SERPENTINE

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Two billion years ago. The Great Oxygenation.

The process began when blue and green photosynthetic bacteria, frantic for hydrogen, gained the ability to source it by processing water. This metabolic shift within the microscopic organisms inhabiting the oceans resulted in the release of massive amounts of oxygen into the Earth's atmosphere.

Oxygen, as the bacteria's incessantly leaking waste product, causes the biggest pollution crisis that ever happened on Earth. It irreversibly alters the chemical equilibrium of the atmosphere, establishing the environment as we know it today. Cyanobacteria, the newly evolved world-makers, force an ultimatum upon all living beings: breathe or disappear.

500 million years later. The stratosphere is achieved.

Organisms that previously hid from sun exposure in the ocean deep can now withstand filtered rays in shallower areas. Plants can finally spread inland.

Still, the terrestrial environment proves hostile: in order to survive, plants develop a three-dimensional structure that can counteract gravity and prevent collapse or dehydration. This plant tissue is called lignin, or wood.

500.000 years ago.

Wood is one of the first materials extracted and shaped by humans into tools and artefacts, thanks to its malleability and relative resistance. These objects participate in the human colonisation of the planet.

Burning logs releases the heat energy necessary to cook and absorb the chemicals in foods that humans were previously unable to digest; as their diet expands, humans start to inhabit colder areas, dramatically increasing humanity's geographical dispersal.

Homo sapiens emerge as a new species, no longer oriented toward arboreal life. For them, trees are not environmental features to climb in search of rest and protection; instead, they become objects to cut down for construction and fire.

10,000 years ago. The Agricultural Revolution.

The shift from hunter-gatherers into static farmers definitively transforms the already complex relationship that humans have with the forest. The introduction of agriculture enables exponential population growth in humans, far outpacing the rate of forest regeneration around the world. As land is appropriated to cultivate crops, societies formalise their territorial management through disciplines like geometry and law, regimenting spatial and social behaviour through the regulation of terrain.

Animism adopt a fragmented worldview made up of a multitude of bioregional politics. Both living beings and inanimate objects embody spiritual entities that act alongside humans in the making of the world. The hierarchical and anthropocentric vision of monotheism, meanwhile, is more compatible with centralised government and territorial dominance.

4th century Emperor Theodosius I delivers a decisive blow to the magical rituals that revolve around trees and forests by felling them all.
In doing so, he aims to elevate the cult of Christianity to the official religion of the Roman Empire and to strip the forest of its mythology.

Rooted in dualism, Christianity envisions a strict separation between nature, humankind and the divine. Distinguishing the immaterial soul from its material carrier, Catholicism asserts the binary of subject and object, dominator and dominated. Trees are merely the soulless carriers of their own wooden materiality.

1240. De Proprietatibus Rerum

Among the 19 books of Bartholomeus Anglicus's thirteenth-century compendium, one volume—De herbis et arboribus—contains the first known botanical woodcuts. De Proprietatibus Rerum Franciscan monk's proto-encyclopaedia conceptualise the scientific categorisation of biological matter according to Biblical exegesis.

The belief in a divine, designed earth, likening nature to a book revealing the magnificence of God, aligns with the need to study trees and discover new and efficient methods to exhaust their practical utility, through techniques such as land clearing, drainage, domestication and fertilisation.

1492. Christopher Columbus's journey to the American continents.

The study of botany makes unprecedented advances in terms of arboreal classification, exploitation, transplantation, and regeneration. Colonisation marks the starting point for a system of exchange and appropriation that goes on to become global capitalism as we know it today: the division of the world into coloniser and colonised, the former invested with the moral authority and technological means to extract resources—and with the social prerogative to exploit labour of the latter.

1664. John Evelyn published Sylva: Or a Discourse of Forest Trees and the Propagation of Timber in His Majesty's Dominions.

The text is an analysis of forest management commissioned by the British Royal Navy. Evelyn addresses the catastrophic state of the forest resources of the kingdom and advises tree planting not only as a national duty to counteract over-exploitation, but also to preserve the interests of future generations.

Several decades later in Germany, Hans Carl von Carlowitz coins a term now very familiar: 'nachhaltig', or 'sustainable'. In his 1713 book Sylvicultura oeconomica, and in his capacity as head of the German Royal Mining Office, Carlowitz envisions a future with 'such conservation and growing of timber that there will be a continual, steady and sustained usage.' His eloquent arguments, however, attract opposition from subsequent generations of scientists.

