Myths and cultures of the forest

A chapter in: *Trees of the people,* by Alan R. Walker
www.alanrwalker.com

We people are descended from a line of creatures, the sort called primates, who spent most of their time up in the trees. They were inhabitants of woodlands and forests. There they found food as leaves and fruits, also refuge from predators, but may have lived in fear of leopards – adept at tree-climbing. Probably these ancestors resembled modern chimpanzees, with strong arms, highly mobile at the shoulder and equipped with dextrous fingers and large, highly mobile, thumb. We retain this physical inheritance that has allowed us to become the tool-using primate. Our next huge evolutionary leap was to walk and run upright; to run upright as long as it took to wear down our prey. So now our time as arboreal creatures seems to have blessed us with affinities with trees. They fascinate us and our love and sense of connection with trees is different from how we feel toward any other kind of plant.

Treed savanna in East Africa, thought to resemble the environment that we people evolved in as *Homo sapiens.*

Down from the trees but not away from or able to thrive without them. As tool using beings our dextrous powerful arms and hands enabled us to select special stones as tools to crush, to cut and make sparks with.

We discovered how to make and control fire. Then we discovered how much tastier and nutritious food is when cooked. With that fundamental invention of cooking we took our first step leading to our current technological lives. Soon enough in evolutionary time we learnt how to cut branches and tree stems, and to manufacture charcoal. We are creatures of the wooded savannas, the woodlands, and the forests. The way we live now and use, manage and relate to trees and wooded land is rooted in this early history of our ways of securing food and shelter.

A thick forest of tall trees with useful wood products, but gloomy to enter, difficult to walk through and easy to become lost in.

Plants are the dominant life form on Earth, by sheer mass of vegetation, number of species, range of distribution, and as trees that tower above us. Plants are fundamentally different from us, except for the basic mechanism of the genetic workings of cells. We can read the mind of a pet dog, we can anticipate what a herd of cows, or the bull, might do next. Despite our ability for these insights we have no way to relate to plants as we do to animals. Plants we know as something to eat, something to cultivate for several uses, and to wonder at all that physical bulk of leaf, flower, seed and woody mass. Trees specially so: they start as small seeds, mature into saplings that grow taller than us, then seem to disappear into the sky. We may wish to hug them but the tree cannot

respond to us. Like no other plants, trees create many of the landscapes we live in: wooded savannas, woodlands, forests. We venture into a forest with a sense of anticipation of how to find our way and what we might find there. And how can we understand what it is that all these different trees are doing, how they live? We tell each other stories about the creatures who are truly of the forest. Stories take on a life of their own, they transform into myths.

Phantoms and the forest.

Evidence of how we lived then points to early days living in the wooded savannas of eastern Africa. Here the sun shines brightly overhead onto open woodlands. A sense of direction is usually easy to maintain when moving through such terrain. Then as we dispersed, over vast spans of time into northern lands, we the found trees there closer together and the sun was less often clearly visible. The further north we colonized Earth the more we encountered dense stands of winter-green trees and starkly leafless or storm-broken broad-leafs.

Wild-man or *Wood-wose*. Credit: Wikimedia.

Lesky. Credit: Dariusz Fluder, Wikimedia.

Losing your way in a forest easily happens. It feels the same as being in thick mist on a mountain top then realizing you have lost your compass: fearful. Distant landmarks are invisible, try one direction, try another, must keep trying! For our ancestors moving through forests following previous tracks, there were variously swarms of ants, snakes, big cats, wolves, bears, and mysterious phantoms to report to members of your clan in conversation around the cooking fire. Myths were born: a lone man living in the woods by choice, or possibly as a punishment, could easily be the source of a myth. The Green Man, or Wild-man, the Woodwose and similar weird creatures of the forests of Europe were sufficiently harmless to become incorporated into utilitarian art. They inspired decoration on external stonework or interior woodcarving. Green-man became sufficiently domesticated as to serve as signage for public bar-restaurants.

Green-man: stone carving on a church. Credit: Wikimedia.

Laume. Credit: Wikimedia.

Somehow, by some quirk of our imaginations, these strange humanoid dwellers of the forest mutated into beings having powers of malign intent against people, but possibly also of protective intent toward the trees and forest. The Lesky of eastern European dense forests was revered by the

people as a pagan deity in the form of a man able to disguise himself as any other person, of any stature, giant or dwarf. The further back in time these deities of the forest are found the more frightful they are. Forests of north eastern Europe are home to Laumes. These take the form of goats, dogs, or bears. They may be chimeras: half-woman, half goat. One-eyed like Cyclops, or large breasted, crooked of spine, and a particular threat to men unwise enough to enter a particular deep recess of the forest. Tropical forests also were home to strange inhabitants, of ambiguous character and intent.

Curupira, in Brazil. Credit: Wikimedia.

