ESSAYS ON SCIENCE AND SOCIETY

The Fires This Time, and Next

Why is the American West burning again, and what might we do about it? There is a short answer to the first part: The American West has large wild-land fires because its extensive wild lands are prone to burning. Planning policy is much harder and requires us to consider fire history.

Natural fire regimes beat to the rhythm of cyclic wetting and drying: it must first be wet enough to grow combustibles and then dry enough to get them ready to burn. Wet forests therefore normally burn during dry spells, deserts after rains. Fire also demands a spark, and under wholly natural circumstances, this means dry lightning. The eastern United States has wet lightning, which normally accompanies dousing rain; only in Florida do thunderstorm days and lightning-kindled fires routinely overlap. The West has dry lightning—and that is why, with or without people, significant fractions of the American West will burn.

Natural fire occurs unevenly. It strikes in some places and at some times, but not everywhere all the time. Before humans entered the picture, after all, vast quantities of biomass were buried with never a chance to burn, so we have coal and oil. The gap between available fuel and accessible flame—a sticky market in nature's unmanaged economy—ended with the advent of our species. We became the brokers of burning, first by controlling ignition in competition with lightning. Later, we learned to create fuel, slashing and then growing to substitute new kinds of biomass and thus defying natural wet-dry rhythms. In this way Paleolithic people challenged, and later agricultural folk reshaped, the "natural" geography of fire. Over the past two centuries, modern humans have shattered even these limitations by burning fossil biomass. From the perspective of fire history, that is the core meaning of industrialization.

The contemporary fire scene can be thought of as the outcome of three forces (or, as a historian might say, three narratives) acting on a naturally fire-prone land. The first is the dominant arc of anthropogenic fire—the enormous impact of industrial combustion. That force is substituting for or suppressing other forms of burning, dividing Earth into two great combustion regimes—one based on the burning of living biomass, the other on the burning of fossil biomass. Like many parts of the developed world, America sits squarely within the industrial regime.

But industrialization came only within the last century. A map of forest fires drawn for the 1880 census reveals a largely rural America, whose fire practices resemble those of contemporary Brazil. The broadest burning occurred in the southeast, but the worst fires broke out in the northeast and around the Great Lakes. Almost all of them were associated with agricultural usage and land-clearing. Today, the overall fire load has plummeted in comparison. The southeast remains the region with the most open fire, primarily still agricultural (or silvicultural) in character. Yet the fire "problem" resides, apparently, in the West. Why?

> "... fire will force us to choose not only between social and biological values, but between competing ecological values."

The obvious reason is that the place is intrinsically fire-prone. The deeper reason comes from the second force: it is that the American West experienced what a historian might call an "imperial" narrative. In the 19th century, state-sponsored conservation policies encountered a landscape that had become largely emptied because the indigenous peoples had been driven off by disease-driven demographic collapses, wars, and forced relocations. It thus became possible, during that historical vacuum, for the young federal government to establish "public" lands that would exclude agricultural settlement. In doing so, it created a habitat for free-burning fire.

In fire-prone landscapes everywhere, the tendency is for people to leave while the fire remains. Those countries with fire problems like America's—notably, Australia, Canada, Russia—are precisely those that underwent a similar colonial history. Resettlement of these fire zones, and even later industrialization, did not erase fire; the people who might have managed it in the traditional way had been put on reservations or otherwise excluded. Land use and fire practices were placed in the hands of new state-sponsored institutions, principally forestry. The new managers faced a hard choice: either convert those landscapes into something less combustible or do some burning yourself. With fire there is no neutral position, because fire may be as ecologically powerful when it is withheld as when it is applied. This debate—whether to found protection on fire fighting or fire lighting—has been nearly universal among all the emerging "fire powers." Each has made distinctive choices.

The last force reflects a national narrative. Three processes converged to squeeze fire out of the reserved landscapes of the American West. Massive overgrazing cropped off the fine fuels that had carried surface fires and made light burning possible; the American Indian went into reservations, removing a dominant source of ignition; and, with the creation of parks and reserves, fire suppression became a goal of the state institutions charged with their administration.

So it was that fire became an object of public policy. That policy and the establishment that ran it were largely shaped during one dramatic year, 1910. The Great Fires that savaged the Northern Rockies, in particular,

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were lethal, costly, and, above all, influential. They traumatized the young U.S. Forest Service, imprinting themselves in institutional memory until the generation that suffered through them had passed from the scene. Their horror triggered (and skewed) a public and highly charged political debate over "light burning"—the "Indian way" of forest protection, as proponents called it, or "Paiute forestry," the name its critics preferred. The outcome established all-out fire suppression as the standard, and that policy survived until the late 1960s when its full costs, ecological as well as economic, made it untenable. All the predictions of the earlier "light burning" advocates became sad truths: sickly biotas, forests fluffed with combustibles, and unexpected human tragedies associated with suppression efforts. Since then, the federal agencies have struggled to reinstate fire, with mixed and mostly marginal results. The Western American landscape is a legacy of that history. It does not have a fire problem: it has many fire problems. Some have technical solutions and are amenable to scientific research. Others, enmeshed in our affection for wilderness, must defer to cultural choices. So the mandala of the national narrative continues to turn.

