

IN PRAISE OF TREES



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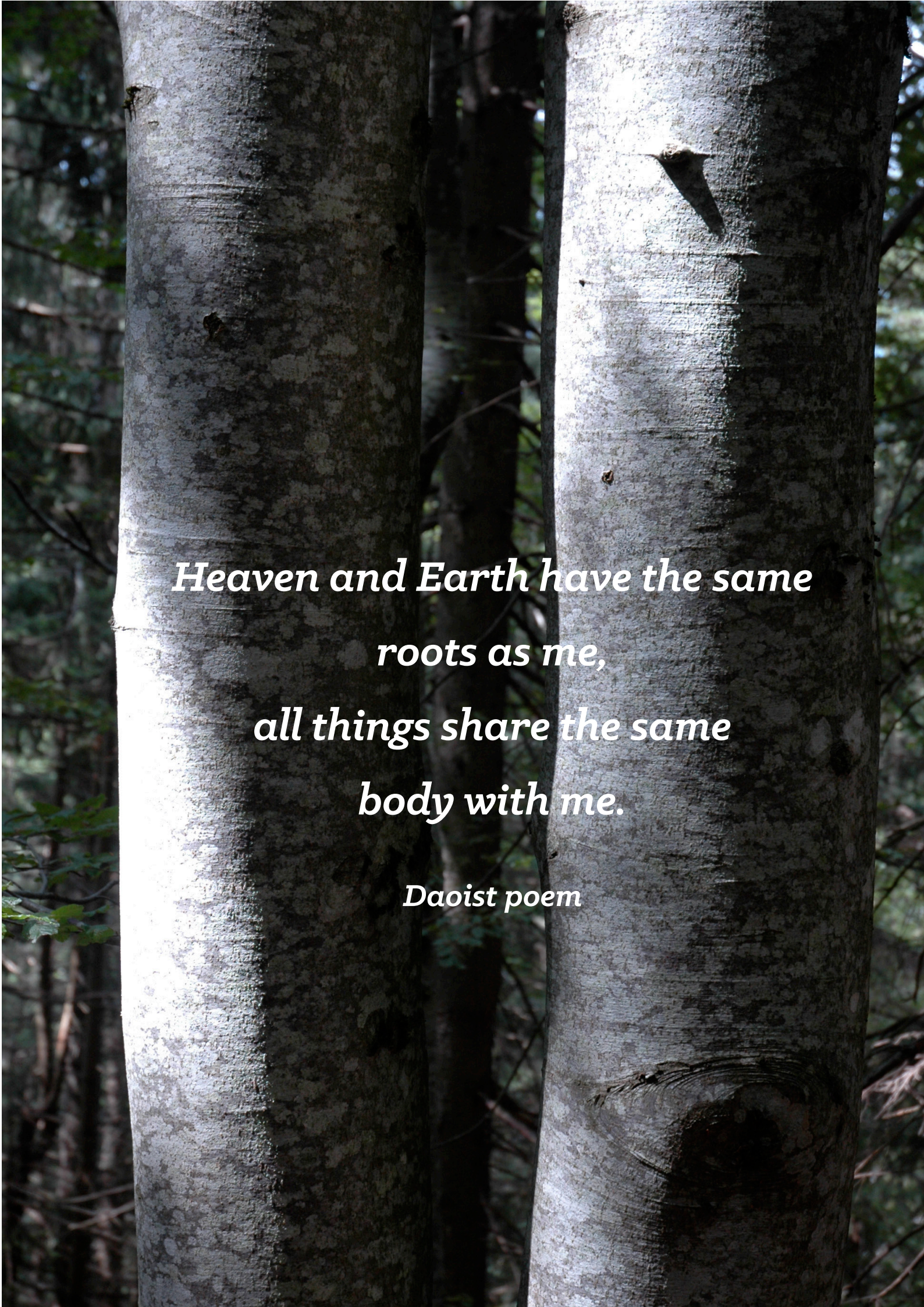
As I write this, the leaves have fallen from the trees and their branches stand black against the sky. There was a time when I hated this wintry sight but now I am stopped in my tracks by the beauty of this skeletal calligraphy. I am just as moved by the soft greens and browns on the clumps of winter oaks that skirt the South Downs. And since I already loved the tender green of spring as the buds started to unfurl, the magnificence of mature summer trees, and of course the rich reds and golds of autumn, the circle of the tree year is now complete for me.

I know I am not unique in responding to trees on this visceral level. We humans are creatures of nature and have lived inseparably from trees for much of our history. They provided us with an early home, with food, shelter and medicines, and the material for that great evolutionary leap – the taming of fire. And now, in these challenging days, when the natural world we have reliably depended on for hundreds of thousands

of years is being wiped out around us, befriending trees offers one way to start repairing the fabric of life. That is why, with Chinese medicine colleagues, I have set up the Chinese Medicine Forestry Trust, to seek donations from the worldwide profession in order to plant trees and help protect forests throughout the world.