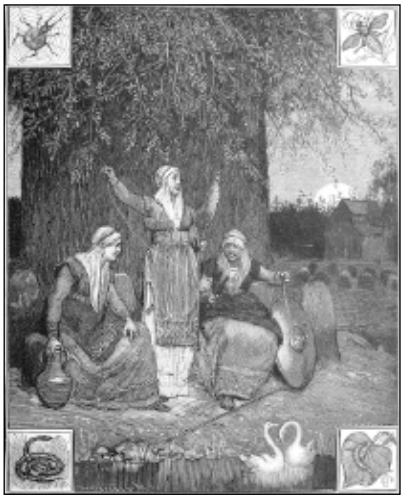
Yashini, under an ashoka tree. Credit: Wikimedia.

The Curupira of Brazil are like men in form except for their feet. These point backwards! Tracks Curupira leave in the forest will lead any too-curious human away from their maker. A Curupira guards the forest with his spear as a threat to any human who mistreats or mismanages their fair share of the resources of the forest.

Forested landscapes, as portrayed in our large cultural inheritance of drawings and paintings are a human construct. This is in the sense that the forest, the grassland, the lake and the mountains are where they are

by happenstance of climate, weather, ecology, fire and storm. We construct landscapes in our minds and even build them to our designs, as parks and gardens. From long ago we populated these landscapes with deities and with systems whereby the nature of our world, its workings could be created in our minds and explained to other people. We created cosmologies in our minds.

Yggdrasil. Credit: Wikimedia.



The three *Norns* at the base of Yggdrasil, weaving the threads of fate.

The Norse concept of Yggdrasil is a vast tree central to the rest of the world. Or at the centre of nine other components of the world. The tree is an ash: a species of long tall branches and deep roots, of fine-grained wood of great utility, even as firewood. Its branches support the heavens, its trunk is enormously thick, whilst its roots search the underworld for water and fertile minerals of the soil. At the base of the trunk live three deities. They are Norns, individually named as Urd, Verobandi and Skuld. Their role is to tend the ash tree whilst weaving long threads of fate to ensure the tree remains central and upstanding. Also the god Odin associates closely Yggdrasil and has powers of healing and wisdom,

but also potential for warfare and even for insane frenzy, for possession by evil spirits.

Graphic concepts of the forest.
A well known botanist and author of many books about trees once asked 'Can artists draw trees?' His answer was along the lines of trees being almost impossible to portray accurately in the sense of the mechanical accuracy of a camera that records much fine detail. This has been a problem for many landscape artists over long times, many eras, and specially in Europe and North America where landscape painting without trees, except for sea-scapes, would be problematic, or not fit for sale. How many artistic representations of prairies, savannas, moorlands are there?

The Harvest Wagon, by Thomas Gainsborough, Credit: Wikimedia.

A portrait of a single tree, as the only subject, preferably as a broad-leaf tree leafless in winter can be done to almost mechanical accuracy as some of the examples here show. Otherwise the examples by famous landscape artists such as Thomas Gainsborough, focus on the human interest. Focus on people doing some workday task needing lively activity.

The trees act as a background, with little attention to the almost impossible task of dealing with the leaves – too small, too many and so many similar shades of green. It can be done, almost to the level of identity to genus of tree, but few artists attempt that. A distinct exception is line-art, in black or brown using pencil or ink, usually of leafless trees, and finely revealing the forms and textures. Also so useful for illustrating identification guides to species of trees.

Cairn in Snow, by Caspar David Friedrich. Credit: Wikimedia.

An alternative for artists has been to adopt a grotesque style. There are usually available old or storm damaged trees in winter, stark enough to portray with paint on paper. Additionally the artist may use a surreal style to create trees of their imagination. Trees of tapering conical shape of a spruce but without any leaves. Trees battered by storm, struck by lightning or victim of some malign power. A tree may be shown as if mutilated by people using the arboricultural methods of coppicing, pollarding, or the shredding of branches going up the main trunk. Fully natural and realistic artwork showing very old trees in all their gnarly decrepitude are popular. There is something about ancient trees such

that we imbue them with magical powers: old and wise; ancient and enduring; showing resilience and fortitude. Ancient woods as well: a professional botanical historian may define these woods by reference to old maps and land-ownership records. Often these days any old patch of wood nearby might romantically be called an ancient one.

Oak Major, in Sherwood Forest, painted by Andrew MacCallum. Credit: Wikimedia

Oak Major, in winter and in summer, both Credits: Wikimedia.

Trees lend themselves well to the needs of photographers with their techniques and art. Trees do not run away, hide in the undergrowth, or flap about except during storm. If a broad-leaf tree in summer is just a mass of green dots soon enough its interesting structure will be revealed. Isolated conifers can be found that display their typical symmetry, itself one

of the fundamental differences between needle-leaf and broad-leaf trees. Needle-leaf conical growth is dominated by one bud at the very top of the tree. This is the apical meristem, a class of cellular tissue dedicated solely to producing new cells for growth. Broad-leafs trees can grow in many directions, replace lost branches, and some species can continue to grow again after we coppice or pollard them. Photographs reveal all these forms better than paintings usually do.

Wyndams Oak, painted by J.D.Surgey: this closely resembles the current living tree. Credit: Wikimedia.

General Grant, a national shrine of the USA. Credit: Wikimedia.

Sitka spruce in its natural symmetrical cone form growing in a botanic garden.

Sacred trees.

