

Reflections Around a Mutilated Tree

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ABSTRACT

Pinus aristata Engelm., the Bristlecone Pine, has existed in Colorado, USA, since the Oligocene. This tree species is one of the most long-lived of all known organisms, reaching greater ages even than the Sequoias. In Colorado it now occupies only very limited areas, all at or near timber-line, on the higher mountains. Its continued existence is, however, severely threatened by 'souvenir hunters' who indiscriminately saw off 'decorative' branches, some of which have been around 600 years old and belonged to a tree perhaps over 1,000 years old. The increasingly easier access to Nature by powered vehicles poses a definite threat to the vegetation; in winter, snowmobiles and skidoos cause considerable damage, and now a kind of all-terrain vehicle has been constructed which may be even more destructive during the snow-free months. It runs either on wheels or tracks, can climb steep hills, and according to advertisements will 'run over sticks and stones'. A plea is entered for Man to approach Nature with more reverence and humility.

When I was a small girl at school, studying Swedish history and learning about the ways of the Vikings, we were shown a picture by one of Sweden's then foremost artists illustrating human sacrifices at a viking temple. It was a very realistic picture and showed the unfortunate victims with their limbs cut off and mutilated in the most terrible fashion. The horror, not to say the physical revulsion, which I felt over these senseless acts of brutality, has remained with me throughout my life. Any act of meaningless destruction is abhorrent to me.

This all came back to me, in full force, when I stood in front of the mutilated giants of trees on a mountain slope in Colorado. Here they lay, as if writhing in agony, limbs cut off and their very lives—in an already harsh environment of struggle with the elements over many centuries—threatened, in order that some persons could have 'an interesting decoration' of branches in their rock garden or over their mantelpiece.

Not one of the approximately 100 trees in the grove had escaped. Every one wore scars—some old, some new, but all distinctly man-made. The wind and the snow can bend and twist the branches of these trees, but will hardly ever break them. The scars these trees bear are inflicted with knives, axes, and saws.

I leaned down over one of the freshest cuts, obviously made with a motor-saw and smooth enough to enable me to count the rings. The branch had been barely a foot (30.5 cm) in diameter, but was sound and firm, without any sign of decay or damage in the wood. With the aid of my botanist's hand-lens I could count not less than 600 growth-rings from bark to centre. They were all very narrow, and some may have escaped my attention because of this, so the count is most likely an under- rather than an over-estimate. That branch was there in the days when the cave-dwellings in Mesa Verde in the southwestern corner of the State were inhabited—already before the Spaniards discovered this beautiful land, and long before gold and other precious metals attracted the Anglo-Saxons to these hills.

BRISTLECONE PINES

The trunk of this tree (Fig. 1) is over two feet (61 cm) in diameter, and the branch started about 4 feet from its base. How old could the tree be? A thousand years? Perhaps even more. It is a Bristlecone Pine (*Pinus aristata* Engelm.), one of the most long-lived tree species known, and surely among the longest-lived of all organisms. Bristlecones in California have been dated by growth-rings to a venerable age of over 4,000 years (Schulman, 1956). These Colorado specimens could certainly not compete with this figure, but no doubt they are the oldest living things in this State and should be left alone and not wantonly destroyed.

The Bristlecone Pine approaches its northeastern limit on this mountain slope in Colorado only some 50 miles (80 km) west of the large city of Denver. The extreme north-west locality is north-east of the Rocky



Fig. 1. *Bristlecone Pine* (*Pinus aristata* Engelm.) at an altitude of ca 3,657 m (12,000 ft) in the Rocky Mountains of Colorado, surrounded by alpine tundra. The cut-off branch in the lower foreground showed a ring-count of fully 600 years. Photo: G. Kaersvang.

Mountain National Park and not very far from the Wyoming border, but there are several other groves in various localities to the south and west among the high peaks of the Rockies. Both on Mt Evans and on Pike's Peak (whence the species was originally described) they grow in protected areas, but not so anywhere else.

The Bristlecone Pine is a tree exclusively of high altitudes and very dry climates, found only in areas of little precipitation and usually around or above 10,000 ft (3,048 m) in elevation. Outside the Colorado and New Mexico Rocky Mountains, it is found also in Utah, Nevada, Arizona, and California—usually near or at timber-line.

