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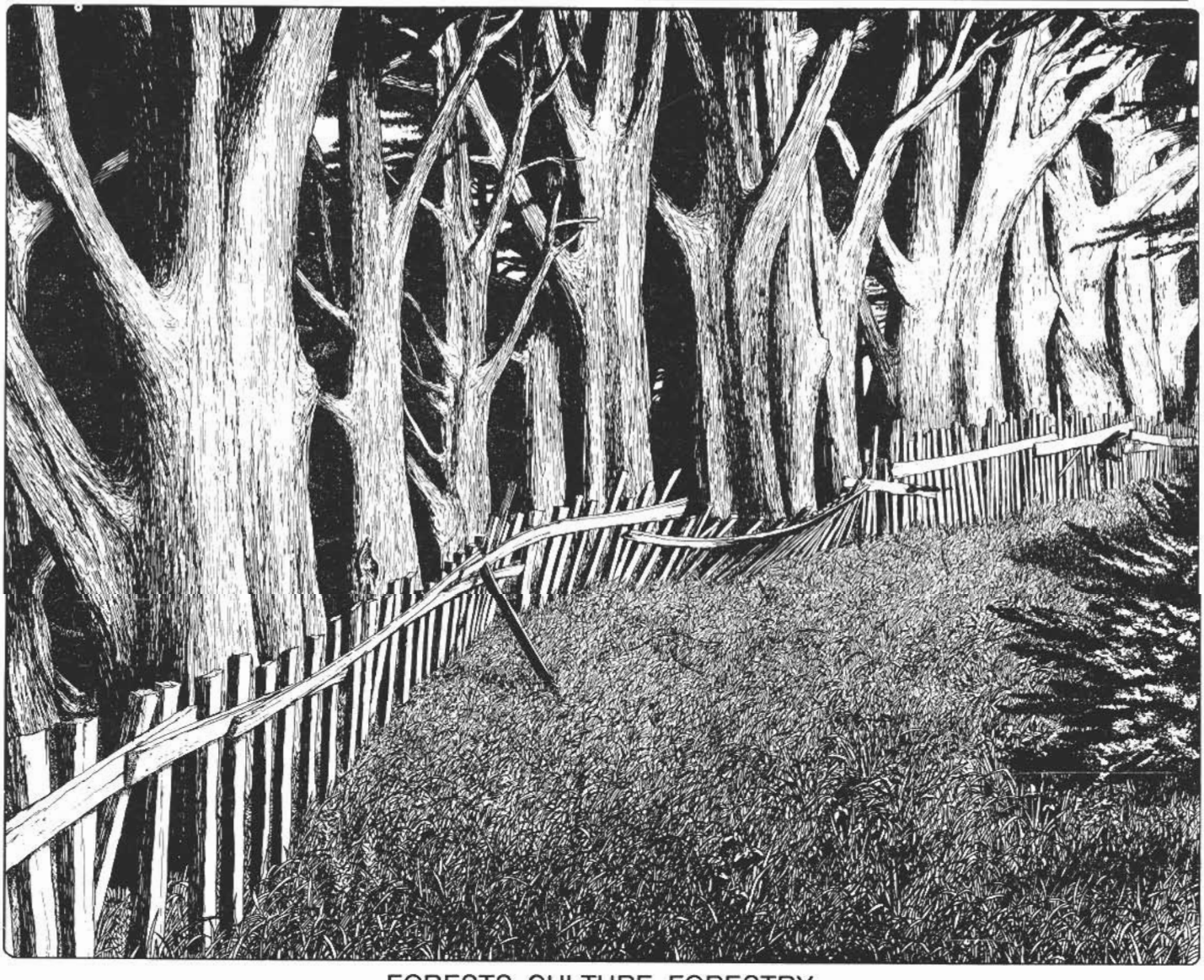

FORESTS, CULTURE, FORESTRY

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The Aim of **The Trumpeter** is to provide a diversity of perspectives on environmental relationships and Nature. By "diversity" we mean cross- and transdisciplinary reflections from both scholarly and nonscholarly sources. Our purpose is to investigate deep ecological philosophy as this manifests itself in the activities and lives of people working in different ways to come to a deeper and more harmonious relationship between self, community and Nature. **The Trumpeter** is dedicated to exploration of and contributions to a new ecological consciousness and sensibilities, and the practice of forms of life imbued with ecosophy (ecological harmony and wisdom). **Published Quarterly by LightStar Press, P.O. Box 5853, Stn B., Victoria, B.C., Canada V8R 6S8.**

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INTRODUCTION: FOCUS ON FORESTS AND FORESTRY

Bob Nixon

Forests? So what, if we cut them down?

The nations of the Mediterranean basin eliminated their forests to propel fleets of conquest. Canada and the United States wiped out forests to clear a continent for settlement. In the process, a forest products industry evolved to make a myriad of products for human use.

Within the last ten years we have witnessed the assault upon the Amazon forests and the devastation of other rainforests in Asia and Africa. Is it not the right of nation-states to use their resources? Should not the Earth's remaining forests be used to provide wealth to hasten the industrialization of local economies?

The answer to these two questions, since the beginning of recorded history, has usually been yes. And yet, today, a new, unexpected tide has begun to flow within the consciousness of humanity, and it relates to forests. In the past, we were arrogant. Today, we are becoming frightened.

An example: Depletion of the ultra-violet, light-filtering layer of the atmosphere near the Earth's poles is killing plankton in the sea. Less oxygen is renewed for us to breathe. Less food is produced for sea mammals. Whales may yet become extinct, not at the hands of whalers but as a result of collective human activities that do not seem related to them.

Both forests and oceans produce oxygen while fixing carbon dioxide. Humans and their industry produce vast quantities of carbon dioxide and deplete oxygen, while simultaneously destroying the planet's ability to restore the balance. If we consume 6 per cent more of the available oxygen ratio in the atmosphere, fires will no longer burn. Combustion will cease to be physically possible. Human civilization as we know it will cease to exist.

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Knowing of this kind of interconnectedness raises new, troubling questions for us. Can it really be true that human technology has the ability to unbalance the planetary support systems and communities upon which all life depends? And if this is true, if the disruption has begun, what can we do about it?

Intuitively, I believe, or perhaps I should say it is part of a deeply buried emergency species survival response genetically encoded, that there is something calling us to begin a centuries-delayed examination of our relationship with forests. Such an examination, more fundamentally, implies a look at this highest known order of land-based biological complexity and diversity. Forests are also one of the oldest, continuous systems of biological activity with land-based community structures. We have begun to realize that such high-order biological systems as natural forests (not wheat fields or tree plantations) are the key component of the planet's equilibrium and maintenance system. It is not a mechanical, but a living process interconnected with every other biological process on the Earth. That which threatens natural forests, we now realize, threatens us all.

A link seems to exist between the growing hunger for understanding of forests and the more frightening aspects of global environmental disruption. Do not ask me to fully explain this any further. I do not claim any special insights, but the linkage is real, although I do know that each of the authors in this forests issue of **The Trumpeter** must have been at least lightly touched by this linkage. During these past five years as publisher and editor of **Forest Planning Canada**, I have continued to be humbled by the intensity with which "the public" increasingly seeks and devours ever more detailed information about forests.

Only in the last ten years have researchers begun to probe the deeper realities of natural forests. The assumption of yesterday has been that natural forests must be replaced with "man-made" forests. Thus, we failed to do any serious research to learn about the contributions of the remaining natural forests, since the wisdom of yesterday told us that all natural forests must cease to exist. (Just as natural grasslands were replaced with monocultures and exotic grasses.)

Today we are not so sure. In many countries serious research has begun to fathom the larger range of values of natural forests. Although such work is barely underway, preliminary findings are unexpected and exciting. Yesterday, only emotional prose and poetic verse lent weight to argument toward establishing values for forests beyond raw materials. Today science is telling us of important discoveries that help us to appreciate some of the forest's deeper and more complex values.

And yet, we still know so very little about forests. As a forester, I learned to view forests as a source of industrial fibre. Now, I know that forests are so much more than vertical assemblages of lumber, so very much more important than just a source of consumer products.

Perceptions are changing, at too slow a rate for some, but the direction of change appears to offer hope. Now, forests are being seen as more than mere retreats for the spirit of humankind, in the face of accelerating technological change. Natural forests, the new research tells us, are no longer something to move through, in the economic sense, in our quest for higher gains, but indeed are a key element in the balanced functioning of planetary life.

There is much yet to learn about forests. There is much to learn about how to plan our future interrelationships with them. But the flood tide is near. Our job, now, is to listen closely to voices which seek to share this new knowledge with the rest of us, which is what the authors in this issue of **The Trumpeter** aim to do.

About the author: **Bob Nixon** is the editor and publisher of **Forest Planning Canada: Canada's Community Forestry Forum**, P. O. Box 6234, Stn. C, Victoria, B.C. V8P 5L5, Canada ($24 Can per year--6 issues). He is a B.C. registered forester with degrees from Cornell University. He has been active on the environmental front for a long time.

VALUES DEEP IN THE WOODS

Holmes Rolston, III

In a forest, as on a desert or the tundra, the realities of nature cannot be ignored. Like the sea or the sky, the forest is a kind of archetype of the foundations of the world. Aboriginally, about sixty percent of Earth's land surface was forested; historically, forests go back three to four hundred million years. Humans evolved in forests and savannas in which they once had adaptive fitness, and classical cultures often remained in evident contact with forests. In modern cultures, the growth of technology has made the forest increasingly a commodity, decreasingly an archetype. That transformation results in profound value puzzlements. What values lie deep in the forest?

The Forest Primeval

The central goods of the biosphere - hydrologic cycles, photosynthesis, soil fertility, food chains, genetic codes, speciation, reproduction, succession - were in place long before humans arrived. The dynamics and structures organizing the forest do not come out of the human mind; a wild forest is wholly other than civilization. Confronting it I must penetrate spontaneous life on its own terms. The genius of forestry as a pure science helps us to appreciate the biology, ecology, integrity of the forest primeval. Immersed in a nonhuman frame of reference, foresters know the elements, raw and pure.

Applied forestry, making a commodity out of an archetype, is humane and benevolent at risk of prostituting the primeval. The principles reorganizing the managed forest do come out of the human mind. Seeking goods of their kind, humans modify the natural kinds. A domesticated forest, like a caged wolf, is something of a contradiction in terms. There remains what used to be a forest or wolf now reduced to something less. A tract of pine planted for paper pulp is not deep woods. The radical values are gone.

In the forest itself there are no board-feet of timber, BTU's, miles, or acre feet of water. There are trees rising toward the sky, birds on the wing and beasts on the run, age after age, impelled by a genetic language almost two billion years old. There is struggle and adaptive fitness, energy and evolution inventing fertility and prowess. There is cellulose and photosynthesis, succession and speciation, muscle and fat, smell and appetite, law and form, structure and process. There is light and dark, life and death, the mystery of existence.

Life Support Value

A forest is objectively a community. Only subjectively, with human preferences projected onto it, does it become a commodity. "Forest products" are secondarily lumber, turpentine, cellophane; the forest "produces" primarily aspen, ferns, squirrels, mushrooms; this life is never self-contained but incessantly ingests and eliminates its environment. Trees must photosynthesize and coyotes must eat. The flora, like the fauna, make resources of soil, air, water, nutrients.

Many species have found a home in the forest ecosystem, life-supporting niches into which they are well-fitted. This objective satisfaction (=support) of life occurs with or without our human experiences. That the forest is able on occasion to satisfy human preferences seems a spinoff from its being valuable - able to satisfy organic needs - on its own.

Endangered Species/Endangered Ecosystem Values

There can no longer be found about 500 faunal species and subspecies that have become extinct in the United States since 1600, and only rarely found another 500 that are (officially or unofficially) threatened and endangered. Hardly a stretch of forest in the nation is unimpoverished of its native species - especially those at the top of trophic pyramids: otters and peregrine falcons. We have only scraps of undisturbed once-common ecosystems, such as hemlock forests, and no chestnut forests at all. Acid rain is impoverishing the Adirondacks and the Great Smokies. An area of tropical rainforests the size of West Virginia is being destroyed annually.

All this ought not to be. Rather, forests ought to be optimally rich in native fauna and flora, in community types, and some forest ecosystems intact enough to support grizzly bears, wolverines, red cockaded woodpeckers, Chapman's rhododendron. What the forest produces is individuals, but, at a deeper level, what the forest has produced is species and ecosystems. Extinction shuts down forever life lines that flowed over the continental landscape long before humans arrived and that might, apart from us - or together with us, were we more sensitive - continue for millennia henceforth.

Natural History Value

A pristine forest is a historical museum that, unlike cultural museums, continues to be what it was, a living landscape. A visit there contributes to the human sense of duration, antiquity, continuity, and our own late-coming novelty. The forest - we first may think - is prehistoric and timeless; world history begins with armies and kings. The perceptive forest visitor knows better and realizes the centuries-long forest successions, the age of sequoias or great oaks; he sees erosional, orogenic, and geomorphic processes in rock strata, canyon walls, glacial moraines. The Carboniferous Forests were giant club mosses and horsetails; the Jurassic Forests were gymnosperms - conifers, cycads, ginkgoes, seed ferns. A forest today is yesterday being transformed into tomorrow.

Each forest is unique. Forest types exist only in forestry textbooks; what exists in the world is Mount Monadnock, Tallulah Gorge with its unique colonies of **Trillium persistens**,

Mobley Hollow on Sinking Creek. Forests with their proper named features and locales - Grandfather Mountain, or Chattahoochee National Forest - always exist specifically, never abstractly. When visited by persons with their proper names, the encounter is valued because it yields distinctive, never-repeated stories - the biography of John Muir in the Sierras, or one's vacation hiking the Appalachian Trail.

Scientific Study Value

At least half of what there is to be known about forests remains undiscovered. Successive levels of biological organization have properties that cannot be predicted from simpler levels, and the least known level of organization is that of landscape ecology. Do forests inevitably appear; given a suitable moisture and climatic regime? We are not sure why tree line lies at the elevations it does, or why the balds in the Southern Appalachians are there. We are beginning to suspect that insect outbreaks sometimes convey benefits to a forest, something like those of fires, and of which we were long unaware. How do the nonfruiting mosses get propagated over long distances?

Does diversity increase over time? Stability? Do the species at the top of trophic pyramids rise in complexity? In neural power? All this seems to have happened, but why we do not know. Biologists are divided over whether intraspecific or interspecific competion is a minimal or a major force in evolution. Sizeable natural systems are the likeliest places to settle such debates. To destroy the relict primeval forests is like tearing the last pages out of a book about our past that we hardly yet know how to read.

Aesthetic Values

Like clouds, seashores, and mountains, forests are never ugly; they are only more or less beautiful; the scale runs from zero upward with no negative domain. Destroyed forests can be ugly - a burned, windthrown, diseased, or clear-cut forest. But even the ruined forest, regenerating itself, has yet positive aesthetic properties; trees rise to fill the empty place against the sky. A forest is filled with organisms that are marred and ragged - oaks with broken limbs, a crushed violet, the carcass of an elk. But the word "forest" (a grander word than "trees" in the plural) forces retrospect and prospect; it invites holistic categories of interpretation as yesterday's flora and fauna pass into tomorrow. This softens the ugliness and sets it in somber beauty.

One has to appreciate what is not evident. Marvelous things are going on in dead wood, or underground, or in the dark, or microscopically, or slowly, over time; they are not scenic, but an appreciation of them is aesthetic. The usefulness of a tree is only half over at its death; an old snag provides nesting cavities, perches, insect larvae, food for birds. The gnarled spruce at the edge of the tundra is not really ugly, not unless endurance and strength are ugly. It is presence and symbol of life perpetually renewed before the winds that blast it.

In the primeval forest humans know the most authentic of wilderness emotions, the sense of the sublime. By contrast, few persons get goose pimples indoors, in art museums or at the city park. We will not be surprised if the quality of such experiences is hard to quantify. Almost by definition, the sublime runs off scale.

Recreation/Creation Values

The word **recreation** contains the word **creation**. Humans go outdoors for the repair of what happens indoors, but they also go outdoors because they seek something greater than can be found indoors - contact with the natural certainties. Forests and sky, rivers and earth, the everlasting hills, the cycling seasons, wildflowers and wildlife - these are superficially just pleasant scenes in which to recreate. They are the timeless natural givens that support everything else.

Those who recreate here value leisure (watching a sunset, listening to loons, or to rain) in contrast to work for pay; they value being in a wild world that runs itself and need not be labored over. They value work (climbing, setting up camp) that isn't for pay; an environment with zest, in contrast to a boring or familiar job. They value an escape, if you like, but they value also being drawn to roots. They want to know the weather, protected by minimal but enough cover and shelter as to leave rain or sun close at hand. They want to submit to the closing day at dusk, to be roused by the rising sun without benefit of clock. They want to know the passing seasons when migrants return, or leaves fall, without benefit of calendar.

People like to recreate in the woods because they touch base with something missing on baseball diamonds and at bowling alleys - the signature of time and eternity.

Character-Building Value

It is no accident that many organizations that seek to form character use wildlands - Boy and Girl Scouts, Outward Bound, the National Outdoor Leadership School, church camps. Similar growth occurs in individuals independently of formal organizations. The forest provides a place to sweat, to push oneself more than usual, to be more on the alert, to take calculated risks, to learn the luck of the weather, to lose and find one's way. The forest teaches one to care about his or her physical condition. In the forest, one has no status or reputations; nobody is much or long deceived; nobody much has to be pleased; accomplishment and failure are evident. One is free to be himself or herself, forced to a penetrating sincerity.

It is no accident that forestry as a profession has a powerfully positive image; we do not expect a forester to be a sissy, lazy, complaining, naive, arrogant - certainly not one regularly in the field. Professional life and personal life overlap, and the probabilities are that a seasoned forester is genuine, competent, patient, wary. If, past applied concerns, a forester has an admiring respect for the woods we have yet the more evidence of character.

Nonhuman Intrinsic Values

Surrounded by politicians and economists, even by foresters at business, one gets lured into thinking that value only enters and exits with human preference satisfactions. Surrounded by the forest, a deeper conclusion seems irresistible. The forest is value-laden. Trees use water and sunshine; insects resourcefully tap the energy fixed by photosynthesis; warblers search out insect protein; falcons search for warblers. Organisms use other organisms and abiotic resources instrumentally.

Continuing this deeper logic, organisms value the resources they use instrumentally because they value something intrinsi-

cally and without further contributory reference: their own lives. No warbler eats insects in order to become food for a falcon; the warbler defends her own life as an end in itself and makes more warblers as she can. A warbler is not "for" anything else; a warbler is for herself. From the perspective of a warbler, being a warbler is a good thing.

Biological conservation is not something that originates in the human mind, modeled by Forplan programs, or written into Acts of Congress. Biological conservation is innate as every organism conserves, values its life. Nonconservation is death. From this more objective viewpoint, there is something subjective and naive (however sophisticated one's technology) about living in a reference frame where one species takes itself as absolute and values everything else relative to its utility.

