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Life on the Edge

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Publisher

John Wages
publisher@permaculturedesignmagazine.com

Senior Editor

John Wages
editor@permaculturedesignmagazine.com

Editorial Guild

Rhonda Baird Keith Johnson

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Permaculture Design
Post Office Box 60669
Sunnyvale, CA 94088 USA
editor@

permaculturedesignmagazine.com
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Permaculture Design welcomes your articles, news items, photos, and other materials of interest. Please contact the Editor in advance of your submission to request writers guidelines and present your ideas. (editor@permaculturedesignmagazine.com)

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#98	Decolonizing Permaculture	September 1
#99	Ecological Restoration	December 1
#100	To be announced	March 1

An Exploration of Edges

John Wages

A TRANSITION ZONE, where two ecosystems meet, contains species from both ecosystems, plus many others that are specialized to the zone of overlap. Humans evolved in such a zone, where forests adjoined grasslands in East Africa. Shorelines are another example. In the shallow, hyper-oxygenated waters along a rocky beach, starfish and crabs hunt shellfish and other prey, while becoming part of the land food chain. In flat terrain, meandering rivers and creeks provide a sinuous edge. Rocks, pebbles, and pilings provide another kind of edge where biofilms and mussels attach. Seen in global context, the planet's rivers are zones of overlap between marine and continental landscapes. Salmon and other migrating fish ferry nutrients, notably phosphorus, across that edge.

During my pre-high school summers, I wandered the countryside on foot and by bicycle. Once, wading up shallow Chiwapa Creek, I came across a tremendous swarm of tiger beetles on a sand bar. At first, I thought they were flies, and as I approached, they flew up in a great cloud, moved a few feet, then settled again. Looking more closely, I saw they were brown, spotted tiger beetles, not as large as the iridescent green ones I knew that lived singly under rocks and did not take flight easily. I caught a few for my collection and stored the memory for this editorial. I ran across other unique edge-dwellers, like the toad bugs (*Gelastocoridae*) that lived in the narrow zone of mud along parts of the creek bank. Imagine my surprise to find them at the pond back home, where I'd never noticed them before. Chiwapa and the other creeks of northeast Mississippi once meandered from one side to another, across their bottomlands, flooding every spring and depositing a new layer of fertility. Sometime in the early 20th century, the government dredged and straightened most of them to improve drainage, so that farmers could plant earlier. Imagine the productivity of the sinuous creekbanks—how many edge-dwelling beetles, amphibians, and birds must have called them home! Aerial views can sometimes show the faintest hint of the meanders that once existed. Can we restore the edge-rich environment in a way that preserves or even enhances the productivity of the farmland, while regenerating the productive riparian ecosystems?

We can use edge effects to increase the diversity and quantity of yields. Chinampas, crenellated ponds, and non-linear paths are well known ways to increase edge in gardens and on farms. Permaculture designers have only begun to explore the potential of such systems. Even in the absence of deliberate design, edges are inevitable—a simple fence of posts and wire provides protection from mowing and grazing, and a trellis for vines that moderate the wind and create a shady microenvironment beneath. Gradually, a hedgerow grows to hide the fence, and berries and wild plums emerge. More thoughtful design followed by active management can result in a multispecies hedge that yields food, fodder, a windbreak, visual aspect, shelter for wildlife, and other benefits. In this issue, Molly Phemister describes such productive hedges, and

gives us an example of the use of edges in the espaliered “Peach Walls” of 17th-century France. These intricate systems are not self-managing, requiring pruning to the flattened form, and long-term maintenance as well. In this regard, they remind me of the work of the New Alchemy Institute in the 70s (newalchemists.net), and of Jerome Osentowski's high-altitude greenhouses, the subject of an exciting new book due to come out shortly. In this issue, we review his book and provide a glimpse into these ultra-productive systems. Even if the systems are complex and do require maintenance, their intense productivity still allows the designer to become the recliner—provided the bioshelter is fitted with a suitable hammock!

