Chapter 5

When is Nature Not?

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Domination of the world by humans is usually thought of as a unique process in the history of life on earth. But there is fossil evidence to show that something similar occurred about six to eight million years ago. It was the dramatic rise to dominance in tropical regions of a group of fast-growing grasses, leading to the creation of savanna habitats.

In what was geologically a wink in time, during the Miocene, savanna grasses took over half the land on earth once occupied by forest.[1] Changed forever was the face of Africa, of Asia, of North America and of Australia.[2] Biologists have described "a dramatic near-synchronous expansion of C4 grasses around the world within about a million years."[3] Their mention of "C4" refers to the highly efficient photosynthetic pathway of these grasses.

Human domination of the world has resulted in many animal extinctions, and so it was with these grasses. Various forest-dwelling mammals disappeared from Africa, Europe, Asia, North and South America, apparently because of habitat loss.[4] For many leaf-eating mammals that survived, a change in diet to more grass can be detected in carbon isotopes in the enamel of their fossil teeth.

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[1] Bond, Woodward, and Midgely, "Global Distribution," 525.

[2] Some Australian ecologists dispute that fire maintains Australia's savanna habitats so I have listed Australia last.

[3] Beerling and Osborne, "Origin of Savanna Biome," 2023.

[4] Damuth and Theodor, "Miocene Ungulates," 7899.

Human domination was made possible by many tools adopted by humans, and I would argue that savanna grasses also relied on a "tool"—fire. Fire was not new at this time. Fossil charcoal in large amounts can be traced back more than 300 million years.[5] But fires increased dramatically in the late Miocene as grasses spread. Charcoal layers in the sea point to vast fires in Asia and Africa, and ash in the Atlantic and Pacific can be identified as coming from grasses.[6]

An increasingly monsoonal climate is thought to have aided grasses by increasing the opportunities for fires.[7] Monsoons feature a pronounced wet season, ideal for growth, followed by a dry season during which fires lit by lightning can spread over large areas. Fires in many savannas burn each year.

Grasses are often the plants that benefit most from fire. Fire is a major force by which dominant grasses compete with shrubs and trees because they recover more quickly from fires than woody plants. In grasses you have the evolution of flammability: they have evolved to burn. Their short-lived leaves accumulate as fuel beneath living plants. In what is a form of symbiosis, grasses promote fire and fire promotes grasses.

American ecologist Robert Mutch was the first to advance the notion of flammability as an adaptation favoured by natural selection—in 1970.[8] His theory has won support in many subsequent papers, with titles such as "Kill Thy Neighbour" and "Are some plants born to burn?" The evolution of flammability is very evident in Australia, where fires allow spinifex to displace mulga woodlands, buttongrass to

[5] Scott, "Pre-Quaternary History," 281.

[6] Beerling and Osborne, "Origin of Savanna Biome," 2023.

[7] Osborne, "Atmosphere, Ecology and Evolution," 35.

[8] Mutch, "Wildland Fires and Ecosystems," 1046.

displace shrubs, and black spear grass to displace softer grasses. Buttongrass in particular seems made to burn—it will ignite at temperatures below 1°C, at night during fog or when frost is forming.[9]

Late Miocene grasses set the world on fire, and planet earth has been burning ever since. Fires lit by lightning, and more recently by people, have benefited grass-exploiting animals, including humans, as well as the grasses themselves. Fire was the most powerful tool at the disposal of early humans. *Homo sapiens* began by burning forests and grass, and now burns coal, oil and gas. Without fire, and without plant-based fuels to burn, humans would never have achieved such dominance. The parallels between grass success and human success are thus substantial.

One could argue there is one big difference in that humans are one species and grasses many. But the rise of humans has not been the rise of a single species. Our crops, livestock and companion animals have multiplied along with us. And our success has been exploited by many others, including rats, mice, cockroaches, lice, crows, seagulls, vast numbers of weeds, and some exceptionally nasty ants.[10]

Our rise could even be classified as a second stage in a single process, because we would not have gone anywhere without grasses. We evolved in savanna. Most of our staple foods—wheat, rice, corn, and sugar—come from grasses, and grasses feed our livestock. But it must be said that our most important grasses were not part of that Miocene grass explosion.

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[9] Low, "Born to Burn," 24.