Trees not only provide us with a feast for our eyes, also literal feasts of densely nutritious fruits and seeds as nuts and berries. Hazel trees produce good crops of the nuts that people can use as instant source of food for people, and which can also be stored as reserves for hard times. The trees respond well to coppicing that produces thin supple new stems that we use as withies for fencing and building work. Some species of trees have particular scents and aromas: myrrh and frankincense as gifts in the New Testament of Christianity are from gums of certain trees. Myrrh comes from savanna trees of the genus *Commiphora* whilst frankinsence is extracted from trees of the genus *Boswellia*.

Bodhi tree, of Buddhism. Credit: Wikimedia.

Banyan tree in a public park, Australia.

From recorded history onwards people are known simply to revere trees, more love for them than fear of the forest. This leads to the social designation of distinctive groves as sacred. The trees are there for the people to be worshipped. The Druid priests of pre-Christian people of Europe, such as the Celts, acted not only as law-makers and judges, but also as stores of practical knowledge of the times and effects of seasons for agriculture and arboriculture. In many other regions and countries

of the world there are groves, individual trees and particular species held sacred. Examples include: *shimboku* trees of Japan, the *dangsan namu* tree of Korea, and the *bodhi* tree of India. It was a *bodhi* tree under which Buddha meditated. Sacred groves of trees have a history of worship as far back as records go. They continue to be revered as *fengshui woodlands* of China, the sacred shrine groves of Japan, and the church-forests of West Africa. Giant *sequoia* trees of North America are viewed by many awe-struck visitors who travel far to stand beneath them, staring far upward in amazement. The famous individual *sequoia*, 'General Grant', was named as the USA's Christmas tree by President Calvin Coolidge, then promoted by President Dwight Eisenhower as an official national shrine.

The T-wood, as a memorial or a political statement?

Beech trees in the T-wood; not planted for timber production.

A grove or a distinctive wood may be created as a memorial or for other symbolic motive. An example pictured above is locally known as T-wood, from its shape as seen from downhill. It was planted, in the 1760s, in a Greek cross shape (not in crucifix form). Entirely of beech trees, which are not native to this area: they must have been imported

from afar as saplings, in huge number. There are two versions of why the owner of the stock farming pasture on which T-wood stands had this grove planted. As a memorial to a family member fallen in battle, or as a political protest against the government of the nearby city who sequestered part of that landholding to make a large reservoir of drinking water. A potent gesture in either case, and in continues as a fine stand of a beautiful species of tree, that have a long future remaining.

Apollo chasing *Daphne*: leaves sprouting from her hands and feet. By Theodor van Thulden. Credit: Wikimedia.

People easily relate, both as yardstick and emotionally, to the rate of growth of seedlings to saplings to young trees, to these trees bearing cones or flowers, then seed. A rate of the same scale as the children that we know and care for. Soon enough these young trees grow beyond us, but then form a canopy whilst the undergrowth diminishes, making it easier for us to create footpaths through a new wood. Then, as the trees continue to grow and shed seed long after our individual lives we make

certain species sacred. The spreading banyan tree provides a sacred place under which to gather and discuss our business and gossip. The fig tree, species *Ficus religiosa* is one of many species of that large genus that produce ample nutritious fruit.

There are benevolent tree deities. In West Africa, specifically Dahomey and Nigeria, the tropical forests are guarded by *Azizas*, who provide assistance to the people who also live in the forest. These deities resemble in some ways the sprites and fairies of the forests of Europe: little people, usually female but sometimes male, that inhabit the forest and may provide assistance to people out foraging and hunting. In the mythologies associated with Hinduism, Buddhism and Jainism there are maiden deities of the forests called *Yashinis* – usually benevolent by sometimes of ill intent.

A major theme of European mythology and art of woodland derive from stories written by Ovid, the poet writing in ancient Rome. His many tales under the title *Metamorphoses*, as change from one state of form to another, are often the subject of recent European art. Well known of these stories is the infatuation of the god Apollo, with the woman Daphne. But she loved more deeply the trees and woods through which she wandered and wished to spend her life amongst. The more *Apollo* persisted in his courting of *Daphne* the more she metamorphosed toward the form of a tree: her fingers sprouting leaves, her arms becoming branches.

Dragon carved as a bench in a woodland nature reserve.

Silviculture and wood-work.

A pragmatic social culture of tending and harvesting trees probably started when our ancestors needed more than fuel-wood collected as fallen branches. People who first inhabited that half of our world's land-mass, the Americas, migrated from far eastern Eurasia, from the lands called Beringia. Then the level of the oceans was much lower, during the Last Glacial Period that ended 11,700 years ago. The people walked, and some may have rowed canoes made by carving and digging out logs of massive conifer stems. By the time these new peoples reached what is now the coast of southern Alaska they were probably well pleased with the sight of several species of massive conifer trees. Now the town of Sitka is established on the coast of Alaska and the spruce tree named after it, also known as *Picea sitchensis*, is indigenous to a narrow coastal strip that extends along to the Canadian province of British Columbia and thence just into Washington State.

Pounding a stem of black ash to release fibres for basket making. Credit: April Stone, Wikimedia.