By the end of the eighteenth century, the French naturalist-cosmologist Georges-Louis Leclerc—otherwise known as the Comte de Buffon—completes his Histoire Naturelle, générale et particulière.

The publication demonstrates the shift in European thoughts away from Biblical cosmogony and towards the study of natural phenomena as the basis to theorise the origin of life on Earth. In the place of Biblical interpretations, however, he advocates for a utilitarian notion of progress, denying the inherent value of conservation. With a moral affinity for productivity, Buffon even advocates the cutting of forests in Northern Europe to increase ground heat, and calls Nature the mistress of noble man.

1829. Nathaniel Bagshaw Ward invents the Wardian Case.

The steady intensification of colonial exploitation leads scientific development into the liminal zone between pure theory and applied intervention. The Wardian case is a paradigmatic example—a wood-and-glass box employing the terrarium principle to circulate moisture from day to night and admitting sunlight while in transit. The Wardian case, proves vital for the development of international trade, making it possible to transplant commercially significant specimens from their native habitats to cultivation in new countries for new markets

1847. The Economic Botany Collection is initiated by Sir William Hooker, director of the Kew Royal Botanic Gardens.

Motivated by the growing interest in unfamiliar flora with commercial value, Hooker amasses a variety of timber specimens, plant derivatives, and manufactured indigenous articles to illustrate the transformation of materials into objects of use. According to Hooker, 'the purpose of the museum is to inform not only the scientific botanist but also the merchant, the manufacturer, the carpenter and the cabinetmaker, about the variety and qualities available in the British colonies'. Not surprisingly, the first acquisition by the Kew is a selection of wood samples debuted at the Great Exhibition of 1851.

The Great Exhibition of the Works of Industry of All Nations is inaugurated by Queen Victoria, Prince Albert and Henry Cole to celebrate the achievements of industrial production. The event is housed in the Crystal Palace, designed by Joseph Paxton as an immense glass structure, a groundbreaking feat of engineering reflecting a modern architectural ideology of terraforming. As a horticulturist himself, Paxton is occupied by the creation of artificial environments to shelter the exotic plants imported by European traders and scientists from colonised territories.

But the Great Exhibition centres on the human subject, reducing plants to decoration and trees to material samples. Fears about increased pollution is submerged beneath the euphoria of mechanised future prosperity. In his article 'What is to be done with the Crystal Palace?', Paxton proposes to engineer the conditions for human survival under glass and steel.

In mechanical production, the logic of efficiency alters and compartmentalises resources. Before the Industrial Revolution, however, the subdivision of land under the peasant economy allowed different initiatives to coexist in forest spaces. According to environmental historian Mauro Agnoletti, the Roman word "silva" was used for both wood and pasture. Trees and animals cohabited in farmland. In the attempt to maximize productivity, forests are now exclusively dedicated to wood production while all other rural spaces are cleared to cultivate grain feed for animal livestock.

Over time, beef consumption will become by far the leading cause of deforestation, responsible for up to 70% of logging in the Amazon rainforest.

1864. The American naturalist George Perkins Marsh publishes Man and Nature.

Originally titled Man the Disturber of Nature's Harmonies, the book is inspired by Alexander von Humboldt's conception of the world as a web of life that connects the smallest organism to the highest mountain, in firm opposition to Buffon's anthropocentric view.

Presenting human exceptionalism in negative terms, Marsh is the first to claim that without extensive and urgent afforestation, Earth may be 'rendered no longer fit for the habitation of man'. By virtue of its eloquent arguments, Man and Nature is the first work of natural history to influence American politics and paves the ground for the Forest Reserve Act of 1891. Despite the enduring success of Marsh's theories, the time is not yet ripe for public opinion to engage with the complex question of forest and resource management.

Late 19th century.

Despite growing concerns about pollution the process of industrialisation engages trees not only as timber but also as fuel. When the scarcity of wood becomes critical, a convenient and extremely effective alternative emerges in the extraction of subterranean coal, the relic of plant photosynthesis from more than 300 million years ago.