True, warblers take a warbler-centric point of view; spruce push only to make more spruce. But no nonhuman organism has the cognitive power, much less the conscience, to lift itself outside its own sector and evaluate the whole. Humans are the only species who can see the forest for what it is in itself, objectively, a tapestry of interwoven values. Forestry ought to be one profession that gets rescued from this beguiling anthropocentrism through its daily contact with the primeval givens.

Religious Value

"The groves were God's first temples" (Bryant, **A Forest Hymn**). Trees pierce the sky, like cathedral spires. Light filters down, as through stained glass. In common with churches, forests (as do sea and sky) invite transcending the human world and experiencing a comprehensive, embracing realm. Forests can serve as a more provocative, perennial sign of this than many of the traditional, often outworn, symbols devised by the churches. Mountaintop experiences, a howling storm, a quiet snowfall, solitude in a sequoia grove, an overflight of honking geese - these generate experiences of "a motion and spirit that impels . . . and rolls through all things." (Wordsworth, "Lines Above Tintern Abbey").

Being among the archetypes, the forest is about as near to ultimacy as we can come in phenomenal experience. I become astonished that the forest should be there, spontaneously generated. There are no forests on Mars or Saturn; none elsewhere in our solar system, perhaps none in our galaxy. But Earth's forests are indisputably here. There is more operational organization, more genetic history in a handful of forest humus than in the rest of the universe, so far as we know. How so? Why? A forest wilderness elicits cosmic questions.

Deep Values

Such value are, it is commonly said, "soft" beside the "hard" values of commerce. They are vague, subjective, impossible to quantify or demonstrate. Perhaps. But what is really meant is that such values lie deep. The forest is where the "roots" are, where life rises from the ground. A wild forest is, after all, something objectively there. Beside it, culture with its artifacts is a tissue of subjective preference satisfactions. Money, often thought the hardest of values, is nothing in the wilderness. A dollar bill has value only intersubjectively; any who doubt this ought to try to spend one in the woods. Dollar values have in the forest (and therefore in pure forestry) no significance at all.

What there is objectively significant? The phenomenon of forests is so widespread, persistent, and diverse, appearing almost wherever moisture and climatic conditions permit it, that forests cannot be accidents or anomalies, but rather must be a characteristic, systemic expression of the creative process. Forests are primarily an objective sign of the ultimate sources, and only secondarily do they become managed resources. The measure with which forestry can be profound is the depth of this conviction.

About the Author: **Holmes Rolston, III** is a professor of philosophy at Colorado State University, Fort Colins, Colorado. He is the author of **Philosophy Gone Wild** (Prometheus Books, 1986) and **Environmental Ethics** (Temple University Press, 1987). The article printed here was originally delivered at the Society of American Foresters Convention in Minneapolis, Minn. Oct. 1987. It was then published in longer form in **American Forests** in May/June 1988. The shorter version is reprinted here with permission of the author and **American Forests**.

FORESTS AS SANCTUARIES

Henryk Skolimowski

Forests and the Original Geometry of the Universe

We all know how intricate are the relationships between a single tree and the forms of life that live in it, and around it. But why are trees so important to human beings, who are, after all, as a form of life, so distinct and different from trees? Although distinctive and different, human beings are part of the same heritage of life.

One reason that trees and forests are so important to humans has to do with the natural geometry of the universe. We must therefore distinguish between man-made geometry, stemming from Euclidean geometry, the geometry we learn at schools, from natural geometry, especially the geometry of living forms.

When Euclid was inventing his geometry, which has become the basis for man-made forms, the Greek mind became enamored with Aristotle's analytical and classificatory approach to the world. With Socrates and Plato the Greek world is still held in unity and harmony. With Aristotle, we begin to divide, chop and atomize, to put things into separate compartments, where they are identified by special labels and definitions.

Euclid and his geometry only reinforces the tendency toward atomism, separatism, thinking in neat logical categories, here are the axioms, here are the rules of derivation, here are the theorems

derived from the axioms through the accepted rules of derivation. All very neatly and rigorously defined. A triumph of the rational Western mind, which came to depend so much on the power of formal reasoning and the meaning of axioms, which would become the ultimate bricks out of which other things would be constructed.

What should not escape our notice, in particular, is Euclid's emphasis on the importance of the point and the straight line. Let us be aware that we never see this point, because the point as such is invisible; we hardly meet a straight line in Nature. Yet the architecture of the human world, or, to be more precise, the architecture of the world as constructed by modern man, is founded on straight lines and those invisible points.

Let us put the proposition in general terms: The geometry that dominates our lives, when we live in a city, in a modern house, or when we drive an automobile, is the geometry derived from an abstract man-made system. It is a geometry which, after a while, constrains and suffocates us.

We have distinguished natural geometry from man-made geometry. But what is natural geometry? Natural geometry consists of the forms by which and through which the universe has evolved, the forms by which life has evolved. What are these forms? These forms are circular, spiral, round and womb-like. When we contemplate the architecture of the universe, the galaxies and the atoms, amoebas and trees, then we immediately see that the dominant forms and shapes of Nature and the universe are round and spiral, and so often amorphous.

The dancing universe does not move in straight lines. It moves in spiral, circular and irregular motions. The life dancing in, and through the universe, is not choreographed by the computer and its linear logic. the quintessential symbol of life is that of the womb.

All life has emerged from primordial womb which is irregular, amorphous and full of connecting loops and spirals. We, as individual human beings, were conceived and nursed in the wombs of our mothers. Natural geometry conditioned our early impulses. Natural geometry shaped our early growth. Natural geometry formed our bodies, which are expressions of this geometry. Look at your own body and see it in terms of natural geometry. Your body is full of irregular shapes, round, oval, asymmetrical. There is hardly any straight line, within the architecture of it. The head is such a funny irregular egg. The hands and legs are irregular cylinders. The eyes and the mouth, the neck and the stomach are but endless variations on the theme of natural geometry.

Being nursed and conditioned, shaped and determined by natural geometry, we respond to it in an intuitive and spontaneous manner. Why do we rest so well in the presence of a tree? Because in it we find an outlet for our natural geometry. The communion with the trees, being surrounded and nursed by them, is for us a return to the original geometry of life. That is why we feel so good in the act of this communion. **We were born and nourished by natural geometry, and to this geometry we long to return.** By dissolving ourselves in the geometry of the tree, we resolve tensions and stresses accumulated and thrust upon us by artificial geometry. **We must clearly see that the artificial geometry of man-made environments is full of tension and stress.**

To dissolve in the primordial matrix of life, this is sanity.

To enter the communion with the shapes which spell out organic life, this is a silent joy.

To lose oneself in the forms soaked in the substance of life, this is a fundamental renewal.

Trees and forests are important for deep psychological reasons. In returning to the forest, we are returning to the womb not in the psychoanalytical terms but in cosmological terms. We are returning to the source of our origin. We are entering the communion with life at large. The existence of the forests is so important because they enable us to return to the source of our origin. They provide for us a niche in which our communion with all life can happen.

The unstructured environments which we need for our sanity and for our mental health, as well as for the moments of silent brooding without which we cannot truly reach our deeper selves, should not be limited to forests only. Rugged mountains and wilderness areas provide the same nexus for being at one with the glory of the elemental forces of life. Wilderness areas are life giving in a fundamental sense, nourishing the core of our being. This core of our being is sometimes called the soul.

To understand the nature of the human being is ultimately a metaphysical journey; at the very least it is a transphysical journey. Transphysical translated into the Greek language means metaphysical. The metaphysical meaning of forests has to do with the quality of spaces the forests provide for the tranquility of our souls. Those are the spaces of silence, the spaces of sanity, the spaces of spiritual nourishment, within which our being is healed and at peace.

We all know how soul destroying and destructive to our inner being modern cities can be, and actually are. The comparison between the modus of a technological city and the modus of a wilderness area informs us sufficiently about the metaphysical meaning of the spaces of forests, of the mountains, of the marshlands.

Though the trees are immensely important to our psychic well being, not every tree possesses the same energy and meaning. The manicured French parks and the primordial Finnish forests are different entities. In the manicured French parks we witness the triumph of the Cartesian logic and of Euclidean geometry, while in the Finnish forests, immensely brooding and surrounded by irregular, female-like lakes we witness the triumph of natural geometry,

What is natural and what is artificial is nowadays difficult to determine. However, when we find ourselves among the plastic interiors of an airport, with its cold brutal walls and lifeless plastic fixtures surrounding us, on the one hand, or within the bosom of a big forest, on the other, we know exactly the difference and without any ambiguity. In the forest our soul breathes, while in plastic environments our soul suffocates.

The idea that our soul breathes in natural unstructured environment should not be treated as only a poetic metaphor. It is a palpable truth. This truth has been recognized on countless occasions, and in many contexts, although usually indirectly and semi-consciously.

We go to a lovely old cottage. The old wooden beams supporting the ceiling attracts us immensely, as no concrete and iron beams will ever do. We go to a modern flat, undistinguished, except that there is a lovely wooden panelling along the walls of the rooms. We respond to it. We resonate with it. We do so not because we are old sentimental fools, or for aesthetic reasons alone, but for deeper and more fundamental reasons.

Life wants to breathe. We breathe more freely when there are other forms of life which can breathe around us. Those old

beams made of oak in the old cottage breathe. The panelling made of wood in the modern flat breathe. And we breathe with them. Those plastic interiors, concrete cubicles, tower blocks and rectilinear cities do not breathe. We find them "sterile," "repulsive," and "depressing." these very adjectives come straight from the core of our beings. And those are not just the reactions of some idiosyncratic individuals, but the reactions of at least a great majority of us.

A plastic interior may be aesthetically pleasing. Yet after a while, our soul finds it uncomfortable, constraining, somewhat crippling. The primordial life in us responds quite unequivocally to our environments. We have to learn to listen carefully to the beat of the primordial life in us, whether we call it instinct, intuition, or the holistic response. We do respond with great sensitivity to spaces, geometries and forms of life surrounding us. We respond positively to the forms which breathe life for these forms are life-enhancing. Life in us wants to be enhanced and nourished. Hence we want to be in the company of forms that breathe life.

It is therefore very important to dwell in the surroundings in which there are the forms that can breathe, the wooden beams, the wooden floors, the wooden panellings. Lucky are the nations that can build houses made of wood, inside and outside. for the wood breathes, changes, decays, as we do. It is also important to have flowers and plants in our living environment. For they breathe. To contemplate a flower for three seconds may be an important journey of solitude, a journey of return to original geometry, which is always renewing. We make these journeys actually rather often, whenever plants and flowers are in our surroundings. But we are rarely aware of what we are doing.

Forests and spirituality are intimately connected. Ancient people knew about this connection and cherished and cultivated it. Their spirit was nourished because their wisdom told them where the true sources of nourishment lie.

Sacred Forests in History

Ancient people were intimate with their surroundings. They often wove themselves into the tapestry of life surrounding them so exquisitely that we can only admire their sensitivity and their wisdom. They had a very special understanding of the places, the locus genius of their territory.

Forests were, of course, of great importance to ancient people, and almost everywhere in the world where trees grew, some forests were marked as special enclosures, indeed as sacred. These forests were to be protected, and never desecrated. In the seminal book of Sir James Frazer **The Golden Bough** (1935), we have impressive and eloquent evidence how people, from the paleolithic era onwards, went about preserving and worshipping their forests, how they set out certain forests as sacred. "In them no axe may be laid to any tree, no branch broken, no firewood gathered, no grass burnt, and animals which have taken refuge there may not be molested."[1]

In the world of classical Greece and then of Rome, these special groves and forests were usually enclosed by stone walls. This enclosure was called in Greek **Temenos**, a cut off place, or a demarcated place. A better translation would be "a sacred enclosure." Indeed, a periodical entitled **Temenos** started to be published in England in the late 1970s explicitly evoking the spirit of Temenos, as a sacred enclosure, and calling for the creation of sacred spaces.

In Latin the terms for these demarcated places was **templum**. Templum was the original root of the word "temple." To begin with, those sacred enclosures were the sanctuaries in which religious ceremonies took place. They were, in fact, open air temples. When later on temples were erected as monumental buildings with columns and all, sacred groves and forests did not cease to exist. They were still cherished and protected. They inspired the sense of awe, the sense of the mystery of the universe, a higher sense of in-dwelling, being close to gods. According to the Roman philosopher Seneca, writing in the first century A.D: If you come upon a grove of old trees that have lifted their crowns up above and shut out the light of the sky by the darkness of their interlacing boughs, you feel that there is a spirit in the place, so lofty is the wood, so lonely the spot, so wondrous the thick unbroken shade.[2]

This sense of the mystery of the universe which some places evoked more than other places, led ancient people to celebrate and protect these places. They felt that in those places their life was enriched and deepened. In sacred groves and forests, they felt close to gods and other sublime forces of Nature. This sense of the mystery of the universe has, by and large, been lost by modern Western man. But not entirely so.

When we go to Delphi, on a crisp spring day, at the time when the hoards of tourists did not desecrate the place yet, and when in peace and tranquility we identify ourselves with the spirit of the place, we feel a tremendous power emanating from the surroundings.

The sense of the sacred resides in us all. But now it requires very special circumstances for this sense to manifest itself. Our jaded bodies, our overloaded senses and overburdened minds make the journey of transcendence, to the core of our being, rather difficult nowadays.

For ancient people the sense of the sacred was enacted daily. The whole structure of life was so arranged that the human being could not only experience the sacred but was encouraged to do so. It is rather different in our times.

In the sacred groves and forest of ancient Greece, particular species of trees were dedicated to particular gods. Oaks were in the domain of Zeus, wills of Hera, olives of Athena, the laurel of Apollo, pines of Pan, vine of Dianisios. But this identification was not rigid. The ancient Greeks were generous and flexible people. In various localities, due to specific traditions, different trees could be dedicated to different deities. On the island of Lesbos, for instance, there was an apple grove dedicated to Aphrodite.

Many of the sacred groves contained springs and streams and sometimes lakes. The pollution of these springs and lakes was absolutely forbidden. There was usually a total ban on fishing, with the exception of priests. It was believed that whoever would angle and catch fish in Lake Poseidon would be turned into the fish called fisher (Pausanias, 3,21,5).

In Pellene there was a very special sacred grove, dedicated to Artemis the savior, which only the priests could enter. This was rather unusual. The common rule was that ordinary people could enter the grove providing they came ritually clean, not guilty of any serious crimes, especially blood guilt.[3]

The tradition of sacred groves and forests was maintained by the ancient people throughout the world. Sacred groves in India are as ancient as the civilization itself. Indeed, they go back to

prehistoric, pre-agricultural times. While the idea and the existence of sacred forests and groves did not survive in the West, as we have progressively become a more secular society, such groves survived in India until recent times. However, with the weakening of the religious structure of beliefs, the very idea and, hence, the existence of the sacred groves and forests have been undermined in India. Yet there are still some sacred groves in India dedicated to specific deities and under their protection.[4]

One of my favorite definitions of the forest is that given by Buddha. For him the forest was "a peculiar organism of unlimited kindness and benevolence that makes no demands for its sustenance and extends generously the products of its life activity; it affords protection to all beings, offering shade even to the axeman who destroys it."

The native American Indians are particularly sensitive to the quality of natural places. For them, to worship a mountain or a brook or a forest was quite a natural thing, for every plant, every tree as well as Mother Earth and Father Heaven were imbued with spirit.

In the cosmos infused with spiritual forces, delineating special places as particularly important and sacred was as natural as it was inevitable. These special places were also the places of ritual and ceremony, the ones in which the sacred was enacted in daily life; and in the act, the essential mystery and divinity of the universe was re-affirmed.

In the Western world the churches and shrines served this purpose, i.e. of connecting the human with the sacred. But that was some time ago. As we have become progressively secularized, so we have lost the sense of the mystery of life and the sacredness of the universe. The churches are now hollow and reverberate with nothingness, for the spirit is gone from the people. The churches are being closed. In England alone two thousand of the existing sixteen thousand churches have been closed. It is reported that only three percent of the people regularly attend the Anglican church. And so the Bishop of Durham proclaims: "It is not now the case that England is a Christian Country." Is it not similar in other so-called Christian countries?

The original temple, or templum or Temenos have lost their meaning, for our hearts so often are cold, and our minds have lost touch with the mysterious and the sacred. As we have impoverished the universe of the sacred, so we have impoverished ourselves. As we have turned sacred groves and other forests into the forest products industry, we no longer have natural temples in which we can renew ourselves.

Towards a Spiritual Renewal

We are now reassessing the legacy of the entire technological civilization, and what it has done to our souls and our forests. Our problem is no longer how to **manage** our forests and our lives more **efficiently,** in order to achieve further material progress. We must now ask ourselves more fundamental questions: How can we renew ourselves spiritually? What is the path to the life that is whole? How can we survive as humane and compassionate beings? How can we maintain our spiritual and cultural heritage?

The wilderness areas, which I call life-giving areas, are important for three reasons. First, they are important as sanctuaries. Various forms of life would not survive without them. Secondly, they are important as givers of timber that breathes and out of which will be made beautiful panels and beams that breathe life in our homes. Third, and most significantly, they are important as human sanctuaries, as places of spiritual, biological and psychological renewal. As the chariot of progress which is the demon of ecological destruction moves on, we wipe out more and more sanctuaries. They disappear under the axe and saw of man, and then are polluted by plastic environments or turned into Disneylands.

The rebuilding of sanctuaries is vital to the well being of our bodies and the well being of our souls, for the two act in unison. We have lost the meaning of the Temple (Templum) in now deserted churches. We have to recreate this meaning from the foundations. We have to re-sacralize the world, for otherwise our existence will be sterile. We live in a disenchanted world. We have to embark on the journey of the re-enchantment of the world. We have to recreate rituals and special ceremonies through which the most precious aspects of life are expressed and celebrated.

Forests still inspire and infuse us with the sense of awe and mystery, that is, when we have the time and quietness of mind to lose ourselves in them. And here is an important message. Forests may again become sacred enclosures where great rituals of life are performed, and where the celebration of the uniqueness and mystery of life and the universe is taking place. It depends on our wills to make the forests the places of the re-sacrilization of the world. The first steps in this direction were taken by the famous Polish director, Jerzy Grotowski, who has abandoned the theatre in order to make nature and particularly forests the sacred grounds for humanity's new communion with the cosmos.[5]

While I was at Findhorn in 1979, I met the legendary Man of Trees, Richard St. Barbe Baker. By the time I met him, he was in his nineties. A beautiful man in his old age, emanating uprightness, calmness and solidity of big trees. From early childhood his passion was to plant trees. And he planted millions of them all over the world, throughout his busy and productive life. During his talk at Findhorn, he led a meditation of a special kind. He asked us to imagine that each of us was a tree. We stretched our arms as if we were trees, while our feet were solidly grounded in the earth, just as the roots of trees are. For him, interacting with the forest was a form of religion. Each tree was a form of alter.[6] We must develop a similar spirit of reverence and empathy for the trees and forests. For they are true sanctuaries.

Let me finish with a short poem.

Of Men and Forests

Forest are the temples.
Trees are the altars.
We are the priests serving the forest gods.