Trees and human health

It seems extraordinary, but simply looking at trees – or even just pictures of trees and natural scenes – triggers instant physiological changes. Our heart rate, blood pressure and cortisol levels drop, our facial muscles relax and we are drawn into a state of healing parasympathetic dominance. The scientific evidence for what is broadly known as ecotherapy harks back to a 1984 study into the relationship between trees and health. When two groups of patients recovering from gall bladder surgery were evaluated, those whose hospital

A photograph of two tree trunks in a forest. The trunks are dark and textured, with some light-colored bark. The background is a dense forest of green leaves and branches. The text is overlaid in the center of the image.

*Heaven and Earth have the same
roots as me,
all things share the same
body with me.*

Daoist poem

ward windows looked out onto trees were discharged earlier and used fewer analgesics than those who were confronted by a bare brick wall.¹ This deep - and usually unconscious - healing response might explain why so many of us tune in to nature documentaries and why in the UK the BBC's *Countryfile* programme is watched by up to ten million people every week. It might also explain why paintings of trees, mountains and rivers have always hung in Chinese homes, restaurants and public buildings.

Daoist philosophy places humans at the heart of the natural world. We are neither superior nor inferior, but seamlessly integrated with all phenomena, whether living or not. Nature is a place of belonging. When we gaze on the natural world, hike amidst forests and hills, stroll through city parks and along wooded riverbanks, kick through piles of leaves, dig our hands into rich earth to plant seeds and bulbs, we are allowing the forms, smells and sounds of nature to fill our senses. Unlike the linear and conscious designs of the city (however wonderful and useful they may be), these infinitely varied and complex forms have sprung forth in response to natural laws - what the Daoists call *ziran* ('self so' or 'spontaneous'). We humans of course are also *ziran* and for all but the tiniest and most recent part of our evolution have lived inseparably from the rest of the natural world.

A 2019 meta-analysis of nine studies involving over eight million people published in *Lancet Planet Health* found that proximity to green space in cities reduces mortality from all causes.² For every 0.1 increment in 'vegetative score' within 500 metres of a person's home, there was a 4 per cent reduction in early deaths. Another study in the same journal found that making greenspaces more complex in design - mirroring the spontaneous and irregular *ziran* quality of nature - significantly increased their health benefits.³ It's both amusing and encouraging that walkers spontaneously and anarchically create 'desire paths' in the most carefully laid out parks and gardens, much to the annoyance of their designers.

The benefits of connecting with nature are not only physical. Among children, it can improve cognitive functioning, self-control and self-discipline, while for adults, living within sight of green space results in reduced aggression and crime rates.⁴ A 2011 study of urban environments reported a 21 per cent higher risk of anxiety, a 39 per cent higher risk of mood disorders and a doubled risk of schizophrenia among those who live in or were born and brought up in cities.⁵

In Japan, mindfully strolling through woodland, absorbing the smells, sounds and sights, is known as *shinrin-yoku* or forest bathing. When researchers took groups of volunteers to either urban or forest environments, they found that walking in the woods significantly lowered stress levels (reducing cortisol, pulse rate, blood pressure and sympathetic nervous system activity) compared to walking in the city.⁶

'Hardiness' is a description of personality style proposed by clinical psychologist Suzanne Kobasa in 1971. It encompasses qualities such as resilience, self-control, patience, self-confidence (including the belief that we can change circumstances by our own efforts), the appreciation of challenge as opportunity (and thus a reduced fear of change) and curiosity and interest in the outside world. These qualities - which are similar to the 'warrior spirit' cultivated in the martial arts - help us to deal with the inevitable difficulties and stresses of life.

Contact with nature - especially working in nature (for example gardening and agriculture) or experiencing its joys and challenges through activities such as walking, backpacking or wilderness camping - can increase hardiness while benefiting physical health, strength and emotional well-being. Gardening, for example, offers rich rewards. As an English saying goes, "If you want to be happy for a few hours, get drunk; if you want to be happy for a few years, get married; if you want to be happy your whole life, get a garden." Yet gardening also requires commitment, physical effort, patience (plants grow at their own speed) and resolution (dealing with pests and failures). Like many of the most worthwhile activities, it is a skill that takes many years of practice and careful observation to master. It can offer valuable social connection (especially community or allotment gardening) as well as something else - a healing, restorative connection with the natural world. The physical and mental health benefits of gardening have been demonstrated in numerous studies, with individual or community gardening playing an important role in healthy ageing.⁷

The Forest School movement uses the natural world to provide educational and developmental challenges.





