphylococcus, as though a scourge from fetid Third-World tropics had established itself. There is scant reason for modern housing and suburbs to burn: the built landscape has become less

combustible, and can yet become more so. We know how to keep roofs from burning, how to protect exterior walls from heat and flame, how to design yards that shield against fire rather than propagate it, how to protect people. Last-minute flights in cars over crowded, smoke-obscured roads don't do that. Nor does erecting windbreaks of red cedar, ready to saturate a downwind house with ember showers. Nor does permitting combustible roofing. Nor does allowing one hazard to site next to another, so that fire can jump from one to another without regard to landscaping in between. We know all this – know how to encode such knowledge into law and custom - yet have allowed the woody patch to sprout and tenaciously propagate without taking remedial measures.

Instead, the borders of the two fire realms have slammed together like the earthquake-prone frontier of two tectonic plates, ready to erupt with an occasional Richter-scale fire. The patch burns of history have somehow burned through the overlays of contemporary life.

When the wind comes ripping o'er the plain

For days, all over eastern Oklahoma, on commercial pastures, public lands, and private preserves, fires had daily sprung up, sprinted over hills and swales, and sunk into oblivion with the dews of evening. It had been a mild, wet, windy spring, and pastoral burning was slightly behind its normal schedule. On April 8, taking advantage of favorable conditions, the burning had continued into the evening. The next day, Friday, had a cold front forecast, and most burners stayed their hand. But some did not, and there are always stray sparks. Like black rats, houseflies, and litter, flames travel with people.

A few late morning fires became many. The gusting winds fanned errant spot fires into firefronts, and whitecaps of flame into a tsunami. The normal logic of fire spread and fire breaks collapsed as swarms of sparks flew locust-like over normal barriers and feasted on fresh fuels of dry grass, field encrusted cedar, and vulnerable houses, and smoke columns bubbled up like thunderheads. By evening, April 9, fires had rampaged over a swath of central Oklahoma. An estimated 100 homes had burned; several thousand residents had been evacuated; one firefighter had died. Governor Brad Henry declared a state of emergency over 31 counties.

Along that exurban fringe, and in some case well within it, two visions of landscapes collided. Each had its own relationship to open fire.

The city wanted no open fire, and eagerly traded grassy kindling for woody fuel. Urban fire services would gladly banish fire. The city's response to the outbreak was for residents to flee and for firefighters, outfitted with the apparatus of industrial combustion in the form of engines, pumps, and aircraft, to attack the assaulting flames. Given the extraordinary pace of the burning and its capacity to fling firebrands hundreds of feet ahead, this was a quixotic quest. It was not possible for a fire militia to scale up as quickly as the flames had, and there was no way for it to contain a fast sprawl as extensive as the slow sprawl of urbanization. The firefight was telegenic, instantly transported into a virtual world that became digitally visible and engaged even those far removed from its searing heat and obscuring smoke.

By contrast, the countryside demanded fire, but wanted it on its terms, not that of arsonists or accidental incendiaries. One of the breakout burns threatened the southwestern borders of the Tallgrass Prairie Preserve. It was not the fire in and of itself that mattered – the land would be burned anyway. What mattered was its regime; the preserve had a rhythm of patch burning and didn't want it broken if possible. Quickly, the staff at the Preserve responded, much as their city counterparts did, with diesel-fueled vehicles, quads, and pumps. But they did not attack the flames directly. Instead, they picked out a graveled road far in advance of the front, laid down several passes of water on the downwind side, and then drove quads along the upwind side and stripped out lines of fire with driptorches. There were no overhead TV action news cameras, no

panicked residents scrambling into the nominal safety of SUVs and the open highway, no loose similes by which to remake a quasi-natural event into a semblance of a terrorist attack. They met feral fire with tamed fire.

The city saw fire as an intrinsic threat, responded to the crisis as a social disaster, and dispatched an all-hazard emergency service. The country responded to the threat as a problem in land management. A wild fire was a familiar problem to deal with, like a hailstorm, not a specter from an alien world. The city media reported on and analyzed the fires with the same breathless and hackneyed language used for the fires in Griffith Park or the Angeles National Forest. Drought. Fuel buildups. Wind. These were the putative causes, though fires traditionally burned at this time of year, which was a period of plant dormancy, and fuel and drought had meaning only when applied to eastern red cedar, not a year or two's growth of grass. So, too, the responses were clichéd. Drop water from aircraft. Send engines. Evacuate. The public mood was shock, mingled with a sense of voyeuristic self-regard – shock that such fires had struck Oklahoma, a macabre touch of vanity that Oklahoma could claim fires that normally cavorted on the California coast. The countryside saw those flames as part of living on the land. It suffered no burned houses, reported no lives threatened, endured no cindered assets. Fire control was the flip-side to fire use; both were matters of tending land, of a piece with watering fields, cleaning ditches, or cropping surplus bison.

The difference matters because democratic politics derives from its citizenry, and even in Oklahoma most citizens reside in cities and suburbs. More and more of the state's inhabitants know fire only as refracted through TV, radio, podcasts, the internet, twitters. They do not heat their houses, cook their meals, read and tell stories over a fire. They use flame less and less on their yards, and find it difficult to imagine its semi-domesticated use in remote pastures and nature preserves. Yet urbanites will determine the ultimate fate of fire on the land. The fires they witnessed were the ones that leaped I-35 and Highway 51, that rushed over empty lots and unkept pastures on the city fringe, that sent smoke like a squall line through city centers. The fires seemed, as one begrimed fireman in Wellston exclaimed, like "hell on Earth." His counterparts on the preserve might instead imagine the nominal conflagration as a poorly lit patch burn that had temporarily slipped its leash.

Then they ended. However fierce, grass fires, even those fed woody supplements, burn fleetingly. They pass with the wind. Within hours the flickering front had blown itself out.

That is not likely to happen, however, with the contemporary fire regime. It rides the historic front between two realms of combustion, and until its gusty passage ends, the fires will continue to move from grass to woods. Whether postwar houses prove as durable as the post oaks and blackjack oaks of the Cross Timbers remains to be seen.

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Anyone familiar with the literature from this region will recognize that I add nothing about prairie fire and patch burning to what its resident scientists and managers have published. My contribution is to attempt to emplace that lore within a larger context of fire history. Fire in the

prairie patch is reasonably well understood; it is not in the oil or woody patches, much less the ways in which the parts might be joined.

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