We are also the priests serving the inner temple.
Treat yourself as if you were an inner temple.
And you will come close to the god which resides within.

To walk through life as if you were
In one enormous temple,
That is the secret of grace.

Notes

1. Sir James Frazer, **The Golden Bough**, Vol. 2, p. 42.
2. Seneca, **Epistoles**, 4,12,3.
3. For further discussion see: J. Donald Hughes, "Sacred Groves: The Gods, Forest Protection, and Sustainable Yield in the Ancient World," in **History of Sustained Yield Forestry**, N.K. Steen, Ed., 1983.
4. For further discussion see: Madhav Gadgil and V.D. Vartak, "Sacred Groves in India - a Plea for Continued Conservation," **The Journal of Bombay Natural History Society**, Vol. 72, No.2, pp. 314-320, 1975.
5. See Jerzy Grotowski, **On the Road to Active Culture**, 1979; and his other writings.
6. See especially: Richard St. Barbe Baker, **My Life, My Trees**, Findhorn Press, 1979.

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METAPHYSICS OF THE TREELINE

Arne Naess

In many parts of the world, but perhaps most clearly in the far North, the treeline is full of symbolic value: enigmatic; mystical; threatening; liberating; alluring; attractive, but also repulsive; ominous; warning. No single person or animal has the capacity of experiencing all these 'tertiary qualities' of the treeline. The same holds good for the drama of crossing the treeline, from above or from below.

The term "treeline" is misleading: there is no line, but a narrow or wide border area. If the terrain is near horizontal the area is wide, perhaps miles wide, if very steep, rather narrow, but never sharp. Therefore, it is a shock for one to see for the first time an artificial wood covering the slope of the valley far up, but then suddenly coming to a halt. There is an upper limit. Suddenly not a single tree! From full grown trees to just nothing. An abnormity, an experience of something utterly valuable being destroyed, the landscape desecrated, a personal loss, even if one has never been near the place.

Here I shall only relate what a certain group of people have experienced of an immensely rich reality - a group to which I belong but which counts millions of people. I shall start with the more simple, obvious experiences.

Moving up towards the treeline, there are signs of new challenges met by the trees. Harder wind, less deep soil, and more subtle challenges. The trees get smaller, gnarled, skew, fantastic shapes. Some have fallen over. As the distance between them gets bigger, they tend to clump together. Then there are only a few of them at particular spots and some very lonely ones. They may be courageous, haughty, even triumphant.

But the properties alluded to are subordinate gestalts, subordinate forms of what is real, the higher order gestalts dominate. One is that of movements upwards as far as possible, overcoming obstacles, trying to 'clothe the mountain' (Bjorenson).

Some of the trees are immensely successful in 'clothing the mountain'. They look like tiny bushes compared with their brothers and sisters further down. Perhaps they are only a few feet tall, whereas their kin are 50 or even 100 feet. But if you call them stunted, they will indignantly reject the suggestion: 'What do you insinuate I am lacking?' The small tree has produced cones. It has realized all possibilities, including that of reproduction. Every essential function of a tree-life has been carried out and fulfilled. Mere size has nothing to do with quality of life.

But then there are others just merely alive. Stunted, deformed, not shaped freely under the pressure of wind. No cones, no expression of fulfillment, just surviving, half dead from exposure, winter after winter, cold foggy summers alternating with dry ones. And then there are others in some respect healthy and thriving, but only in certain, limited ways. Every tree has had a clearly different life experience from birth. The rough terrain, the innumerable small differences of conditions have had easily seen consequences - never the same, any two trees. The treeline is a mighty presentation of the life dramas. You are near some, far from others.

Only few people have the background to enlarge the high order gestalts in the time dimension. They who have will see the waves of cold and warm climates after the last ice-age. What they see is a wave either of further clothing of the mountain or a retreat leaving stubs and other signs of trees much higher than at present. The treeline is seen as moving up or down, never a long time in rest. Seen as moving, or really moving? Really moving.

There are other kinds of higher order gestalts. People whose home is in or very near dense forests of spruce may see the density as something like a protective wall or in other positive ways. But others see the near trees as essentially blocking the view or even one's existence, hindering the free expansion of life and thought. If the trees are old and saggy with branches hanging down, they may communicate resignation, sorrow, melancholy. Real or imagined? Real! When the big trees are swayed by wind, the rhythmical movement is slow and the music may have the heartbreaking character of a funeral march. Or they express slowly something like 'doomed! doomed! doomed! . . . ' At night or dimly seen, the wall of trees may invite merciful death.

In such and similar cases the existence of a treeline somewhere high, reachable but far away, inevitably gets to be a promise of freedom, a proof of limits to any sorrowful, prison-like existence and source of doubt or guilt. Approaching the treeline there is no wall any longer. The trees have moderate tallness, there is

more free air in between, the light shines between them and between the branches.

When rich high order gestalts involve the contrasts low/high and dark/light, they are apt to acquire metaphysical dimensions. This is strengthened by movement from the low and dark towards the high and light treeline, and further strengthened by lightness in the sense of ease of movement at the treeline compared to that in the dense wood. The treeline experience acquires the character of an experience of reachable supreme freedom.

Those who feel at home in the forest, and those for whom part of the wood is part of their home itself, may experience other aspects of the treeline, aspects widely different from the above. The upper limit of the wood marks the end of security, the end of the world we master, the opening towards a harsher world of wind- driven snow, dangerous precipices, useless expanses.

Above the treeline there is a cold, hostile world, below a warm friendly world. So there is in the negative experiences still a contrast of metaphysical dimension. Both the positive and negative gestalt attest to a supreme gestalt of a Janus-faced existence, either comprising bad and good on equal footline, or telling that one of the aspects is even more real than the other.

But how is this metaphysics to be understood? What status as insight can it have? Here we have a meta-metaphysical question that of course cannot be adequately dealt with here, but certain essentials of three different approaches may be suggested by three enthusiasts, H, S, and T (the homocentrist, the spiritualist, and the ecosopher T).

H: The power of human imagination is overwhelming! There is no limit to what human genius is able to **project into** nature. The richness of the treeline symbols attests to it. The flights of the imagination take off from the plain of brute facts: The leaves of trees are green, the stems grow upwards, . . . The rest is wonderful projections of the human mind!

S: Strictly speaking the leaves of trees as such are not green. The atoms are colorless, **not even grey**, and the electromagnetic waves or particles making up the stem do not strictly speaking grow upwards. But there is another realm beyond the material world. The new physics attests to it - a world of the spirit beyond space and time, a spiritual realm. The human mind is in direct touch with this realm and 'spiritualizes' nature. There is no matter?

T: The richness and fecundity of reality! How overwhelming! The **abstract geographical structure** 'treeline' points to a seemingly infinite variety of **concrete** contents! More is open to the human ecological self than what can be experienced by any other living being on this planet!

- The metaphysics of the treeline is in a sense a more serious affair for T than for H and S. It lets us understand the spontaneous, immediate experience of a treeline, as an experience of **reality as such**. Beyond the cleavage subject/object and spiritual/material!

- One of the most chilling, spontaneous experiences today is the awareness that what mostly is labelled 'reforestation' does not really restore a forest in its biological richness and diversity, with its multiple metaphysical implications. But the fact that so many people have strong negative reactions to sham reforestation should guarantee a change of policy.

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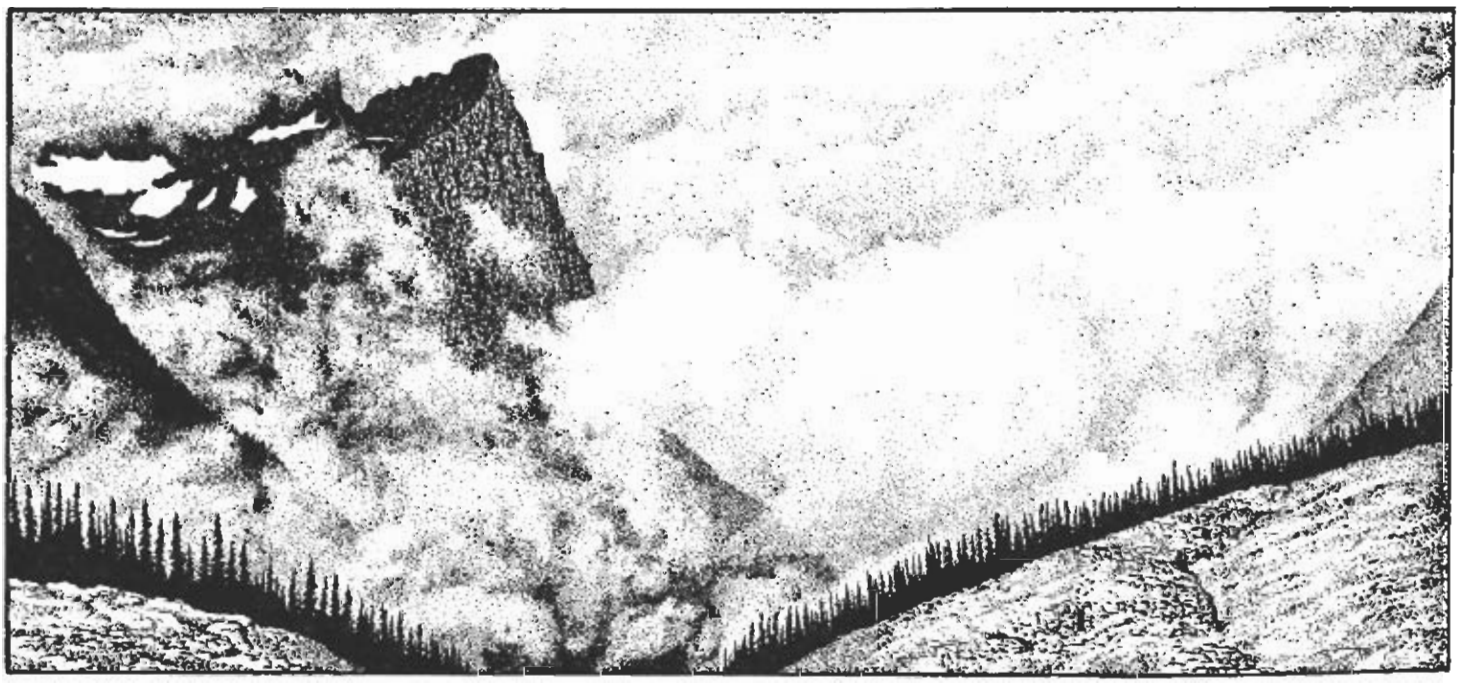

TROPICAL RAIN FORESTS: THE LOSS OF INCREDIBLE RICHES

Michael Soulé

Rain Forest Ecology

Tropical rain forests are complex, beautiful places. More varied types of life can be found in a square mile of rain forest than in all North America. These ecosystems have evolved over millions of years, unhampered by the ice age and, until recently, relatively unchanged by human intervention. The plants and animals of the forest all have adapted to the presence of tremendous amounts of water. It is estimated that at any given moment, over 2/3 of all the fresh water in the world is present in the Amazon rain forest alone. Some forest areas receive up to 400 inches of rain each year.

Most of the nutrients in the forest exist in the lush canopy a hundred feet above the ground which is teeming with life: flowering plants, animals, birds and insects, many of which never touch the ground. Little light reaches through the higher levels. The forest floor is relatively bare, with little top soil and with roots which lie mostly on top of the ground. Dense undergrowth is found only on the perimeter of the forest, where clearing has let the sun in. Insects and moisture work together to decompose organic material at ground level in a matter of days. The nutrients rise in the trees to renew and resupply the canopy and the soil does not build up. When trees are removed the land quickly loses its capacity for supporting rain forest growth.

Bare land, unprotected from the sun, dries out quickly. The poor soil can only support agriculture for 2-5 years. Then the land is usually sold to ranchers. The farmers move on to clear new land. Grazing is continued for up to ten years, but the productivity of the land gradually lessens until it can no longer sustain grazing. While this beef production provides an income to large land owners, it gives little return to the natives of the forest. An acre of rain forest might have produced more food and supported more people, but often the incentives and techniques of utilizing the forest intact are lacking: and so understanding of the inherent value of the forest slips away. For this reason, it is essential that we strive to study and learn about these wonderful and unique environments, before they are lost.

Historical Perspective

The first European explorers of the Amazon region of South America saw an expanse of forest that seemed to stretch to the end of the earth: the lush green canopy of the largest forest in the world. They never could have imagined a time when people would be discussing how many years were left until the rain forests were gone. Today, magazines, newspapers, journals, and television all regularly report about the alarming rate of destruction of the Amazon and the disappearance of tropical rain forests around the globe.

In 1906, Manuel Cordova-Rios, a 15 year old Spanish Brazilian, on a routine rubber cutting expedition in the upper Amazon, was taken prisoner by a small band of native Indians living deep in the forest. The story of his seven years with these Indians is a wonderful parable about the treasures which lie in the rain forest. During these years with the Huni Kui, he learned about the forest, about how to live in harmony with its intricate web of life, and about medicinal plants of the forest. Later in his life, the wisdom he gained from living years in the forest helped Manuel become a famous healer. He often returned to this region to help natives remember the forests' treasures.

Precious Losses

Manuel's story shows us how the influences of the outside world already were beginning to disrupt the life of the forest dwellers. The demand for rubber was fuelling the first real international interest in the Amazon. Today, 80 years later, the Amazon forests, and other rain forests throughout the world are being threatened by dams, mining, agriculture and grazing which destroy an area of tropical rain forest the size of New Hampshire each year. The rate has doubled in the past ten years. That means that every minute 50 acres of rain forest are destroyed. With it the unique and wonderful bird, animal and insect life within the forest disappears also. Each day one species, one unique creation in all of existence, disappears forever. While rain forests cover only two percent of the earth's surface, they are home to half of all the species of life on the planet. We are losing forms of life faster than we can discover the possibilities they might hold for us. Of all the plants identified as cancer inhibiting, three-fourths come from topical rain forests. Unfortunately, knowing about these treasures of the rain forests does not seem to be enough to stop their destruction.

Pressures Increase

There is great diversity among rain forests around the globe, yet the basic structure of the forests and the basic problems encountered region to region are the same. Rain forest land is cleared to grow crops, to graze cattle, to build dams, to mine ores and to build roads in hopes of gaining wealth. In the process, the value of the intact forest is lost, including the value of the lives of those people who live there. They are often displaced, relocated, or resettled, in a new kind of colonialism.

Worldwide, there is tremendous pressure put upon the forest by the burgeoning human population. In many regions, especially in the Amazon, this is compounded by the pressure of large outside forces interested in the wealth the forest might yield. Most of these large scale projects are fuelled by rising national

debts and government hopes that the forest can help relieve these debts.

Long Term Effects

Pressure upon the forest grows steadily, yet the consequences of clearing are still not widely understood. Unlike temperate forests with rich soil that can be replanted, rain forests are not replaceable because of their complexity and poor soils. One thing is clear: no one knows the effect of the loss of rain forests on the planet as a whole. These forests are intimately tied to the world's climatic balance. Even the slightest shift in the world's climate, which could come about as a result of their destruction, could upset the entire balance of life on Earth.

While the problems of rain forest destruction are great, so too is the response from the environmentally conscious community. More and more organizations and governments are taking an active role in addressing the roots of the problem. Some of these roots lie in the unknowing actions of people who live far from the forest. Buying rare wood products like mahogany, and eating fast food hamburgers, put tremendous pressure on the rain forests. That is why the work of people like Jose Lutzenberger and John Seed to raise awareness of the rain forests is so crucial today.

As people gradually awaken to the plight of the rain forests, change is taking place on many levels. The United Nations Food and Agriculture Organization (FAO) recently completed a worldwide tropical forest action plan to pinpoint possible problems and solutions related to forestry and governments. The International Union for Conservation and Nature in Switzerland and Friends of the Earth in the U.S. have both launched tropical forest campaigns to help governments and development agencies reduce the pressure they put upon the forest. One of the more creative strategies proposed is the exchange of national debt in rain forest countries for preservation of land from commercial use. These government-level programs hold promise for slowing down forest destruction.

Java's Success

Another major part of the solution lies in the perceptions of those who live in or beside the forests. It is estimated that there are over 1000 rain forest tribes throughout the world, many on the verge of extinction. Columbia has 60, Indonesia 360 and Africa over 200. In the Philippines, some seven million people live in the rain forests.

Peter Ashton believes that the fate of the rain forest in a given region could depend greatly upon the local native and tribal people who live in it, not just those who make major decisions on a large scale about the forest. Mr. Ashton is a biologist from Harvard who has many years' experience in the rain forests of Java. There he sees a culture able to utilize the existing rain forest resources in a productive way. While Panama struggles to feed its two million people through an agriculture and grazing strategy that destroys the forest, Java, with an area roughly one half as large as Panama, is able to feed 95 million people and export food. Mr. Ashton believes that the Javanese tradition of animism engenders a basic cultural respect for the living world, and has contributed to a more harmonious relationship with nature and the development of ways to use the forest intact.

Natives Banding Together

Manuel's Huni Kui tribe is one example of how forest dwellers have worked together to protect their home. They originally came together as survivors of other tribes that had been killed in wars with rubber cutters. Together they found a way to survive in the forest. Today, the native people of Amazonia, who are usually left out of major decisions about their forest home, are beginning to work together to fight for their forest. They have formed a Union of Indigenous Nations, a National Council of Rubber Tappers and an Amazonia Alliance for the People of the Forest. As in Java, these native people understand the forest and its many gifts and live in cooperation with it. They understand the fundamental principles that many people have forgotten, the ability to behold the diverse beauty of the universe and our part in it.

In 1985, a native of the Amazon spoke to the World Commission on Environment and Development:

There are people here in Brazil, particularly in Amazonia, that still live [in the forest], and these people do not want to end up at the level of survival. These people do not want to have their lives degraded to the point of asking how much carbon dioxide and how much oxygen they can breathe. These people want a full life, a life with dignity . . . We want the possibility of life for the indigenous peoples of Amazonia, for the riverine populations, and especially for our comrades who are conscious that to defend the tropical forest, to defend the environment in which they live, is to rescue the right of human beings to continue living there. They know this above all from the education they have had from the indigenous peoples and from nature itself.

The rain forest problem has become what Richard St. Barbe Baker saw as a possible rallying point for a worldwide movement to save the world's trees, not just by stopping their destruction and replanting for the future, but by raising people's consciousness about the role of trees and forests in our lives and finding ways to further inspire people's reverence for all life.

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ISLAND FOREST

Richard Martin

I'd like the large area of Crown Land forest in the middle of Hornby Island (in the Gulf Island Archepeligo in B.C.) to remain undeveloped and unmanaged for silviculture for the time being for two sets of reasons.

First, the proposal to manage and develop a woodlot program for this area has not given any consideration to its natural values, but jumps right over them into the peculiar perspective of the forest industry, in this case "suitably scaled down and laundered for Hornby." Let me give some examples.

1. According to Ms. Bernier's article on forestry in the November 1983 **First Edition**, "A 'dirty' forest, in which growth is stagnated and many trees are weak, sick, overmature or dead is likely to suffer from many ills."

