

Forest and Tree Conservation Through Metaphysical Constraints

*Here stands a silent grove black with the shade of oaks;
at the sight of it, anyone could say, "There is a spirit here!"*

— Ovid (Fasti 3. 295-296)

Introduction

All cultures of which I am aware have separate, dedicated, hallowed natural spaces. They may be mountain summits, caverns, headlands, springs, or pools. They are very often single trees, tree groves, or forests. Faulstich (1998) suggests that this reverence and love of natural places be called “geophilia,” and says that we need natural landscapes, not only as terrain, territory and resource, but as cognitive sustenance. Edward O. Wilson (1984) suggests the term “biophilia,” which implies that we have a genetic basis for a love of nature. For some traditional cultures, e.g. North American First Nations or aboriginals, all land and water are a sacred environment, as are the associated flora and fauna and the overarching sky. But even among such cultures there are special places or manifestations of additional significance. This paper will deal with trees and groups of trees as such manifestations or places of significance.

Most people feel kindly disposed to, or even “love” trees, since they provide them with many directly useful resource products. Moreover, they are a habitat for desired fauna; protect watershed lands, streamsides, and springs from erosion; provide shade for humans and their animals; and are a source of aesthetic enjoyment. A utilitarian attitude often results in their being removed in order to convert them into useful material. Other relationships toward trees, however, involving respect, awe, worship or fear, will be referred to as “sacred,” and usually result in tree or forest con-

servation and preservation, rather than utilization.

Trees, groves, or forests become sacred through a recognition of some kind of power that they express. This power may evoke in us attitudes of worship, awe, or fear (many other emotive feelings have been suggested, but these three span a spectrum which is sufficient for this paper). Sacred individual trees and groups of trees have characterized almost every culture and religion where trees are capable of growing. Even in virtually treeless deserts, the date palm became the Tree of Life to early Semites and

Assyrians (Altman 1994). To our ancestors who lived closer to the earth than many of us do today, or to traditional societies even now, trees were often not only essential providers of resources, but became powerful symbols of fertility, generosity, permanence, birth and growth, refuge, healing, strength, energy, beauty, and inspiration. Moreover some species and some individual trees or groves were regarded as cosmic centers, the abodes of gods or powerful spirits (such as dryads), and homes of the ancestors. These trees, groves, and whole forests were protected because of these metaphysical aspects, very often to the entire exclusion of any utilization. However, some were carefully used for specific purposes, such as collecting medicinal plants for healing or for repair of a temple or shrine.

Unfortunately, these sacred trees have all too often been destroyed, in the name of religion and in the name of progress, because they were considered primitive or pagan remnants of a conquered culture. In Guatemala, the Maya-revered kapok tree (*Ceiba pentandra*) is removed in modern land clearing or for construction, though I know of one tree which was saved due to local protest: the road makes a strange diversion around it. In the 8th century, the oak of the god Thor at Geismar was cut down by the Christian, St. Boniface; and the Grove of Trminsul, or Yggdrasil, the Universal Tree, the most sacred place of the Saxons, was destroyed at the order of Charlemagne (Hughes 1991).

Many legends also recount the unfortunate events that often befell those who did not respect the sanctity

of these trees and groves. My first encounter with sacred forests, and the stimulus of my interest, occurred in Venezuela in 1974, when I encountered María Lionza. She is the forest goddess who is depicted astride a tapir, and is still worshipped and held in fear by a rather substantial number of Venezuelans. The forest abode of María Lionza is tropical rainforest of 40,000 ha and has not been entered for slash and burn agriculture (*conuco*) by campesinos because of the dire misfortune that befalls anyone who cuts or burns her trees. The forest was officially gazetted in 1960 as the María Lionza National Monument and is one of the best protected areas in the Venezuelan park and reserve system (Hamilton 1976). What follows deals with metaphysical relationships between people and nature. The metaphysical constraints providing for tree and forest conservation usually have as a result a long-term utilitarian benefit. They often were “codes of conduct” towards nature—perpetuated by wise shamans, whether they be ancient seers or witch doctors or modern ethicists such as John Muir.

I contend that the more we know about these sacred trees, groves, and forests, the better can we understand their conservation status, their likely future without intervention, and possible methods of perpetuating their conservation. In this process a classification or typology of these would appear helpful. Such a suggested typology would include: (1) cosmic species; (2) trees of unusual size, age, or species; (3) historic trees; (4) sacred groves and temple groves; (5) temple-support forests; (6) trees and groves of malevo-

lence; (7) patterns of landscape harmony; (8) forests of healing or sanctuary; (9) restoration and dedication forests. It must be noted that these are not discrete classes, but grade into each other, just as groves grade into forests.

Classification

Cosmic species (trees of life). The cosmology of many early cultures involved a mythical tree which was the axis of the world, with branches reaching far into the heavens and roots penetrating into the underworld. An excellent discussion of this topic, with examples from Norse, Russian, Babylonian, Indian, Aztec, Mayan, Egyptian, Greek, Chinese, and many other cultures has been presented by Altman (1994) in a book entitled *Sacred Trees*. He classifies cosmic trees into three groups: world trees, trees of life, and trees of knowledge. For the purposes of this paper these distinctions are not made, but a few examples will serve to illustrate the metaphysical relationship that resulted in the physical species manifestation of these cosmic trees becoming “no” trees—so revered that they were strongly protected by the culture involved. The life-force aspect is evocatively summoned by Mathiessen (1972) in his book *The Tree Where Man Was Born*:

The tree where man was born, according to the Nuer, still stood within man's memory in the west part of the south Sudan, and I imagine a great baobab thrust up like an old root of life in those wild grasses that blow forever to the horizons, and wild man in naked silhouette against the first blue sky. That bodeful man of silence and the past is everywhere in Africa.

And indeed today in parts of Africa, the bodies of certain important individuals are placed in the hollowed-out trunk of the baobab as a coffin to symbolize the communion between the vital forces of the plant gods and the body of the departed (Altman 1994).

In classifying sacred mountains, Bernbaum (1997a) has a category he calls “mountains as centre”—for example, Kailas in Tibet and Gunung Agung in Bali—as representing the cosmic axis around which the universe is organized. Cosmic species of trees have some of this same meaning. The mythical Yggdrasil of the Norse was an ash tree (*Fraxinus excelsior*), and all ash trees took on some of the awe of this cosmic tree. The first tree of the world to the Mayans was the *Ceiba pentandra*, the silk-cotton tree, or bombax. There are many other well-known cosmic species. One of the most revered is the pipal, or bo, tree (*Ficus religiosa*), whereunder the Buddha received enlightenment; consequently all pipal trees are considered holy by Buddhists everywhere. The mythic world tree of the Hindus is represented by a banyan (*Ficus bengalensis*) which protected the infant Lord Krishna. Even today, no Hindu or Buddhist shrine is complete without a pipal or banyan tree planted nearby. Moreover, these fine, wide-branching trees have become natural assembly points for village meetings, community events, and dispensation of justice. All species of *Ficus* in South Asia seem to be revered because of their association with various deities (Chandrakanth and Romm 1991). It is of interest to note that biologists have

now recognized the importance of the genus *Ficus* as a keystone mutualist of great significance to maintaining biodiversity (especially of frugivorous insects, birds, and mammals) in tropical forests.

