

PERMACULTURE

TURN YOUR LAWN INTO AN EDIBLE LANDSCAPE

By Dan Hemenway

Bill Mollison has presented the world with a warning, a vision, and a gift. He sees all three as one and has given them a name — Permaculture.

The Australian-born ecologist's warning is of horrific destruction to the global ecosystem, already evidenced by worldwide abnormalities in weather, expanding deserts, and millions of human refugees. Most of this destruction is caused by modern agricultural methods and other technologies that are out of proportion in scale and intensity to human lives and understanding.

In the United States alone, farm topsoil is disappearing at an average rate of 12 tons a year for each person who eats grain. Drinkable water is so scarce that U.S. companies import it from places like Norway and New Zealand with a growing fleet of converted oil tankers. Major forests — those that aren't being cut outright at the rate of 100,000 acres per day — are dying of a variety of diseases thought to be symptomatic of an ecosystem ailing from our toxic byproducts. Acid rain drenches much of the nation, sterilizing thousands of ponds and streams and causing as-yet-undocumented effects on human health.

Mollison's vision is that we can heal our relationship with the Earth, starting at our very doorsteps. He sees home gardens with vegetables, grains, flowers, poultry, herbs, and fruit trees replacing the depleted fields of corporate agriculture. He sees vast tracts replanted to productive forests or native prairie plants. He sees people rediscovering self-reliance in food production, water supply, housing, energy, income, and recreation. And he envisions human communities based on cooperatives — sharing resources and creating sound, self-sustaining, local economies independent of corporate interests. Mollison anticipates that many people would be employed in restoring the Earth and making restitution to its exploited people — planting trees in the deserts, renewing local agriculture, crafts, and building skills.

His gift is the art of Permaculture, a process by which we go from where we are now to that vision of self-reliant harmony with the Earth.