However, these are exactly the trees which are necessary for healthy populations of our various woodpeckers: Hornby forests, especially the overmature trees, provide good habitat for the spectacular crow sized pileated woodpeckers. Owls and many other bird species nest in the large hollows of partly dead trees. Their fallen limbs, branches, and trunks support beautiful colonies of lichens (especially Lungwort and Rubber Raft Lichen), mosses (such as Thread Moss), and fungi, and act as nurse logs for ferns, shrubs (like huckleberry) and tree seedlings, and eventually rot and decay into ground-enriching humus.

Wrens need the mazes of dead and fallen branches to flit about in. Beetles, centipedes, salamanders and myriad insects thrive in their presence. The old-growth firs and cedars ("overmature" in forestry jargon) provide eagle and hawk nesting and perching places. Around herring spawning season dozens of eagles can be scattered from the water's edges to the upper crests of the forested Crown Land, flying among and perching on the tall old "conky" snags. Some of our shore-dwelling herons nest high in sick old trees as far from the water as Crown Land.

2. Again, according to Ms. Bernier, "Trees growing far apart are poor workers, and if they are too close together, they are very small and thin for their age."

However, trees growing "too far apart" provide opportunity for an understudy of smaller trees of diverse species, and of ferns and flowers, of shrubs such as salal, oregon grape, ocean spray, and little pipsissewa; and when far enough apart we have a clearing in the forest, or an opening letting in sunlight, a glade for browsing deer and grouse and other ground-foraging birds, for mice and shrews, for slugs and snails. There are always reasons for trees growing more or less widely apart: seep springs, boggy grassy areas choking out tree seedlings, moss carpets concealing barren conglomerate winter creek beds and gullies, gravelly side-hills and ridges and outcroppings, and cliff edges and wind-swept areas - to name a few areas of our Crown Land uncongenial to tree growth.

Trees growing "too close together," "small and thin for their age," provide a safe hiding and feeding place for a variety of small birds and insects, grand webbing frameworks for spiders, prime mushroom habitat, and the raw material for Nature's own thinnings into eventual clumps and clusters of live trees, especially those like wild cherry which thrive together, with the residue of dead little trees making natural compost-in-process. This closeness of little stands of young trees is just a natural result of the self-seeding process, and is of value to the creatures that can utilize them in that density.

3. Again, according to Ms. Bernier, there "may even be weed trees which cannot be sold or used and which should have been kept out." But "weed-trees" or deciduous (leaf-shedding) trees such as alder, are a central part of the variety of wildlife habitat that our Crown Land provides. Their immense volumes of leaves and twigs blanket the ground in the fall, covering some resting insects, rotting away over the winter season to help rebuild the soil disturbed and washed away after the last logging and road-building operations, helping to hold water in place for the ground to absorb into the cracks and fissures of the water table; their systems breathe in enormous amounts of carbon dioxide in return for our oxygen. Especially valuable are our alder trees, so vilified by foresters as "weeds," with their nitrogen-fixing root-nodules and useful nutrients to poor and recuperating forest soils. Their extensive and fast-growing root systems help stabilize loose and eroding topsoils.

The quick regeneration of alder, maple, and willow provides sheltering canopies to capture sunlight, with open spaces beneath for sword ferns and nettles and miner's lettuce and grasses. The less common "weed trees" such as dogwood, arbutus, cascara, wild cherry, elderberry all contribute to the diversity and hence stability of our Crown Land forest and its creatures.

Rather than trying to change the forest to fit prepackaged forest "management" concepts, it is far better to try to understand, enjoy, and learn from the diversity that Nature is offering us here, so that the profit we gain is practically non- exploitative.

The second set of reasons that have not yet been brought forward in the discussion, about whether our Crown Land forests here on Hornby should be opened up to silviculture, are hard to talk about because they touch something deep and personal and because we have such varied backgrounds that don't provide complete common language to express these deeper things. But to initiate a discussion let me call these spiritual values. What I'm getting at is this: Hornby has many abodes for the spirit. On Hornby Island there are many places where, at certain times, various spiritual experiences can emerge from the background noise of the commonplace and the everyday. In other words, on Hornby there are many places where various moods, energy conditions, and states of being, and unity of mind and body can be experienced in unique ways related to these places. More specifically, there are places of Beauty, places of Magic, places of Power, places of Solitude, and places of Community. These are places where these qualities come through with particular undiluted intensity. Many of these places are well known to us locals as well as to many visitors.

Many places of Beauty are now found in Helliwell Park: the grass-capped cliffs standing high over the waters, and the mighty old-growth fir stand, for example. Some are partly on private domain, as the sculptured sandstone flower gardens flanking the east side of Tribune Bay in the spring sunshine. Some places of Magic are now in private ownership: The oak groves above Kniefel's Hill in the full moonlight, for example. Then there are places of Power like Spray Point in a roaring winter Southeaster, and places of Community like the new Hall occupying center stage on Hornby.

But some places of Beauty are scattered over the crest of Hornby on what is Crown Land: the most familiar is probably the lookout from the cliff's edge near the top of Mt. Geoffrey at the end of the old overgrown logging road, where the great flake of rock leans forward from the mountain, a dogwood tree growing up from the leaf and moss and debris covered crack, sunlight playing off the wave formations moving through Lambert Channel, Denman Island and the snow-patched Beaufort Range beyond, with Mt. Arrowsmith anchoring the scene to the left and Mt. Albert Edward soaring to the right. A place of incredible Beauty - and as such it should stand above the "management for use" proposals.

Almost as powerfully beautiful are the west-facing cliffs above the Shire and Rubinoff's Farm, although recently they have on top suffered a series of alterations by chainsaw carrying horse riders who have hacked an enlarged trail through twisted and gnarled cedar clumps, through ancient moss-covered logs, across moss and flower-covered lookout points at the cliff's edge, against a background of broken branches and trampled patches of salal and oregon grape, created probably by tethered horses.

But more importantly, in addition to such specific places or areas of special beauty or magic or solitude, the Crown Land as a whole is suffused with a quiet beauty and grace that will amply repay the person who is willing to dismount from their vehicle, trained animal, or trained preconceptions and make a real effort to still themselves and open themselves to the beauty, magic and solitude that are available (as "states of grace" in the terms of those of you religiously inclined). Every acre there is an artistic tangle of seasonally and daily changing geometric form and color content, some easily seen (silvery, grey, dead, alder tree with lichen colors on scraps of bark flaking from trunk, shadows from barely living trees moving lightly on remaining tree framework), and some repaying only intense and repeated effort, like the intelligible semi-chaos of a Gordon Payne painting. Every step, whether of game trail, human trail, or old road, can push a thought to the fore about what is being seen, smelled, felt - thoughts about humankind's efforts and nature's effects, about God the Father and Mother Nature, or about the tangle of problems waiting for one at home. Whatever. Or no thought.

To my mind, each and every old growth fir tree on Crown Land should be revered as the monarch it truly is. "Overmature old tree"!? Good grief, what blindness and hardness of soul! Fire-blackened bark a half-foot thick, massive horizontal arms stubby and scantly needled, top broken from storms raging over hundreds of winters, saps and juices gathered from far and wide and powerfully thrust skyward through a trunk four feet across, conky knobs evidence of fungal attacks weathered internally, meeting place for eagles and ravens and those not afraid to see Mother Nature! Powerful reminders of what once was, and is, and shall be! An opportunity for a moment of transcendence!

It is innocents like these that are planned for reclassification into the brave new world of plantation forest "management of weeds, which should be eliminated": Little bright green clearings with overhanging willows and ocean spray crowding into the precious light; clumps of ferns and swamp sedges and amanita muscaria mushrooms and yellow sunlight; old grassy logging road bulging over the rise through a tunnel of overhanging young alders, with just a glimpse of distant waters through the leafy scenes; dense little thickets of young firs with reddish-brown carpets of needles the setting for a purple- pink coral root flower living parasitically from the hidden tree roots.

At the very most, silviculture should be allowed to proceed only in areas of low and commonplace interest, as determined after wide community input and/or discussion, and an inventory of natural and spiritual values should be made insofar as these can be determined, and only to a degree and extent compatible with the preservation of the Crown Land as a whole as a place of the spirit in the senses mentioned above (not that there aren't lots of further senses of "spirit" as well), and only with guarantees and ongoing supervision by community "watch-dog" organizations-- such as the Island Trust and/or Ratepayers and/or committees of such, and only on a provisional, experimental basis, with no implied expectation of continuance of such a program, until the results are in and can be digested by responsible overseers, with more than narrow economic interests in the forest.

The Crown Land forest is for me a cathedral - not made by hands - and this must be taken into account. Certainly not the greatest cathedral in the world or even in B.C., I admit, just a little rundown provincial diocese, but worth preserving nonetheless.

About the Author: **Richard Martin** is a poet and electrician who lives on Hornby Island and who has a deep interest in the natural world and in philosophy. He his written on many subjects related to his interests. This article appeared earlier in **First Edition** No. 41, Dec.83/Jan/84, published by the Hornby Island Free Press, Hornby Island, B.C. Reprinted here with permission.

THE ECOLOGICAL CONTINUUM OF THE FOREST

Diane Coogle

Like anyone else, I learned in school about the natural cycling of the forests: logs make dirt that feeds the trees that turn into logs to make more dirt to feed more trees, and that's the way the forest grows. I learned it in school, and I learned it in the woods

I grew up in. It was common sense to me, a fact of life as obvious as the turning of the earth measured against the rising and setting of the sun.

But just as there was a time when astronomers thought the earth stood still while the sun circled it, so there seems to have come a time when foresters have forgotten what makes the forest live. I once attended a presentation for Forest Service personnel and a few conservationist guests by Chris Maser, then a research employee of the Bureau of Land Management. His subject was old-growth forests, and his message was that same truth of my childhood: to deprive the forest of any one of its necessary elements is eventually to destroy the forest. To back up this truth of the necessity of the function of each part for the successful functioning of the whole, he began with a story from Buddha, Buddha? From a man employed by the Bureau of Land Management? My respect for BLM rose an inch or two from its previous position of zero.

For four hours Chris Maser talked about how a forest recycles into its ecological continuum, expanding the simplistic knowledge of my childhood. Intellectually delving into the intricate interrelationships of the forest, he followed the decaying process of a log as ants and beetles, termites, arachnids, mites, and a host of other insects and bugs ate it, lived in it, traveled through it, and turned it into soil. The network of forest life is so complex that even the parasite that lives in the stomach of the termite is important to the process of life in the forest, for without it the termite could not digest the hard center of the decaying log. During that process of decay, the log becomes a sponge, a water reservoir for the forest even in the driest months, a fact Maser proved to his fellow foresters one hot dry day in August as he squeezed water from a log before their amazed eyes.

Finally, into this softened, decaying mass of tree becoming earth grow the mushrooms and fungi, and with Maser's elaboration of the vital role of the ectomicorrhizea, the underground fungi, the Buddha story about the importance of each function was vividly illustrated. These micorrhizea which grow on the roots of conifers are essential for allowing the trees to absorb nutrients from the soil. The trees, in turn, supply the fungi with photosynathates - a simple symbiotic relationship; but the tree and the fungi do not a forest make. Maser's key point was always the necessity of all functions to the functioning of the whole of the forest, and with the ectomicorrhizea he brought trees, insects, fungi, and mammals together.

Many micorrhizea reproduce by wind-disseminated spores, but in the Pacific Northwest there often is not enough wind for dependable dissemination. Therefore the ectomicorrhizea, the fungi that fruit underground, become especially important. These underground fruits are rooted out and eaten by the small mammals of the forest, the flying squirrels, chipmunks, and redback voles. In the process of digestion and elimination, these mammals eliminate the spores of the fungi through their feces, and thus, planting fungi, they act as inoculators of the roots of trees throughout the forest. One pellet of one vole contains a large number of spores, and one vole drops dozens of pellets a day, making his innocent and unnoticed contribution to the life of the forest tantamount to that of the unnamed peasants hauling rocks for the Medieval cathedrals raised to the glory of God.

"There are two ways to manage a forest," Maser said. "We can rob Peter to pay Paul, or we can establish a self-sustaining, self-repeating system." In Europe foresters have been robbing Peter to pay Paul for centuries. Traveling there to study European forestry, Maser found trees planted in rows, stands of single-crop forests, acres of forests fenced to keep out the overpopulation of deer; sparse, thinly rooted trees susceptible to wind and disease; bark stripped immediately off every fallen tree for fear of beetles; and nothing, absolutely nothing, on the forest floor. "The Europeans call our forests junkyards," he said. Their's are clean - sterile, with no small animals, no birds, none of the buzzing aliveness of a health forest. Paul, who for three centuries has taken without giving back, has robbed Peter, the forest, of its life and its livelihood, and Peter is dying.

"The old-growth issue is a realignment of values," Maser told us. It turns on the difference between seeing a forest as a junkyard and an ecosystem; the difference between seeing a forest as a timber yard and a continuum of life; the difference between snatching at what we can SEE (Short-term Economic Expedience, one acronym Maser drily said he likes) and learning to see both below the surface of the soil and into the centuries ahead; the difference between trusting a future technology to solve the problems we create and trusting the millennia-old processes of nature; the difference between the values of money (greed) and the values of self-sustained, self-repeating systems; the difference between taking from and becoming a part of. The old growth issue is a realignment of values.

At home where I write I look down into the forest, and in a funneled opening between the oaks and the firs I see a decaying log, something I have in the past taken for granted. No more. Maser told us of a German forester who, in Oregon to study the forests of the Pacific Northwest, saw for the first time in his life a decaying log. "He was like a child in a candy store," Maser said. I can imagine. What an amazing thing it must have been, that log crumbling into the earth, the visual reality of the process that makes the ecosystem work. I look at my decaying log with different eyes now; what I have always known as an essential part of the forest I now see also as a precious commodity. Chris Maser has made me see the forest new.

I hope he has done likewise for the foresters he was addressing. "We cannot continue to take, take, take," he told them. "We must learn to think of the life of a tree not only as the 800 years it will stand but as the additional 400 years it will rot and decay." In addition, he told us we must learn to think of the forests as reservoirs of water. "Most of the world's water comes from the forest watersheds," he said. "The most important product of the forest is not wood fiber but water." Like Einstein, who told us at the onset of the atomic age we must now change our modes of thinking, Maser has urged us likewise and for the same urgent reasons to change our thinking about the forest. Drawing on wisdoms as disparate as Buddha and **Alice in Wonderland**, the **Tao of Physics** and Elizabeth Kubla-Ross, he reminded our foresters of what in the face of economics, formerly called greed, they might have forgotten: what it is that makes the trees a forest.

About the Author: **Diane Coogle** is a freelance writer and editor whose major areas of interest are ecology, art and natural values. She is the current chair or the Rogue River Group of the Sierra Club. She edits **Guide to the Arts**, published under the sponsorship of radio station KSOR in Ashland, Oregon. She also works part-time as a teacher of journalism. This article originally appeared in **Oregon Conifer**, a publication of the Oregon Chapter of the Sierra Club. Reprinted here with permission.

SUSTAINABLE FORESTRY

Chris Maser

This is the second time that I have been in Canada, and you folks are among the most gracious hosts and hostesses I have had the privilege of being with; thank you.

I do not come here with wisdom, only a gift of ideas. Ideas are free. They are not mine in the first place, so I have no expectations of anyone in the audience. If I say something that is of value to you, keep it; if not, let it lie.

We heard some poems read yesterday, and you may well ask what poetry has to do with a conference on forestry in British Columbia. Poets are the clear-eyed visionaries who give us the metaphors to help us to define ourselves and our place in the Universe. The following are two examples:

> To see a world in a grain of sand
> And a heaven in a wild flower,
> Hold infinity in the palm of your hand,
> And eternity in an hour.
> (William Blake)

> Mind is the Master power that moulds and makes,
> And Man is Mind, and evermore he takes
> The tool of Thought, and, shaping what he wills,
> Brings forth a thousand joys, a thousand ills:--
> He thinks in secret, and it comes to pass:
> Environment is but his looking-glass.
> (James Allen)

These poems are as much about forests and forestry as is all the scientific research that has been conducted in our universities, because both poets and scientists are seekers of truth, each of which deals with the human condition in its own way. This reminds me of a movie that I once saw about a Chinese priest in search of the "Book of Knowledge." The priest spent his entire adult life fighting dragons, thieves, armies, and demons of every kind that would block his path to the Book of Knowledge, a path he followed without knowing where it would lead. Finally, after years of struggle, he arrived at the edge of the sea, and there, high atop a lava pinnacle, was the monastery that housed the Book of Knowledge - the book that held the meaning of life. As he reached the monastery, he was welcomed by a monk, the keeper of the Book of Knowledge. After resting awhile from his arduous journey, the priest opened the Book and found within a mirror that reflected the image of his own face. And within that reflection was all knowledge contained, for the priest saw the wisdom of what he had become as a result of his trials and struggles and the choices he had made along the way.

He had learned that discrimination of choice determines which path a person's feet are destined to walk. He had learned that desirelessness is the key to freedom from materialism's prison cell. He had learned that good conduct is the sole responsibility of the individual traveller and is not dependent on the behaviour of anyone else. He had learned that all the demons along his path were but distortions in the house of mirrors of his own soul and that he must identify the one true reflection. He had learned that wisdom can neither be taught nor given away, that wisdom, the inexplicable knowing beyond knowledge, is the child of experience and must be earned. And he had learned that love, being of God, overcomes all obstacles.

We and the priest are one, and like his, ours is an inner journey, a journey without end, a journey without distance, a journey in which we are both in Creation and creating. As we create, either on the material or on the spiritual plane, so we are in creation, and we are either freed by our creations - those born of love - or imprisoned by them - those born of fear. The choice is ours because we have free will, which means that each day, with pen in hand and an inkwell called choice, we write our autobiographies. And change is the putty with which we mold and remold our character, the mirror image we will one day see in our Book of Knowledge - our Book of Life.

There is boundless help for us in our approach to life, if we will but seek it. Consider Zen; one page in our Book of Knowledge might be a gift from Zen - to approach life with a beginner's mind, a mind simply open to the wonders and mysteries of the Universe. A beginner sees only what the answers **might** be and knows not what they **should** be. If, on the other hand, I become an expert, say in forestry, I think I know what the right answers **should** be, and no longer see what they **might** be. The beginner is free to explore and to discover, while the expert grows rigid in a self-created prison.

This conference is about our human view of the forests of British Columbia, what we are doing to them in the name of forestry, what the consequences of today's decisions will mean to the future, and it is a challenge to the rigidity of our conventional economic thinking. Although all of this has already been addressed in the above paragraphs, it has not been discussed within the narrow confines of that which we call forestry. I will now do so.