Members of the genus *Quercus*, the oaks, were trees of life to Greeks and early northern Europeans. This was the tree symbol of Thor, Jupiter, and Zeus. It was believed that Zeus could communicate to mortals through the oak tree, and a sacred oracle grove was protected at Dodona, Greece (Altman 1994). Other cosmic trees have to do with knowledge or wisdom, one of the most well known being the one which stood in Christianity's Garden of Eden and which bore the forbidden fruit of knowledge of good and evil. It is thought that the apricot, pomegranate, or fig should be the representation of this fruit, even though northern artists and writers have usually depicted it as an apple. This is a vast subject, but these few examples will have to suffice.

Trees of unusual size, age; special species. Unusually powerful patterns in trees, such as old, hoary, spreading-crowned trees, tall, sun-dappled woodland groves, or dense ancient forest, have always invoked in men and women (and even technologically oriented people today) a feeling in which their self-importance is at least temporarily shed and they feel connected to some greater context in which they are embedded. Such trees and groves become objects of awe and are saved from the axe (and nowadays from the chainsaw and bulldozer). Perhaps the banyan tree (*Ficus bengalensis*), with its strange pattern of aerial roots, is

given special meaning by virtue of its appearance, large size, and longevity. Certainly today, thousands of visitors (are they "pilgrims"?) come from far distances to view the famous Curtain Fig tree on the Atherton Tableland of Queensland, Australia, and many tourists in Honolulu wander in awe through the aerial roots and trunks of the fine banyans on the grounds of the Iolani Palace. But the banyan has other metaphysical properties that promote its conservation wherever Hindus live. This is the tree of immortality or tree of life (also of love, fertility, protection and healing) and is protected throughout India, Sri Lanka and Nepal.

In the United States, very large trees, such as the sequoia (*Sequoiadendron giganteum*), or very old trees, such as the bristlecone pine (*Pinus aristata*), are given protection in many places, including Sequoia National Park and the Forest of the Ancient Bristlecone Pine, respectively. Some individual trees are named (the General Sherman sequoia; The Patriarch bristlecone), and seem to command special awe to beholders, who attempt to capture their "essence" on film, or who, preferably, sit and look in contemplation. Hoary, wide-crowned, stout-branched oaks have, by virtue of these characteristics, become revered and protected. Perhaps for this reason, and also because of its production of mistletoe the oak was adopted by the Druids as the most sacred tree. One of the two famous Druidic oaks (which subsequently attained Christian significance as "Gog and Magog") near Glastonbury, England, was over 2,000 years old and 3.4 m in diameter when



Figure 1. The Patriarch Tree, a bristlecone pine over 4,000 years old, is protected in a "Forest of the Ancient Bristlecone Pine." (Photo Lawrence S. Hamilton.)

cut down finally in 1906 (Altman 1994). Oaks also achieved sacrality in other metaphysical terms, as in the oracle grove of Dodona, Greece, where priests and priestesses would go to consult Zeus and hear his messages in the rustling of the wind.

Historic trees. Many significant events in history have taken place under the shade of specific known trees, and these trees have taken on a symbolic affection or reverence, associated with the event that occurred there. The North American Iroquois Confederacy was founded and nurtured under a tall white pine (*Pinus strobus*) called the Great Tree of Peace, and the trunk symbolized the law and its branches meant shelter and protection for the six nations, or tribes (Alt-

man 1994). When the early European colonists came to America, treaties and charters were signed under the branches of large elms and oaks (e.g., Treaty Elm and Charter Oak), which were then preserved as trees of special significance. Their large size and historical connections made them revered until their demise. It is of interest to note that their wood was often used to make objects of public importance, and the "power" kept active in this manner. Moreover, seedling descendants of many of these historic trees are lovingly planted in public and private places to keep the tree spirit alive.

In Central Europe, the most venerable oak in many towns and villages became the site of justice where the

magistrate sat when he passed judgment (Altman 1994), and these trees were preserved as “justice trees” under which many agreements were made, involving only the spirit of the tree rather than the presence of a lawyer. Altman also writes of the *canelo* or cinnamon tree of the Mapuche people of Chile and Argentina, who believe that no one can tell a lie under its shade, and all promises made there must be kept.

Sometimes a grove or forest symbolizes a historic event that is honored. A treaty of brotherhood after long strife was agreed to in Sikkim in 1463 in a forest area called Kabilongchuk by the Bhutia and Lepcha peoples (Chakraborti and Bose 1995). They reported that as of 1995 no felling of trees is allowed, and local belief is that anyone damaging trees will become sick. There is no grazing. Though small in size (6.5 ha), the almost total protection has maintained a rich mix of tree and other plant species, including three orchid species. Each year the motivation for protection is strengthened by a brotherhood ceremony in the grove.

In the water-scarce Canary Island of El Hierro, a laurel tree (*Ocotea foetens*) is commemorated on the coat of arms (and as a taxicab logo) because of its long history of capturing cloud water, and is called the fountain tree, *Garoe* (Gioda et al. 1995). It was used by pre-Hispanic populations as a water collector until 1610 when a hurricane removed it. “Garoe” means sacred or holy tree. In memory of this Garoe, another laurel was planted at the same place in 1945. Today, this is a new fountain tree producing potable

water for the citizens of El Hierro. Many other fountain trees exist around the world in areas of low rainfall but having fog which is captured (e.g. Chile, Peru, Oman, Cape Verde). Indeed, in dry country, any tree or cloud forest that supplies water should be revered and conserved.

Sacred groves and temple groves.

Almost all ancient peoples of whom we have knowledge demarcated some areas of forest that held special meaning as places of worship. Sir James George Frazer in *The Golden Bough* (1935) has given an elegant account of this process and of how “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.” In this he alluded to the Kikuyu tribe of Africa setting aside groves. Such sacred groves worldwide were surely our first and best biodiversity preserves. Gods or goddesses lived therein, or could be induced to appear or give messages, if the worshippers danced hard enough, sang well enough, or prayed enough. In the worlds of ancient Greece and Rome, these special groves (each tree with its own wood nymph or dryad) were often enclosed by stone walls that protected them from grazing animals, and they were called *temenos*, a cut-off place, i.e., a sacred enclosure (Skolimowski, undated). In Latin the term was “templum,” the original root of the word “temple.” In these open-air sanctuaries and places of worship, shrines—and, gradually, elaborate temples—were often constructed, or sacred stones were contained therein. These gave further protection to the

surrounding trees, plants, and animals.

There is indeed in Europe a strong visual connection between sacred groups of trees and temples. Evans (1901), in his study of the Mycenaean tree and pillar cult, suggested that wooden and stone pillars resembling tree trunks were thought to be able to harbor the souls of sacred trees and the god or goddess therein. One suspects that the Greek temple with its myriad stone columns may have been an architectural way of symbolizing a sacred grove (Harrison 1992). Even the Gothic cathedrals of Europe with their imposing columns may have symbolic (as trees) as well as architectural value. And, conversely, when impressed with the lofty trunks of trees (e.g., a California redwood grove), people are prone to talk about "cathedral groves," and experience feelings akin to religious reverence.