The many peoples of these lands, twenty two cultures of language and custom, greatly value trees for their usefulness as lumber for build-ing homes, the many other uses of the wood and leaves, their beauty as individual tall straight trees, and their spiritual significance. Similarly

for Western hemlock trees and Lodgepole pines. The culture during that first colonization by people developed as a joint tenancy. Natural resources had rights of being there first, indigenous by their evolution as new species on Earth. The people then made themselves indigenous to this new land by their migration, by their intelligence to think with, and their wisdom from thinking collectively. Thereby the people integrated with this new world of plants and animals. These people, with their culture acted as custodians, managing their natural resources collectively and passing on their wisdom by myths and story-telling.

Archaeological trace of a raised linear walkway over open terrain in a forested region of Amazonia. Credit: Wikimedia.

Far to the south of this vast new land, in the forests of what is now Mexico, Guatemala, Venezuela, Brazil and other countries of the Amazon basin, the people lived in the forests from the early days of migration southward. Swidden agriculture (or slash and burn; its pejorative sense) would have been a common early method of providing food in these forested lands. But from the early days of these migrations people in some regions developed much more substantial, long-lasting, structures to aid their agriculture. Specially so in areas both fertile but prone to waterlogging. The people constructed massive earthworks as raised mounds for their crops and these were interconnected by raised earthen walkways.

These earthworks date from long ago, 10,000BP for example, but still remain visible from the air in the area now called the Llanos de Moxos (plains of . . .) in Bolivia. Smaller archaeological sites in the Amazonian region, as large scale modifications of land for agriculture, go back to 45,000BP.

Baobab in Madagascar, used to store drinking water. Credit: Pascal Maitre, Wikimedia.

There are many ways whereby people have learnt to use resources of the woodlands whilst leaving the trees growing healthily and regenerating. Coppice and pollard technique, as noted earlier, is the clearest example. Resin from conifer stems must have long ago been the adhesive to use for binding a stone tip to spear or arrows. Inner layers of bark, the soft cambium and phloem, are a source of nutrients for hungry people, as well as voles and deer. Birch bark, peeled off as a tube is good for construction of small containers. Oak bark provides tannins for curing the hides of deer for manufacture of shoes and belts. There are specialist methods to prepare bark-wood and stem-wood to provide long flexible strips for making baskets of various styles and sizes. Traditional methods are still followed to make items both utilitarian and aesthetically pleasing. The black ash tree, *Fraxinus nigra*, of North America is one source

of such woody material for weaving. Suitable individual trees, thirty to forty years of growth, are selected for the felling of a single tree. As cut logs the wood is processed to yield fibres, both long and flexible, for weaving. This is done by pounding the log with the blunt face of a hand-axe. Gradually a mass of long fibres of the xylem tubes appear under the hammering. These fibres are processed further for weaving by hand into strong durable baskets, much in popular demand. Similarly in Europe, strips of oakwood about twenty millimetres wide are cut off a log using a spokeshave tool. These are sufficiently flexible to weave into baskets: much in demand as essential equipment for gardeners and horticulturists.

Silver birch growing massive in a botanic garden: a *Champion tree*, rewarded for its girth.

Cultures of sharing resources.

As the number of people living in woodlands and forests grows there develop conflicts of interest over rights of access to resources. Sometimes such conflict is framed by the concept known as 'The tragedy of the

commons', so named by its first proposer. As the human population in a particular area increases the share of resources available to each person (the commons) diminishes toward ruinous impoverishment. In practice, as studied by more recently by many economists and anthropologists, where there is sufficient combination of social cohesion, collective wisdom, and rule of law, this tragedy is usually avoided. Many studies of how the indigenous people of these lands gain land-rights, land-tenure, either individually or as a common-property. Then the resources are tended using local knowledge and cultures of sharing. Deforestation decreases significantly. New methods of agriculture and silviculture can be adopted as communal sharing and dissemination of knowledge.

Radical change in forest management has a long history. An English author, Arthur Standish, wrote about agricultural methods and policy. He published in 1610 an essay that became personally approved by King James I, about the state of England's forests and their over-exploitation for building ships, houses and for conversion to charcoal for smelting metals. Standish advocated the planting of 240,000 acres (97,000 hectares) in the hope that, "…there may be as much timber raised as will maintain the kingdome for all uses for ever …" Foresters of England and the rest of the United Kingdom are still working hard following on from this scheme, with much wider areas of regeneration, reforestation, afforestation, plantation . . .

What is a forest?

As the artwork and photographs here show, the simple aesthetic pleasure and emotional reward from trees and woodlands is specially rich. Trees define their surroundings as landmarks, as yardsticks of scale and relevance. Trees break up the horizon and reveal how far away it is. Trees soften the hard fearsome profiles of rocky mountains. Trees can be admired one by one, species by species and by obviously distinctive form and structure. The roots of trees extend about as far as the tree's own canopy. The rootedness and size of a tree can make it a place in its own right, specially so if bearing low branches for climbing up between.