As we liquidate the ancient forests, we are redesigning the forests of the future. In fact, we are redesigning the entire world, and we are simultaneously throwing away Nature's blueprint. Nature designed a forest as an experiment in unpredictability; we are trying to design a regulated forest. Nature designed a forest over a landscape; we are trying to design a forest on each hectare. Nature designed a forest with diversity; we are trying to design a forest with simplistic uniformity. Nature designed a forest of interrelated processes; we are trying to design a forest based on isolated products. Nature designed a forest in which all elements are neutral; we are trying to design a forest in which we perceive some elements to be good and other bad. Nature designed a forest to be a flexible, timeless, continuum of species; we are trying to design a forest to be a rigid, time-constrained monoculture. Nature designed a forest of long-term trends; we are trying to design a forest of short-term absolutes. Nature designed a forest to be self-sustaining and self-repairing; we are designing a forest to require increasing external subsidies -

fertilizers, herbicides, and pesticides. Nature designed forests of the Pacific Northwest to live 500 to 1200 years; we are designing a forest that may live 100 years. Nature designed Pacific Northwest forests to be unique in the world, with 25 species of conifers, the longest lived and the largest of the genera anywhere; we are designing a forest that is largely a single-species, short rotation.

Everything we humans have been doing to the forest is an attempt to push Nature to a higher sustained yield. We fail to recognize, however, that we must have a sustainable forest **before** we can have a sustainable yield (harvest). In other words, we cannot have a sustainable yield until we have a sustainable forest. We must have a sustainable forest to have a sustainable yield; we must have a sustainable yield to have a sustainable industry; we must have a sustainable industry to have a sustainable economy; we must have a sustainable economy to have a sustainable society. Put another way, we must first practice sound "bio-economics" (the economics of maintaining a healthy forest), before we can practice sound "industrio-economics" (the economics of maintaining a healthy forest industry), before we can practice sound "socio-economics" (the economics of maintaining a health society). And it all begins with a sold foundation - a sustainable forest.

We are not now headed toward sustainable forestry, because we are training plantation managers, not foresters. A forester manages a forest. We are liquidating our forests and replacing them with short-rotation plantations. Everything Nature has done in designing forests adds to diversity, complexity, and stability through time. We decrease diversity, complexity, and stability through time by redesigning forests into plantations.

We have a unique forest in the Pacific Northwest, yet we are teaching and practicing European plantation management. We need to develop our own forestry in updated, revitalized university curricula that stress forest ecology, not product harvest, that teach good writing, speaking, and people skills, in addition to timber cruising and sale layout. We need to learn to see the forest as a living system that produces raw materials - such as healthy soils to grow trees and filter water; pure water to drink, with which to irrigate crops, and for electricity; salmon and steelhead, deer and elk; and the countless other products and amenities we derive from forests.

We must learn to reinvest part of Nature's capital, such as large, merchantable logs and large snags, in the maintenance of forest health, so our mills will have a sustainable harvest of timber from fertile, healthy, stable soils, clean water, clean air, and clear sunlight through time. To reinvest means to give up some of the short-term profits to ensure the long-term sustainability of the forest for future generations. Fertilization and planting trees are not reinvestments. They are investments in the next commercial stand; they are investments in a product, not a reinvestment in maintaining the health of a process. We do not reinvest, because we do not see the forest - only the product, the tree. We do not reinvest, because we ignore the four cornerstones of forestry - soil, water, air, and sunlight. If we continue to ignore the fact that the four corner stones of forestry are variables whose health must be accounted for in our economic endeavors, we will surely destroy the forests of the world for future generations.

And we need to understand that a sustainable yield is a trend within some limits, and that even the timber industry must be flexible and continually change over time. To this end, our schools of forestry must become leaders on the cutting edge of research, management, and human relations, rather than the last bastions against inevitable change.

We can have a sustainable forest, but only if that is what we are committed to and only if we constantly question and re-evaluate what we think we know along the way (both academically and professionally), and only if we retain all of the pieces (including ancient forests) from which to learn. We can have a sustainable forest industry to produce wood products for people, but only if we redesign industry to operate, in fact, within the sustainable limits set by the forest, not by corporate-political economics. In both cases, we must learn humility, which means we must learn to be teachable by Nature. In both cases, we must become students of processes - not advocates of positions. In both cases, our schools of forestry and our governments must be leaders, rather than anchored resisters of change. In both cases, we must work together for a common goal, with a common commitment: a sustainable forest for a sustainable industry for a sustainable environment for a sustainable human population.

We need to maintain ancient forests because they are the only living laboratories we have through which we and the future may be able to learn how to create sustainable forests - something no one in the world has so far accomplished. As a living laboratory, ancient forests serve four vital functions. First, they are our link to the past, to the historical forest. The historical view tells us what the present is built on, and the past combined with the present in turn tells us what the future is projected on. To lose the ancient forests is to cast ourselves adrift in a sea of almost total uncertainty, with respect to the potential sustainability of future forests. We must remember that knowledge is only in past tense; learning is only in present tense; and prediction is only in future tense. To have sustainable forests, we need to be able to know, to learn, and to predict. Without ancient forests, we eliminate learning, limit our knowledge, and greatly diminish our ability to predict.

Second, we did not design the forest, so we do not have a blueprint, parts catalog, or maintenance manual with which to understand and repair it. Nor do we have a service department in which the necessary repairs can be made. Therefore, how can we afford to liquidate the ancient forest that acts as a blueprint, parts catalog, maintenance manual, and service station - our only hope of understanding the potential sustainability of a redesigned, plantation-forest complex?

Third, we are playing "genetic roulette" with the forests of the future through genetic selection for mass woodfiber production in plantation management. What if our genetic simplifications run amuck, as they so often have around the world? Maintenance of ancient forests are thus imperative, because they contain the entire genetic code and a full complement of vital processes for a living, healthy, adaptable forests, in the fact of the immanent greenhouse effect, that will demand the absolute limits of adaptability for our forests to survive the unprecedented, sudden climatic change. We can help them by maintaining as much biological diversity as possible, which in turn will make our forests as resilient as possible. Resiliency, which equates to adaptability, and will allow the plant and animal communities the greatest opportunity to adapt to new and changing environmental conditions.

Fourth, we must maintain intact segments of the ancient forest from which we can learn to make the necessary adjustments, in both our thinking and our subsequent course of management, to

help assure the sustainability of the future's plantation-forest complex. If we choose not to deal with the heart of the ancient forest issue - sustainable forests, we will find that reality is more subtle than our understanding of it and that our "good intentions" will likely give bad results.

Although there are many valid reasons to save ancient forests, there is only one reason that I know of for liquidating them - short-term economics. Economics, however, is the common language, the common objective that drives western civilization; is it not, therefore, wise to carefully consider whether saving substantial amounts of well-distributed ancient forests is a necessary part of the equation for maintaining a solvent forest industry?

I have often heard that "We can't afford to save ancient forests, they are too valuable and too many jobs are at stake." I submit, however, that we must be exceedingly cautious that economic judgement does not isolate us from the evidence that without sustainable forests, we won't have a sustainable forest industry. Therefore, if we liquidate the ancient forests - our living laboratories - and our plantations fail, as plantations are failing over much of the world, industry will be the bath water thrown out with the baby.

As we liquidate the ancient forests of the world, for whatever "rational" reason, we are, as a global society, simultaneously destroying our historical roots and grossly impairing our spiritual well-being. What we are doing to the forests is but a mirror reflection of the mentality with which we treat ourselves and one another. All we have in this world as human beings is each other - here, now, this moment. And when everything is said and done in our frantic drive for short-term economic gains, if we have lost sight of each other, we will find that we have nothing of value after all.

About the Author: **Chris Maser** is a consultant on sustainable forestery and was formerly a researcher for the Bureau of Land Managagement. His book **The Redesigned Forest**, published by R. & E. Miles, P.O. Box 1916, San Pedro, CA 90733, has won unqualified praise for its clarity and high relevance to current issues in forestry. The paper published here is based on a talk he gave at the Series on Sustainable Forestry put on by the Environmental Studies Program at the University of Victoria. The proceedings of this series is being prepared for publication by the ES Program at UVic, Victoria, B.C., Canada V8W 2Y2. Reprinted here with permission.

REFLECTIONS ON CONFLICTS OVER FORESTS: WORK, JOBS, INCOME AND A NEW APPROACH TO ECONOMICS

James F. Berry

I: Conflicts in Montana

Public TV, August 8, did a piece on the conflict between loggers and environmentalists over publicly owned forests in Montana. It illustrates a lot of points. The loggers passionately proclaim that the environmentalists ignore the human need for jobs and income, while the environmentalists just as passionately proclaim the need for wilderness and beauty for its own sake as well as for the sake of the whole of life, including the human: "What happens when the timber is all gone and there is just wasteland left?" They point to barren areas which previously were clear- cut and where nothing grows today, because of the loss of fertile soil and the altitude and climate. The Forest Service, in an administration devoted to eliminating subsidies for the powerless, comes down on the side of subsidizing the timber company for the sake of jobs and the local economy, and the supply of timber for the building industry, or so they say.

This is classic stuff and it needs to be thought through. The purpose of sensible economics is to preserve wealth, augment it and enhance it. The wilderness and the wildlife in it are treasure, wealth and beauty, as well as a divine voice; irreplaceable in any real sense. It is not commodity, although the timber companies, the loggers and the Departments of Interior and Agriculture see it as commodity, and they ignore the long range results of what they do. The translation of treasure into money is impoverishment. In a sensible society money is not riches; money is an exchange lubricant. Our society has made money into God, into an end in itself, and turned a blind eye to the destruction of national treasure for private gain and for employment. The true **purpose of work is to do something that ought to be done.** This has been perverted into something like: "the purpose of work is to get an income, to make money. So that now the need for a job is the need to make a living to get access to the necessities of life. What the job achieves, good or bad, is of no importance." That is pure travesty. If one can get enough income to support self and family by clear-cutting forests, then is it one's duty to clear-cut forests? We seem to assume that it is. But long range results are the most important consideration. The jobs and the income from these jobs will last for only months or a few years. The loss will last for eons. What took hundreds of millions of years for nature to produce will be gone forever for benefits that are fleeting, and which could be had without the destroying of treasure. The essential goods, to which the logger gains access with the money paid for his logging, are available whether those trees are cut or not. There has to be a better way to give him access to what he needs.

It is the system which needs change. The clash should not be between the loggers and the environmentalists but should be removed to the arena of principle. What distribution system will address the needs of the loggers and the needs of the earth community? The argument is not over how best to serve the human inhabitants, but how best to serve the whole of the life

system, humans and non-humans alike. Humans do not exist except in a context of nature. Wipe out the natural world and the human is diminished to zero.

But I have got myself into a good deal of trouble with friends who find my thoughts on work to be unpalatable. I have stated it in stark, raw terms sometimes, intending to shock. The point is and has been that work is what ruins us, that is, the wrong kind of work, work done for money which converts treasured resources into a marketable commodity, which in a few hours or days or years will become junk.

It is also noteworthy that most of the work done is tending to and operating machines; in the case of logging, huge machines cut off a tree at the ground, pick it up and lay it in a stack as easily as if it were a toothpick. The human worker is not doing the work but serving machines which do the work. The human person is not really a worker at all but a robot tender, getting things done by pushing buttons and pulling levers, eliminating the need for real workers, workers with skills, with strength and intelligence. The machines save the employer a payroll and turn the work into tedium. **Industry does not set out to provide jobs but to achieve the greatest possible production with the least possible cost of production.** So industry's real goal is to eliminate jobs, to increase production so that the maximum amount of earth stuff - trees in this case - can be processed in the shortest possible time. Sanity requires that earthstuff be converted at the lowest possible rate. That forest has to last a long time; our grandchildren have a stake in it, and their grandchildren, and so on, in perpetuity.

My solution is the same as it has always been. Assure the logger an income. See to it that there is work available which does something that ought to be done, not something that ought not to be done: work which is wholesome for the worker and wholesome for the wilderness. **Remove the forests from the grasp of the money makers.** See to it that wood is recycled, and that its real value is placed on it. Restore the forests to wilderness. The important thing is to preserve forests not to destroy them.

The subject of ownership comes to the fore right away. What ownership rights are proper to the earth and its resources? Justice and common sense repeat over and over that **the land is a commons whose benefits are to be shared equitably by all its inhabitants, human and non-human.**

II: Conflicts on the Pacific Coast

There is another dispute between loggers and environmentalists going on, on the west coast. This time it is centered on whether or not the endangered spotted owl will be protected or abandoned in favor of jobs, for people who cut down trees for making kleenex, paper napkins and cardboard boxes. The debate is shaped so as to ask whether owls are more important than wage earners. A governor passionately declares that whatever rights the owl has, they are as nothing compared to the needs of the workers to be employed, to get an income. And besides that, kleenex is a lot more important than trees. Producing stuff is what economics is all about and kleenex and cardboard boxes constitute such production.

Thus, because the trees are there and because there is nothing else for local industry to exploit, the trees have to be converted into money. No one evaluates whether processing trees into almost instant trash is a wise thing for this society to be doing. The divine presence in creation represented by owls, the other animals and the forest itself, is not compared to the desolation of a clear-cut, or to the trash dumps and the junk heaps, where the stuff made from the trees will be shortly after they are cut. The distress of the loggers is what we must focus on as the controlling factor.

The nation's forests, the world's forests, are disappearing because of the kind of thinking we have been describing, and the economists, the PhDs in the universities and in the government are doing little, if anything, to straighten out that way of thinking. Economic analysis consists of adding up bottom lines and unemployment statistics, per capita income, etc., without regard for what is happening to the support system, the earth. Maximum production and maximum consumption, continually growing, are unquestioned national goals. The nation's wise men and opinion leaders, columnists and commentators, government counsellors, honored university professors, newspaper editors, preachers, are nearly all satisfied with that.

So the earth has gone into deficit. The environmentalists and the ecologists and the nature lovers know it, but the wise men who advise Presidents and Secretaries of the Interior do not know it. That stuff on those garbage barges, sanitary fills and overloaded city dumps is what was just lately wealth. The wealth was turned into money as it was turned into junk. The money is still in existence, but the wealth is gone, and a large cost has not been paid. The state of mind, the system, says the faster wealth becomes trash the better, because conversion of anything for pay, from one condition to another makes the Gross National Product grow. It's the work done converting earthstuff that earns income, the transition from one state to another - from standing tree to fallen tree - to transport truck - to pulp mill - into kleenex or cardboard boxes - to the store - to the shopper - to trash basket and garbage truck - to city dump. Every step involves the exchange of money and the growth of the GNP, what the "wise" (!) men call economic health. Note that the money exchanges following on the EXXON oil spill off the coast of Alaska will make the GNP grow. The nation will be judged to be better off for the oil spill, in the eyes of the accountants. Accountants and economists make "value-free" judgements.

What are we asking for? We are asking for a better way of evaluating what is good and bad, in the way we interact with the earth. We don't believe that oil spills and other disasters should show up in economic measures as positive events. The economic impact of an event should be judged in terms of its actual costs, it real bottom line. How has it affected the ability of the earth to sustain life? And we do not believe that we should think ourselves better off because we have made more stuff into junk this year than we did last year. And we do not believe that loggers should be denied income, when they are not cutting down forests. The real deficit is the earth deficit. The measure of the failure of the human enterprise is to be found in poisoned water, air, and soil; in the ozone layer and the greenhouse effect; in the loss of forests and the loss of wealth generally; in the loss of beauty and loss of divine presence.

III: A New Approach to Economics

I. THE FIRST LAW

Economics is the study and practise of preserving the source and sustenance of the total life system, while producing and distributing the things necessary to human well-being.

"Preserve the source" is the first law of economics (Wendell Berry). "Maintain capital" is another way of saying it.

2. CLARIFICATIONS

The human species belongs to the earth community of life and is entitled to take what is necessary for human well-being, while being obliged at the same time to contribute human capabilities to the well-being of the earth, to making the earth complete. The human is part of the earth and the earth process, and the part is not greater than the whole. The human journey is an aspect of the earth journey. There can be no human prosperity in a poisoned and degraded earth.

Human work is meant for the accomplishment of those things that ought to be done. That is, human work is to be aimed at human well-being, within the requirement that the well-being of the earth is a primary consideration. This is critical. Bad work, that is work that ought not to be done, is what brings about ecological damage.

Technology has made human work so effective that there is much more human effort available than is needed for basic human well- being. As a result, human effort has been, in a major way, turned to the production of the trivial and the unnecessary, and the harmful; to the pursuit of money, to doing work that ought not to be done.

3. A Second Kind of Work

Therefore, a second kind of work must be invented: work which preserves the source, repairs ecosystems and restores the earth to health and beauty, in places where human work has damaged it. This kind of work should be funded much as highways are funded today. The automobile is about to lose its preeminence on the American scene. This kind of public works should be substituted for road building right away. Surely, this kind of work could be made available to unemployed loggers.

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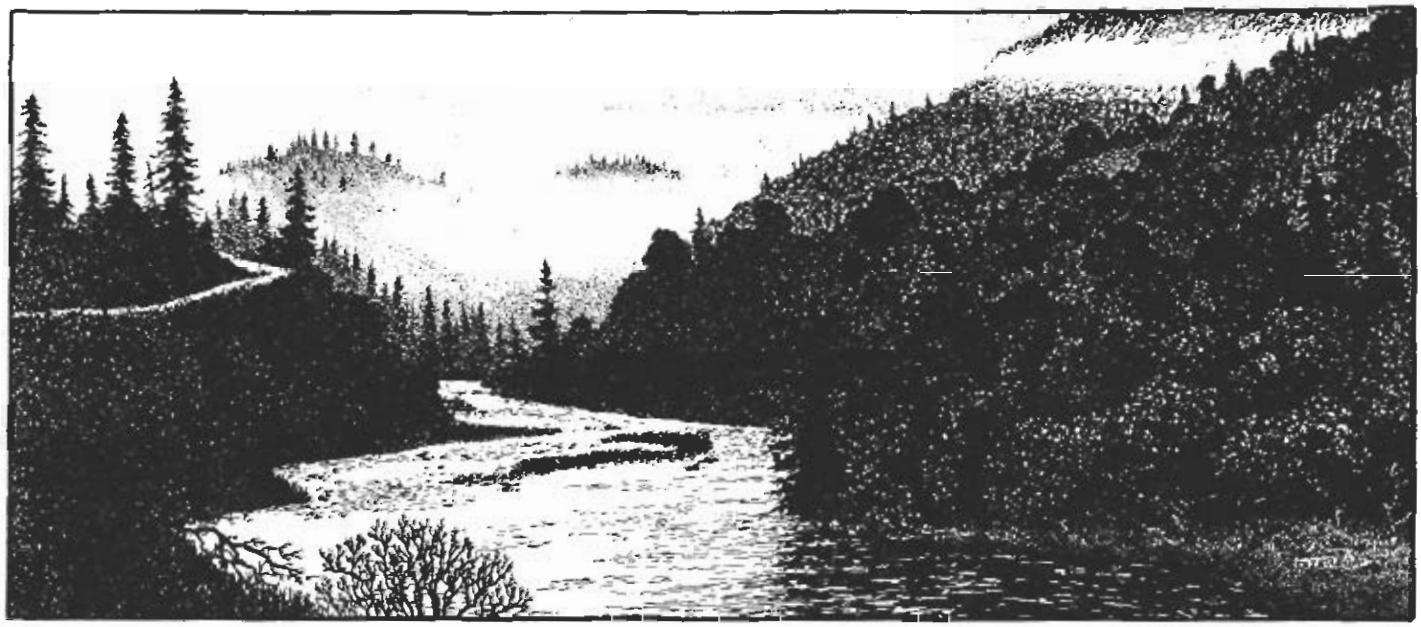

QUALITY IN CULTURE AND SILVICULTURE

Norman Jacob

Introduction

The forest lands of B.C. are being depleted. This is reflected quantitatively by the rising backlog of not satisfactorily restocked (NSR) areas, by the increasing distance between established mills and the high volume stands of timber that such operations require and by the growing financial rewards that induce corporations to log the remnants of old growth which survive. Similarly the wasting away of communities formerly sustained by the product of these forests is indicated by the growing number of jobless, sick and homeless - both indigenous and non-native peoples who in former times obtained their livelihoods from these lands.