Sponsel and Natadecha-Sponsel (1993) pointed out that Buddhist temples in Thailand were often built in forests (*wat pa*), and by association the surrounding forest became sacred space. These forest temples ranged in size from 0.5 ha to 8 or more ha. The authors suggest that there are approximately 37,000 temples in Thailand, almost all of which have a sacred tree or a sacred forest. In some heavily transformed landscapes, the few natural forest areas remaining are temple forests, as in Lebanon, where they occur within monastery walls. Elsewhere, as in the Western Ghats of India, the sacred groves, although they may or may not have temples or shrines within, represent the last vestiges of wild biodiversity in the land-

scape, since any product removal is religiously restricted (Gadgil and Vartak 1976). In one instance, Nair and Mohanan (1981) discovered four threatened plant species in two sacred groves in Kerala. Pei Shengji (1993) points out that the temple yards of Buddhist temples in Yunnan, China, maintain biodiversity of many useful plants for ritual, edible, or ornamental purposes, and has documented this amazing variety. In the United Kingdom, a Living Churchyard program has developed in recent years to arouse interest in nature conservation in church and chapel yards and cemeteries (numbering over 20,000 sites in England alone). Since most of these were carved from ancient forest and meadows, they often contain plants now locally rare, and some of the largest trees in the environs may be found there.

In Japan, shrine and temple groves in both the Shinto and Buddhist faiths are extremely common, and Oyadomari (1990) estimated that the total area of shrine groves was 117,300 ha as of 1980. She indicated that these areas not only provide an important reverential landscape for the shrines or temples, but that they are used as places of festivals and community gatherings. An old Japanese proverb says that spirits left alone cast no curse, and hence these shrine groves were in the past seldom touched for fear of evil spells. In the urban areas of Japan today these groves are often the only green fragment of semi-wild nature in a sea of concrete and stone.

In the Kathmandu Valley, Nepal, where the many sacred groves appear as vegetative islands in an intensively

used landscape, like spiritual oases (Mansberger 1991), they usually contain unhewn sacred stones representing clan or family ancestral guardian deities, but sometimes contain shrines or sculptures. In most cases they are located at sites of visual prominence, or the site of a spring or a traditional trail crossing or a stream ford. Mansberger pointed out that they are *in situ* storehouses of useful plants that are otherwise rare or absent in the valley (150 different species representing one-tenth of all plant species in the Valley). He recognized that they are also important as repositories for religion and culture. In the Khumbu region of Nepal, sacred groves around monasteries and temples are better preserved than forests protected by the Nepali government or in Sagar-matha National Park (Stevens 1993).

Temples have, in some places, promoted the planting of trees around them to enhance their spiritual integrity and force. This seems to be particularly the case with Shinto temples, where awe-inspiring groves of *Cryptomeria* were planted (Oyadomari 1990). These entranceway trees induced an appropriate mood of worship in the temple visitor, even before entering the temple. Chandrakanth and Romm (1991) describe how particular species in specific orientations to one another and to the temple are planted in Karnataka state, India, as "star," "zodiac," and "planet" forests.

Sacred groves, without shrines or temples, are manifestations of the human spirit and human imagination as abodes of deities or ancestors in very many cultures around the world. Early Greek, Chinese, and Sanskrit

classics attest to their age and universality. The origin of the many sacred groves and holy forests scattered over the landscape of India is well recounted by Wachtel (1993), who summarized the story from the Ramayana. They are supposedly clumps of an Himalayan mountain torn up by the monkey general Hanuman in order to bring sacred medicinal plants to the wounded man-god-king Rama. In flying 3,000 km with the mountain and back (after the healing plants were taken), bits of mountain and vegetation dropped off and became the sacred groves. These holy forests are often today still a source of healing plants. In the Coorg district of Karnataka state there were at least 600 sacred groves of various sizes, ranging from a single tree to an area of 40 ha and totaling in all at least 4,050 ha (Chandrakanth and Romm 1991). Here local people worship to appease the local and family deities and their ancestors.

Sacred groves have been perhaps best documented and studied in the field in India and Nepal. Madhav Gadgil has been a leader in India in documenting the *raison d'être*, distribution, and status of the sacred groves in several regions. He and Vartak (1975) for instance, describe two groves, one of which is sacred to the goddess Janni and the other to the goddess Kalkai. A recently published UNESCO-sponsored book, *Conserving the Sacred for Biodiversity Management* (Ramakrishnan et al. 1998), contains an imposing set of descriptions and case studies of sacred groves in India (plus a few sections on groves elsewhere), and is a welcome and sub-

stantial addition to the literature. In Nepal, Ingles (1990) has recently summarized much of the knowledge and documentation of sacred groves and carried out extensive field study of the present management in 26 of them. One of the most interesting studies of sacred forests has been carried out among the Dai people of Yunnan in southern China by Pei Shengji (1993). The hill-top forests here are where the gods and ancestors reside, and any gathering, hunting, wood chopping, or cultivation are strictly taboo, thus protecting essentially 1.5-2.5% of the total area of the prefecture of Xishuangbanna. Indeed, Frazer, in his great work *The Golden Bough*, gives examples of sacred groves from every inhabited continent. Other chapters in this volume bring into the available literature many new examples of sacred groves, and moreover indicates their value as reservoirs of biodiversity as well as places where traditional cultural values are reinforced.

Temple-support forests. Also in a sense “temple groves,” but susceptible to harvesting, are those which are set aside as forests dedicated to sustain a temple nearby or its rituals. Such temple-support forests may be managed for narrowly economic objectives if the temple needs money (Chandrakanth and Romm 1991). For instance, some in Karnataka, India, are managed to fund temple trusts. In Nepal, the *guthi* forest is managed to provide forest products to a religious center, and villagers refrain from using the forest otherwise because it is sinful. Ingles (1990) did an interesting survey and analysis of the management and condition of religious forests in Nepal, most

of which were of the *guthi* type rather than sacred forest where no harvesting went on. Products from these forests included wood for use in cremations, for idols, for temple repair, for construction of orphanages or schools, and fuelwood for cooking in religious festivals. Some forests were harvested to provide cash for funding temples, or for performance rituals.

It is of interest to note that the Wood Committee of the International Council on Monuments and Sites (ICOMOS) has embarked on an historic forest preserves project. This promotes the use of authentic wood restoration in temples or other significant cultural structures, especially those associated with World Heritage Sites. In order to achieve this, the project seeks to identify and protect nearby existing groves or forests, or to plant such preserves for the future. In many cases these will be de facto temple-support forests, for many of the World Heritage structures are religious in nature and constructed with wood.

Trees and groves of malevolence. In many places trees are protected out of a fear of misfortune befalling the person who injures or cuts the trees, or who otherwise does not treat the trees circumspectly. Of course, any tree or grove that is the abode of, or is beloved of, a deity often has penalties associated with any human harm to it. But the essence of the relationship in these cases is ostensibly one of reverence or worship.

Another class is oriented chiefly to the metaphysical influence of malevolence or punishment. The forest of María Lionza in Venezuela, already

mentioned, seems to be less a place of worship than a place where harm befalls those who disturb this forest, where the goddess roams.

