

## Strabrechtse Heide

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§ The Dutch are the tallest people in Europe, and Holland the most densely populated. It is an odd pairing, but then the Dutch have long had more stature on the world stage than the size of their country suggests. Allowing for some exaggeration, their story is a distillation of Europe's. Certainly that is true for their landscapes.

The Strabrechtse Heide is a patch of deliberately rough country embedded within an intricate mosaic of rural, urban, and industrial tiles, squares and rectangles fringed with streets, hedgerows, and canals. Coming upon it almost startles, like finding a splash of spilled paint on a Piet Mondrian canvas. The Heide is a chimera of Calluna heath, grasses, wetlands, shrubs, and pine woods, one of the gems of Netherlands' nature conservation. It sprawls tidily over a mere 2,000 ha – a jewel box compared with big-box parks like Yellowstone, Kruger, or Wood Buffalo. (The largest of Dutch protected landscapes barely qualify for the smallest of American wilderness sites.) That there is any fire at all is both inevitable and astonishing.

§ The Netherlands – the Low Countries – are a delta for a multi-branched Rhine, and are correctly known far more for water than for fire. But with allowances for its environmental peculiarities, the Netherlands are also a kind of historical delta through which flow the classic landscapes of temperate Europe. They are, in shorthand, a garden.

As it stabilized after the Middle Ages, that scene had three components – the arable field, the pasture, and the woods, or in the language of Latinate agronomy, the *ager*, *saltus*, and *silva*. These were cultural landscapes, as expressed literally in such terms as agriculture and silviculture. Each component featured fire in some fashion. Colonizers cleared with fire and axe, farmers burned arable-land fallow according to regular rhythms, pastoralists fired rough patches that often blurred into arable and woods, and the woods knew fire through swidden cultivators, patchy burns to stimulate berries and mushrooms or to expose mast, and escapes from pastoralists. All this burning, however, occurred within an anthropogenic matrix. In temperate Europe, where seasons changed temperatures rather than precipitation, there was no routine cadence of wetting and drying, much less regular bouts of dry lightning. Like the landscape within which it resided, fire was an artifact of people. In particular it depended on the availability of fallow, which in a cultivated landscape had to be tolerated, if not grown outright.

During the agrarian revolution that gathered strength during the 18th century, reformers, with the assistance of the state, sought to intensify production on each of the tripartite features of the classic landscape. This was particularly true for agriculture and silviculture, the latter evolving into forestry. With special vehemence theorists and ministries denounced both fire and fallow. They made explicit that what divided modern from primitive agriculture was that primitives used fire, while moderns found alternative means to fumigate, fertilize, and otherwise catalyze and recycle according to the principles that made this kind of farming an exercise in applied fire ecology. Accordingly, a long-simmering distrust of fire in the hands of peasants and herders mutated into a more virulent form. If fire was a tool of cultivation, officials and academics demanded a different tool. After all, fire had no legitimate basis in nature: it existed because people put it in. They could also take it out.

§ Within temperate Europe, the model morphed as it adapted to the oddities of local circumstances, substituting different kinds of trees, for example, or using coppice or shrubs. Then it pushed against those geographic frontiers. Sweden carried the model into the boreal forest, converting swathe after swathe of coniferous forest into swidden fields, and eventually into tree farms. France thrust the model, now remade by long tenure in temperate environments, back into its Mediterranean origin, and thereby commencing what became a ceaseless firefight.

Russia projected the model from the mixed-forest realm of central Europe into central Eurasia. Britain made the European anomaly the imperial norm, and so expansively exported the ideal that the sun never set on it.

And Holland? Holland expanded the model, polder by polder, into the deepening off-shore of the Atlantic, reclaiming the sea for farms. In the 17<sup>th</sup> century it joined other sea-faring countries and leapt over the Atlantic altogether to plant trading factories in the Americas, Africa, and Asia. The Dutch East India Company was not interested in settlement or conquest but in commerce. It in fact discouraged demographic colonization at Cape Town, and elsewhere; seized Brazil's sugar colonies for only a couple of decades; acquired a handful of tropical islands; and only really got sucked – reluctantly - into imperial conquest in the East Indies, where they became involved in plantation forests for teak; such settings attracted fires like black rats to East Indiamen galleons.

Throughout, Dutch explorers and traders encountered fire as a normal landscape feature on a scale unimaginable not only in waterlogged Holland but over all of temperate Europe. Where they could, they condemned fire, and punished those who set them. But the dominant encounter of fire-intolerant Europe and a fire-prone Earth was left to the major imperialists, notably the British, French, Russians, and the Neo-Europeans birthed in settlement societies such as America, Canada, and Australia.