But the forests and communities of this province are also being degraded in other more qualitative ways that industrial and regulatory mechanisms are less able to enumerate or measure

objectively. Soils are being eroded from clearcut slopes that the forest mat previously held in place; salmon are losing the river passages and spawning grounds that landslides and silting have destroyed; and grizzly bears are being deprived of the foraging habitat which clearcut logging has eradicated. The natural qualities that formerly made forest lands habitable and sustaining of human livelihood are being destroyed.

Conventional silvicultural measures, such as herbicide and fertilizer applications and even tree planting, intended to regenerate barren sites with fir and other 'valuable' timber offer a short term respite from alder and 'weed' growth but also invite destructive consequences. The chemicals added to the soil, that find their way into the water we drink and the flesh of the salmon we eat, and the fast growing 'jumbo' trees selected for their speedy growth - that replace the many 'races' of trees that nature has selected - may effect other unforeseeable consequences.

Manipulations of forest ecosystems can lead to surprising and novel occurrences that effect fundamental structural and systemic changes both of nature and society. The intensity of, and the area affected by, fire and insect infestation may be unexpectedly great. Regional biogeoclimatic systems such as rain forest may evolve into new forms such as savanna or desert; global climatic patterns may render currently populated areas uninhabitable. Such natural changes will certainly effect societal changes. Nature, after all, interpenetrates society. Surprises and novelties arising in society may cause political, social and economic forms to change with similar unpredictability.

The development of natural and societal systems is evolutionary. We require an understanding of change that accounts for irreversibility. Dynamic or equilibrial models which assume the opposite that change can be undone, will not suffice. Thus the evolutionary view poses fundamental questions for the management and control both of biological and societal systems. If we are to remain adaptive to change - to sustain ourselves in change - then it seems we must account for this uni- directionality in time and indeterminability of change.

We must expect surprises and novelties to occur, the outcome of which we not only do not know but also cannot know. We must expect qualitative changes that we cannot undo. Unpredictability and irreversibility, as well as non-optimizability, will limit our capability to manage and control the forest environment. the ecological and evolutionary perspective asserts that there is much about our forests that is in its very nature unmanageable and uncontrollable. There is a creative reality in the forest itself that precedes the conceptual realities that human interests may impose upon it.

If we examine modern forestry we find that predictable, reversible and optimizable mechanical systems remain the analogs by which forestry professionals continue to evaluate and attempt to control unpredictable, irreversible and non-optimizable biological processes. Both traditional 'sustained yield' forestry in which timber output is maximized and a modern 'sustained financial yield' forestry where profit or economic present worth is maximized fail to account for qualitative change. The concepts of the European mind of another century remain at the heart of modem forestry.

It seems important to understand the rationale by which we impose systems of management and control upon essentially self- managing and self-controlling biological and cultural processes. Our society presses onwards in its replacement of built-in biological and cultural knowledge and information by that which is added on technologically. Yet we do not ask whether technological knowledge and information is an adequate substitute for that which is biological and cultural. Such creative actions as we are currently engaged in, creative of ourselves as well as of other life, are irreversible and unpredictable and this I feel should concern all thinking people. Indeterminable novelty is the source of creative evolution but is also the cause of entropic dissolution. Thus choices that individuals, communities and nations make can significantly affect the future course of change and our survival.

Valuing the Qualitative

There are many meetings and conferences for you to attend, at which you may learn something about stumpage royalties, export duties, automated milling operations, harvesting technologies, and sometimes site regeneration practices. These subjects are important but they are not what this presentation is about.

If you attend these other conferences you will note that the presenters speak from industrial, financial and occasionally environmental perspectives. Although the viewpoints expressed differ substantially - the traditional forester's from the modern forest economist's the industrialist's from the conservationist's - they are likely to hold one view in common.

Most will share the belief that **the quantitative has a greater reality than the qualitative**. Charts, graphs, tables and computer output will figure prominently in their presentations. They will speak about maximum rotation period, optimum culmination of mean annual increment (cmai) and annual allowable cut (aac). These discussions will be organized about other more **abstract concepts** such as sustained timber yield and the normal forest, about a sustained financial yield and the perfect market.

This preference for the quantitative is also apparent outside of forestry, indeed throughout our culture. The sheer weight of numbers, facts and indices that newspapers, magazines, radio and television feed us daily also indicates that people tend to value quantity over quality. In the universities it is quantitative work and quantity thereof that are most generously rewarded. The modelling of economics after classical mechanics and similar arithmetizations in biological and other social sciences indicates the same. The bias in the forest industry toward timber production over non-timber values and the marketing of quality wood as homogeneous fibre again suggest this perception. In scientific theory, in technological practice and in the tactics used by interest groups **quantity wins out again and again over quality.**

I am deeply concerned about this perception of reality because I think it is unnecessarily narrow and will lead to dangerous errors in judgement and action. **Sustainability has a lot to do with revaluing the qualitative and reconnecting quantity** - essentially a kind of quality - **with the qualitative reality from which all quantitative expressions obtain their meaning.** I want to address quality and what it means for a sustainable forestry.

When I began my study of forestry for the NRC (1987), I went about and visited various people all of whom were men whose profession was forestry. I talked to them about the state of our forests and how it seemed to me they were very rapidly diminishing in quality. At least my experience of walking in the forest was telling me as much. Their reply, essentially, was that my

worries were unfounded. **The decimated landscapes I had walked through were not as real as I had thought.** At least not as real as their **projected** growth and yield statistics and the **idealized** forests upon which these forecasts were based.

Few wanted to talk about my experience of walking in the forest or what that experience could teach. Few wanted to talk about the qualities that exist in the forest itself or their relation to abstracted quantity. The **qualitative nature of change,** that it is irreversible, unpredictable and offers many surprises, was another difficult area of discussion. The significance to them of this reality, the significance to forest management of this reality - **that there are things we cannot undo, the outcome of which we not only do not know but cannot know** - was generally lost.

My approach to forestry in particular and sustainability in general isn't exactly mainstream. I have met a couple of foresters and a few ecologist who think about change in these terms. What I describe is more the terrain of the emergent evolutionists.

What We Experience is Real

Yet my experience of quality has its feet on the ground. The reality whose qualities I immediately perceive is a lot firmer than the abstracted reality which theories of the normal forest and perfect market arrive at only through numerical manipulation. How does the notion come about that that which we can translate into number is more real than the quality which is the source of that number? When I allow myself to feel what the forests, and this world have come to, it seems to me that we have missed something very, very important. One way out of this dilemma is to actually ask **"What is real?"**

At first this question seems so remote from practical action that it embarrasses one to ask it but philosophers have been asking 'what is real?' for millennia. It is not, I believe, irrelevant to the current subject. How we answer this question is perhaps the determinant of how science, technology and knowledge in general evolve. Our answer determines how we act.

On the one hand we have the idealists who have argued that the world is a reflection of what is in our minds. A denial of the ultimate reality of the material world and our perceived separation from it and from each other has been the consequence of that course. Opposing the idealists have been the materialists who asserted that mind was ultimately a manifestation of matter. The progressive impoverishment of experience has been the outcome of that course.

Underlying both these positions has been a dualism in which the world is viewed as being divided into subjects and objects. Science and dialectic have been the two major outcomes of this way of thinking about the world. Whereas science has subjects investigating objects dialectic on the other hand has subjectivity overcoming objectivity, i.e. incorporating the latter in the former.

As you may guess, we could go on for some time in search of an absolute reality. Since we are finite beings in all likelihood we would not find it. Our primary reason for our interest in what is real, however, is to guide us in what we must do to live - in this case to find out how we may live **with** the forests. My view is that it is only through a false understanding of the reality **in** the forest that we choose to live **against** the forest. This essay is in part an examination of why we live against the forest and seeks to find a way to live **with** the forest. **In order to do this we must change our perception of the reality in the forest itself.**

Our actions depend upon what we experience. We may listen for a time to this and that theory of what is real but finally when we choose, we choose based upon what we have experienced. On this basis - based upon our immediate experience - we determine that the forest in itself **is real.**

What exactly is it about the forest that we experience and that on this basis determines for us its reality? How do we know that the forest is real? We know that the forest is real because we experience its qualities. We experience these qualities directly - in immediate terms such as touch, smell and sight. We may also sense in the forest a quality that we cannot touch, smell or see. We may if we wish call this presence spiritual. There are forms that we derive from our sensations, such as leaf, trunk, moss, lichen and bird. There are characteristics in the forest such as reproductive vigour and resistance to disease that are necessary to survival. There are functions that we may only recognize in their absence such as the loss of the water- retaining qualities of the forest around Cypress Creek after the forest has been clearcut. In many cases we become aware of this quality only after our homes have been flooded.

All of these qualities and many more have a reality that our abstracted quantities only vaguely reflect. It seems unfortunate therefore that people who make important decisions about the forest are often so alienated from that reality. Walking in the forest it seems would be a potion against the misapprehension which comes from too much **analyzing of quantities of fir** and not enough **experiencing of fir itself.**

Experiencing the Forest

I would like you to imagine yourself a traveller in a very old coastal forest. There are very young trees of less than a hundred years, which are growing very quickly. There are mature trees of about 200 to 400 years whose growth has slowed but which are still gaining in bulk. There are very old trees, perhaps 800 years old, which may be losing more wood than they are gaining.

Where you are standing, in the warm wet bottom land, the earth is soft and springy. The moss and rotting wood beneath your feet gives a little. Touching the fir tree next to you its bark feels thick and carved. You feel the wetness of the air against your skin. The smell of live and rotting wood fills the air. You can hear a variety of birds and perhaps the voices of other animals. Turning your head above, you see a green canopy and beyond that sky. The forest has many tones, forms and qualities through which it **speaks.**

The aboriginal people who lived in this low lying forest, only a few human generations ago, knew the language of fir, cedar and other tree nations. We may have forgotten these languages but let us try to remember. Perhaps as travellers we may learn a few phrases. Maybe we can construct something of their grammars and begin to understand their meanings and significance.

As indigenous people did, let us journey over the mountains and into the next watershed. The climb up allows us to see how other fir and cedar are living, higher up the valley. In a short time our feet begin to tell us that the soil is shallower. It seems like many firs are growing out of sheer rock. Air is drier and cooler. We hear different sounds than before. In this near alpine area making a living is evidently much harder. Fir have become

shorter and acquired other qualities that allow them to resist this harsher environment. If we speak to one of the fir we hear that many fir generations have passed since valley and near alpine fir have intermingled. They have for a long time now remained apart. Through the passage of time, valley and near alpine fir have grown into **distinct clans**.

Higher up in the alpine the forest stops entirely. We journey over a ridge of rock and pass down into the neighbouring watershed. As we make our way we again come upon fir. They look like the near alpine fir we encountered before but are again different. The dryness here has made them hardier still and denser than their relations across the ridge.

As we descend into the valley bottom there is an intermingling of fir and pine. The soil is drier. We are leaving the coastal range and entering the drier interior where fir are giving way to pine; another fir clan but now also a pine clan living among the fir.

We sit down on a fallen log and reflect upon what we have felt and thought, about the various regions through which we have passed. We have experienced something of an ecologically intact whole forest, unquantified and disaggregated. This reality has been conveyed to us through the qualities of which the forest itself consists. **Note that the forest has been unable to convey to us its values in anything but qualitative terms.** I think we can agree that the experience this forest has given us is real.

Abstractions

Yet when we describe the forest to each other, it is usually in terms such as timber, stumpage, and so forth. We strip the forest's meaning down to one dimensional quantity.

Human culture effects a transformation of the forest's inherent qualities - forms and functions that we sense and which are naturally occurring - into quantities of lumber, plywood and paper that are devoid of the primary qualities in the forest itself. Thus quantity is itself a quality but is only one kind of quality. Quantity is something we abstract from the forest reality we actually experience. We may say that this quantity is a conceptualized or abstracted reality when compared to the experienced reality of sensation, form and function that is immediately presented to us as we walk in the forest.

This imaginary walk is my way of calling to your attention the very abstractness of our so-called facts. I have chosen to take you on a walk in the forest. **I would have provided smells, tastes, sights, and sounds if that were possible.** The other course, of analysis and fained objectivity, would likely have resulted in my losing you in abstractions of my own construction. The point I wish to make is that the so-called facts which we so casually throw about, in defence of this or that position, are ever only **perceived useful relations**. They are constructions of the mind and it is important for us as individuals, communities and nations always to be checking and ready to reject such mental constructions when they lose their connection with the reality that exists in the world around us - in this case, in the forest.

I suggest to you that forestry, forest economics, conventional economics and the global system of exchange which are imposed upon the forest are grossly out of line with the reality that exists within the forest. The result of this way of understanding what is real by which we have quantified quality wherever it has been possible has been harsh. We may look to the dizzy heights of scale and capitalization which threaten the forest industry's collapse and the destructuring of forest ecosystems upon which that industry depends. As a consequence of this way of thinking, global markets and global scale technologies have been accorded a greater reality than either global biophysical systems or local biological and social structures.

Other cultures whose perception of qualities in the forest have been more intimate than our own - which have sought to spiritualize the quality in the forest - obtained relatively gentler relations. We may compare the relative abstractness of modern quantitative understandings with the abstractness of various traditional ways. In many respects the animisms and totemisms of indigenous people have achieved a truer reflection of non-abstracted qualitative reality than has our quantification.

In some ways the system of perceiving the world in terms of abstracted quantities is superior. The increased production obtained by factories, farms, and schools is a function of our ability to attach numbers to things. **Management and control of biological and cultural systems have been made possible through this quantification of reality.** In other respects, as far as traditional methods have been better able to **appreciate and protect** these values, modern quantitative abstractions are decidedly inferior.

The stories and myths of aboriginals have enabled these peoples to sustain the forest in ways that we with our quantitative powers have been unable. It is not always clear that quantitative methods are **operationally superior** to other qualitative or spiritual methods. There are qualitative understandings and ways of living that connect us more directly with the qualities that are the basis of our experienced reality and that we ought to explore. **Quantity is a Species of Quality, the Valuation of Which Determines What is Optimal - Where, When, For Whom and For What.**

I would like now to focus on the major practice which obtains from quantification. When we simplify a system into quantitative constituents we are able to maximize, minimize or more generally to optimize various of its parts. This optimality is what we mean when we say that this or that economic arrangement is more efficient or more productive than another.

These abstractions - abstract quantities which we obtain from the qualities that exist in the world itself - can permit us to get more of something out of a system than we could otherwise. Quantifying of qualities allows us to optimize the systems of qualities that exist in the world about us. This is what agriculture, silviculture, industry and medicine are all about.

The abstraction of quantity from primary qualities which exist in the forest itself permit traditional foresters for a time to optimize in some place timber yield and forest economists for a time to optimize for some of the people financial yield. Thus while traditional foresters and forest economists differ about particulars, about whether material production or financial gain are to be maximized, about the exercise of optimization in itself - about the beneficence of getting the most out of our forest lands that is possible - they concur entirely.

But a system may be optimized only for a specific purpose or end, for a specific duration, for a certain place or part of a system. Efficiency and productivity have meaning only in so far as we are able to place these concepts within a broader framework. These and other species of optimality are static system constructs, are machine paradigm concepts, that assume a physically impossible reversibility in change. They are meaningless outside of that paradigm. If we must use them we ought duly to

circumscribe their application. When we are forced to talk about efficiency or productivity we ought at least to qualify **what for, where, when, and for whom** a proposed 'improvement' (typically an ecosystem simplification) is more efficient, more productive, optimal.

Based on these factors - purpose, place and time - based on the abstraction of qualities from which quantity is obtained, **very different optimalities result.** Quantities must be checked against the qualities from which they are abstracted, i.e. those things that we ourselves experience. Usually many qualities are subsumed into one quantity and thus we must ask whether a certain addition of quantified qualities is a case of adding apples to oranges. Related to this question is another that asks: what qualities have been discarded from the equation or externalized?

More broadly, there are paradigmic sorts of questions to ask. **Is this system of facts**, eg., economics, forestry, agriculture, **a useful system of relations** - i.e. useful in the sense of being consistent with our valued purposes? Facts or perceived useful relations ought to be evaluated from the vantage of paradigms other than the static mechanical viewpoint. **The evolutionary paradigm provides a perspective around which reality may also be constructed.** Since we are here concerned with sustaining ourselves along a healthy evolutionary course we must ultimately ask whether the operative paradigm which we are currently in - the vessel and its navigator - are directing us on a safe course down this evolutionary river of life.

We have learned over the past century that science does not consist of immutable laws but consists instead of interpretation. Science is interpretation. The record of this interpretation is history and this history evolves. This interpretive quality - this subjectivity - of science is well illustrated by physicists such as Shrodinger and by mathematicians such as Godel. They say that **our knowledge of the world is intrinsically indeterminate.** As Godel has demonstrated even in mathematics, complete systems of knowledge are an impossibility. This applies to relatively simple non-living systems such as the theoretical sciences, e.g. physics and mathematics, encompass. It applies to the more complex essentially empirical sciences such as metallurgy, materials science and chemistry. Certainly it applies to the extremely complex living systems that biology, economics, and other social sciences attempt to describe.

We make sense of the world through a certain viewpoint that we value. A reality is then constructed around the metaphor or metaphors that emerge from that concensed value or values. In the past when we have seen the world as a machine - using the metaphor of a clockwork mechanism - efficiency and productivity have emerged as primary values. As we embrace the computer metaphor and interpret the world as an information processing **mechanism** efficiency and productivity are reinterpreted in light of a somewhat altered metaphor.

But while physics and mathematics have incorporated the new perceptions using less static metaphors such as of a river, economics and forestry have stubbornly held to the old viewpoint of the world as machine, or more recently, but essentially the same, as computer. The operative paradigm in either case - clockwork mechanism or computer - is a static one in which a steady state, even steady growth state, has been assumed possible. Both forestry and economics adhere to this old paradigm. Sustainability or 'sustained yield' (when it has not meant the liquidation of old growth forests) has meant maintaining the same productive output or increasing that output. But our experience of the forest, reflected as well in other aspects of our lives, tells us that something is at fault with this paradigm. The machine or computer paradigm does not agree with our experience. The forests are not being sustained. Our communities which depend on the forest are not being sustained.