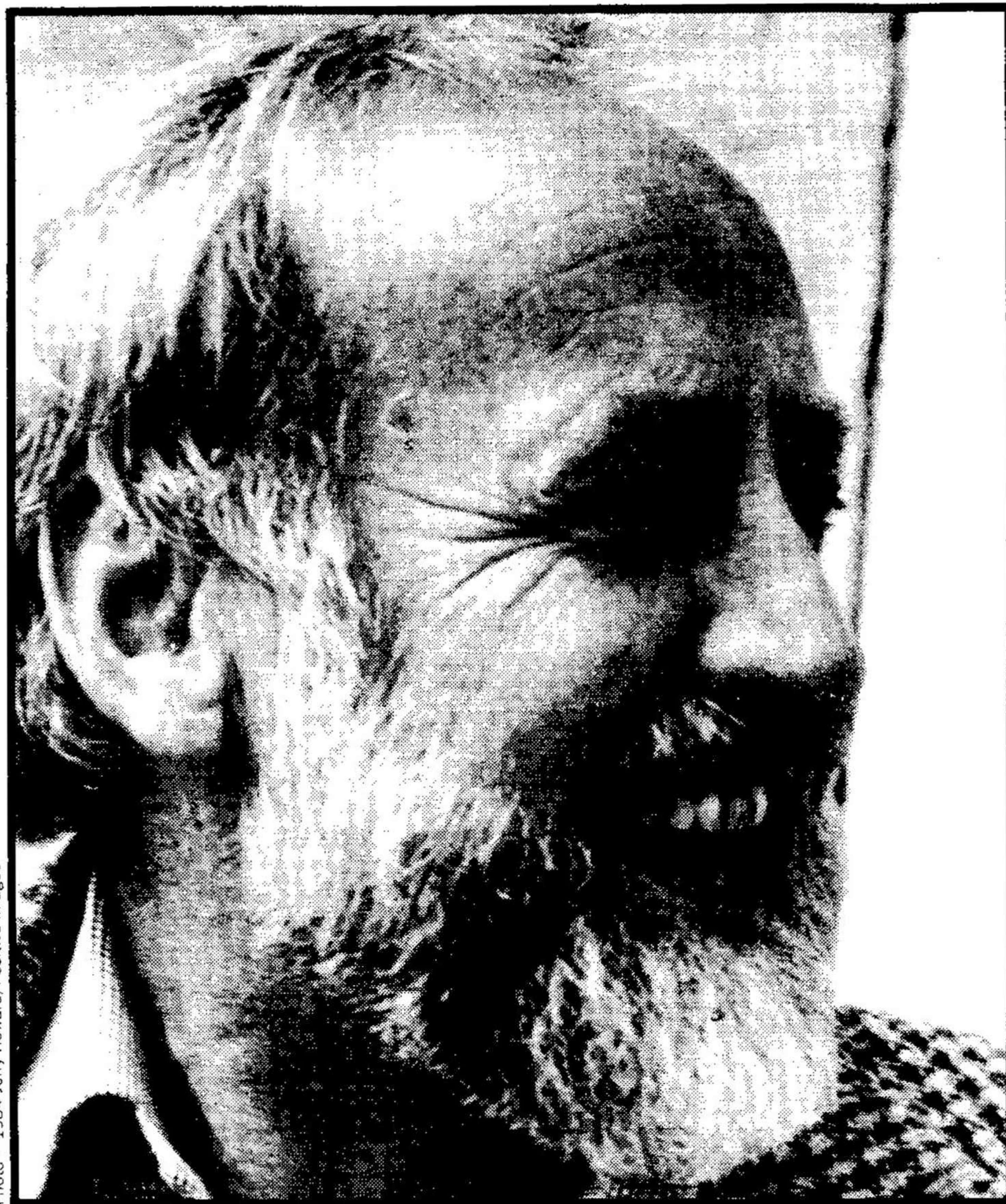


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Bill Mollison instructs aspiring Permaculture designers on how to go from where we are now to his vision of self-reliant harmony with the Earth.

WORLD-CLASS GARDENING

Mollison coined the term Permaculture to denote the design of human living spaces around environmental principles. One of the major influences in the development of Permaculture was the book *Tree Crops — A Permanent Agriculture* by J. Russell Smith (Devin-Adair, New York; 1950). Smith points to the abilities of trees to create and hold soil while producing large crops of food, such as fruit and nuts. He maintains that tree crops offer a major opportunity to feed ourselves while stabilizing American soils from the terrible erosion to which they have been subject.

"The real systems that are beginning to fail are the forests, the atmosphere, and nutrient-cycle systems," Mollison says. "We are the ones who are causing that. We have long been lulled into a very false sense of security by reassurances that the logging companies are planting eight trees for each tree cut. When you take something out of the forest that weighs in excess of 150 tons and put something back which doesn't weigh much more than 10 ounces, you are not in any way preserving biomass.

"In destroying forests we are destroying the system which should be helping us," he continues. "The effects of this on world climate are becoming apparent both in the composition of the atmosphere and in the inability of the atmos-

phere to buffer changes. We will experience immense variability in climate.

"The cause of the death of forests is multiple insult. We point to some bug, and we say that the bug did it. It is a conspiracy . . . to blame the bugs. But the real reason the trees are failing is that there have been profound changes in the amount of light penetrating to the forest, and in the quality of air, water, and soil."

Working to create conditions for settlement in the Australian desert, Mollison and his colleagues carried forward Smith's thinking about protecting soil — and thus ecosystems — by planting perennials with useful functions (such as trees). Into this he first integrated the highly developed Australian art of directing and storing rainfall runoff and then added low-cost, site-appropriate housing of indigenous materials: wood, stones, mud, thatch, clay, or whatever else lends itself. Animals — providing milk, eggs, leather, down, wool, compost, and other useful products — contribute to the overall picture, with poultry and small stock foraging close to the home and larger stock foraging and gathering up nutrients in the hinterlands.

EMBELLISHING THE ELEMENTS

In a Permaculture, all the environmental elements of land (contour, soil type, elevation, wind patterns, sunlight, native and introduced plants and animals, rainfall) and people are integrated — and embellished — to harmoniously serve the residents. At the same time, the quality of the environment, soil, water, air, and local climate is protected and enhanced.