Children are taught to work, play and study outdoors in woodland environments throughout the year (and in most weathers) with the aim of developing such qualities as 'self regulation, intrinsic motivation, empathy, good social communication skills, independence, a positive mental attitude, self-esteem and confidence'. Research indicates these aims are largely achieved.⁸ For older children and adults, life-enhancing nature experiences and challenges are found in outward bound courses, wilderness therapy, rites of passage programmes and the growing field of ecotherapy.⁹ We all understand how medicine and healing can go beyond needles and herbs to embrace every aspect of our lives. So while we may counsel patients on the benefits of changing their diet or taking more exercise, inspiring them to spend time in natural environments (rather than in the gym) can also be an important part of the healing process.

As befits this journal, we should also remember the even more direct healing properties of trees. They make up a significant proportion of the 50,000 plant species employed as medicine and we use their bark, roots, leaves, flowers, fruits and seeds in most of the prescriptions we write. I was recently given a list of the over 200 species of Chinese medicinal trees and shrubs that Tony Harrison has grown in the Bristol herb garden. It included *Nui Xi, Fu Zi, Shi Chang Pu, Sha Shen, Huo Xiang, Mu Tong, He Huan Pi, Ze Xie, Zhi Mu, Du Huo, Bai Zhi, Qian Hu, Du Huo, Tian Nan Xing, Mu Tong, Qing Hao, Yin Chen Hao, Xi Xin, Tian Men Dong, Zi Wan, Sheng Ma, Huang Qi, Bai Zhu, Chai Hu* and many more.

Humans and trees working together

Not far from where I live in Sussex, the 3500 acre Knepp estate has been conducting an exciting exercise in rewilding over the past 18 years. Giving up decades of attempts to farm unforgiving clay soil, the decision was made to rewild it, in other words to let it simply do its own thing, assisted by the introduction of the nearest thing we now have to the ancient animals that roamed the English landscape – long-horned cattle for aurochs, Tamworth pigs for wild boar, and a variety of deer species. In something of a miracle, the result has been a vast explosion in biodiversity with an influx of multiple bird and insect species – many thought to be more or less extinct in this part of the country. Much of the area has reverted to wild scrubland with self-seeded trees protected from hungry deer by the thorny plants that grow around their base.

Since woods and forests spontaneously grow in this way in a wide variety of natural environments – from the steamy rain forest to the great forests of the frozen North – it might seem that humans have no role to play – other than a purely destructive one. However, the human-tree relationship can also be positive. I often visit the River Dart in South Devon where thousands of acres of natural oak forest line the river and surrounding valleys. Wonderful as it is, however, this natural forest has fairly limited biodiversity. The tree canopy blocks much of the light and while ferns and other shade tolerant plants do grow, the variety of medium and small plants – and therefore the insects and birds that thrive on them – is limited. But wherever humans have cleared spaces or thinned the trees, precious light pours in, encouraging an explosion in biodiversity.

Around 20 years ago, I decided to make a yurt and learnt how to coppice ash and chestnut trees. That was when I discovered that coppicing (cutting the main trunk when a tree is just a few years old, thus allowing multiple trunks/branches to sprout and be harvested for multiple uses) is an ancient practice which significantly extends the life span of trees. And of course humans, in their restless travels and exploration, have spread tree species throughout the world – further and more effectively than animals and birds are ever capable of.

The more we learn about trees, the more wonderful they are

Many years ago, unable to sleep one night, I watched with growing amazement an Open University programme about 'the wood-wide web'. We now know that in healthy forests, fungal networks – one single organism sometimes spreading several kilometres – run beneath the ground. They extend thin silken threads called hyphae which penetrate the root tips of trees and other plants and enter into a symbiotic mycorrhizal relationship (mykos/fungus + riza/root). The fungal

mycelia feed soil nutrients such as phosphorus and nitrogen to the tree in return for photosynthate – carbon-rich sugars produced by photosynthesis and therefore unavailable to subterranean species. And not only is there a relationship between an individual tree and its fungal network, but trees can communicate with and support each other via this wood-wide web. Young seedlings, unable to photosynthesise due to dense canopy cover, are fed by neighbouring trees so they are ready to take their place in the sun when the older trees die. Indeed dying trees have been found to ‘deliberately’ donate their carbon resources to the web for the benefit of the whole tree community. The mycorrhizal network is also a route for trees to warn each other of impending danger, for example an aphid attack that allows neighbouring trees to marshal their biochemical defences. These alarm signals are also transmitted above ground by the release of volatile chemicals. For example when elms and pines are attacked by leaf-eating caterpillars, they recognise the taste of caterpillar saliva and release pheromones to attract parasitic wasps. The wasps lay their eggs inside the caterpillars and the larvae then consume the caterpillars from the inside out. Similarly, when umbrella thorn trees start being consumed by hungry giraffes, they emit distress signals in the form of ethylene gas. Nearby trees then pump tannins into their leaves to sicken and even kill the giraffes when eaten. The giraffes, however, have countered this and learnt to browse downwind or else munch trees too far away from each other for the gas to travel.