In addition to ecological edges, permaculturists walk a cultural edge, as several of the articles in this issue describe. At the edges of life, we deal first with birth and later with death. How much violence in the world comes because of the way we treat newcomers? Can we design more humane approaches to welcome the newborn into the world? How much needless suffering comes from failing to prepare for one's own death? And, the loss of a loved one can be a defining edge in one's life, with other memories becoming “before” and “after.” Thanks to the authors who share some very personal experiences and views. As this issue shaped up, it became clear that writers were going to contribute more on these cultural edges than landscape designs. Perhaps this signifies where the real challenges lie—anyone can build keyhole beds, but it takes an awful lot of thoughtful observation to discern the leverage points on our social problems. Alan Booker has something to say about the role of permaculture in facilitating larger scale societal changes, and the importance of creating new stories.

Adam Brock will guest edit our next issue, Decolonizing Permaculture (deadline Sept. 1). If you have an idea for an article, please contact us at editor@PermacultureDesignMagazine.com. In #99 (Ecological Restoration), we will cover techniques for regeneration of productive ecosystems, both wild and cultivated—wetlands, soil remediation (remineralization, the restoration of biological activity, building new topsoil), the use of native and drought-tolerant plants in design, reforestation, and other elements of ecosystem repair. New and experienced designers, please share your insights with our readers (by Dec. 1).

Thanks to our dedicated web designer, Kelly Woo, volunteer Elizabeth Nitz of the Colorado Permaculture Guild, and webmaster Keith Johnson. We've tested the ordering functionality of the new website, corrected a few problems, and everything looks good. Check it out. Tell us what you think, and more importantly, where we should take it from here.

We've begun the process of converting the older issues of the *Activist* into pdf. Our original timeline called for this task to be complete by next summer. We may be able to finish several months ahead of schedule. Δ

Plant Medicine at The Edge

A New Culture of Healing

Jesse Wolf Hardin

PERMACULTURE IS A REVOLUTIONARY concept in our modern western civilization, in societies built on endless production and consumption, disposability, planned obsolescence, and waste. Thanks in part to this movement of visionaries and care-takers, the term ‘sustainability’ has become part of the vocabulary of the masses. This is vitally important, even if relatively few in America today seem willing to make the changes in thinking, lifestyle, and politics necessary to support a society that consumes no more than can be replaced, that accommodates the needs of not only humanity but also nature, environments, and the entire rest of the natural, interconnected world.

Nothing can ever be truly permanent, of course, in a universe predicated on exchanges of energy and an endless evolution of form and expression. For culture to be permanent in any sense—sustainable and lasting—it must also be permeable, porous, and penetrable by new ideas, experiences, situations, needs, and norms. It will be defined not by an unchanging quality, but by being sustained through conscious and caring change. The most resilient and durable life forms, such as bacteria, are able to quickly adapt and evolve; others are flexible, such as the river

“It seems self-evident to me that the core concern of healers is healing humanity’s relationship with nature/ the green/Gaia.”
—David Hoffmann

willows that bend from the pressure of wind or water but then easily spring back into the air and light. The most significant response and change take place at the far, leading edge of society, far from the static and stultifying middle. And when that conventional and conformist middle is determined to exist in an artificial, homocentric, and ecocidal bundle outside of nature, the crucial and exciting edge unfolds in the direction of authenticity, compassion for other species, a life in balance, the living earth, and the intimacies of place.

The edge is the milieu of evolution. And for we humans, it is the place of conscious choice and change, the exceeding



Kiva Rose with Aralia berries

of imagined limitations, the stretch in yoga, the dancer’s or gymnast’s leap into excellence, the moment of inspiration, and the field of accomplishment. It is where we—like life itself—dare to take chances, to try something new, to envision and explore. The edge is the state of deepened presence, heightened awareness, and awakened senses—of fascination and enchantment, creativity and revelation, passion and engagement, purpose and commitment—and thus of manifestation and satisfaction, realization, and reward. It is there that life presents all its colors and flavors, that opportunities present themselves and nest-bound baby birds dare a leap of faith into the imposing but beckoning sky.