What is a wood, or a forest: how can they be defined? Foresters are reticent about this problem of semantics and usually resort to wording in accountancy terms, some datum to be entered in a spreadsheet. Careful observers of wood, botanical ecologists who spend decades measuring the workings of an area of land bearing trees, come to stress the slow but always active dynamics of growth, production of seed, senescence, decay and replacement. They measure how a forest has migrated by use of historical analysis of deposits of pollen left in the mud at bottom of lakes. They observe the shorter term dynamics of forest succession as trees respond to gaps created by storm, fire, drought and pest infestation.

An old oak tree that had been coppiced, forming 5 new stems, during some part of its long history. Then left without further silviculture, as part of a wood for recreation. Secondary growth as many new branches show the tree's modular character and its adaptability to survive change.

This modern ecologist's approach can seem too remote from aesthetic appreciation of woodlands. One way to combine both approaches to understanding is a mental process called 'unselfing'. That is: recognizing that we people, us of species *Homo sapiens*, are as much a part of nature as the trees are. Some cultures, the forest dwellers of Peninsular Malaysia for example, believe that if there were no people in the forest, the world would collapse. A belief both pragmatic and in cross-continent resonance with the *Yggdrasil* of people from the northern forests of Europe.

Cultures of woodland management are much wider than the technical and administrative business of plantation forestry, with its complex financial relation to the timber (lumber) trade. Building with wood, single houses through to multi-story apartment blocks, is expanding business worldwide. The ways in which wood can be engineered, processed by techniques of lamination using synthetic glues, gives not only much greater flexibility of design and architecture but also many options for beautiful design.

A dead Scots pine at the edge of pine-wood where it grew isolated from other pines: revealing adaptability of plants. This tree grew many branches on a short stem, maximising access to its fundamental resource as sunlight, whilst minimising use of resources for growing stem-wood.

Metaphorical woodlands.

Life on Earth started in the oceans, possibly using the heat energy and mineral nutrients streaming out of deep-sea vents of hot water. Microorganisms, and then simple multicellular life evolved. The crucial step for this story about trees was the revolution of photosynthesis that providing ample and endless source of energy for simple, then more complex, plants. Later, much later, animal life came into being: forms of life that could develop only because they lived by predation on plants containing reserves of energy and nutrients accumulated from photosynthesis. Life is easy to define: living things spontaneously replicate themselves. Living things continue to live on as populations of a species for a million years or so before being replaced by others that are better adapted to changing environments. This happens through genetic variation, by which new

kinds of plants and animals arise. Most of these will not live on as a species, so amongst the few that do there are always variants that do not fit into the neat categories and schemes we devise. This is the wonder of life for us to see, its vitality of rejuvenation.

These beech trees, species *Fagus sylvatica,* are defined genetically by sexual reproduction with their flowers. How these trees have grown in this wood depends on their phenotypic patterns of growth in response to their environment of other beeches of the same age, planted close together. Each branch has grown as a module adapting to its access to space in the canopy to spread its leaves then photosynthesize.

Trees and other plants are described by botanists as modular. That is they are composites of many similar parts, and these parts are often disposable by the season (leaves), in response to storm (fallen branches), or roots heading off in a new direction as they find a rich pocket of minerals. Conifer trees (the group called gymnosperms) grow straight up as their regenerative tissue, a meristem of ever-dividing un-specialised cells, matures into the modular parts: bark, cambium, phloem, stemwood. Other meristems similarly produce the modules called branches. The more diverse angiosperm trees, all the broad-leafs, have more flexible modularity because of their many meristems under the bark of branches and stems. These growing points, these buds, are what responds when a tree is snapped off halfway up in a storm, or pollarded by a forester. The meristems spring into action to produce new branches.

Another beech, *Fagus sylvatica*, growing in isolation has adapted to the absence of other trees by modular growth of many small branches at the ends of an array of about 10 main branches, forming a high domed shape that maximizes access of leaves to sunlight.

So the fundamental character of the type of plant called tree is a biological world away from how animals are built and work. Trees have adaptability. This character enables them to grow around or through the problems of fire, storm, competition with other trees for a place in the sunshine. Trees growing naturally at the edge of a stand will grow so that most of its foliage forms a canopy like a side-wall, catching enough energy from the sunlight there instead of competing for a place in canopy of the stand. Similarly trees planted closely in rows for production of timber grow up strongly into the sunlight from above, so forming the tall straight trunks needed by foresters.

Our aesthetic and emotional relation with trees leads us to rely on much metaphor to describe what these plants are doing, to describe what a tree

needs to do to reproduce itself as no more, in the long run, as just several more reproducing trees. Authors of text books of botany avoid metaphor as much as feasible, relying on pedantic style and long glossaries of technical terms. Authors of popular science books have no alternative to much use of metaphor, maybe with several explanatory boxes of technical details. Trees do not suffer from the reproductive indignity of their vast wastage of seed, they cannot regret all the lost energy and material. Trees described as 'mother', for example, despite the inconvenient fact that the trees are bisexual, misses the gulf of reproductive methods of plants compared to mammals like us. Huge yearly production of seed provides a local population of trees, a forest of them, the opportunity to migrate. To thereby possibly come to grow on more fertile land. Trees migrated from mainland Europe across to the islands of Ireland and Britain as the glaciers of the last ice-age retreated. They migrated as all that vast quantity of seed produced more trees on the empty and potentially fertile ground ahead. Trees called 'granny-pines', small, old isolated Scots pines, *Pinus sylvestris*, did not make this species of tree one of the most successful ever, as measured by range of its distribution. From the first tiny population of a newly evolved species, somewhere in central Europe, this tree migrated west to the Atlantic seaboard and east to almost the Pacific ocean. It was the reproductively robust trees, one hundred years young, shedding pollen and seed into the winds at the margins of this forest, that created these vastly distributed forests.