There are many examples of individual tree species being associated with misfortune because the spirits that dwell therein are quick to anger if insulted. Of course, any sacred tree that was violated brought on penalties. Buddhist monks in Thailand are today taking advantage of this phenomenon by wrapping important trees in their orange robes so that it is a spiritual crime to destroy them, thus saving them from the axe or chainsaw—and with them some of the surrounding forest (Ekachai 1990). But elsewhere there seems to be something almost like malevolence involved. In Ecuador, for instance, the *compadre aluvillo* tree (*Toxicodendron striatum*) reportedly imparts a rash to anyone who does not take off his or her hat in greeting when passing under the canopy (McComb 1998, personal communication). Also in Ecuador, the *Ceiba pentandra* (a cosmic tree in some places) has within it a small man (a *supi*) who protects forest fauna. Hunters become confused by the sound of him banging the tree with his axe and begin to wander in decreasing spirals toward the tree. When they reach the tree the *supi* changes to a snake, a boa, and the hunter is never seen again (McComb 1998, personal communication).

Trembling aspen trees (*Populus tremuloides*) have been considered bad luck trees by French-Canadian wood cutters. The redbuds or Judas trees (*Cercis* spp.) are considered cursed by many, because it was sup-

posedly the tree on which Judas Iscariot hanged himself after betraying Jesus. The Basoga people of central Africa believe that when any tree is cut down, the tree spirit is angered and can cause the death of the tribe's chief or a member of his family; a medicine man appeases the tree spirit before the tree is felled (Altman 1994). This same metaphysical relationship existed between some trees (especially cottonwoods, *Populus* spp.) and several North American First Nation peoples, and such trees were only cut down after a ceremony to appease the spirits. I have also heard of a tree of the rainforest of Ghana and neighboring countries that has a reputation for evil power because it is toxic to almost all other plants (presumably through allelopathy) and creates a mini-desert around itself. I seek confirmation of this and the name of the species (though the one given to me was *Oukoybaka aubrevillia*).

Some forests have been avoided by people due to the real or imagined presence of beasts, witches, or evil spirits. While many investigators actively seek in remote forests a sight of yeti (Nepal), Sasquatch (western North America), a bigfoot (China), Mapinguari (Brazil), and others such creatures elsewhere, many folk shun these forests out of fear, and they remain safer from logging and land clearing. Old European legends and fairy tales often depicted gnarled, dark forests where evil spirits lurked—haunted forests. The Grimm brothers' collection of fairy stories out of Germany perpetuated for many children an attitude that the forest is a place of enchantment where misfortune or

misadventure are common. In Europe these superstitions have largely disappeared, though in remote areas one still hears stories of trespassers having misadventures or disappearing.

In some villages of Kerala state, India, rattan (*Calamus* spp.) is thought to be associated with snakes, and since snakes have a strong religious connection, locals do not harvest the very useful rattan out of fear (Mohan and Muraleedharan 1988). They do, however, use a tribal group called Ulladans to do the harvesting—and suffer any evil consequences!

In Pohnpei, Micronesia, Pohnpeians have an ambivalent attitude about the *nanwel* (upper wild lands), but the principal one is that of fear of supernatural dangers from the *eni* spirits therein (Anson and Raynor 1993). While they will enter the *nanwel* for short periods to extract resources, they are unwilling to live in it. Even when in this forest, they do not call each other by name but shout in brief animal cries, for fear that an *eni* may identify that person and lure him or her to some unlucky or disastrous experience. This belief has slowed markedly the rate of conversion of this upland forest to agroforestry and cropping.

However, just as it is with the weakening protection provided by worship and reverence, fear of the mysterious and malevolent in nature is being dissipated by science and rationalism. Allelopathy seems to be a much more satisfactory explanation for sparse or no growth around some tree species than is evil emanation. And, increasing technology—the power of machines—has overpowered the uneasy feelings

that these trees and forests were better left alone.

Patterns of harmony in the landscape. The human spirit is more tranquil, and feelings are more kindly, when there is a “fit” or harmony between elements in a landscape, including the relationship of human built environment to the mosaic of hills and dales, fields and forests—domesticated and wild places. Forests, groves, windbreaks, and even scattered trees have important roles here in engendering positive feelings toward the environment. Where such tree elements do give harmony, in some places and times, tree landscapes have been conserved. In particular, the placement of groves with respect to wind direction, water source protection, and aspect has given rise to what have been termed “spiritual landscapes” in China. These have developed using geomancy and driven by the mystical insights of *feng shui*, which arose as early as the Sheng dynasty, 1766-1123 BC (Rossbach 1983).

“Feng” (wind) and “shui” (water) were forces to be reckoned with, and when these forces were ignored in carrying out landscape-modifying activities, the human occupants or users suffered, and when they were harmonized, people prospered. Modern-day soil and water conservation advocates might think about adopting some of the *feng shui* approach since they often deal with wind and water erosion processes and control. Lovelace (1985) described the application of *feng shui* to the interpretation and manipulation of landforms, vegetation, and hydrology to ensure the well-

being of villagers in South China, and illustrated the concept, which included the location of a tree grove with respect to water source, settlement, and grave sites. In many places, these feng shui groves constituted the only samples of the original native vegetation. These groves became sacred to the Hakka people, and even today both natural and human-made feng shui forests are given the utmost protection as the home of spirits (Ni Gen-jin 1994). The Hakka also realize the importance of these forests in conserving water and soil and in preventing shallow landslips on the mountain slopes. They believe that the trees secrete natural disinfectants for diseases, as well as producing rich anions, which are a longevity element. Chandrakanth and Romm (1991) feel that *de facto* feng shui patterns are at work in Vietnam and Nepal. Perhaps it is overdue in the Western world to adopt concepts of landscape harmony in the conservation of strategic trees, groves, and forests. Perhaps one even sees it in practice, for intuitive ecological reasons, in some of the splendid forest mosaic landscapes of the United Kingdom and elsewhere in Europe.

Forests of healing and sanctuary—wilderness. A Buddhist monk, Phra Paisal, was quoted in the *Bangkok Post* as saying:

The forest commands a magical, mind-calming power which is conducive to the meditation process. Deep concentration becomes easier. When your mind is at peace, life becomes one with simplicity. This is the first level of the relationship between forests and dhamma. Lack of inner peace accounts for a person's constant hunger for external arousals and

sensory pleasures (Ekachai 1990).

Great religious figures and philosophers have gone to the wilderness or the forest, or contemplated beneath great trees, in order to heal a troubled spirit or to find peace and sanctuary. In many cases these places have become sacred sites, or, as in the case of the Buddha, all trees of the species under which he attained enlightenment have become sacred. Modern urban people often find the need to turn to trees and wildlands to achieve respite from the noise, pollution, crowds, and stresses of their lives. Forests that provide refuges from the pressures of industrial society are becoming increasingly important and being given protection. A Texas A&M University environmental psychologist has found that even the sight of trees (in a city) can quickly lower a person's blood pressure and relax muscle tension and brain wave patterns, which indicate reduced stress (Wexler 1998). Even in the mid-1800s, Henry David Thoreau fled to Walden woods to simplify his life; there, partly through what might be termed "forest therapy," he developed his extremely moving philosophy. Thoreau wrote in 1851: "From the forest and wilderness come the tonics and barks which brace mankind" (Thoreau 1893).