Mollison describes these principles in the books *Permaculture I* and *Permaculture II* (International Tree Crops Institute, P.O. Box 1272, Winters, CA 95694; 1979). In recognition of the impact of his books and of his worldwide work in training nearly 1,000 people in the principles of Permaculture design, he was awarded the 1981 Right Livelihood Award (known as the alternative Nobel Prize) in Stockholm.

Permaculture begins with the individ-

ual and his or her skill and practice at observing nature in the immediate environment. For example, one might observe the kinds of weeds, shrubs, and trees that grow on one's plot of land and notice that there are shadbushes with their delicious berries, and wild lettuce. Then one knows that other species in those families would survive that microclimate. This approach may seem simplistic — yet an amazing number of people choose what to plant by looking at seed catalogs rather than at what already grows well on their land.

Having few techniques of its own, Permaculture borrows from nature, or from people's observation of nature, those techniques appropriate to the particular circumstances of place and time.

START AT YOUR DOORSTEP

While the Permaculture vision is utopian, its process is ultimately realistic. Mollison advises students and readers to start small and close to home, typically with a doorstep garden. Plant your first garden right outside the kitchen door, he advises. Keeping the garden where you can care for it easily results in very high yields with minimal effort.

The doorstep garden is the keystone of a Permaculture technique of landscape design based on roughly concentric zones. Zones grow progressively wilder and less cultivated the farther they are from the home.

Zone I includes the house itself and the portion of the area immediately around it that receives frequent use and traffic. The Permaculture design includes not only landscape, but attention to energy, shelter, water, and labor and monetary investment. Layouts both inside the home and outside are fine-tuned to minimize steps and other work and maximize yield and other desired results.

Energy-conservation possibilities are always examined — particularly low-cost strategies requiring little skill, like caulking, as well as solar-energy options, and the feasibility of gathering rain water from rooftops. In general, a Permaculture design seeks to enhance family self-reliance and reduce dependence on centralized food and energy supplies, using the lowest level of technology appropriate to the task.

Zone II, still relatively convenient to the house, is stocked with activities which usually require no more than once-daily attention. Here might be laying hens, small fruit, and a vegetable and herb garden. The differences between the doorstep garden and the Zone II garden exemplify the difference between the two zones. The doorstep garden is intensively managed, usually cultivated by French-intensive (raised beds) or sheet-mulch (use of cardboard or newspaper covered with grass clippings, leaves, etc.) techniques. Every square inch of earth is covered with the types of plants that receive daily use: culinary herbs, such as chives, parsley, and garlic; salad vegetables; first-aid herbs, such as aloe; and table flowers in adjacent plots. All can be harvested by barely reaching out the door.

In the Zone II garden grow vegetables, fruits, and herbs that will be used periodically or harvested all at once: asparagus, lavender, sage, dry beans, sweet corn,



A doorstep garden is covered with plants that receive everyday use.

winter squash, and strawberries, for example. The Zone II garden is often shared with poultry for part of the season to assist in fertilization and pest control.

Zone III features orchards and more extensive range for small animals such as poultry. A playhouse for older children might be here, whereas a play area for small children would be located in Zone I. Zone IV features semi-cultivated tree crops — those that need no more than initial pruning — and possibly forage for larger livestock such as cattle and horses. Zone V is essentially a wild landscape, used for forage, for berries and wild herbs to be harvested lightly, and for planting inexpensive seedlings of desirable tree species — as much as necessary to hasten the regrowth of the land.

IN TOWN AND COUNTRY

Everyone has access to a Zone I. It is wherever one lives. In the city, Zone I may include an apartment, perhaps a solar porch or window gardens, and very likely rooftop gardening. Toddler parks, where parents come frequently to supervise small children, offer potential for Zone I or Zone II community gardens.