[10] Low, *New Nature*, 1.

Humans have a powerful relationship with fire, just as we do with grasses. Indigenous people often lit fires. Most of the early explorers in Australia saw evidence of deliberate fire.[11] Fire was used by people all around the world.

In 1969 Rhys Jones published his milestone paper in which he claimed that Aborigines had farmed the land by use of fire.[12] They were fire-stick farmers. "Aborigines as farmers" was a wonderful way to raise their status in mainstream Australian eyes. European settlers had justified their land grabs by asserting that the Aborigines had failed to manage or improve the land in any way. Rhys Jones was refuting that argument.

But now the concept of Aboriginal management has become so entrenched it has led to the idea of Australian vegetation as a human artefact. Tim Flannery pushed this in a 2003 essay:[13] "it's not an exaggeration to say that Aboriginal fire and hunting literally made the Australian environment that the Europeans first encountered. It was a vast, 47,000-year-old human artefact, designed to provide maximal food and comfort to its inhabitants in the most sustainable manner."

But Flannery overstates the importance of ignition and ignores the role of flammable vegetation in making fires easy to light. The Aborigines could use this method only because flammable vegetation had evolved millions of years before their time. Botanist David Bowman has put it like this: "Aboriginal people played an important part in the making of flammable Australia as we know it, but they did not

[11] Pyne, *Burning Bush,* 121.

[12] Jones, "Fire-Stick Farming," 224.

[13] Flannery, *Beautiful Lies,* 41.

trigger the relentless fire cycle; rather, over some 40–70 [thousand years] they learnt to harness the naturally-occurring fires to their economic advantage."[14]

Indigenous Australians extended a natural process by increasing the frequency and reducing the reach of fires, but they did not initiate something new. They appeared to wield enormous power only because Australia carries so many flammable plants. Among these are eucalypts, paperbarks, and many other plants with highly flammable bark and flammable oil in their leaves. Flammability helps eucalypts outcompete rainforest trees, cypress pines and she-oaks, and it also helps grasses compete with eucalypts.

Instead of talking about "Aboriginal fires" we should acknowledge the mutual relationship that existed between people and particular plants. Humans needed the grasses to light fires, but grasses didn't need humans to the same extent because there is lightning as an alternative source of ignition.[15] To call the Australian bush an "artefact" in this situation is to misunderstand completely the relationship between those who were doing the burning and those who were being burnt.

The *Oxford Dictionary* defines an "artefact" as "the product of human art and workmanship … as distinct from a similar object naturally produced." This is not a valid way to think about Australian landscapes in which human ignition was only one force among many. Environmental philosopher Val Plumwood has strongly attacked Flannery's image of the Australian vegetation as something created: "The picture of Australia as a human product presents creativity as the prerogative of the human and denies the role of forces much older and more powerful than the human in shaping the

[14] Bowman, "Australian Landscape Burning," 261.

[15] The world is hit by eight million lightning strikes each day. Scott, "Pre-Quaternary History of Fire," 281.

continent." To quote Plumwood again: "Counting something (e.g., a place) as purely human (or 'cultural') when it involves the labor of nature jointly with human labor hides or denies the work of ecological systems and human dependency relations on it."[16]

This "artefact" example, and its popular reception, shows how inadequate humans can be at thinking about nature as an active agent. Other examples abound. *The End of Nature*, an important best-selling book, provides an extreme example.[17] Its author, Bill McKibbon, argues that because human-induced climate change has impacted upon nature everywhere, nature has ceased to exist. McKibbon sought to jolt people's concerns about climate change, but his conclusion, that nature ceases to exist as soon as there is some human influence, is nonsensical. It denies the reality that humans once lived in most habitats. McKibbon really means "wilderness" when he says "nature," but this word is also problematical.[18] Does humanity cease to exist if it is influenced by nature? Why should the reverse be true?

Another heavy-handed perspective comes from Michael Pollan, in his book *The Botany of Desire*: "What if those potatoes and tulips have evolved to gratify certain human desires so that humans will help them to multiply? What if, in other words, these plants are using us just as we are using them?"[19] This is like arguing that grasses exploit people when fires are lit; it simply shifts causality from people to plants, while perpetuating the simplification.

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[16] Plumwood, "Concept of Cultural Landscape," 132–38.