The clash was violent: the social collision between different peoples had its environmental counterpart, as one firefight mirrored another. The most spectacular expression followed the establishment of forest reserves that were turned over to professional foresters to administer. State-sponsored forestry created the apparatus of modern-era fire protection; its institutions, its science, its purposes. Yet forestry was a graft onto the great rootstock of European agriculture. It might, for a while, tolerate fire, but it sought, as an ultimate intention, fire's extirpation. Until fire was controlled, modern forestry was impossible.

This ambition set into motion a heroic experiment in fire exclusion whose full costs, both economic and ecological, have become increasingly apparent during the past few decades. Of course forestry was only a part of the attempt to reconstruct alien landscapes wholesale into something more familiar, more productive, and more secure. Controlling fire was a means not only to control the countryside but to control the peoples who resided on them. This political imperative was never far from the minds of those who decided in what ways fire ought to exist. Garden landscapes required garden-like societies in which everyone had his place and time, even if such a vision was as rare as those outlier European landscapes that knew no regular rhythm of wetting and drying.

This story of exported pyrophobia is now well known, and is recycled like phosphorus through the narrative ecology of environmental history. The fire community in the Big Four firepowers appreciates thoroughly the ruinous folly of imperial Europe trying to impose its vision of a fire-free world onto taiga, tallgrass prairie, savanna veld, and pine steppelands. But just as once-colonized nations tended to become, in turn, colonists, seemingly forgetful of all they found detestable and foolish about ignorant imperialists, so the new firepowers tend to promote their own understandings as normative. The absurdity of applying the ecology of Strabrechtse Heide to America's Yellowstone or Australia's Kosciusko national parks, however, is no less absurd than transferring the fire ecology of such places to the Heide.

§ Northern Europe's great heathlands sat awkwardly within the manicured landscape of field and forest. They were an accidental byproduct of clearing, burning, and grazing in which the woods failed to return, the land often became waterlogged, and the minor flora that had previously underlain the forest or had clung to impauperate soils amid sand and rock spread promiscuously. Grazing and burning kept them in woody heath, often pocked with grasses and wetlands. On poorer soils they were extensive; a survey in 1850 reckoned the Netherlands' heath cover at 750,000-800,000 ha. Mostly it was used for rough pasture, for which fire was mandatory to keep the browse palatable to sheep and cattle.

It was the kind of scene that drove academic agronomists and ministers of agriculture into a frenzy. It was, in their lexicon, “waste.” Worse, it was burned, which doubled the wastage. If browsed by sheep, fire and hoof worked to replace *Calluna* heath with the grasses that sheep preferred. States labored to convert the wastelands to arable, usually by paring and burning – that is, swidden applied to organic soils. Or they sought to plant it to trees. Or, as in Scotland, it became prime habitat for grouse and an economy of sport hunting. The heath itself had little value: even animal husbandry sought to improve itself through breeding, close tending, and integrating the flock better with the field. Still, pastoral burning persisted through the 1920s on ever-shrinking parcels of heath.

Everywhere, the rolling heathlands shriveled, and might have vanished altogether in the face of woody reclamation and reduced grazing had not something unexpectedly intervened. In many sites, vandals burned the heath for sport – and paradoxically spared it from destruction. Other sites became the scene for military camps; exploding shells took the place of paring and burning, and the tread of tanks substituted for the hoof and teeth of sheep, cattle, and swine. And here and there, as the heath threatened to disappear, champions arose to declare them cultural relicts, worthy of at least ceremonial preservation.

That is what happened to Strabrechtse Heide. In 1950 the Netherlands state forestry bureau bought 1,000 ha as a preserve, an act that so infuriated the local *boers* that between 1952 and 1954 they burned off almost the entire site in protest, an outburst that may have saved the Heide from biotic decay. Within a decade the foresters reinstated some sheep, and later some highland cattle, all under close tending, and they burned to promote grass, which the sheep favored, over the *Calluna* that ecologically defined the heath. In the 1970s the local authorities banned open burning altogether. The Heide overseers ignored the ban, and continued to fire the site, even though in patches little bigger than carpools and with less depth than a strong rake. Something had to prune the woody growth. Hand clearing was too expensive; mechanical treatments often too crude; it was either fire and livestock or the loss of the Heide, which by now had additional value for its complement of rare species, especially of butterflies, ants, reptiles, and the occasional floral plant. In the 1990s the reserve received official permission to do the burning that they had been obliged to do of necessity. Across the country the landscape of heath had by now imploded to little more than 40,000 ha, most of it in poor health.

So they burn. They burn in late winter or early spring, typically in latter half of February after the snow has gone and before the birds breed. They like some frost. They burn in small patches, the way a gardener might prune back a hedge or weed a flower bank. They burn shallowly, taking away only the lightest grasses and tiniest twigs, but often with enough flash heat to top-kill birch and other woody invaders. These resprout or sucker from the base but then the sheep eat them back, and with their reserves exhausted, the young trees die. At the same time, to protect fire-sensitive junipers, they isolate and shield individual trees.