In all countries of the world, it is important that forest areas of healing and sanctuary be set aside and protected from logging, clearing for conversion to other uses, motorized travel, and the noise of technology. Fortunately this is being done as governments respond to public clamor for such places, and even the private sec-

tor has joined in. I regard all of these declared and protected wilderness areas, primitive areas, core zones of national parks, and the like as examples of this class of metaphysically protected forest. Perhaps even the nature-tourism sites, though having an economic role, may also have some elements of *re*-creation as well as recreation. Faulstich (1998) opines that nature tourism (one of the fastest growing sectors of the global economy), however dysfunctional, has evolved as a means to reconnect us with the sacred landscapes of our heritage. While we may dismiss the tourist experience in national parks as somewhat superficial, it reveals the power of landscape, trees, and wildlife to reflect the myths of who we are and where we belong.

It is this love of nature, and the desire to maintain as much of it as possible free from the major imprint of human activities, that spawned the wilderness movement in the United States. This resulted in the establishment of a National Wilderness Preservation System in 1964. Currently, around 5% of America's land surface is in wilderness status. This movement has spread to other countries where the history, geography, and population situation has been favorable for dedicating large blocks of forest land as wilderness or strict reserve (e.g., Canada, New Zealand, Australia, Russia). The core areas of biosphere reserves around the world are also essentially dedicated to strict protection in order to let natural processes function largely uninfluenced by humans. Such areas often provide forests of healing and sanctuary, as

well as reservoirs of biological diversity and places where evolutionary processes can continue without warping by human action. Currently in the United States a network of enthusiastic groups, highly motivated by "biophilia" or "geophilia," but firmly science-based in conservation biology, are attempting to enlarge and link existing wild protected lands into large wildland ecosystems and corridors. They are united under the umbrella of The Wildlands Project and are attempting an intriguing, almost spiritual, crusade for wilderness recovery. This includes, as an example, a continuous corridor from Yellowstone National Park in Wyoming USA to the Yukon in Canada (Wild Earth, undated). This concept is gradually spreading to other countries, as a vision of large species- and gene-conserving ecosystems or bioregions is captured by others. A vision of a more-or-less continuous linked series of protected areas along the Andean Cordillera is being proposed by Jose Pedro de Oliveira Costa (Brazil) and Danilo Silva (Ecuador). And, in their wilder moments, James Thorsell (formerly IUCN's World Heritage advisor) and the author are talking and writing about a Conservation Corridor of the Americas, from Tierra del Fuego to the Bering Sea. A MesoAmerican Biological Corridor of connected wild lands has been endorsed by the seven Central American governments, and would be an important middle segment of this Corridor of the Americas.

In a paper originally entitled "Wilderness is Where my Genome Lives," but now in his book *Traces of*

an Omnivore, Paul Sheppard suggests that “although we may define ourselves in terms of culture, language, and so on, it is evident that the context of our being, now as in the past, is wilderness—an environment lacking domestic plants and animals entirely, and to which, one might say, our genes look expectantly for those circumstances which are their optimal ambiance” (Sheppard 1996). Indeed, our previously mentioned Thoreau said: “In wildness is the preservation of the world” (Thoreau, 1893). Even in landscapes that have been mostly culturally altered for a long time, there are wilder places in rough topography or inaccessible areas where a seeker may find relative solitude and sanctuary. And there are still existing some of the sacred groves mentioned previously, particularly around water-source areas and holy wells.

Spiritual restoration and dedication. Metaphysical forces sometimes work not only to give sacredness to trees or forests, but to establish new trees or forests. Some examples of this may serve to provide some hope in an overall worrisome picture of the destruction of holy trees, groves, and forests around the world by increasingly secularized human societies.

When one stops to think of it, this very day or week many ceremonial trees are being planted to honor a fine person, memorialize a loved one, celebrate a birth or graduation, or commemorate some other significant personal, community, or national event. In such ceremonies, cuttings (or seedlings grown from seed) from already revered trees often are used to perpetuate, in a sense, the spirit of the

tree. In the United States, offspring from famous trees are perpetuated and offered as planting stock for these special occasions. The American Forestry Association is currently offering descendants of the George Washington tulip tree (*Liriodendron tulipifera*), for instance.

“Forest monks” are promoting tree planting in Thailand as a mark of respect toward nature and other living things (Sponsel and Natadecha-Sponsel 1993). Pei Shengji (1993) points out that the taboo on tree cutting in the holy hills of the Dai people in Yunnan (see above) is responsible for them planting trees for use at lower elevations in fuelwood forests and agro-forests; somewhat of a “spin-off” from sacred forests, yet it is reforestation due to metaphysical constraints.

A recent and excellent example of “sacred” reforestation in India is described by Bernbaum (1997b), who participated in developing the program together with two Indian scientists (Drs. Purohit and Dhyan) and the chief priest of the Badrinath temple (His Holiness Sri P. Shredharan Namboodari) for degraded slopes and valleys nearby. Badrinath has been a religious site, regarded by many Hindus as the most important pilgrimage site in the Indian Himalaya, with around 450,000 pilgrims coming per year. Badrinath has its name from the sacred *badri* tree (a juniper), which was the form that Lord Vishnu’s wife Lakshmi took to protect him from a snow storm. The first tree planting ceremony in September 1993 resulted in roughly 20,000 seedlings being blessed by the chief priest and planted for religious merit by pilgrims. Pil-

grims also provided donations for tree care, and the many beggars who frequent such a pilgrimage site received cash and food equivalent to their daily begging earnings, plus religious merit, to care for the trees instead of begging. According to Bernbaum, all agreed. Though there were some problems, both physical and political, with this first planting, the process has been repeated and extended in 1996 to sites at Kedarnath, Tungnath, and Hanumanchatti, and continues today. Also, the idea of giving pilgrims packages of blessed tree seeds to take back home and plant is being tried. Bernbaum listed the metaphysical reasons that various interviewees gave for planting trees as follows: (1) re-establishment of the ancient sacred forest of Badri- van; (2) sacred plants, herbs, etc., needed for religious practice; (3) worship and service to a deity (e.g., Hanuman or Lord Vishnu); (4) religious duty (dharma); (5) selfless action (karma yoga); and (6) restoration of a healthy environment as a basis for religious practices and goals. Perhaps this kind of "religious merit planting" might be replicated in many other areas where pilgrimage sites exist.

Deterioration of Metaphysical Protection

In view of the scope of the many metaphysical influences and forces giving protection to trees, groves, and forests, it would seem as though the world would be clothed in sacred verdure. Not so, as we all know. The alarming rate of loss of forests worldwide has been periodically documented by the Food and Agricultural Organization of the United Nations (FAO)

through surveys. Currently the planet is losing forest cover (i.e., totally deforestation, not just logged and left in forest) at an annual rate of 13.7 million ha (FAO 1997). Some of these are sacred forests. And though not quantified, we are all aware of single-tree attrition as houses, roads, parking lots, industries, and so forth remove ancient and even once-revered trees in clearing for urban and transportation infrastructure. Trees and groups of trees once protected out of reverence, awe, fear, or love are being lost, and with this disappears some of our biological and our cultural heritage.