[17] McKibbon, *End of Nature*, 43

[18] Low, *New Nature*, 37

[19] Pollan, *Botany of Desire*, back cover.

In these three examples, which have come from prominent, influential writers, the crudeness of the thinking suggests a widespread blind spot, a failure to properly consider nonhuman causality. To paraphrase the three examples:

1. Aborigines lit fires, therefore Australian vegetation is an artefact;
2. Humans have changed the climate, thus nature has disappeared;
3. Crops benefit from humans, therefore crops rule humans.

A more subtle example of fudged thinking runs through our thinking about extinction. We are in the midst of a global extinction event, during which more mammals have gone extinct in Australia than anywhere else.[20] Humans are clearly to blame. But Australians are also told that foxes and cats caused the extinctions. It so happens that some of the vanished animals were never seen by Europeans, much less killed by them. Some extinctions took place in deserts where no axe or hoof ever went. Parallel narratives exist: foxes and cats did it; people did it.

Weeds are another environmental problem where agency can be contested. A weed expert[21] working on camphor laurels told me that all the hundreds of thousands of feral camphor laurels in the Bellingen valley in New South Wales owe descent from six trees planted a century ago at the local school. Native birds feeding on the school ground berries have spread the seeds far and wide. Many of the world's worst weeds happen to have seeds that are widely spread by birds.

If it is acceptable to talk about Aboriginal people farming the land with fire, surely one may talk about birds sowing camphor laurel seeds. Birds get the habitat they want when they drop seeds, in what represents a mutually beneficial relationship with

[20] Johnson, *Australia's Mammal Extinctions*, 1.

[21] Judy Davies, pers. comm.

plants. With six trees planted by people, and hundreds of thousands planted by birds, who is more accountable for the weed problem in Bellingen Valley? One could ask the same question about the weed problems caused by lantana, blackberries, prickly pear, and other major weeds.

Humans are held responsible for weed problems, and for extinctions, because human actions—the introduction of foxes and foreign plants—came first, leading to subsequent problems. But if you adopt that line of argument, questions must be raised about whether humans are responsible for the fires they light, because the evolution of flammability preceded the lighting of fires. Rainforest had declined because of grass and eucalypt-fuelled fires long before people reached Australia; indigenous Australians accelerated the process but were not the main cause of rainforest loss.[22]

I believe we should accept responsibility for extinctions, and for weeds, but only because we have comprehension, foresight and morality to guide us, not because we are entirely to blame. We are the only participants who can intervene and for that reason we should. It has been unlucky for most life forms on earth that a species as powerful as us has arrived, but fortunate for some that we pay some heed to moral values. If killer ants had risen to world dominance they would not have set aside safe areas for other species, nor devised laws to protect them.

To think more realistically about the world we should acknowledge the power of nonhuman agency. In my book *The New Nature* I give many examples of animals as "ecosystem engineers" shaping landscapes, including elephants, seals, wombats, beavers, seabirds, termites, and corals.[23] But most people, including experts, are so

[22] David Bowman, *Australian Rainforests*, 285.

[23] Low, *New Nature*, 49.

reluctant to recognise nonhuman influence that animal agency is regularly attributed to people. In the Northern Territory the salinization of coastal wetlands has been blamed on human-induced sea level rise, when the main cause has been water buffaloes creating swim channels that let in the sea,[24] and in north Queensland, debates have raged about whether certain mounds of shells represent indigenous campsites or old nest sites of orange-footed scrubfowl.[25]

Our language limits our thinking about nonhuman agency. On small islands where seabirds breed, nutrient levels can rise so high that native plants die and soil erodes into the sea.[26] We should be able to talk about seabirds "polluting" island soil, but the word "pollution" is almost never applied to nonhuman wastes, and "erosion' is seldom applied to animal impacts.

Christmas Island in the Indian Ocean is an example of a place where animal agency is especially obvious. The island's red land crabs are such efficient consumers of seeds and seedlings that they produce an open rainforest structure.[27] But invasive yellow crazy ants reached the island long ago on ships, and they now prey heavily on the crabs and have eliminated them from some areas. Where ants dominate, the rainforest is now much denser with seedlings and saplings.[28] The difference between crab-ruled and ant-ruled rainforest is obvious—one is easy to walk through and the other too thick. Christmas Island must have been a much better place for plants and insects before it was colonised by crabs. Not only do the crabs consume seeds and

[24] Low, *Climate Change and Invasive Species,* 15.