Zones III, IV, and V are most rationally managed as commons in urban and suburban areas. They may be municipal, civic, or church food parks. Vacant lots might be planted with vigorous plants that need little attention and can provide wood, berries, or other useful functions. A

bamboó patch in one corner of a park or lot can provide edible shoots and useful canes, as well as tranquil privacy. Almost any food planting will encourage omnivorous birds, who will also eat insects and sing. Some benefit is possible from such land even if it is subsequently "developed" by the owner.

The suburbs, classically the resource sinks of the American social system, have populations in the range of the ideal ratio between humans and land. Here amateur gardeners can routinely produce four to six times the yield per square foot of professional farmers, because of the close attention they can give their plants. Here are the breadbaskets of the future!

Even now 53 percent of the households in the United States garden, Mollison points out. Using only about 600 square feet on the average, they produce 18 percent of U.S. food.

THE POWER OF YOUR LAWN

To exemplify the power of the suburbs, let us look at the lawn. As a social institution, the lawn originated as a petty imitation of the grand parks of the landed English gentry. To have a bit of park and topiary was to be a little bit noble. Food was not produced in the lawn, for that implied an embarrassing need to provide for oneself.

Now in the United States, we have 30 million acres of lawns — a patch of grass equivalent in area to the state of Indiana.

The Argument Against Tillage

Perennial plants, especially trees, are usually prominent features of a Permaculture design. The perennials help hold and develop soil; tillage, on the other hand, as it is almost universally practiced in both modern and traditional agriculture, destroys the soil and is a leading cause of erosion and the decline of fertility. Proper use of no-tillage agricultural methods will eventually enable us to raise enough grain to feed the world's population, Permaculturists argue, citing evidence presented by Masanobu Fukuoka in *The One-Straw Revolution* (Rodale Press, Emmaus, Pennsylvania; 1978).

"Whether you are an American or an East Indian, if you are a grain eater, it now costs about 12 tons of soil per person per year for us to eat grain," Mollison warns. "All this loss is a result of tillage in agriculture. As long as you are tilling, you are losing. . . . We have lost

50 percent of all the soils we have ever had before 1950, and we have lost 30 percent of the soils we had in 1950. And we will inevitably lose another percent of the soils that remain. . . . We don't see that we will have agricultural soils within a decade."

Even so, there are no dogmas about tillage in Permaculture. Practitioners recognize that it must be continued during a hoped-for transition to a more sustainable agriculture, which is being developed first on steeply sloped lands and soil otherwise regarded as marginal. Here tree crops and associated activities, such as poultry forage, flower production, aquaculture, and beekeeping are thought to produce about as much food in the short term as plowing the fields, and build more productive ecosystems in the long run.

—D. H.

This amounts to about one-twelfth the area of all U.S. farmland. These lawns are almost all watered, and consume significant amounts of other agricultural materials. For example, the phosphate used on American lawns is equal to about a third of that used to grow food for the population of India, according to Mollison.

Let us redesign these lawns as gardens. Since they are all irrigated, and have the capacity to be amply irrigated with roof water and domestic graywater (from showers, dishwashers, etc.), we should be able to at least double the national yield if we were to plant them with edible crops. Thus, we could produce 100 percent of the American food supply, with ample capacity for small animals such as rabbits and poultry (including their eggs) to be produced at most suburban and rural homes.

Moreover, I know from personal teaching experience that some sound instruction in recycling, biological pest control, and organic soil management can increase the average gardener's yields two- to five-fold.

ONE FAMILY'S EXPERIENCE

"I live in an edible landscape of about a half acre," writes Earle Barnhart, a scientist, designer, and consultant at the New Alchemy Institute in East Falmouth, Massachusetts. Over a 10-year period, he and his wife "have transformed a fairly conventional lawn into an assembly of more than 200 useful plant species. Our landscape now includes a home-with-greenhouse, a netted vegetable garden, a chicken house and habitat, beehives, and plant crops from many regions of the earth. All kitchen scraps and plant wastes are recycled within the landscape, their nutrients returning to us in fresh fruit, vegetables, and eggs," he explains.