When people ask me 'Is this efficient?' or 'Will this increase productivity?' I am hard pressed to provide an answer. Other than in a non-changing static world these words have relatively little meaning. In a world that develops the paradigms of dynamism or of evolution other meanings than those generally established must be assigned to these words. If we are to use them at all we must at least ask: what for? where? when? for whom? Efficiency if it is to have any meaning at all is a relative concept with no absolute value. **A certain relation or system is only ever optimal or efficient in relation to other factors and these relations and factors are fluid and ever changing.**

The paradigm of creative evolution, which is the primary interpretive basis for this presentation, assigns the concept of efficiency, productivity and other species of optimality a relatively minor role. More importantly, we must concern ourselves with irreversible change. Concepts such as efficiency and productivity which assume the opposite, that change is reversible, must be reinterpreted in light of this property. Secondly, we must address unforeseen surprise and unpredictable novelty.

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SUSTAINABLE SILVICULTURE: REDEFINING FUNDAMENTAL ISSUES

Alexander Jablanczy

In 1986 when I completed the sixtieth year of my professional life, I received a surprising and honouring invitation to write the book relating to **Sustainable Silviculture**. It seemed ironic that exactly half of my career, until 1956, was spent in central Europe, the cradle of modern forestry; and the other half in Canada, one of the richest forested countries, but the least progressive in concern about the care of its "inexhaustible" national resource.

My sixty-year period of devotion to forests included more than ten years of basic and advanced studies in three countries, with three different languages, namely Hungarian, Czech and English.

The adjective "sustainable" at first, astounded me. For it reminded me that during the first half of my forestry life the concept of silviculture never needed such elaboration. Silviculture implicitly comprised the essence of sustenance, in the handling of forests.

No Other Silviculture Imaginable

There was no other silviculture imaginable for us young foresters, while learning, planning, managing, or teaching in our profession. The law required it and the professional oath obliged us to use it in every occupation in forestry.

The idea of sustenance (perpetual maintenance) means uninterrupted productivity of beautiful healthy forests for centuries.

European Law: Ecologically Limited Economic Production

Legal provisions, applicable technologies, management activities, engineering services, etc., are governed in Europe by the principle of ecologically limited economic production - sustenance. Any departure from that socio-economic legacy is a deplorable mistake.

The regular use of agricultural concepts, like clear-harvest, tillage, plantation, chemical support and protection, etc., are only justified on lands where such technologies of "agroforestry" do not destroy the soil after repeated rotations. And then, only on close-to-agricultural soils, called **relative forest sites**, which, in most countries will sooner or later be converted for agricultural production.

All other forest soil types may be thought of as **absolute forest soils**. That is, sites which are maintainable only be the preservation of the natural or quasi-natural ecosystem. Regular application of agricultural concepts to these, the majority of forest sites, inevitably ruins all beneficial capabilities of the soil.

Why a New Book?

Already in books and magazines, North America has the world's richest supply of forest literature. Along with translations from foreign languages, all aspects and techniques of forestry are exposed. As well, the encyclopedic knowledge of trained experts is well-founded.

So the motive behind the demand for another book on silviculture can probably be found in the wide gap between the encyclopedic knowledge of North American forester experts and the backward practice in managing the forest.

Responsibility for management, especially within Canada, is most often transferred to secondary industrial establishments which are not cognizant of the bio-technical problems of silviculture. Forests are simply considered a renewable resource by the public and by the managing wood product companies.

In recent years the outcry from the educated public is increasingly critical because of the obvious destruction of forests by mismanagement.

The Hon. Frank Oberle M.P., Federal Minister of Science and Technology, now Minister of Forestry, quoted a citizen in his **The Green Ghetto - Can We Save Canadian Forestry?** (1983): "If the public realized what was going on, there'd be a riot," and added himself, "What would happen if Canadians realized their children would inherit an economy from which the chief engine had been removed by simple mismanagement?" (p. 46)

The best service the proposed new book can offer is corroboration of public awareness about its responsibility towards the nation's natural resource, the forest. The challenge is to change the public perception about the basics of forests and forestry, by removing myths spread by expedient circles, and by offering right, tested fundamental systems for safe continuous use of multi-purpose forests.

Dr. Leon Minckler, U.S. Forest Service, concluded after his life-long observations that "forestry is not a branch of agriculture." Dr. Hamish Kimmins, a professor of ecology at the University of B.C. teaches that the forest is not a renewable but a maintainable resource. Both prestigious experts' statements emphasize the irreplaceable role of specific ecosystem characteristics for each type of forest, and both reject the application of agricultural techniques on absolute forest sites. And finally, consider this quote from Ralph S. Johnson:

> Clearcutting of extensive areas is second only to fire in being detrimental to the ecosystem and the greater percentage of biomass removed, the worse it is. In western Nova Scotia, fire and clearcutting have resulted in the trasition of about 500,000 acres from productive forest land to heath land...Clearcutting and planting is neither new nor improved forest management. The ancient Egyptians, Greeks and Romans were doing it 2,000 to 3,000 years ago. (Ralph S. Johnson, "Clearcutting Degrages Forests," **The Advance**, Liverpool, N.S)

The public must be convinced of the need for its participation in this forestry debate. The public must become convinced that its knowledgeable cooperation has a substantial value for professionals in their efforts to redefine fundamental issues about socio-economic forestry in Canada.

As the public learns, it will realize that Canadian forests, in general, and those in the United States in many regions (especially mountainous states) are in the process of destructive management manifested by indiscriminate clearcutting and monocultural conifer plantations - termed the CC-MC (Clear-Cut- Mono Culture) syndrome. This is contrary to normal development of the forest toward partial or deferred cutting and mixed-stand management practices. The state of Canadian forestery is vividly revealed by the Science Council of Canada's report **Canada's Threatened Forests**," 1983, p.5. It verifies that "One-eighth of Canada's (high quality old growth) **productive forest area has deteriorated** to the point where huge tracts lie devastated, unable to regenerate a merchantable crop within the next 60 to 80 years. Each year some 200,000 to 400,000 ha of valuable forest are being added to this shameful waste."

Clearcut-Monoculture Obsolete

During the last two decades, the provinces have allowed the CC-MC syndrome to become the most used management system. In spite of its wide-spread use, it is an obsolete method. CC-MC has as its prime goal, short-term profit and represents an anti- economic, retrograde direction for forest management.

Associated environmental losses have already provoked dissatisfaction from many public coalitions in the various regions of the country. And now, national organizations are voicing concern.

Countless cases of European documentation have proven that the unlimited clearcut-monoculture coniferization, along with other ecosystem degradation practices like short rotation, grazing, wildlife over-population, and elimination of broadleaved tree species and shrubs, results in diminished productivity of forests, despite occasional success in the first rotation.

Our current practices are doomed to fail in North American as they have failed everywhere. Silviculture based on sound ecological principles can offer safe techniques for maintenance of close-to-natural healthy forests, without destruction of beneficial qualities.

All harvesting methods interfere with forest ecosystems. Consequently, it is an important responsibility of the forest manager to apply multi-variable ecological silviculture, when representing the land-owner and the nation in the discharge of his or her duties. Ecological management should replace the over-simplified mechanized plantation approach in use today.

Environmentally-based forest management is able to propagate healthy, productive forests, creating more jobs (a wider variety of forest jobs, too) for people in our richly forested regions. In addition, aesthetic values are not compromised nearly as much as with clear-cut management.

There is much to be done to reorient North American thinking from its misinformed, simplistic CC-MC syndrome model to a progressive, ecological long-term economic reality. But a reorientation in thinking will require a prudent, gradual evolution on several fronts simultaneously.

These include:

1. In the legal system, general provisions of the law must require the maintenance of forests by sustained management for all categories of ownership. The Canadian Constitution entrusted the provincial governments with the management of all other functions connected with the handling of forests. Most of our forest land is owned by the people, but almost all the responsibility for the protection of the delicate ecosystems rests with private companies licensed by the provincial governments.
2. Registered professional foresters must be allowed to become independent from the wood processing industry.
3. Co-operatively, scientists, teaching institutions and other experts should develop stand-treatment and regeneration practices appropriate to local ecological and economic conditions.
4. Forest protection agencies should avoid, or at least reduce the use of chemicals, whose use is unavoidable with the current anti-ecological practices.

If reasonable experts and a well-informed public speak out together against the intolerable assault now taking place upon our forests, there is no doubt that substantial steps will be taken in the right direction. We must accept the historical evidence. (See: Jamie Swift, **Cut and Run: The Assault on Canada's Forests**, 1983.)

The bureaucratic separation of harvesting and other cutting operations from silviculture, along with other management activities, as well as leasing out these duties to commercial interest, has proven to be disastrous.

Placing the wood products industry as the middleman between the forester and the landowner (and forest laborer) creates expensive duplicate administration, and obscures the responsibilities for decisive planning.

The Canadian forester, while employed by a private company, most often is working within public forests, with an important but obscured responsibility to the public forest owner and the forest contractor or laborer who is also a citizen owner of the public forests, which are now leased to the private sector.

The forester's duty has become obscured. This, combined with the bureaucratic separation of management activities, is the major impediment in North American forestry. Greenwood and Edwards in **Human Environments and Natural Systems** (1973) recommend that relieving the wood products industry of functions in forest management would be beneficial to both the industry and the forest.

Saving prosperous forests is the manager-forester's responsibility - Dr. Minckler wrote in the **Journal of Forestry** (July, 1983), "Real responsibility and authority would be placed close to the forest itself. . . in essence my idea is to get more and better forest practice on the ground and reduce administrative overhead."

About the Author: **Alexander Jablanczy** is a retired professional forester with extensive experience in both Europe and North America. This article originally appeared in **Forest Planning Canada** 4/1, Jan/Feb 1988, pp. 7-9.

LARGE SCALE SUSTAINABLE FORESTRY AS A HOLISTIC DISCIPLINE

Robbie Newton

The Context

Let nature do the leading has become one of the gift guide phrases of sixteen years of working with my own ten acres of forest, just one fragment of the personal sustaining environment which has led me to the view of this proposal. Motivating the development of my perspective has been a deep curiosity about every context of nature, and an everyday openness to new learning about it, which sloughs away the old until only a useful core is left. And at that core I have come to understand that nature is characterised by activity, not achievement; that the trees, or whatever achievements nature displays, are just stabilities in that activity; that within the relationships between all these different stabilities lies nature's formative expression; that rivers, mountains, trees and humans are just samples from its active memory; that completeness is the only enduring quality of nature and that only a sustaining environment is creative. The downside is that on a world scale, sustaining environments have regressed to a patchy and vulnerable distribution, under the expansion of human dominion.

The human notion of dominion breeds misunderstanding. It values the achievements, instead of the creative activities that make them possible; it interprets healthiness in terms of growth and dominance over disease, instead of seeing that health is a domain of active balances within which the depth exhibited by qualities of connection like resilience and resourcefulness are health's credentials; it makes the bottom of the heap something to be trampled under, instead of being recognized as the fundamental resource upon which everything else needs to be built; and it sees garbage as a low point in value, instead of the ultimate food resource, the building block of nature. Inherent to this proposal is the return of dominion to nature on nature's terms, a re-submission to those healthy self-supporting tendencies which give rise to the birth and development of life on this planet.

The Proposal: Its Basic Image

The following outlines how forests could be returned to the category of sustaining environments on a large scale. In many senses it is only a sketch written in the knowledge that only the contribution of many more minds, voices and experience can make it complete. Yet the form of the proposal is complete, taking as its focus an image of its achievement and understanding that the achievement is only an expression of the principles that connect it with the boundaries of the rest of forestry's reality. In choosing to imitate and align with nature in the structure of this proposal, it also becomes, like nature, self-forming and self-linking, turning even its own structural garbage into a fertile resource and leaving in its wake little for the bureaucrats to build empire with.

The Principles That Define Connection

1. 'Islands' of development within a large scale matrix of non-development, or permanent forest.

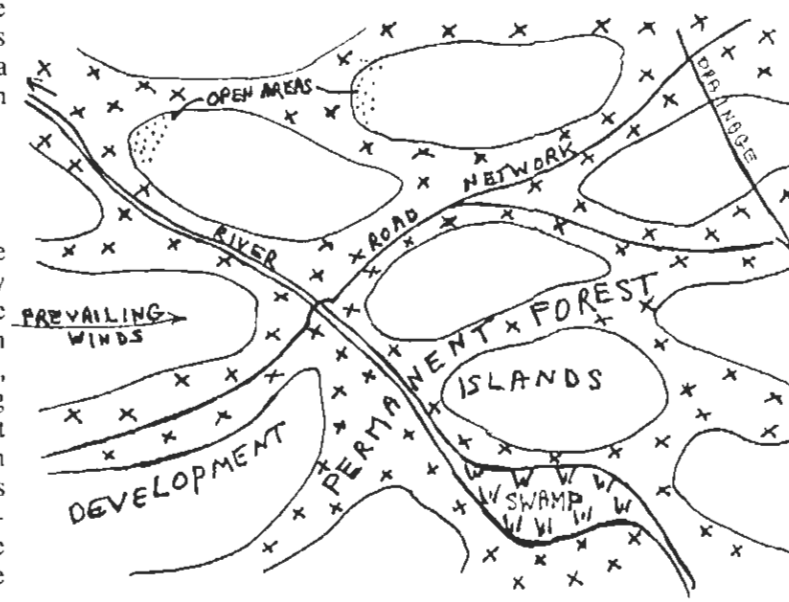
Islands, like colonies, families or species associations, represent nature's own self-protective starting points: If a natural grouping cannot self-survive as an island within a sustaining territory, then it is the development process which is at fault and needs correcting.

2. Non-development or permanence is the long term dedication of the forest matrix, which plays out the role of containing the development within a cover of sustained health.

Permanence does not only imply wilderness or non-intrusion. Permanence is the dedication, a healthy and complete forest environment is the goal. Recreation, hunting, mushrooming are examples of many activities that are not destructive of that permanence and are quite compatible with that goal. But it could also be a resource area for other forest products such as shake blocks or even extra high quality lumber, where non-destructive forestry techniques can be employed. It is also the most natural place to locate a permanent road network, just as it would be for nature's own highways such as swamps and watercourses. The major role of the permanent forest is to build up a healthy and complete forest environment, where it would provide a natural protection against transmission of disease or forest fire or problems like runoff and erosion.

3. Each island is to be sufficiently small that natural re- forestation can be initiated by the surrounding permanent forest.

4. Each island is to be species self-sufficient.



In the diagram some open areas are indicated in the islands, areas where non-productive deciduous species and other smaller forest vegetation natural to that region are maintained, so as to rapidly restore the island to its natural species mix after logging. This is only a way of illustrating a principle, when logging practices are not being specifically defined. Any forestry practice which recognizes the balancing role of 'weed' species in rejuvenation is equally valid.

5. No island may be an exporter of its detritus or derivative consequences to the surrounding permanent forest.

This is another self-sufficiency principle, in the sense that detritus at one stage of a cycle is nutrient at another stage of another cycle, and that those interconnections should maintain a self-supporting harmony. Forestry practices which create a disharmony in that respect, which might display themselves as excess runoff, fire hazard, harbored pests or diseases not containable within an island, are not acceptable practices.

6. Each island is surrounded by buffer strips which mediate between development and permanent forest.

These strips, which are intended to harmonize between permanence and development, could be thought of as selectively logged but where the expected lifespan of a tree is significantly greater than that of trees in the developed areas.

7. The exploitation or productive use of adjacent or close islands is to be 'staggered' both spatially and in time.

Where a disruptive technique such as clearcut logging of an island is employed, then that 'intrusion' on nature's order must be isolated from similar intrusions, in space and time, sufficiently for the health of that island to recover in a predominantly healthy surrounding environment. Non-disruptive uses need not be limited in this way.

8. Nature is to be regarded as the leader in directing the use of all the land.

The health of the forest environment, whether that of a bioregion or of a single tree or of its surrounding ground cover, identifies the successes or stresses that are taking place. Intellectually derived principles take second place to nature's redirections in identifying large or small scale resolutions.

The Key Principles That Define Acceptable Forestry Practice

One key to this proposal lies in principle no. 5, detritus containment. Detritus is the functional excess of a species' existence, meaning it cannot be utilized by that species and therefore has to be handled by its sustaining environment. This is a problem faced by all species and all environments, and its resolution by the interactions of other species and by environmental processes such as wind and rain or even fire, ends up defining what 'sustaining environment' means to each species. The capacity of those combined environments to healthily utilize each and all detritus excesses determines the success and the mix of the species that can be permanently supported. If we consider the current scale and terms of the erosion of our overall environment, we can also recognize how badly humans have managed their version of that chore by comparison with nature's own record. The processes of nature have consistently built up the world's environment over billions of years, whereas our intervention has created a precipitous downturn which makes the demise of the dinosaur appear like a leisurely detour.

Nature is self-supporting, it builds healthily on the interconnections of the detritus of species families. When we harvest lumber, we are removing some of the detritus from the resources of that family, but when we strip log we are grinding up the whole family creating a puddle of effluvia suited only to insects, fungi and bacteria. We set the species families back to the very origin of their detritus production/use cycles, to start it all over again with all the slowness and disconnectedness that characterized early evolution.

All we need for our use is the core wood from 'enough' trees, in fact a small proportion of the total detritus that each tree generates in its lifetime and only the same measure of the food for other species members, and at that some of the least digestible. Our needs are just a fringe of nature's, a minor component, and the devastation that has been the result of our wasteful consumption is a powerful indictment of our lack of imagination. What is needed is for the efforts to acquire those trivial needs, to align themselves in the same healthy positive direction that nature can support.

That is why the second key lies in principle no. 8, allowing nature to do the leading. Nature has a depth to it, which we obviously have not appreciated. Our attempts to control or interfere with nature produces reactions which are currently devastating world wide. Accepting a subsidiary role and humbly allowing nature to do the leading is quite seriously the only way we can expect the health of the environment to consistently move upward again.

Establishing the healthiness of the permanent forest is at the root of this resolution. Having a network of permanently healthy and productive forest containing each island of development means that all the negative consequences are also contained and discouraged, whatever development logging practices are being employed: a containment which could also be identified as subjecting each island to an invasion of healthy natural processes from its surroundings.

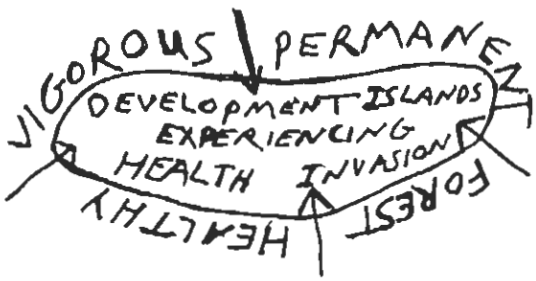
The Scope of the Proposal

The basic image and its guiding principles are an understatement. To properly appreciate what I am suggesting, you will need to expand your notion of the diagram until it encompasses the whole forestscape of British Columbia. I will be realistic only to the extent that I am limiting the scale to that of a political jurisdiction; to think on a smaller scale is to misunderstand the magnitude of the consequences that this world now faces relative to forestry. But if that is understood, it will be appreciated that I am suggesting that 30-50% of the forested area of B.C. be dedicated to permanent forest, not in a few large parks, but in a matrix which interweaves and contains all forest development.