[25] Bailey, "Hens' Eggs and Cockle Shells," 21.

[26] Low, *New Nature*, 53.

[27] O'Dowd, Green, and Lake, "Invasional Meltdown," 812.

[28] Ibid.

seedlings, they also eat fallen leaves that would otherwise shelter small invertebrates. Red crabs have much in common with humans, as abundant domineering animals that alter whole landscapes when they divert resources to their own ends.

I do not think humans are as different from other species as we are usually thought to be, because I see so many parallels between us and crabs and ants and grasses, and because I can see that we often exaggerate human impacts and underestimate other players.[29]

A couple of years ago I wrote a report for the Australian government about climate change and invasive species.[30] Of all the introduced plants and animals I considered, the species that concerned me the most was gamba grass, a giant African grass imported into northern Australia for pasture. Farmers want this grass because it produces far bigger leaves than any native grass, but in northern Australia, what is intended as food for cows often becomes fuel for very big fires. Gamba grass fires are so hot that eucalypt trees are often killed.[31] Gamba is only one of many introduced grasses that can shift fire regimes into a self-perpetuating alternative stable state.[32] The Queensland government assessed the risk it poses and reached an alarming conclusion: "If large areas of northern Australia become dominated by gamba grass, the associated fire regime is predicted to transform Australia's eucalypt-dominated tropical woodlands into tree-free grasslands."[33] Climate change, by increasing the fire risk, makes that more likely. Here is a plant that poses as much threat to biodiversity as a thousand bulldozers.

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[29] Low, *New Nature*, 49.

[30] Low, *Climate Change and Invasive Species*, 1.

[31] Rossiter et al., "Testing Grass-Fire Cycle," 169.

[32] D'Antonio and Vitousek, "Biological Invasions," 169.

[33] Csurhes, *Assessment of Potential*, n.p.

Governments have since moved to ban it, although existing plantings remain (and are spreading).

This example shows that when planning for climate change we need to consider nonhuman agency. It is not enough just to ask: "How will climate change directly affect humans and other species?" We should also ask how climate change could benefit species that cause harm. In some ecosystems the main threats to biodiversity may well come, not from climate change directly, but from undesirable species that thrive under climate change.

It is therefore important to have a suitable framework for thinking about the future. We should see ourselves as not always operating alone when we cause environmental harm. All too often, perhaps most of the time, we have partners in crime—species that exploit situations and worsen outcomes. The number of animal and plant "pests" contributing to conservation problems is vast, and includes rats, mongooses, elephants, monkeys, deer, pigs, birds, snakes, centipedes, starfish, bees, vines and various pathogens.[34]

Here are some suggestions for better thinking about this topic. We should stop always thinking about nature in the singular, and more often as a "they." When a farmer razes a forest to create a pasture, it is not true that all birds suffer. The pastures so created suit birds such as magpies that dislike forests. What this shows is that there is no one response to us—or to anything else—by other species, but rather many individual responses, because each species has its own needs. We should think of nature as a multiplicity rather than as a single thing.

[34] Low, *Feral Future*, 1.

We should beware the simplistic duality of humans versus nature. The concept of harmful humans and innocent nature is a useful rhetorical device for advancing nonhuman interests, but ultimately it limits our thinking. We have to be able to recognise when nonhuman species behave unhelpfully (and when humans behave well). We have a moral obligation to prevent such awful outcomes as rats on islands exterminating birds by eating their chicks.

We need new ways of thinking about causality, which recognize how often it is shared. Humans are implicated in recent extinctions but they are not the only villains. Nor are they the only reason why fires burn so far or weeds spread.

Finally, as I keep emphasizing, we should acknowledge the active agency of nature. Many forces are at play around us but we tend not recognize them. For as Val Plumwood says: "Many philosophers try to impose consciousness as a condition of agency."[35] But unconscious agency can be extremely powerful, as Freud concluded. Perhaps that helps explain our reluctance to think more carefully about these issues. Our conscious minds prefer a simple picture of a consciously ruled world. But ultimately, a world in which animals and plants are active agents of change is more satisfying.

[35] Plumwood, "Concept of Cultural Landscape," 124.