"In winter, an attached greenhouse provides fresh salads and daytime solar heat for the family," he adds. "It is also a place for propagating vegetable seedlings and perennial crops for outdoors. The greenhouse contains grapevines and figs inside and is shaded in summer by black locust trees and grapevines outside."

Barnhart sees his home as a model of what can be accomplished, since his fellow Cape Cod residents face some of the country's highest food and energy costs.

DOUBLING YOUR PLEASURE

A key principle of Permaculture is to multiply each element's purposes and useful associations. Tree crops, for example, can act as heat-saving wind-breaks or sun-shading canopies for buildings. Barnhart points out, and fruiting shrubs can grow in the form of noise-reducing hedges. A classic example that Mollison often uses is combining a greenhouse with a chicken house, since each sometimes needs more heat than it can generate or store.

We add the greenhouse to the south face of the chicken coop, with a 5-foot-high chicken-wire divider to prevent the chickens from eating the plants. We include a gate in the fence so people can walk from one side to another.

The first benefits we look for are the ones we sought. Chicken body heat keeps the space warmer at night and the solar feature provides additional daytime heat — which may be necessary to keep the coop within the optimum range for egg-laying.

In addition, in the daytime, the chickens go outdoors when the coop becomes too hot. They therefore function as automatic thermostats. Chickens also provide carbon dioxide, feather dust, fertilizer collected in the coop litter, and air movement, all of which benefit the

greenhouse. The litter can be periodically composted, generating a third source of heat as it decomposes into fertilizer.

The greenhouse, if it is well-designed, provides chickens with improved ventilation, greens in the form of weeds and culls, and — if the correct glazing is chosen — a source of ultraviolet light to enhance winter production of vitamin D. From time to time, when crops in the greenhouse are to be changed, chickens can be released on selected beds to scratch up insects, particularly slugs, and to consume any edible vegetable matter.

Additional design elements can be added to make the system more productive. Rabbits, fish, graywater-treatment systems, aquatic plants, earthworms, and mushroom production have been included in poultry-greenhouse designs.

SEEKING THE GARDEN OF EDEN

The Permaculture zone system rests on the degree of sensitivity and understanding with which we are able to intervene in the environment to make it produce what we want. In Zone I, there is almost constant opportunity for close attention to detail. The person who has sensitized her or his ability to observe closely will rapidly detect a draft from a sash that needs caulking, become aware of the rhythm of shuttering and unshuttering that makes best use of window sunlight, or note important changes in insects or plant health in the doorstep garden. Fine-tuning these details becomes part of the daily routine and the additional time this tuning requires is virtually nil compared with the benefits.

The sought-after result of all Permaculture design is systems as self-sustaining as possible, which are adjusted when necessary by gentle, aware, informed and restrained human intervention.

To make Permaculture training and consulting widely available in the United States, Mollison has visited every summer (Australian winter) for the past three years, training about 700 Permaculture design apprentices in two- to three-week courses. Apprentices may give talks and workshops and produce designs. Their designs are submitted to qualified designers, both as a quality check for the clients and as a measure of when the apprentice can be certified as an independent designer. This system is safeguarded by registration of the term "Permaculture" as a trademark nationally and as a service mark in most states where there are designers. This in no way restricts individuals from applying the concepts as they see fit, yet does provide quality control of those collecting money for Permaculture teaching or design services.

In addition, about 10 major Permaculture centers and dozens of smaller groups have formed in the United States to provide information, education, design, and referrals. Individual Permaculture designers and design apprentices often offer weekend workshops to the public. These workshops, together with Permaculture books and other publications, provide a basis for most people to apply the principles to their own lives. Many people begin just with the Permaculture books.

"Really, what we are up to is trying to let things function in a natural way," Mollison explains. "Perhaps we seek the Garden of Eden. And why not? We believe that a low-energy, high-yielding agriculture is a possible aim for the whole world. It needs only human energy and intellect to achieve this."

To Learn More

The International Permaculture Seed Yearbook, Yankee Permaculture, P.O. Box 202, Orange, MA 01364. \$7.50.