That sounds like a massive and imposing commitment, which is exactly what it is and what is needed, but it is not an imposition in the sense of a burden, because the permanent forest is doing what nature has learned to do well, support itself and still create a beneficial excess to share with its surrounding environment. This will mean that even when the management of the development islands is defective, the consequences to the environment are being mitigated. It is worth noting here that nowhere in this proposal are foresters being told how to do their work, only what is not acceptable to our shared environment.

At the same time, it should be remembered that for the most part the forests of B.C. are at various stages of recovery from

past logging, so that areas newly dedicated to permanent forest



are likely to be far from that goal and the healthiest route towards creating permanency is likely to be some form of selective logging. Most of the regrowth timber that would normally have been harvested is still likely to be removed, as an area is help towards creating a healthy and vigorous permanency.

Along with the extra health will come greater productivity, so again the loss to development of the use of 30-50% does not represent an equivalent burden. In fact, forcing forestry to focus its efforts on smaller areas will emphasize the value of good forestry practices and again result in higher productivity. Nor should the development islands only be identified with forestry. As a model, the principles of this proposal are equally valid for other uses, from mining to ski resorts to residential developments and agriculture.

And a Gentle Touch at Being Practical

A massive amount of detail work is needed to make this suggestion a practical proposal but the detail work is mostly in application, not prior planning. Delineation of permanent/development forest areas need only be tackled as development plans are presented; road alignments are mostly existing; watershed and erosion consequences have mostly been demonstrated and so on. All past logging experience is relevant and locally valid and all relevant decisions are local. There are no major consequences which cannot be covered by establishing workable principles.

There is also a major opening up of different options created by delineating the islands of development. By being small and definable, they can be treated as small woodlot or alternate development options, available to a widely different range of users and uses. The inevitable commitment of very large areas to very large companies would no longer be the only end result. Allowing logging companies the unrestricted use of forest land on a large scale has been and continues to be destructive of an important and necessary contributor to the sustainability of this world's environment. We cannot afford the consequences of not re-creating healthy forests.

We could laboriously and bureaucratically set up guidelines and standards of what good and acceptable forestry techniques are, and then laboriously and bureaucratically try to control forestry practitioners in their work. That kind of approach will be necessary if large area logging continues to be allowed. But bureaucratic resolutions never achieve their goals: too little too late should be stamped on every bureaucrat's door. Rules are rarely stronger than the power that opposes them, and the powers of multi-national logging companies will undermine any system which does not embed them with nature as an equal partner.

My preference is to let nature do the leading and inspiring, and to surround all our own developments with nature's best as a permanent reminder.

About the Author: **Robbie Newton** is a philosopher/scientist dedicated to allowing and encouraging nature to express itself as fully and healthily as is consistent with the same goal for his own human nature, and to use the teachings from those interactions as guides to a happier direction for human society.

WILDWOOD TREE FARM

Merv Wilkinson

A selective forest-harvesting operation in constant production - but geared to the rate of re-growth: You can either work with nature and have a constant forest with all that is in it, or gut the forest as we are doing in B.C. for a fast buck and have nothing in a very short period of time. The Romans used the clearcut method in logging around the north of Africa and in Lebanon. Result? It is still desert.

Cutting on my tree farm started in 1945. There have been eight complete cut overs since that time and cut number nine is in the mill for this fall. There is constant removal of specialized products from the farm. It is all calculated to stay within the re-growth potential.

The active area of tree farm is 137 acres. Re-growth (conservatively figured) is 500-750 board feet per acre, according to soil quality, giving a harvest potential of some 68,000 board feet per year (approx. 340 cubic metres).

Products produced are: sawn timber--including peelers, pulp wood, firewood, poles, fence posts, Christmas trees, and other smaller products. Sheep are used for brush control, so there is a by-product aspect. The sheep produce a profit, thus turning a cost factor into a profit margin.

No chemical is needed to control undergrowth, and if the area is not over-grazed, the sheep do not attack the conifers. Likewise, they do not completely wipe out alder, maple and other deciduous species. Because the stand is a mixed forest there is a very healthy bird population, and the result is that I have little trouble with insects. Similarly I have no problems with bacterial rots, conk, etc.

The original timber cruise, circa 1938, was 1,500,000 board feet. The cut since 1945 has been 1,378,292 board feet, including pulp wood, plus $20,000 in specialty products. I cruised the farm again in 1985. The present volume with adjustment for

regrowth is 1,173,250 board feet. Fourteen milling operators or their buyers have received products from this farm. Twelve families or households get their wood fuel requirements from the farm.

All re-growth is by natural seedlings, eliminating planting costs. Other than keeping the main logging roads free of brush along the sides (as a fire precaution), no fires are used on the property. All brush is allowed to return to the soil. Superior trees are left for seed stock and all genetically defective trees are removed as soon as practical.

I maintain a mile and a quarter of permanent roads, engineered to give all-weather access. Skidder trails are semi-permanent, subject to change if advantageous. Permanent log decks and roadways are re-usable, which is a tremendous cost saver. The present book value of my main roads is 30 cents per foot. These roadways handle the self-loading trucks of today.

The farm has consistently provided a basic one-third of my income since the beginning of the operation. I do my own falling and bucking but contract out the yarding and hauling. Contractors have always been very eager to return to the operation, an indication to me that they like the show. Their comments, which I have written down from time to time, clearly spell that out.

The original plan was for the stand to revolve or replace its volume in a 75-year period. It is a good harvesting age for most species in my location. If the plan completes its cycle, there is no doubt that the volume will be there.

About the Author: **Merv Wilkinson** owns a small forest area on Vancouver Island which he calls Wildwood Tree Farm. He manages it by
selective cutting and has prepared an information sheet to describe how he views and what he does on the farm. If you wish further information you can contact him at (604) 722-2823.

POETRY

CYCLES

Manuela Lima

Limbered and solitaire, its leafless branches
Reaching through spring tears and acrid waves
Of trembling air wrapped in renewed promises
Of rebirth, the tree in the musty yard
Quivers at morning's gentle mirth
Chirping from evergreens and dewy slate.
Along the lean fingers of its limbs
Embryos stir, exhaling scentless fumes
Of unseen sweetness, and juices squirting
In ravenous hollows and tireless enamel
Bleeding with pleasure and spewing, hungrily,
The stony hearts onto the ground.
From the winter--withered boughs
Unfolds, anew, a giving always free,
In the quiet, impregnated cherry tree.

CHOP

Richard Langlais

I chop wood
aim ax
to the block
the wedge arcs
air and log split
all the ions mingle
halves calve aside
honed steel
rends earth asunder
while snow falls.

POEM OF PRESERVATION AND PRAISE

(for the Hemlock/Canadice Watershed)

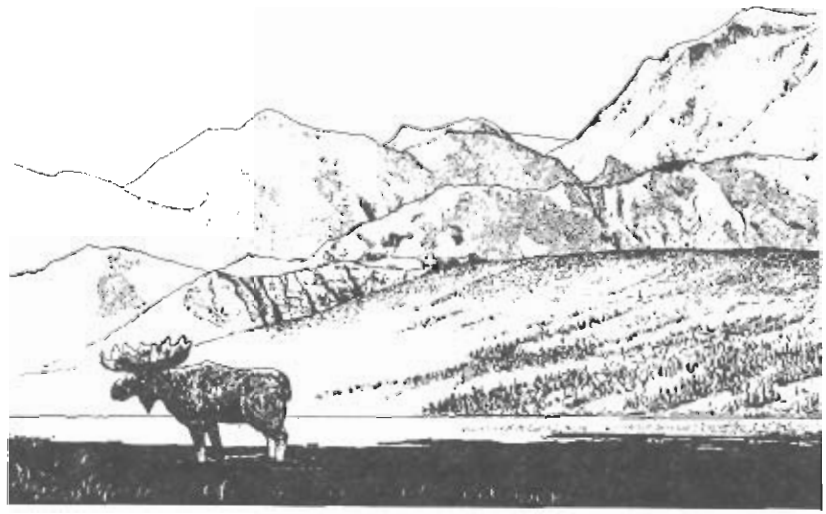
Stephen Lewandowski

Here is the land
where trees have a vote.
Watch how they are cast.
White Pine votes for clean air.
Black Willow votes for water.
Young Poplars loitering in a crowd
vote for a flowing spring.
Tribes of Chestnut and Elm
are sadly diminished;
their once great pluralities
silent.
Shagbarg Hickory votes
in a hail of nuts.
Sugar Maple and Black Cherry
cast a sweet ballot.
At the marsh edge
Beech, Birch, Maple and Ash
gather to discuss issues.
Scotch Pine plantations vote
in a block like a union.
Here and there
lonely idealistic Hemlocks
hang against a shady bank
still voting against gravity.
Again this spring
with flower, leaf,
root, branch and bole,
trees vote unanimously
to bask in sunshine, to
hold soil and drink water,
and to return us breath.

ECOLOGICAL TRACKS

S.J. Brito

Student snow tracks
across grass lands
of western college square
silently tell me
how very much
we are like our
domesticated woolly brothers
who are easily misled
into following a
cultured lead goat;
though staunchly incorrigible
enough not to listen
or give close attention
to sub-social laws
that attempt to
neatly compartmentalize us
into a nation of
dependent sheep, who
would fall over bloated
with political rhetoric
that could decay us
right on the center
of blissful platform
were it not for
a free thinking spirit
who rescues us from
this damnational state
of a bleak social order.
Thus we enter
a bright state
of mature acuity
which causes us
to subtly realize
the significance of becoming
transformed into that
essence of an
ecological-caring being.



QUICKENED TO AN EXPIRING SIGN

Richard Langlais

Ringed to stillness by the golden forest
needling reminders of its vow to be valley,
instead of sky and meadows of clouds,
the tarn, a pailful less now,
by throwing itself down the lower cliffs
at dawn infuses the waking cabin with its roar
while I recall you slipping gently out its door.

Passes a tossing night with no return;
frozen to silence from silver water
I watch steam from my tea tend
upwards to the black cliff where
yesterday a metallic clang, a clatter of stones,
released to loudness the darkening woods
quickened by sudden wind to an expiring sigh.

About the poets: **Manuela Lima** has been publishing poetry since she was 10. She has received awards in both Portugal and North America. Presently she is living in Victoria with her two daughters and attending the University of Victoria. She was the winner of the 1988 Marjorie Peters Award of Creative Writing for "Cycles". It was originally published in the 1988 **American Poetry Anthology**, John Frost, editor (American Poetry Assoc., Santa Cruz, California, 1988). Reprinted with permission.
Richard Langlais has worked for Canada National Parks on the Columbia Icefields, and has also studied Chinese Literature, with study in Taiwan and a six month walk in Tibet. He is the author of **Road News From Tibet**, published by Asia 2000 Pub., Hong Kong. Two of his poems were published in **Soundings**.
Stephan Lewandowski is with the Ontario County (US) Soil and Water Conservation District. He has published several books including **Honey and Ashes** from Tamarack Press and **Inside and Out** from Crossing Press.
S. J. Brito is an associate professor of English at the University of Wyoming. He has written three collections of poetry and several articles about life in the West. He is author of a recent book of poetry, **Red Cedar Warrior**, Jelm Mountain Publications, P.O. Box 338, Laramie, Wyoming, 96120, 1987, ($9.95), which is about the clash between white and Native cultures, as well as an appreciation of Native cultures.

EPILOGUE

Editor

Although this entire issue has been devoted to forests and forestry, we are not finished with this subject. The next issue will continue the discussion begun here. We will also return to philosophy of technology.

When we approach the subject of trees, forests, and our forestry technology practices, we are awed by the magnitude of the subject. In part our perspective on trees and forests is historical. Just to appreciate the role of tree and forest as primal symbols in diverse traditions is a profound and difficult undertaking. The tree and forest function as symbols of knowledge, of life, and of the esoteric teachings of mystical orders. And where would the poetry of our lives be without trees and forests?

But there is also the economic representation of forests and forestry. Just as farming practices reflect the way a society values persons and processes, so forestry practices reflect the actual cultural values by which a society is guided. Plato noted in the **Republic** that the kind of person one is depends on which aspect of oneself is put first. If one puts physical pleasure ahead of the life of reason, then one's life will be directed by the appetitive aspect of the self. One will be pulled thither and yon by a capricious immaturity totally inappropriate to being a responsible, morally wise, human person. Such a life does not allow higher faculties their proper role in directing our lives, and therefore we always live incompletely, and not from all that we know and are. The wise, however, live from the balanced wholeness of self, which is grounded in the principles of the Cosmos. A society as a whole reflects dominant character patterns. These patterns may involve acquired needs and hungers which lead to compensatory seeking. What needs and hungers drive our society to try to remake Nature in its own image, while justifying this as economic necessity? Here social science understanding of culture is relevant. There are also other ecological modes of understanding emerging in the physical sciences.

Our understanding of trees and forests has begun to shift our sense of the physical and biological realities of our situation. The facts, Bob Nixon and others point out, are that trees, and the forest communities they help to create, are absolutely essential to the continued functioning of the biospheric life processes that are necessary for human survival. Forests have been called the lungs of the Earth. We are cutting out huge chunks of these lungs, and, as if that were not enough, we also are pouring polluting chemicals over the bared tissue that would otherwise assure healthy regrowth. We are letting in more UV, while turning the air and rain more acidic. If a group applied for a permit to conduct the experiment that we are now running worldwide, they would never be allowed to proceed. Thus, science is forcing us to ask what we must do to save the forests and trees, while we also help to bring forth a new flourishing of forest lands that have been ravaged by bad practices. Our survival depends on this thoughtfulness and commitment in action.

We must each become aware of our interdependencies and act responsibly appropriate to them. Then, we must work with others to improve human relationships so as to help counteract the hungers that we might otherwise bequeathe to our children, because we do not teach and nuture them with unconditional love. At the same time, we must become conscious of our links to trees and forests in everyday life, and so strive to reduce our consumption and waste. Then we must work with others to evolve new cultural practices and an alternative ecological forestry. Our practices must not separate and fragment our activities and selves, so that we come to see ourselves as dependent on clearcutting forests, if we are to economically survive. Forest workers must become foresters in the noble sense described by Holmes Rolston.

We trust that the meditations and reflections on trees, forests, and forestry practices in these pages will be helpful, in pursuit of deeper ecological understanding and practice. As is now clear, we must redesign our technology practices in relation to both forestry and farming. We must aim, over time, to return to practices based on an understanding of the wisdom that resides in all natural beings; Nature's wisdom is greater than humanity's. We must learn to respect this wisdom more than the seductions of clever power and fast bucks. We need to redeem our older traditions, insofar as they contain wisdom relevant to our plight. Instead of forest workers who liquidate forests, let us train and employ foresters who are caretakers of natural forests, not plantations. The way we now practice forestry makes only short-term economic sense for only a few; such ecologically bad economics must not be allowed to dictate the character of our practices. Just as the military must revitalize the noble virtues of the honorable, chivalrous tradition, so must foresters and farmers regain the dignity to practice their noble professions in ways that are consistent with the flourishing of all beings, that is, ecosophically. To learn in depth what this means is a life- time study. However, regardless of station, we must each become natural guardians of ecos. More on trees, forests and forestry in future issues.

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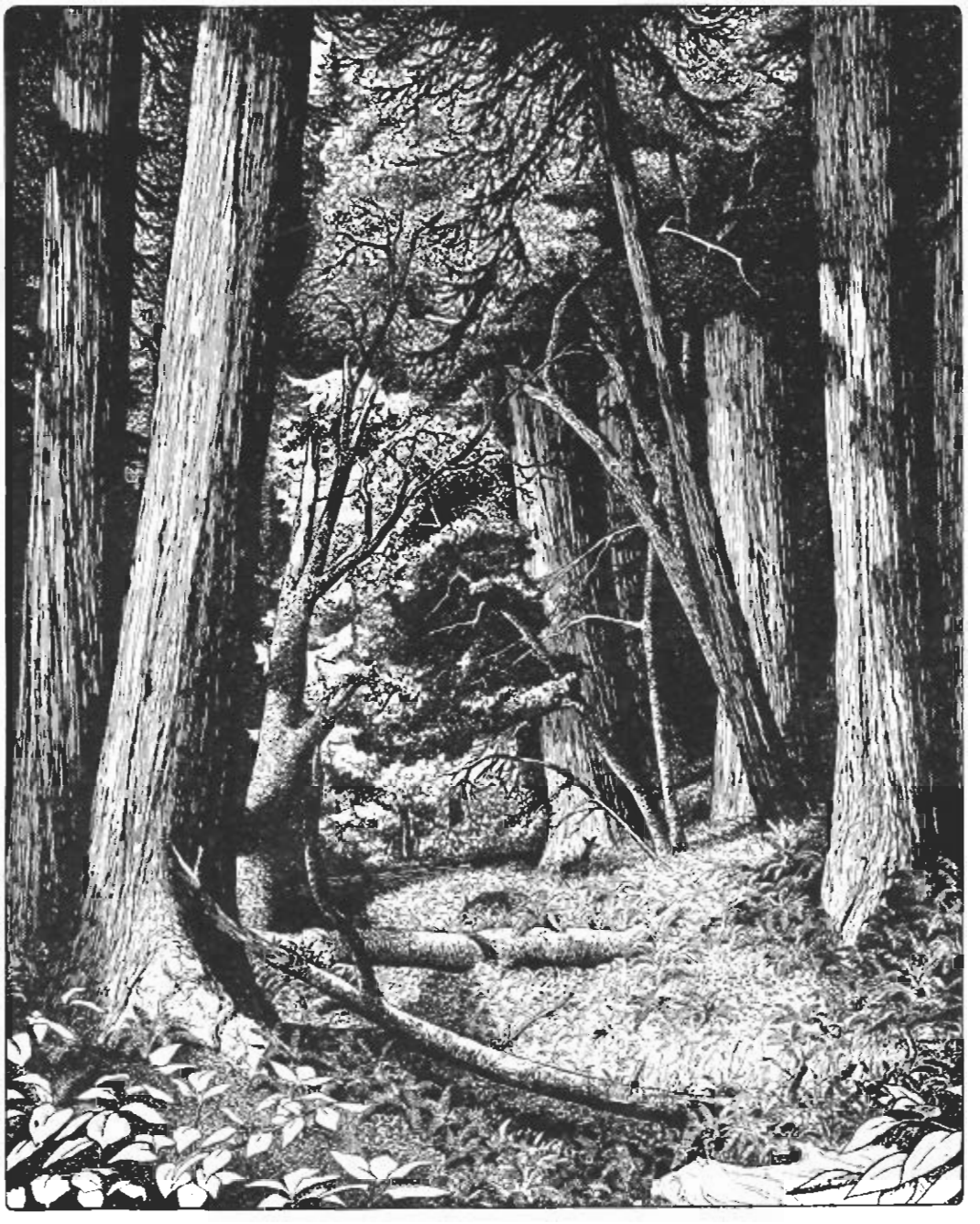

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