This old and decrepit oak tree was photographed in late summer of a mast year. The branches were laden with masses of acorns. How many seeds has it produced in its life-time so far, with no more than a few maturing offspring to show for that reproductive investment of matter and energy during its long life?

Scots pine growing at the natural tree-line and showing its individual adaptation to low temperature as small stature; also adaptation to force of prevailing wind by its flagged shape. This tree bore a small crop of cones.

Trees do not suffer pain as animals do because they have nothing to sense it with: no nervous system, no brain. To describe a storm-broken tree as suffering damage is a metaphor in danger of leading to mistaking trees for humans. Mistaking a pet dog for a fellow human is sentimental: the dog is just using its social skills to pretend. Mistaking trees for people is anthropomorphism. To compare a tree with a broken branch with ourselves with a broken arm is to take our emotional relationship with plant life too far, away from understanding the fascinating botany of these strange life-forms. These plants are so familiar and yet so unlike us. Without a nervous system or anything resembling a brain, trees and other plants have many other ways of dealing with what the external environment throws at them, from wind-storm to being eaten by swarms of insects. Trees and all other plants have modularity which provides them with great adaptability They have chemical messaging systems that are analogous to the hormone systems of us animals. Trees have chemical defence systems against predation by herbivores. Trees readily form

useful partnerships with other organisms of greatly different structure and workings, the mycorrhizal fungi in soil for example. This is the natural wonder of plants, specially vivid with trees. Trees are adaptable but they are not intelligent because the dictionary definition of intelligence crucially includes the ability to think. With what may a tree do any thinking, let along acquire any wisdom? Is it wise of us to try to communicate with each other without using one language that we agree on?

A way between sunlit trees of the forest.

All part of nature.

Woodlands and forests are one of the world's types of vegetation that is subject to much human emotion about the natural world, about the beauty and wonder of it all. Another type of vegetation is open savanna and prairie, sparsely treed if at all. Both are the focus of nature conservationists to protect and preserve these landscapes. Usually it is the animal life that holds most of the attention and interest: the grass is merely something for the gazelles to eat, or the trees to shelter the bears. Inevitably conflicts arise from two greatly ways of thinking about, of trying to understand, the workings of these environments. Myths persist of states

of pristine nature, of remote wilderness. Such places do exist but only in those places too close to the poles or too far up mountain ranges to be habitable by people. Nature conservation needs to work within the limits off the stark facts of human history and our fundamental need for space in which to grow food. We are a part of nature as much are the grasses of the prairie and the trees of the forested lands. But we alone discovered how to supplement our access to resources of food by first inventing how to manipulate fire for cooking our food, then discovering how to extract from the earth sources of energy far denser than wood. By our technological access to sources of energy other than currently growing plants, we can seem to have separated ourselves from nature. Taking a walk through a forest easily reconnects us with the rest of nature. Thereby our love of trees, our respect for them, and even our fears will continue: our myths of dark forests without landmarks or paths made by other people rather than by creatures of the forest who have backward facing feet and carry a spear. Our love for trees will continue with the artwork, the photographs, the poems and songs, the furniture, the baskets, even as we fell the trees to provide the timber to . . .

References and Notes.

Many articles here are accessible using a search engine such Google Scholar.

Allan,V. & Deacon, A., 2020. *For the Love of Trees: a celebration of people and trees.* Black and White Publishing, Edinburgh. ISBN: 9781785393098. [Compilation of photographs and notes by many contributors. 10 contributors writing about why they like trees, and how being amongst trees is good for their health in many ways.]

Anonymous: Wikipedia and Wikimedia many articles and illustrations.

Baragwanatha, K. & Bayib, E., 2020. Collective property rights reduce deforestation in the Brazilian Amazon. Proceedings of the National Academy of Sciences of the United States of America, 117: 34, 20495–20502. [Deforestation of Amazonia has reached record highs in 2019 and is adverse to climate. In Brazil, about 2 million hectares of indigenous land are still awaiting formal recognition, and thus do not have full property rights. Granting property rights significantly reduces the levels of deforestation inside indigenous territories, and the results are of significant orders of magnitude.]

Bastin, J.-F., *et al*., 2017. The extent of forest in dryland biomes. Science, 356: 6338, 635-638. [Dryland biomes cover two fifths of the Earth's land surface but their forest area is poorly known. This paper reports an estimate of global forest extent in dryland biomes, based on analysing large databases of satellite imagery at very high spatial and temporal resolution. We show that, in 2015, 1,327 million hectares of drylands had more than 10% tree-cover, and 1,079 million ha comprised forest. Our estimate is 40-47 % higher than previous estimates. This increases current estimates of global forest cover by at least 9 %.]