Where to Get the Seeds to Plant

The following nurseries and mail-order houses offer seeds, seedlings, and accessories to help you get started in making your lawn into an edible landscape. Many offer catalogs or seed lists free or for a small charge. (This list was reprinted from *The International Permaculture Yearbook*, edited by Dan Hemenway.)

Johnny's Selected Seeds, Dept. WL, Albion, ME 04910; (207) 437-9294.

Ken Ettlinger, Long Island Seed and Plant, Dept. WL, 1938 Flanders Road, Riverhead, NY 11901; (516) 369-0257.

Gro-Tek Indoor Gardening and Home Greenhouse Mail-Order Supplies and Services, Dept. WL, RFD 1, Box 518A, South Berwick, ME 03908; (207) 676-2209.

Le Jardin Du Gourmet, Dept. WL, P.O. Box 8, West Danville, VT 05873.

The Dharma Farm, Darrell Rolerson, Dept. WL, P.O. Box 136, Isleboro, ME 04848.

Hemlock Grove Farm Trees, Dept. WL, P.O. Box 63, West Danby, NY 14896; (607) 564-3346.

Grootendorst Nurseries, Dept. WL, 15310 Red Arrow Highway, Lakeside, MI 49116; (616) 469-2865.

Lawyer Nursery Inc., Dept. WL, 950 Highway 200W, Plains, MT 59859-9706; (406) 826-3881.

Bill Kenney, Tamarack, Dept. WL, Franconia, NH 03580; (603) 823-5656.

Pedigree Nut Tree Nursery, Dept. WL, P.O. Box 46E, R.D. 1, Hickory, PA 15340; (412) 356-7582.

Forestfarm, Ray and Peg Prag, Dept. WL, 990 Tetherby Road, Williams, OR 97544; (503) 846-6963.

Centre For Community Self-Sufficiency, Dept. WL, P.O. Box 797, Bolinas, CA 94924.

Carl R. F. Birkholz, Dept. WL, Route 2, P.O. Box 133, Elkhart Lake, WI 53020; (414) 876-2598.

Steve Ray's Bamboo Gardens, Dept. WL, 909 79th Place South, Birmingham, AL 35206; (205) 833-3052.

Environmental Seed Producers Inc., Dept. WL, P.O. Box 5904, El Monte, CA 91734; (213) 442-3330.

Chestnut Hill Nursery, Dept. WL, Route 3, P.O. Box 477, Alachua, FL 32615; (904) 462-2820.

Jim Lounsbury Nut Nursery, Dept. WL, 1944 Loomis Highway, Loomis, WA 98827; (509) 223-3974.

Agroforestry Associates Inc., Dept. WL, P.O. Box 883, Winters, CA 95694; (916) 795-2132.

International Tree Crops Institute USA, Dept. WL, Route 1, Gravel Switch, KY 40328.

Greenleaf Seeds, Dept. WL, P.O. Box 89, Conway, MA 01341.

Brungardt Farms, c/o Steve F. Brungardt, Dept. WL, Route 1, P.O. Box 53, Gorham, ME 04740.

Darrell Frey, Dept. WL, P.O. Box 86, R.D. 1, Polk, PA 16342; (412) 376-3292.

Greer Gardens, Dept. WL, 1280 Goodpasture Island Road, Eugene, OR 97401; (503) 686-8266.

Northplan Seed, Dept. WL, P.O. Box 9107, Moscow, ID 83843; (208) 882-8040.

Plants of the Southwest, Dept. WL, 1570 Pacheco Street, Santa Fe, NM 87501; (505) 983-1548.

Friends of the Trees Seed Service, Dept. WL, P.O. Box 1064, Tonasket, WA 98855.

Bear Creek Farms Nursery, Dept. WL, Northport, WA 99157-0248.

Grace's Gardens, Dept. WL, 530 Westport Avenue, Norwalk, CT 06851.

Abundant Life Seed Foundation, Dept. WL, P.O. Box 772, 1029 Lawrence, Port Townsend, WA 98368; (206) 385-5660.