Two major underlying forces seem to me to be responsible for the deterioration of sylvan sacrality and other metaphysical influences conserving trees and forests (or, as a matter of fact, other sacred spaces as well). Can anyone doubt that there will be awesome pressures for degradation and destruction of these sites in a world which is currently adding almost one billion individuals every 10 years to the human population? Moreover, the world has been in a demographic runaway situation for many decades, and the impact is compounded by increasing per capita consumption or wants, plus a proliferating technology. A second major force is the more subtle cultural changes taking place, largely due to increasing secularism, materialism, and consumerism. The traditional taboos and values of the elders are no longer held as tightly by each younger generation who have been conditioned by education, advertising, and entertainment media to put more value on physical resources and want-satisfaction than on spiritual resources and

ethical conservation. This is not true everywhere, of course, but it is an all-too-common syndrome in traditional cultures that have long been the custodians of sacred or taboo trees and forests.

Unfortunately, the economic development aid being extended to developing countries emphasizes natural resource management for commodities, energy intensive technology, cash cropping for export earnings, privatization, and global markets. These imperatives tend to ignore or ride roughshod over subtle forces that protect forests. In the past, proselytizing by organized religions of the Western world often resulted in so-called pagan sacred groves being deliberately destroyed and their metaphysical protection denounced as either silly superstition or worship of false gods.

In a study of 660 sacred forests among the Zigna ethnic group in Tanzania, Mwihomeke et al. (1997) found that, on average, only 60% were intact or only slightly disturbed. They found that the main causes for destruction in the remainder were clearing for farming and overharvesting for building poles, timber, and fuelwood. They also found that the most numerous instances of destruction occurred where there was a high influx of immigrants from outside the village area. Similarly, in the Western Ghats of India taboos were increasingly violated under extreme duress, or by outsiders (Gadgil and Vartak 1976). In Thailand, Taylor (1991) indicated that forest monks find it necessary not to wander the country, but to stay put to protect forests in the Northeast, for when they are absent the resource-

hungry villagers often exploit the forest. In Nepal, the detailed study by Ingles (1990) found significant modification and degradation of understory vegetation and soils due to grazing, even though there might still be sanctions on tree cutting that limit it to religious purposes. The same general situation of deterioration comes in reports from Pacific islands, Malaysia, Philippines, and central Africa.

Governments seem to have little concern for the conservation of these special forests or trees, and in developing or developed countries alike it is often only the confrontational actions of concerned locals or preservation-minded nongovernmental organizations that save them from the grindstones of economic development. A great decline in the sacred forest estate took place when European colonial administrations took charge of what had been "unowned" forest land in spite of a long history of traditional occupancy and use. These administrations put forests into managed units for timber resource production, and sacred forests frequently lost their identity as they were incorporated into production forests or into areas earmarked for plantation estate development. Basically the same process occurred in many newly-independent (from colonial rule) nations, where governments claimed all land to which no clear private title existed. To earn funds for their nascent economies, logging concessions were granted to foreign companies, and these production areas ignored any special religious sites in these forests. They also fostered large land clearing and settlement schemes that ignored sacred

trees, groves, or forests.

Even in this climate of pro-development, however, metaphysical attitudes of reverence for trees broke out in many places as confrontation with governments. One of the most interesting of these was the Chipko Movement, carried out largely by women who hugged trees in the Garhwal Himalaya (India) to prevent their being commercially logged. While the most direct motivation was ecological and utilitarian, the movement derived much of its force from spiritual leaders, especially from the philosopher Sunderlal Bahuguna and the Chipko poet Ghanashyam Raturi. An account of this interesting phenomenon, its evolution, and impact was given by Shiva and Bandyopadhyay (1986). This process was emulated in New Zealand by the Native Forest Action Council a few years later by conservation activists, who climbed trees and stayed aloft for days and weeks to prevent these special native old growth forests being harvested. Tree perching and tree-top living is currently in effect in some old-growth forests of the western United States, to protect what are being almost religiously called "ancient forests."

Biodiversity and Cultural Diversity Conservation: Some Suggestions

Several years ago I asserted to the natural science community in the Pacific that the application of more ecological science will not halt the serious loss of genes, species, and ecosystems; nor will more recycling or application of more pollution control technology and so forth. It is not the

ecologists, engineers, economists, or earth scientists who will save our biotic component of spaceship earth, but the poets, priests, artists, and philosophers (Hamilton 1993). It is this latter group that deal with the human emotions, attitudes, and thoughts that vibrate between humans and their biophysical environment. In the face of the destruction and deterioration of the sacred trees and groups of trees just discussed, due partly to the changed sacrality of nature as older mores, taboos, ceremonies, and belief systems increasingly lose their power, we need to turn to the fields of ethics, values, and religion, rather than to science and technology, for increasing our conservation of biodiversity. There are at least eight arenas of hope, or suggestions for strengthening metaphysical tree and forest conservation.

1. Let me commence with a Western science-dictated task: inventory. Heinen (1994) suggested locating all existing sacred forests in the mid-hills of Nepal in a geographic information system (GIS) to permit landscape-level analysis as to their regional extent and position with respect to each other and with other types of parks and preserves. An inventory of all sacred trees and groves in Nepal's Kathmandu Valley was conducted by Mansberger (1991), who speculated about a pilgrimage trail that might even be used by ecotourists so that they become an economic asset to the area as a means of increasing their protection. In addition to location and mapping, inventory of their biological components of groves and forests would reveal something of their biodiversity importance. Ingles (1990) sur-

veyed 26 religious forests in central Nepal, obtaining physical, biotic, and social information, with emphasis on how they were managed to fulfill their various purposes. Gadgil and Vartak (1976) and Chakraborti and Bose (1995) have likewise conducted focused studies in India that provide information on the biological and religious values of such sites. The recent book by Ramakrishnan et al. (1998) has an excellent documentation of many sacred groves, particularly in India, and often relates these to biodiversity conservation.

Much more inventory and identification of sacred sites is needed so that such places of *in situ* genetic and spiritual conservation can be incorporated into national protected area planning. Even small groves, which have limited value in preserving biodiversity due to the “small-island syndrome” of species loss, can still serve as “arboreta” that can maintain precious seed stock and germplasm of some species, both plant and animal, through strict protection or proactive conservation management. Bio-inventories are needed not only in the aforementioned sacred groves and forests but in churchyards, monastery properties, and lands associated with any other religious structures. This is especially needed in strongly transformed landscapes, such as the Mediterranean region, Western and Central Europe, parts of China, and the African lowlands.

It is nevertheless extremely important to recognize that many sacred trees, groves, and forests may be “secret” sites whose spiritual meaning is diminished or threatened by having

them known and listed. They may indeed often be better protected in strong traditional cultures if they are not on a roster. Visitation by “outsiders” usually accompanies the making known of such revered trees, groves, or forests—as has happened so often with other kinds of sacred places such as mountains, water bodies, or the habitat of sacred animals. Such inventory and listing may have benefits, however, if a tree or forest becomes threatened with destruction by outside forces that may be operating in ignorance or in venality. It is imperative that the traditional custodians of such trees or sites decide whether or not the dangers outweigh the benefits, and that no inventory and location data are obtained and used without their full concurrence.