The Heide is as intricate as an wound-coil Swiss watch; too hot a fire might invite invasives, too broad a burn might overwhelm pockets of subspecies, too heavy a combination of fire and hoof might shatter the mosaic as fully as doing nothing might allow it to be overrun by woods. Even so, officials have yet to encompass the whole reserve with flame. In reality, weather offers perhaps 20 days a year suitable for burning, only one or two of which coincide with other calendars. In practice, that is, they burn every two or three years, and use the pattern of burned patches to circulate cattle and sheep around the reserve. Plans call for reintroducing further elements of traditional agriculture – some fields of ancient wheat, for example.

For fire ecologists from North America, in particular, the whole spectacle must seem bizarre – the scale of operations ludicrously minute, the purpose of fire restoration perverse, the operation no more pertinent to understanding the fundamentals of fire ecology than captive breeding is to theories of optimal foraging strategy for wild omnivores. This is a preserve run more on agronomic principles than natural regulation. The Dutch have seemingly drained fire ecology

from the intellectual landscape as fully as they have standing water from their geographic landscape.

§ Yet any theory of fire ecology that aspires to something like universal status must incorporate such scenes as fully as lightning-fired wilderness in the Canadian taiga or foehn-driven flames through California chaparral. Here is the imperial rebound: the misapplication of fire lore acquired in one setting and falsely declared normative and then applied to a very different setting.

The Strabrechtse Heide is as profound a challenge to contemporary understanding of fire ecology as the longleaf pine or Sequoia was to the received wisdom of professional forestry in the 1960s. It challenges the concept of a fire regime as fundamentally derived from purely natural inputs. It challenges assumptions that fire ecology must follow from fire behavior. It forces fire from status as a mechanistic driver and into the role of a catalyst, whose effects are meaningless without reference to herbivores and other biological agents. It questions the pertinence of natural fire, autonomous from human hand and mind, as the normative point of calibration. In place of the wild landscape, to which people are added, it proposes as an alternative point of departure the anthropogenic landscape, for which wildlands are a construct created by removing people.

Of course scale matters: free-burning conflagrations in Yellowstone in 1988 burned probably four orders of magnitude more land than managers burn annually in the Heide. That's the difference in length between a foot and a mile, and in weight between a hamshank and an elephant. But the difference in proportion demands a change in type, not simply of amount; the scaling is not linear. The dappled flash fires of the Strabrechtse Heide simply haven't the space to show the fire behavior witnessed at Yellowstone, or to reveal the coarse mixture of fire effects. Both are shaped by what people do before and after ignition. Trying to explicate fire ecology at the Heide by applying the principles derived from American wildlands or the deep Australian bush is like applying Newtonian mechanics to the subatomic realm. The existing literature on fire ecology relates to an everyday world of landscapes. It is not readily scaled up to the globe or down to the garden. It is not clear that the relationships normally studied (and considered normative) can be adjusted simply to the very large and the very small. What may be needed at Strabrechtse Heide is the fire-ecological equivalent of quantum mechanics.

When foresters from temperate Europe witnessed the flame-flushed tropics and arid outbacks of their colonies, they were astonished, fearful, outraged, and finally determined to force those bizarre and blazing scenes into proper form. The result was a massive misreading of fire's place on the land. Yet North American fire ecologists are likely to make equivalent errors amid the cultivated landscapes of Europe. They might hunt relentlessly for evidence of natural fire, even if it means pursuing charcoal laid down at the height of the last glaciation. They will search out expressions of fire adaptations, especially fire-stimulated germination. They will then try to track the evolution of the current scene from such core data, and propose that future management should seek to accentuate those pure elements and shed 4,000 or more years of biotic contamination at the hands of humanity and its servant species. Such a vision says very little about the scene they are viewing, and much about the scene in which they grew up.

§ In September, 2008 the International Association of Wildland Fire will sponsor a conference to celebrate the 20<sup>th</sup> anniversary of the Yellowstone fires. The proposed topics are the ones familiar to the North American fire community – that fire is natural; that fire's behavior determines fire's effects; that society should accommodate itself to the inextinguishable presence of free-burning fire since it is both unavoidable and necessary. The idea that such a body might gather instead at Strabrechtse Heide would seem a mockery.

Yet the inability to read the fire history and ecology of such places is a serious failure of imagination. Greater Yellowstone and the Strabrechtse Heide are scattered points in a constellation of the Earth's burned landscapes, and not the most extreme; any theory of global fire

must embrace them both, even if it means taking seriously the catalytic ecology of fire in the Heide and the cultural context of the nominally wilderness conflagrations at Yellowstone. As the Dutch have learned over many centuries, big ideas can be found in small places, as small ideas sometimes appear in big ones.

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