Its nearest relative in Colorado is the high-altitude Limber Pine, *Pinus flexilis* James, from which it differs in minor characters. The most distinctive ones are the bristle-tipped cone-scales and the shorter (2–4 cm) needles with waxy droplets on the epidermis and a single resin-duct in the cross-section of the needle. The Limber Pine has smooth-edged cone-scales, longer needles (3–5 cm) without wax deposits, and two resin-ducts in the cross-section. Such a keen-eyed observer as P. A. Rydberg (1906) placed them in different genera, calling the Limber Pine *Apinus flexilis* (James) Rydb., but there is certainly no valid reason for such

a drastic taxonomic distinction between it and the Bristlecone Pine.

Not only are the Colorado Bristlecone Pines probably the oldest now-living beings in the State, but the species is also one of the most ancient geologically. In the Museum of the University of Colorado, there are pieces of petrified Bristlecone from the Oligocene. It is very likely that the species was once far more widespread in the area than at present—especially during a time when the climate was warmer and drier than it is now. The species must have been capable of surviving an enormous range of ecological variation as it either withstood the rigours of deteriorating climates after the Tertiary, including the ice-ages, or, equally possibly, reached its present postglacial distribution in Colorado only during the Hypsithermal period after the last Ice-Age, *i.e.* some 6,000 years ago. In that event what we now have here are only the last, isolated remnants of this re-advance towards more northerly latitudes and higher altitudes during a climatically more favourable period. The species does still produce cones with apparently viable seeds in spite of the rigours of the localities in which it persists, but most of the seeds are consumed by birds and rodents and propagation, if any, is at best not prolific in our days.

The way in which the trees in this particular grove

hang on to life is amazing. On the prevailing windward side the bark is practically polished away by ice-crystals in winter and by blown dust and grit in summer. The tundra vegetation surrounding the trees indicates winter conditions with a scanty snow-cover and thus severe exposure to frost and wind. Only on the prevailing leeward side of the trunk is there any bark, with a living cambium left to provide channels of nourishment for the green branches (Fig. 2).

Those people who wielded saws and axes against these trees probably excused themselves by saying that the branches which they took were dead anyhow and, thus, no damage was done. But in this environment even dead branches serve a function as windbreaks and snow-catchers, and without them the tree is much more 'naked' and exposed to the elements. And certainly, aesthetically, it is far more pleasant to behold a specimen with parts that have died from natural causes but have been left intact, than all these with amputated limbs. Some may even have been alive when chopped off; the bark still clinging to parts of the circumference of the stubs indicates this.

COLORADO MOUNTAINS AND VEHICLES

Colorado is among the most beautiful of all the American states, and one of its greatest advantages is

the ease with which practically everybody can get up to some of its lofty peaks and out into its magnificent Nature. Excellent roads lead up over tundras and high passes, some reaching almost to the tops of peaks that are over 14,000 ft (4,267 m) high. Any car can get to the tundras and high passes, with the driver and passengers comfortably sitting and enjoying the sights (Marr & Willard, 1970; Willard & Marr, 1970).

As if for the more adventurous-minded people, the State is criss-crossed by secondary roads and old mining and logging trails, where 4-wheel-drive vehicles can easily transport sportsmen and hunters to more distant points beyond the main tourist arteries. This in itself is not to be objected to; for it is sad but undeniable that the Americans of our days commonly prefer to perform their activities, including sports, sitting down. Thus in contrast to the few who still enjoy walking and climbing, the great majority prefer to take in the 'great outdoors' from a sitting position.

More and more is being invented to facilitate this sitting down and to combine it with the outdoors. Now it is not enough to have ski-lifts to haul one up the steep slopes so that one can enjoy the race down, but there are also skidoos and snowmobiles to take one even farther afield in effortless comfort.