2. Secular society should support and reinforce the sacrality of sites where biodiversity and cultural diversity are fostered by the protection afforded by metaphysical forces. In the case of sacred groves and forests, surely such sites should be recognized as to their value and be given secular legal protection such as that afforded to national parks, national monuments, and other types of official protected areas. This was exactly the procedure adopted by Venezuela in the case of the sacred forest of María Lionza, which became a national monument in the country’s system of parks and preserves (Hamilton 1976). And in 1990, the parliament of Kenya voted to protect all of the remaining *kaya* forests that have survived only because of the beliefs of village elders who respect them as sacred forests (Negussie 1998). Again, however,

such secular protection must be only with the concurrence of the traditional custodians.

3. Contemporary societies at local, regional, or national levels should perpetuate, not discourage, local folk-songs, stories, legends, rituals, and festivals dealing with trees and forests, to reinforce with younger generations their bond to the biological world, once strongly recognized and “lived” by the older generations. Public support of such traditions, support of folk art in nature, and other incentives can play a role in decreasing the rate of erosion of these traditional values.

4. The section of this paper on restoration and dedication suggests some positive actions that can result in new forests that can heal the earth, providing incipient loci for both biodiversity and cultural diversity conservation. A holy mission to establish new groves, forests, or even individual trees can be engendered not only by priestly blessing and urging as at Badrinath, but by laypersons imbued with a zealotry for repairing denuded landscapes. Organizations such as Men of the Trees, books such as *The Man Who Planted Trees*, and greening programs have, largely by inspiring ardor, resulted in countless numbers of trees being planted. In this deforested world, the healing concepts of restoration, repair, and rehabilitation have an emotional appeal on which we have not yet capitalized. I suggested to the U.N. Environment Program’s executive director prior to the 1992 Earth Summit that an appropriate theme might be the “Three R’s” of the last sentence, and the motto “Healing the Earth.” Somehow it lost

out to “Sustainable Development.” I’m still hoping that the concept of restoration will capture the imagination and support of those mysterious “decision-makers.” In such a program, the metaphysical aspects of trees, groves, and forests should play a major part.

5. In the technical and financial aid programs from the so-called developed countries to the developing countries, projects should be designed that foster the aforementioned aspects of sustainable development that support or restore sacrality. At a minimum, they should be scrutinized to remove aspects that weaken cultural and religious ties to land. This has decidedly not been the case in the past. The high-tech packages, promoting rapid economic development, cash agriculture, monocultures, global economies, and so forth, have all tended to weaken the traditional cultural values that have promoted strong nature-human relations, including respect and reverence.

6. In the field of religious proselytization, missionaries, particularly from Christian churches, have in the past mostly tried to root out so-called pagan feelings of sacrality toward trees, groves, and other elements of nature. Even today, absolute dominion over the natural world is preached by several religious groups who are actively seeking conversions among the “heathen.” Fortunately, there is an encouraging movement among many organized religions of the world to come together in an ecumenical campaign for a gentler, healing approach to nature. Fifty religious institutions banded together and transmitted a

common proposal on respect for nature to the 1992 Earth Summit in Rio de Janeiro (Hamilton 1993). Periodically there are ecumenical gatherings and joint statements from the world's nine principal religions and others, based on the St. Francis of Assisi attitude toward nature, and a Summit on Religions and Conservation was held in 1995. An Alliance of Religion and Conservation has grown out of this; its newsletter, the first issue of which appeared in spring 1997, contained an article on "Saving the Pilgrimage Forests of Krishna." The alliance has stimulated an exciting Sacred Land Project in the United Kingdom, the largest religious campaign on ecology ever undertaken there (Sacred Land 1997). In this project, ancient woodlands belonging to historical monuments, abbeys, and churches will be protected, managed, and, where necessary, replanted. There are encouraging signs that organized religions are taking steps to use their metaphysical influence to achieve forest conservation.

Another good example was a project developed by Thai and Tibetan monks and Thai researchers called "Buddhist Perception of Nature," initiated in 1985 (Nash 1986). This project continues as a quiet force, assembling teachings about humankind's interdependence with nature and producing educational materials that promote environmental ethics and changed attitudes about forest destruction.

7. A hopeful sign comes from the Wood Committee of ICOMOS, and it could well be adopted by governments, foundations, or other organiza-

tions. It is based on the need to supply authentic restoration for World Heritage Sites containing wood. To be authentic for repair and replacement, the wood should be of the same species and with the same characteristics as the original wood (often large, old-growth trees or trees of specific shape or grain). The Historic Forest Reserves project attempts to locate feasible existing forests or groves that could supply such material for each of the World Heritage structures and give them whatever protection is needed, or to establish new forests or enrichment-planting forests that could supply material for historic wooden structures. This intriguing program in many cases can build on existing temple forests or temple-support forests previously described in this paper, for some of these temples indeed are World Heritage Sites or potential sites. But the project looks to a future where historically correct wood may not be conveniently available and proposes to start action now. Such a program could well be expanded beyond World Heritage Sites so that all historically valuable wooden structures have a nearby protected source of supply from which authentic restoration can be carried out. This is as needed in France or Japan as it is in Nepal or Tanzania.

8. Finally, a promising program has developed in the U.N. Educational, Scientific, and Cultural Organization (UNESCO) on "Sacred Sites and Environmental Conservation." It was started with a pilot project in Ghana and is being extended to other sites. This gives long overdue recognition internationally to the *de facto* protec-

tion that has existed through metaphysical constraints or processes.

Conclusion

Needed in all countries of the world is the sense of place that brings us back into a community with trees, wildlife, streams, mountains—with nature. We may call some places “sacred forests,” “ancient cathedral groves,” “friendly retreats,” or “wild sanctuaries,” or even have a favorite tree that we hug. We need these. Sochaczewski (1998) calls them “life reserves,” and it is an apt name, for they can greatly enhance human life,

and conserve biodiversity. Foresters and other natural scientists should not feel embarrassed or reluctant to talk about metaphysical matters, because biodiversity and cultural conservation may be greatly enhanced by the metaphysical. It will not be the natural scientists that achieve that blessed state of “forest conservation,” but the poets, priests, artists and philosophers who influence human behavior (Hamilton 1993). Foresters and biologists, however, must be engaged in the dialogue to bring sound natural science into the discourse arena.

[Ed. note: This paper was originally presented at the International Symposium on Natural Sacred Sites—Cultural Diversity and Biological Diversity Conservation, 22-25 September 1998, UNESCO, Paris, and was revised in 2000.]