Burnt Ridge Nursery, Dept. WL, 432 Burnt Ridge, Onalaska, WA 98570; (206) 985-2873.

Unadilla Farm, Dept. WL, P.O. Box 142, Turners Falls, MA 01376.

Hector Black, Dept. WL, Route 14, P.O. Box 159, Cookeville, TN 38501.

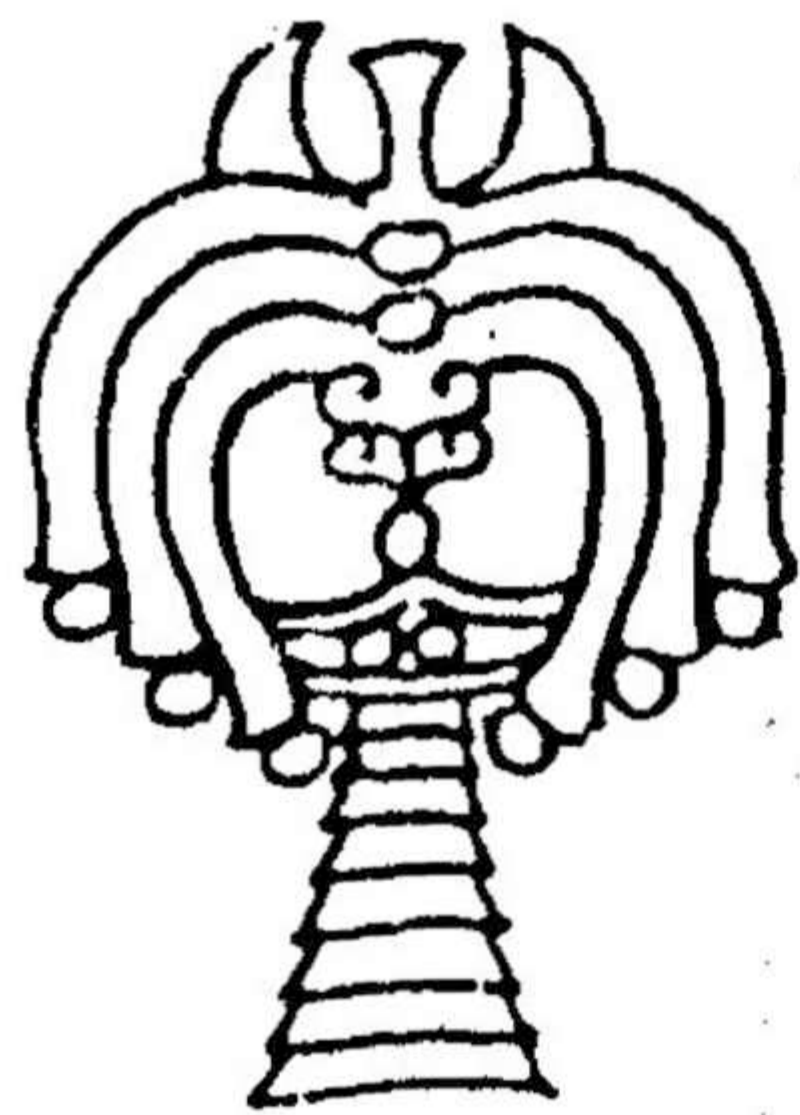
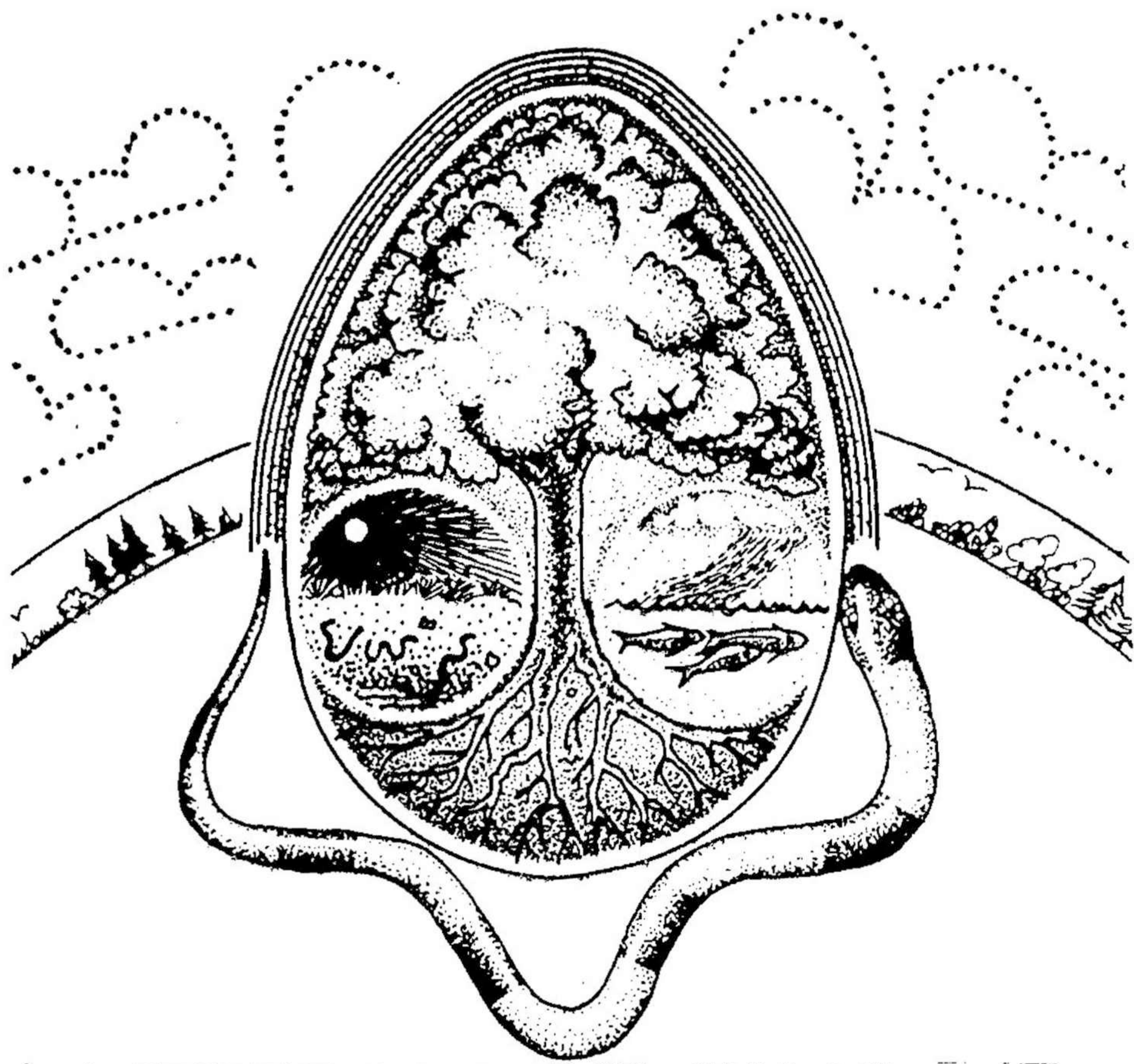
Sandy Mush Herb Nursery, Dept. WL, Route 2, Surret Cove Road, Leicester, NC 28748; (704) 683-2014.

Northwoods Nursery, Dept. WL, 2525 Kingsley Road, Hood River, OR 97031.

Barbara Robidoux, Dept. WL, R.F.D. 2, P.O. Box 334, Union, ME 04862.

Edible Landscaping Nursery, Robert Kourik and Ken Kern, Dept. WL, P.O. Box 550, Oakhurst, CA 93644.

By Hand & Foot Ltd. (tools), Dept. WL, P.O. Box 611, Brattleboro, VT 05301; (802) 254-2101.



Peppa.
las Encantadas ass. 1901
ferme la Garrigue
11300 Festes St. André
France