Blackman, A., *et al*., 2017. Titling indigenous communities protects forests in the Peruvian Amazon. Proceedings of the National Academy of Sciences of the United States of America, 114: 16, 4123–4128. [This study used community-level longitudinal data derived from high resolution satellite images to estimate the effect of titling between 2002 and 2005 on forest clearing and disturbance. Our results indicate that titling reduces clearing by more than three quarters and forest disturbance by roughly two-thirds in a two year window spanning the year title is awarded and the year afterward.]

Briggs, G., 2016. *A Brief History of Trees*. Max Press, London. ISBN: 9781906251789. [Emphasis is on trees cultivated for food, spice, perfumes, cork, and similar products.]

Chazdon R., *et al*., 2016. When is a forest a forest? Forest concepts and definitions in the era of forest and landscape restoration. Ambio, 45: 538–550. [Definitions are needed to support policies that successfully protect, sustain, and regrow forests at national and global scales. A framework to illustrate how different managements drive the relative importance of different aspects of forest state, dynamics, and landscape context.]

Chhatre A. & Agrawal, A., 2009. Trade-offs and synergies between carbon storage and livelihood benefits from forest commons. Proceedings of the National Academy of Sciences of the United States of America,106: 42, 7667–17670. [Use of data on 80 forest commons in 10 countries across Asia, Africa, and Latin America. Larger forest size and greater rule-making autonomy at the local level are associated with high carbon storage and livelihood benefits; differences in ownership of forest commons are associated with trade-offs between livelihood benefits and carbon storage.]

Clement, C.R., *et al*., 2015. The domestication of Amazonia before European conquest. Proceedings of the Royal Society B., 282: 20150813. [Review of evidence of an anthropogenic Amazonia in response to claims of sparse populations across broad portions of the region. Amazonia was a major centre of crop domestication, with at least 83 native species containing populations domesticated to some degree. Populations and food production expanded rapidly within land management systems in mid-Holocene, and complex societies expanded in resource-rich areas creating domesticated landscapes.]

Edwards I. (Editor), 2010. *Woodlanders: new life in Britain's forests*. Saraband, Glasgow. ISBN: 9781887354691. [A well illustrated celebration of woods, woodland culture, crafts, silviculture, woodland management.]

Fa, J.E., *et al*., 2020. Importance of indigenous peoples' lands for the conservation of intact forest landscapes. Frontiers in Ecology and the Environment, 18: 3, 135–140. [Satellite data from 50 countries combined with interview data, showing the state of nature thrives better in forests in which indigenous people have secure land rights.]

Haskell, D.G., 2017. *The Songs of Trees: stories from nature's great connectors*. Viking, New York, ISBN: 9780525427520. [A professional botanist considers the cultural, emotional and spiritual aspects of trees and forests.]

Heckenberger, M.J., *et al*., 2003. Amazonia 1492: pristine forest or cultural parkland? Science, 301: 1710-1713. [Archaeology and history of Amazonian peoples in regions of Brazil reveal unexpectedly complex regional settlement patterns and large-scale transformations of local landscapes over the past millennium.]
Hemery G. & Simblet, S., 2014. *The New Sylva: a discourse of forest and orchard trees for the twenty-first century*. Bloomsbury Publishing, London. ISBN: 9781526640109. [Many detailed line-art illustrations. The original book was by John Evelyn: *Sylva, or, a discourse of forest-trees, and the propagation of timber in his Magestie's dominions*. First published in England during 1664.]

Hight, J, 2011. *Britain's Tree Story: the history and legends of Britain's ancient trees*. National Trust Books, London. ISBN: 9781907892202. [Druids were the priesthood for the Celtic tribes of pre-Christian Britain. The tribes were united by Druids, who acted as judges and oversaw the community's education, medicine, history and science, basing their religion on astrology and astronomy and using trees as sacred symbolism.]

Junqueira, A.B., *et al*., 2016. The role of Amazonian anthropogenic soils in shifting cultivation: learning from farmers' rationales. Ecology and Society, 21:1, 12. [An evaluation of farmers' rationales to understand their decision making in relation to the use of fertile anthropogenic soils, and for dealing with changes in shifting cultivation in Central Amazonia.]

Kimmerer, R.W., 2013. *Braiding Sweetgrass: indigenous wisdom, scientific knowledge and the teachings of plants*. Penguin Books, London. ISBN: 9780141991955. [Traditional harvesters recognize the individuality of each tree as a non human forest person. Trees are not taken, but requested. Sometimes the answer is no. The tree is felled with great care so as not to damage it or others in the fall. Sometimes a cutter will make a bed of spruce boughs to cushion the landing of the tree.]

Lewington, A., 2003. *Plants for People*. Transworld Publishers, London. ISBN: 1903919088. [A densely illustrated book for wide audience about the importance of plants directly to people.]

Lombardo, U., *et al*., 2020. Early Holocene crop cultivation and landscape modification in Amazonia. Nature, 581:7807, 190–193. [About the Llanos de Moxos of Bolivia ancient earthworks here.

Ostrom, E., *et al*., 1999. Revisiting the commons: local lessons, global challenges. Science, 284: 278. [A discussion of Tragedy of Commons concept by Elinor Ostrom, Nobel Prize winner for economics. Here she promotes the concept of common pool resources.]