For ranchers, foresters, and rangers—people with real business in the wilderness—these are indeed



Fig. 2. Wind-scoured trunk of Bristlecone Pine, growing at timber-line in the Rocky Mountains of Colorado, with bark and living tissue only in leeward positions. This tree also has been severely mutilated by 'souvenir collectors'. Photo: G. Kaersvang.

marvellous inventions, enabling these hard-working men to perform their duties and get somewhere with reasonable ease and in relative comfort, where otherwise they were almost constantly risking their lives. These people are most often considerate of the Nature they move in, and are knowledgeable of their responsibilities to it. They do not destroy Nature wantonly.

But in the hands of others, these machines are dreadful threats to the delicate balance in Nature that permits our tundras and timber-line trees to exist unharmed. In the summer, jeeps and motor-cycles leave the roads and tracks, so that their owners can get a feel of their strength and ability to get ahead in the wilderness. In the course of this powered wandering the ground is churned up, tracks that will not heal for decades are implanted into virgin soil, and plant life is ruined for ever in areas where even the mere trampling of feet is a menace (Willard & Marr, 1970). The over-snow vehicles are not quite so innocent, either, as may at first be thought. In the winter snow-mobiles and skidoos pack the snow over the vegetation and destroy its insulating properties, the normal snow-cover being replaced by a hard ice-pan offering little or no protection and melting later than normally. Where the snow cover is scarce, the tracks tear up the ground even more drastically than do the wheels of the summer vehicles.

Worst of all is to see the paths of destruction that irresponsible drivers have cut through and over the gnarled and twisted timber-line trees (*krummholz*) just to show the force of their vehicles and that, indeed, they themselves are lords of the mountain. In so doing they are breaking and destroying these otherwise tough outliers of our forests. Once destroyed, the elfin-wood, *krummholz*, or wind-timber—whatever you prefer to call it—does not easily recover, though whole centuries or even millennia went into its making.

Now I read in outdoor magazines of still another type of vehicle that will ‘help the entire family to enjoy Nature in comfort’—the ATV or All-terrain-vehicle. It looks like a bathtub on six small but deeply-furrowed wheels, or with two of the pairs of wheels replaced by continuous tracks. It can climb steep slopes, go ‘everywhere’ over sticks and stones, and even cross small lakes and gentle streams. It is a kind of ‘summer-skidoo’, invented with the best of intentions but with a complete disregard for the environment. It will allow anybody (who can afford it!) to tear around in forests and glades, and I shudder at the thought of what it can—and will—do to our invitingly open and unprotected tundras! It is so easy to bring there on a trailer along the existing roads, and, once unloaded, there is hardly any limit to what it will do to the roadless

wilderness. My only satisfaction—so far—is that it cannot back up. It can turn on its own diameter, but not drive in reverse. May they all be irretrievably stuck between trees and boulders!

The kind of people who buy this sort of vehicle only ‘for fun in comfort’ are just the kind who, without hesitation or remorse, cut branches off the oldest living things in our land. On foot, they would never walk a distance to see and admire the oldsters where they grow, photograph them in their splendour, and return to the comfort of house and garden with a memory and only pictures to help them revive the impressions. Instead, with a machine to bring them there and also carry a motor saw to cut a branch to take home to a garden where it does not belong, these people are ever so ready to commit any atrocities against Nature—for their own selfish purposes, even if not with deliberate intentions, but just through sheer ignorance and thoughtlessness.

FURTHER PLEAS

These have been some reflections generated by a grove of mutilated trees in Colorado. To people in far-off places, they will not seem to be of much importance: distance has an uncanny ability to make Man insensible to disasters.

But remember, nearer to you, there will be some other feature of Nature that should be approached with due humility, yet is in imminent danger of being destroyed by the happy-go-lucky ‘nature-lover’ who takes it for granted that Nature is indestructible and is there solely for his enjoyment. Europeans and others will soon reach the state of affluence which has made this attitude so prevalent here on this side of the Atlantic.

Alas, Nature is far from indestructible. Evolution teaches us how slow climatic changes and other more abrupt natural catastrophes impose a constant change on all the environment. But it is only recently that we are beginning to realize what a menace Man himself is to his surroundings. Not only has he succeeded in destroying, to a great extent ‘just for pleasure’, the biggest animals, but what he has done and is doing to the Plant Kingdom—on which he ultimately lives—can hardly be comprehended.