The problem that has grabbed public and political attention is the spectacle of burning houses—the problem the agencies call the "wild land–urban interface fire." These fires might better be called "intermix fires." They occur in lands whose use has become scrambled into an ecological omelet, involving abandoned agricultural land as well as public preserves. Their existence and the hazards they pose are simply the result of unmanaged growth: the untrammeled growth of natural vegetation and the uncontained growth of our increasingly far-flung suburbs. The wild and the urban have become the matter and antimatter of the American landscape. When they collide, we should not be surprised by the occasional explosion.

Seen in historical perspective, America is recolonizing its formerly rural landscape. During the first colonization, fires erupted because wholesale clearing by homesteaders, ranchers, and farmers littered the landscape with combustibles. Now, in contrast, they result from refusal to clear, and from the installation of wooden housing. The new colonists are exurban migrants, stocked with urban values and perceptions and funded by an urban economy. They are living on the land, not off it.

This particular problem, of vulnerable dwellings at the edge of wild lands, is a stupid problem to have. The short-term solution is to remove wooden roofs, to clean up around houses, and to provide some elemental fire fighting. (Many of the houses that burned at Los Alamos in 2000 did so from surface fires that crept to wooden siding and could have been stopped with a whisk broom and a squirt gun had someone been on site.) A longer solution is to instigate some basic zoning guides and building codes, although America has not been notably successful with codes in floodplains, earthquake belts, and coastlines subject to hurricanes. What such lands need is a new version of a rural—that is, inhabited—landscape, not one that pretends that people aren't there.

Curiously, since 1891 such "problem fires" have recurred in 20-year cycles. If this pattern holds, we're roughly halfway through the intermix problem, and the crest of the crisis will pass within the next 5 years. If that's right, it may be time to imagine the next generation of fire problems. To deal with that future, we need to change the concept of "defensible space" into something more like "defensible habitat"—expanding our fire zones beyond the fractal exurban fringe into the reserved landscapes. That would entail a dramatic step. In historical context, it would amount to reclaiming our species' role as keeper of the flame. But it will not be easy. Reintroducing fire is complicated. The agencies like to simplify the matter by calling fire a "tool," but that is an oddly mixed analogy. A candle is a tool in the way an ax is. The kind of field fire set by early agriculturalists more closely resembles a domesticated species, say, a sheep dog or a draft ox. Controlled burning in quasi-wild lands is different still—a semicaptive process, like elephants trained to haul logs or grizzlies taught to dance. If we do resume our role as wild-land fire-managers, we must recognize that our control is delicate and vulnerable.

Truck escaping fire in Malibu.

Because fire so depends on the living landscape, it makes more sense to conceive its reinstatement as akin to reintroducing lost species, like wolves. Putting fire back into a landscape is not a process of simply reversing its removal. Success will depend on creating a suitable habitat for reintroduction, because fire takes its character from its context. All biomass is not fuel—and flame is not some kind of ecological pixie dust that you can sprinkle over bad or ugly lands and make them eventually better. Messed-up forests will only yield messed-up fires. Fire is less a tool than a catalyst, and how it works depends on its substrate. That rules out one-size-fits-all solutions. Getting the right mix will have to be gained site by site and will require solid ecological research.

What about the broader policy issues? We understand poorly the boundary between natural and anthropogenic fire regimes—an issue of some significance for nature reserves. We understand even less the border between industrial and anthropogenic fire—the frontier dividing the human burning of living biomass and our combustion of fossil biomass. The furor over global warming is, after all, a crisis of combustion. If we were to slash and burn tens of millions of acres in the American West to restore fire, we would release an immense stock of sequestered carbon. We need better on-the-ground practices for fighting and lighting fires. Most strategies take a mechanical approach—starting fires, stopping fires, shunting biomass around. Instead, we need the fire equivalent of integrated biological control: do spot-burns here, modify fuels there, kindle prescribed crown fires somewhere else. The mix will always depend on location, location, location.

Such changes could give us better fire management on the ground. But as always, the hard questions transcend science and technology. As the global warming issue suggests, fire will force us to choose not only between social and biological values, but between competing ecological values. We may have to choose not simply between driving cars and burning the woods, but between, say, preserving Karner Blue butterflies and releasing greenhouse gases. There is no way to exempt ourselves as active agents: What we do not do will have as much impact as what we do. We have barely begun to pose such questions or to recognize the intricate place of flame amid the vast realm of human interplay with nature. The political choices will become more complex as the geography of public lands is reshaped by various forces as the once-imperial narrative continues to morph into one of decolonization and devolution.

Not least, we remain ignorant and confused about a human-centered fire ecology. Institutions and ideas are as vital for fire's ecology as the flow of carbon or nitrogen. What happens in California affects fire in Montana and Georgia. It is strange that we have so little sense of how to incorporate ourselves in this scene as active agents. We have, after all, enjoyed a species monopoly over fire over the entire course of human existence, and our myths almost universally attribute to fire our Faustian rise to ecological ascendancy. Yet we are peculiarly self-effacing when confronted with the challenge to reclaim our role as keepers of the flame. We should get over it.

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