1880. British inventor Joseph Swan patents a new, more durable filament for incandescent lightbulbs.

Electricity, together with coal, is altering not only urban environments but also forest landscapes. In coppiced woods, trees are repeatedly cut down near to ground level to allow the constant new growth. These are now extirpated in favour of conifer forest monocultures which are suitable to supply the poles that carry electric cables along the streets of urban centres.

1912. Arthur Clarence Pillsbury uses time-lapse photography to record the movement of flowers in Yosemite National Park.

Pillsbury shows his first film during a conference with the National Parks superintendents, who are moved to unanimous agreement on field preservation by the striking sequences of flowers blooming. Trees and plants are finally met with a visual

language that recognises their complexity and agency. Time and time again, new technological developments prove fundamental to fight deforestation, even if they are conceived to serve dominant economic or political interests.

1971. To overcome the lack of geographic and biological information of the Amazon territory, NASA-trained Brazilian cartographers create Radar Amazonia, or RADAM, using Earth-sensing technology developed for the Vietnam War.

The newly visible Amazon can now be fully shaped to the will of Brazil's military government, from mineral extraction to intensive cattle farming and mono-crop agriculture. This same cartographic documentation, ironically, will later become a tool to precisely assess the extent of deforestation and the loss of biodiversity. The destruction of forests may seem unstoppable, but it is increasingly being met by globally emerging initiatives for better interaction with the environment.

1972. Legal scholar Christopher D. Stone publishes a provocative text entitled, 'Should Trees Have Standing?' The canonical book recalls a question that Stone posed to students in a property law seminar, which would become one of the most radical ideas in environmental law for the next 35 years. Stone asks: 'What would it entail to accord legal rights to natural elements? Yes, rivers, lakes, trees, animals…rocks…how would such a posture in law affect a community's view of itself?'

From this point onwards, dozens of lawsuits are filed on behalf of non-human as well as non-living elements. The 'unthinkable', as Stone defines the expansion of legal personhood to natural elements, is an additional tool supporting the survival of endangered ecosystems.

1990. A group of indigenous people from the Bolivian lowlands of Santa Cruz and Beni gather in protest against state practices that have excluded them from their territories.

The March for Territory and Dignity, as it will later be known, protests not only land ownership and jurisdiction, but most of all the denied legal recognition of the complex entanglements uniting indigenous communities and the animals, plants, rivers, rocks and lakes in their lands. Some of their demands are made into constitutional law, making Bolivia a world leader in tropical forest preservation and sustainability certification.

Today.

Since the early 1960s, global timber consumption has increased by 70% according to Peter Dauvergne and Jane Lister. In their book Timber, they visualise this quantity as a boardwalk 40 metres wide and 1 metre high encircling the Earth at its equator.

Consumption patterns are extremely unequal: The global North uses more than 70% of the world's commercial timber to serve a minority of the world's population. Nevertheless, the demand for commercial wood is also growing in the global South: the UN estimates consumption to double from 2005 to 2030, particularly due to single use applications such as packaging for short-lifespan products. In the US alone, 250 million cardboard boxes and 700 million pallets are manufactured every year.

Even functional necessities can be short-lived and replaceable. When Ikea introduced assembly-required discount furniture in the 1960s, the company's founder Ingvar Kamprad claimed democratisation as the company's main concern. 'Flat-pack' furniture reduces solid wood, packaging, and shipping waste, but the final product is flimsier, so it is rarely handed down. Over time, it loses value, so when moving house, it is usually cheaper to buy new furniture than to transport it.

The cost-competitive flat-pack industry shifted Western furniture production from traditional craft regions in Germany or Italy to sites in Asia, Africa and Latin America, seeking not only cheap labour but also fast-growing plantations to replace the dwindling arboreal resource supply from North America and Europe.

The relationship between humans and trees is one that has evolved over the past two billion years. Human consumption long ago outstripped the natural growth rate of forests but sadly, the challenges faced by arboreal communities today come not only from direct human intervention but also from the indirect threat of climate change to every form of life on the planet.

Storms of unprecedented intensity, droughts and fires are rising exponentially across the globe. The images of the aftermath of these events are a mournful plea to consider the effects of human presence, production and design on the planet, and to evolve a new form of forestry practice that cultivates trees for reasons other than simply economic exploitation, to address arboreal resilience and, above all, conservation. Humans, like many other living species, exist because of and only in conversation with forests.

Our survival is the survival of trees.