It is time that we learned not to take Mother Nature for granted, but to approach her with due reverence and humility. It is also high-time for us to start to realize that we, the humans, are parts, not overlords, of Nature.

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The Nerve-gas Controversy and the Environmental Defense Fund

EDF* became deeply concerned by reports in early August of 1970 that the United States Army planned to dispose of a large amount of nerve-gas in the Atlantic. Upon examination of the scientific evidence, it was concluded that feasible alternatives existed to the dumping of this immensely toxic material in the ocean. EDF became convinced that the Army's so-called 'examination of all alternative means of disposing of the nerve-gas' was a show to justify its unswerving decision made at the outset to dump the poison in the ocean.

Unfortunately, EDF were unable to assemble and examine all of the scientific reports and hearings concerning 'Operation Chase' before the Army began to move the nerve-gas vaults to Sunny Point Military Ocean Terminal in North Carolina. EDF considered requesting the Court to order the return of the vaults to their storage sites in Alabama and Kentucky, to await judicial determination of the best way to dispose of the nerve agent, but rejected this course of action because return shipment would subject the population of the area through which the trains would go to the danger of accident for a second time. Further, EDF constrained themselves not to delay substantially the disposal of the nerve-gas because neither they nor the Army could fully evaluate the risk of accident.

These policy decisions necessitated acceptance of the ocean disposal of the nerve-gas, so that attention narrowed to the issue of finding the environmentally least offensive dumping-site. It was discovered that the Army had not considered the consequences of a possible implosion, or crushing, of the vaults due to water pressure at the great depth of the site it had chosen. If such implosion occurred generally among the vaults, the nerve agent would be released rather quickly and cause great damage to the affected ecosystem. It has been commonly thought that the ocean beneath the sunlit level is barren, whereas actually the deep ocean is rich in marine life. EDF concluded that it was important that the vaults should not implode. Then the slowly-leaking nerve agent would be neutralized readily by great volumes of water over a long period of time, with minimal disturbance to the sea.

On 11 August 1970 EDF, joined by the Governor of Florida, filed suit to restrain the Army from sea disposal until it had complied with the National Environmental

Policy Act by proving that it had chosen a site which would minimize human safety- and health-hazards and environmental damage. After reviewing the record, the trial judge concluded that the proposed disposal site was not desirable because of the possibility of implosion, but ruled against EDF's request for a temporary restraining order because of the Army's insistent allegation of an imminent hazard to the public if departure of the ship were further delayed. Accordingly, Judge Green urgently requested that the Defendants attempt to select a more shallow site for disposal of the poison but did not order them to do so as this might delay the disposition.

EDF immediately went to the Court of Appeals, obtaining a stay from Chief Justice Burger of the United States while the Court of Appeals considered the case. After hearing oral arguments on 16 August, the appellate court affirmed the trial court's decision not to grant a temporary restraining order, but extended the stay previously ordered by Chief Justice Burger to provide EDF with time to seek review by the Supreme Court.

After extensively considering all of the factors involved, including our initial decision not to delay substantially disposal of the nerve-gas, EDF decided not to seek Supreme Court review. The Courts were promptly notified of this decision, so that the stay could be dissolved and the ship allowed to depart from port.

The suit made clear that environmental organizations such as EDF have standing, at least in the United States, to challenge Army environmental actions, and that Army officials cannot validly claim that they are immune from suit under the doctrine of sovereign immunity. The suit also brought to the attention of the Federal Government and the public the need for outside review of the kind of decision involved here, in order to minimize environmental and human safety hazards. The suit put officials on notice that such actions can be challenged in a forum where the facts will be fully disclosed through examination of scientific witnesses.

EDF has requested the Department of Defense to provide independent monitoring of the biological effects of the sea disposal of the nerve-gas. EDF will examine other disposal plans of toxic agents and take appropriate action if necessary.

The case was prepared and argued by EDF's General Counsel, Edward Lee Rogers, and EDF volunteer-attorney, Mrs Lola Lea.

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* For a general account of this body and its objectives, see Dr Robert E. Smolker's 'The Environmental Defense Fund' in our first-ever issue (October 1968, pp. 69-70).—Ed.