According to Suzanne Simard, pioneering researcher at the University of British Columbia, “a forest is a cooperative system”. But while trees clearly demonstrate this extraordinary mutual aid, Simard and her graduate students also discovered what they called ‘mother trees’. These – the biggest, oldest and most connected trees in the network – both contribute significantly to the surrounding trees and also have a specially supportive relationship with their own seedlings. As Simard says, “If you’re a mother and you have children, you recognise your children and you treat them in certain ways. We’re finding that trees will do the same thing. They’ll adjust their competitive behaviour to make room for their own kin and they send those signals through mycorrhizal networks.”

Trees, climate change and biodiversity

Trees are our treasured friends in the struggle to protect the natural world against the devastation wreaked by

“When we try to pick anything out by itself, we find it hitched to everything else in the universe.”

John Muir, naturalist, 1838-1914

human greed and ignorance.

- They provide a home, shelter and food to millions of species. For example it is estimated that a British oak alone supports 2300 kinds of invertebrates, birds, mammals and fungi, plus uncounted species of bacteria and other micro-organisms.¹⁰
- Trees absorb pollutants from the air, especially particulate matter and nitrous oxide (although excessively thick canopy cover by the side of roads can trap polluted air). A 2011 study estimated that trees in Greater London remove between 850 and 2000 tons of pollutants a year.¹¹
- Urban trees also play an increasingly important role in cooling the environment. When I was first in Nanjing (one of the ‘three furnaces’ of China) I was proudly told that the Communist party had planted millions of plane trees and brought the fearsome summer temperatures down by several degrees.
- The deep roots of trees help secure the soil and absorb excessive water, helping to prevent flooding, mudslides and soil loss.
- Perhaps most importantly of all, trees act as carbon sinks. A large tree can absorb 4000 tons or more of carbon in its first 30-40 years (although it’s shocking when we realise that this is the carbon impact of taking just four long distance flights). However the numbers we are able to plant when there is good will and sufficient resources can be staggering. A recent nationwide project in Ethiopia, for example, planted 350 million trees in a single day. The long term aim is to restore the 35 per cent tree cover of the early 20th century from its current 4 per cent by planting four billion indigenous trees.

The Chinese medicine forestry trust

We are told that we have only 12 years left to prevent catastrophic climate change and not much longer to

prevent the annihilation of the insect life and soil health that our food supply depends on. Homo sapiens is being called on, for the first time in our evolutionary history, to act as a single and united species, since no nation alone, no fragmented and isolationist group, can hope to solve these problems. If there is to be a solution, it has to be a co-operative global one - a complete political, economic and agricultural revolution. And there are signs that all over the world, the mood is beginning to turn, led in no small part by the extraordinary and novel leadership of children and young people typified by Greta Thunberg.

Many drops of water create a vast river, and change will come from our own, small individual actions - the lifestyle changes we make, our diets and consumption habits, where we choose to bank and save, the political movements we support and speak up for, the demands we make to governments worldwide. And as Chinese medicine practitioners, with our special loving and respectful relationship to the natural world, we can lead the way - making sure that our practices, conferences, meetings, schools and suppliers embrace sustainability, encouraging our professional organisations to lend support to campaigns for meaningful action, and teaching those who will listen how real the threats are to our health and very survival.

The challenge can feel overwhelming and sometimes we need to focus on simple actions that directly help the environment and - through the medicine of positive action - counter the fear and grief that we face when we have the courage to look at the scientific evidence.

This is why we founded **the Chinese Medicine Forestry Trust (chinesemedicineforestrytrust.com)**. All income goes straight to three national and international organisations - The World Land Trust, Tree Nation and The Woodland Trust - which sensitively plant and protect indigenous tree species and support communities by employing local labour. Since planting and looking after a tree can cost as little as a dollar, a regular monthly donation of a few pounds means you can go to bed every night contemplating the fact that you are personally helping to plant dozens of beautiful life-giving trees every year.

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"You should not wantonly fell trees. You should not wantonly pick herbs and flowers. You should not throw poisonous substances into lakes, rivers, and seas. You should not dry up wet marshes. You should not disturb birds and other animals."

One Hundred and Eighty Precepts of Lord Lao, 4th century CE Daoist text

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