Pearce, F., 2021. *A Trillion Trees: how we can reforest our world*. Granta Publications, London. ISBN: 9781783786916. [The Amazon is a working landscape, protected by those who use it, not a model of purity. The so called intact Amazon is actually mostly regrowth of pre-Columbian forest gardens.]
Perlin, J., 2022. *A Forest Journey: the role of trees in the fate of civilization.* Patagonia Books, Ventura. ISBN: 9781938340970. [Page 162: "As they became scarce, the value of trees rose in the opinion of both philosophers and thieves. People of letters were more apt to behold the beauty of trees now that there were so few. Many considered woods and groves ideal places to write."]

Rackham, O., 2006. *Woodlands*. HarperCollins, London. ISBN: 9780007202447. [Discussion here of a picture by Thomas Gainsborough of a wooded landscape titled 'Cornard Wood'. The trees, though beautifully detailed, are barely identifiable. Also the scene lacks identifiable infrastructure, such as ditches, coppice stools and others.]

Roberts, P., *et al*., 2017. The deep human prehistory of global tropical forests and its relevance for modern conservation. Nature Plants, 3: 17093. [Cumulative archaeological evidence now demonstrates, however, that Homo sapiens has actively manipulated tropical forest ecologies for at least 45,000 years.]

Schama, S., 1995. *Landscape and Memory*. Alfred A. Knopf, New York. ISBN: 0697402551. [The founding fathers of modern environmentalism promised that in wilderness is the preservation of the world. Wilderness was presumed to be out there, somewhere, in the western heart of America, awaiting discovery, and that it would be the antidote for the poisons of industrial society. But this healing wilderness was as much the product of culture's craving as any other imagined garden.]

Schlanger, Z., 2024. *The Light Eaters: the new science of plant intelligence.* 4th Estate/ Harper Collins Publishers, London. ISBN: 9780008445348. [Includes discussion of communication between plants, which implies a recognition of self and what lies beyond it. This would change the notion of what a plant is and it asks what is a plant without a means to communicate?]

Simard, S.W., 2021. *Finding the Mother Tree: uncovering the wisdom and intelligence of the forest.* Allen Lane, London. ISBN: 9780241389348. [An autobiography with much detail of author's field and laboratory experiments on the mutualistic relationships between trees and mycorrhizal fungi in the soil.]

Spronk, S. & Si, A., 2024. The trees above: a language-based analysis of tree agency in two indigenous societies. Journal of Ethnobiology. Special Issue. Animacy of Plants: Indigenous Relationalities in Global Landscapes, 11. [An ethno-linguistic study of cultural practices involving trees in two indigenous communities of Australia and India. These peoples are intimately connected with the trees surrounding them.]

Stace, C., 2019. *New Flora of the British Isles*. C & M Floristics, Middlewood Green, UK. ISBN: 9781527226302. [Page 307: "Fagaceae – Beech family. Flowers monoecious, inconspicuous, the male numerous in pendant or stiff catkins or pendant heads, the female in small groups of 1-few surrounded by numerous small scales . . ."]

St.George, Z., 2020. *The Journeys of Trees: a story about forests, people, and the future.* W.W. Norton & Company, NewYork. ISBN: 9781324020233. [Describes how trees define their surroundings by breaking up the horizon, marking the trail, softening hard edges. This because a tree is a rooted thing and it is also a place.]

Tittensor, R., 2016. *Shades of Green: an environmental and cultural history of Sitka spruce*. Oxbow Books, Oxford. ISBN: 9781909686779. [First Nations people of the Pacific Coast of North America value Sitka spruce for its beauty, spiritual significance and the many items it supplies them. All parts of this tree are used to make canoes, woven bowls, glue . . . Sitka spruce and its rainforest compatriots grow tall and wide, so that one mature tree provides a huge amount of timber.]

Trewavas, A., 2014. *Plant Behaviour and Intelligence*. Oxford University Press, England. ISBN: 9780199539543. [Both a textbook of botany with much on how plants adapt to varying conditions during their life and also argument in favour of proposition that plants are intelligent.]

Continues

Tuck-Po, L., 2005. The meanings of trees: forest and identity for the Batek of Pahang, Malaysia. The Asia Pacific Journal of Anthropology. 6: 3, 249-261. [These people believe if there were no people in the forest, the world would collapse. This is closely similar to basis the concept of environmental guardianship.]

Turner, N. J., et al., 2009. Cultural management of living trees: an international perspective. Journal of Ethnobiology, 29: 2, 237–270. [Culturally modified trees are live trees from which materials are harvested or which are modified through coppicing and pollarding, or are marked in some way for purposes of art, ceremony, or to indicate boundary lines or trails. Often their use is associated with particular belief systems or approaches to other life forms that result in conservation of standing trees and forests.]

Watkins, C., 2018. *Trees in Art*. Reaktion Books, London. ISBN: 9781780239309. [A wide ranging and densely illustrated book about how trees have been depicted in art and literature to tell stories of deep significance to people as much as they inform about the botanical nature of trees and woodlands.]