References

- Altman, N. 1994. *Sacred Trees*. San Francisco: Sierra Club Books.
- Anson, H., and W. Raynor. 1993. Traditional resource management and the conservation of biological diversity on Pohnpei Island, Federated States of Micronesia. In *Ethics, Religion, and Biodiversity*. L.S. Hamilton, ed. Cambridge, U.K.: White Horse Press, 133-146.
- Bernbaum, E. 1997a. The spiritual and cultural significance of mountains. In *Mountains of the World: A Global Priority*. B. Messerli and J. Ives, eds. New York and London: Parthenon, 39-60.
- . 1997b. Pilgrimage and conservation in the Himalayas: a model for environmental action based on cultural and spiritual values. Project report. Franklin, W. Va.: The Mountain Institute.
- Chakraborti, D., and B. Bose. 1995. *Studies on “Sacred Groves” in Bihar, Sikkim, and West Bengal*. Calcutta: Jadavpur University.
- Chandrakanth, M.G., and J. Romm. 1991. Sacred forests, secular forest policies and people’s actions. *Natural Resources Journal* 31:4, 741-755.
- Ekachai, S. 1990. Holy war on illegal loggers. *Bangkok Post*, 13 August.
- Evans, A. 1901. Mycenaean tree and pillar cult. *Journal of Hellenistic Studies* 21, 1-103.
- FAO [Food and Agriculture Organization of the United Nations]. 1997. *State of the World’s Forests 1997*. Rome: FAO.
- Faulstich, P. 1998. Geophilia. *Wild Earth* 8:1, 81-89.
- Frazer, J. G. 1935. *The Golden Bough*. New York: Macmillan.
- Gadgil, M., and V.D. Vartak. 1975. Sacred groves of India—a plea for continued conservation. *Journal of the Bombay Natural History Society* 72:2, 314-320.
- . 1976. The sacred groves of Western Ghats in India. *Economic Botany* 30, 152-160.
- Gioda, A., J. Maley, R.E. Guasp, and A.A. Baladon. 1995. Some low elevation fog forests of dry environments: applications to African paleoenvironments. In *Tropical Montane Cloud Forests*. L.S. Hamilton, J.O. Juvik, and F.N. Scatena, eds. New York: Springer-Verlag, 156-164.
- Hamilton, L.S. 1976. *Tropical Rainforest Use and Preservation: A Study of Problems and Practices in Venezuela*. San Francisco: Sierra Club.
- , ed. 1993. *Ethics, Religion, and Biodiversity*. Cambridge, U.K.: White Horse Press.
- Harrison, R.G. 1992. *Forests: The Shadow of Civilization*. Chicago and London: University of Chicago Press.
- Heinen, J. 1994. Agenda for sacred forests. *Habitat Himalaya* 2:1, 2-4.
- Hughes, J.D. 1991. Spirit of place in the Western World. In *The Power of Place*. J.A. Swan, ed. Wheaton, Ill.: Quest, 15-27.

Forest & Tree Conservation

- Ingles, A.W. 1990. *The Management of Religious Forests in Nepal*. Department of Forestry Research Report. Canberra: Australian National University.
- Lovelace, G.W. 1985. Man, land and mind in early historic Hong Kong. In *Cultural Values and Human Ecology in Southeast Asia*. K.L. Hutterer, A.T. Rambo, and G. Lovelace, eds. Michigan Papers on South and Southeast Asia no. 27. Ann Arbor: University of Michigan, 341-372.
- Mansberger, J.R. 1991. Ban Yatra: a biocultural survey of sacred forests in Kathmandu Valley. Ph.D. dissertation. University of Hawai'i, Honolulu.
- Mathiessen, P. 1972. *The Tree Where Man Was Born: The African Experience*. New York: Dutton.
- McComb, M. 1998. Personal communication from executive director of Maquipucuna Foundation, Quito, Ecuador.
- Mohanani, C., and P.K. Muraleedharan. 1988. Rattan resources in the sacred groves of Kerala, India. *Rattan Information Centre Bulletin* 7:3/4, 4-5.
- Mwihomeke, S.T., T.H. Msangi, and J. Yihaisi. 1997. Quantity, distribution and current status of sacred forests in the Ziqua ethnic group, Handeni District. *The Arc Journal* (Tanzania) 6, 2.
- Nair, N.C., and C.N. Mohanan. 1981. On the rediscovery of four threatened species from the sacred groves of Kerala. *Journal of Economic Taxonomy and Botany* 2, 233-235.
- Nash, N. 1986. Letter from Puttha Monton. *Far Eastern Economic Review*, 15 May, 106.
- Negussie, G. 1998. Sacred forests in Kenya. *ArborVitae* (IUCN/WWF) 6, 15.
- Ni Genjin. 1994. Hakka "fengshui forests": their preservation and value. *Forestry and Society Newsletter* 2:2, 6.
- Oyadomari, M. 1990. Cultural perception of nature and its application toward preserving cultural and natural heritage in Japan. Unpublished paper. Tokyo: Chiba National University.
- Pei Shengji. 1993. Managing for biological diversity in temple yards and holy hills: the traditional practices of the Xishuangbanna Dai community, southwest China. In *Ethics, Religion, and Biodiversity*. L.S. Hamilton, ed. Cambridge, U.K.: White Horse Press, 118-132.
- Ramakrishnan, P.S., K.G. Saxena, and U.M. Chandrashekar, eds. 1998. *Conserving the Sacred for Biodiversity Management*. Enfield, N.H.: Science Publishers.
- Rosback, S. 1983. *Feng Shui*. London: Hutchinson.
- Sacred Land. 1997. Issue no. 1 of The Sacred Land Project. International Consultancy on Religion, Education and Culture, Manchester, U.K.
- Schaaf, T. 1998. Personal communication, and workshop held 24-25 September 1998 on developing an UNESCO project on Sacred Sites—Cultural Integrity and Biological Diversity, Paris.
- Sheppard, P. 1996. *Traces of an Omnivore*. Washington, D.C.: Island Press.
- Shiva, V., and J. Bandyopadhyay. 1986. The evolution, structure, and impact of the Chipko Movement. *Mountain Research and Development* 6:2, 133-142.
- Skolimowski, H. Undated. *Forests as Sanctuaries*. Eco-philosophy Publication no. 4. Ann Arbor: Eco-Philosophy Center.
- Sochaczewski, P. 1998. Life reserves. *ArborVitae* (IUCN/WWF), April, 14.
- Sponsel, L.E., and P. Natadecha-Sponsel. 1993. The potential contribution of Buddhism in developing an environmental ethic for the conservation of biodiversity. In *Ethics, Religion, and Biodiversity*. L.S. Hamilton, ed. Cambridge, U.K.: White Horse Press, 75-97.
- Stevens, S. 1993. *Claiming the High Ground: Sherpas, Subsistence, and Environmental Change in the Highest Himalaya*. Berkeley: University of California Press.
- Taylor, J.L. 1991. Living on the rim: ecology and forest monks in Northeast Thailand. *Sojourn* 6:1, 106-123.
- Thoreau, H.D. 1893 [1947]. Walking. In *Excursions: The Writings of Henry David Thoreau*. (Riverside Edition, Boston.) As extracted in *The Portable Thoreau*. C. Bole, ed. New York: Viking.
- Wachtel, P.S. 1993. Asia's sacred groves. *International Wildlife* 43:2, 24-27.
- Wexler, M. 1998. Money does grow on trees—and so does better health and happiness. *National Wildlife* 36:3, 70.
- Wild Earth. Undated. The Wildlands Project. *Wild Earth* (Special Issue).
- Wilson, E.O. 1984. *Biophilia*. Cambridge, Mass.: Harvard University Press.

Lawrence S. Hamilton, Vice-Chair (Mountains), IUCN World Commission on Protected Areas, 342 Bittersweet Lane, Charlotte, Vermont 05445; hamiltonx2@mindspring.com