Natural farming methods and whole-foods diets help make up what is clearly the edge, at a time when the middle/norm is increasingly insulated from nature, subsisting on factory farmed food perverted through bioengineering and tainted with pharmaceuticals. In the same way, the once traditional act of rural homesteading is now on the edge, as are urban wildcrafting and rooftop gardens, plant conservation and animal rescue, traditional tattooing and homebuilt houses, home schooling and alternative schools, self sufficiency and cooperative clans, holistic healing, and community herbalism.

My family and I enjoy a life that many call “on the edge,” sometimes on the edge of going broke, daily at the edge where so-called civilization transitions to rural village and then to utterly wild wilderness: the Anima Sanctuary and botanical restoration project in enchanted New Mexico’s remote and mountainous Gila bioregion. From our modest, solar-powered

cabins here in the canyon, it is seven potentially jeep-sinking river crossings to pavement, ten miles to a tiny village store, and over 100 miles to the nearest hospital, the nearest prepackaged meat, the nearest dangerous gang or abusive police department, back-peddling politician, or drug peddling pharmacy. We maintain a business producing events, books, and the quarterly *Plant Healer Magazine* for herbalists, though it's more of a mission than a business, because its purpose at the edge is to impact and shift our culture, and all the profits go back into new educational projects. This puts us even further out at the edge, in our dedication to healing modalities that are discounted or even vilified by the dominant paradigm and its corporate organs.

Folk herbalism—empowered, unregistered, unapproved—thrives at the far earthy edges of modern healthcare. What was once, in every culture and country, the accepted and much valued tending of self, family, and community using plant medicines, has in the past 70+ years been labeled as inconsequential, undependable, or outright dangerous “alternative medicine,” with its practitioners often dissed. Some herbalists do their best to win acceptance by forming guilds, qualifying their treatments with the latest science, and even dressing conservatively, but it's largely in vain. As my partner Kiva Rose writes, “No matter how ‘normal’ or accredited one might think themselves to be, being an herbalist is to walk an edge. As herbalists, we’re pushing at the borders of what’s considered normal, sensible, and sometimes even acceptable, within mainstream society. Regardless of how straight we look, speak, or feel, the very act of teaching about or treating with botanical medicines tends to place us at the fringes of standardized culture.”

Even within the subset of herbalism, our Traditions in Western Herbalism Conference and *Plant Healer Magazine* help mark the borderlands—the frontiers. Every September, high atop New Mexico’s sky island, the TWHC presents the leading thinkers, teachers, and healers in the field of plant medicine, practical classes, and wild celebration that welcomes nonprofessionals and laymen, caring mothers looking to treat

their children’s ailments, “kitchen witches” making medicine out of plants in their kitchen sinks, the unaffiliated, and those alienated by the exclusivity or formalities of more conventional educational opportunities. Likewise, over the past several years of its existence, *Plant Healer Magazine* has become a voice for herbalism’s outliers and outsiders, explorers and mavericks, activists and conservationists, unconventional dreamers, and unrestrained doers, deep feelers, and celebrants. The quarterly publication helps to connect its readers with a lineage of healers extending far into the past, others who share our interests and devotion, the botanical sources of natural healing, and our own bodies and what those bodies are trying to communicate to us.

In this way, the edge serves as a bridge—a bridge between

The edge serves as a bridge....

the furthest extent of what already is, and what is possible and pending, between treating our wounds or filling our bellies, and working to feed the poor or heal the ailing earth. The edge is not a place apart, but rather, is a contiguous extension of humankind and all planetary life, and at its best, a means for moving from a state of unwellness to a condition of health and hope. The edge is like what we call an ‘ecotone’ in the study of ecology, the mutable transition zones between biomes such as alpine and subalpine, or PJ (piñon/juniper) and high desert. We do not fall off the planet when we reach the edge, we inhabit a place of discovery and risk, of transformation and fulfillment. We’re in an age when there is little that is more radical, adventurous, and exciting than what is in some ways a return—to ancient ways of perceiving and feeling, traditional ways of growing and enjoying foods, and natural ways of helping to heal.

The Plant Healer community is committed to the reclaiming of herbalism’s intrinsic spirit and essential organic nature, its informality and egalitarianism, social consciousness, and courageous if courteous response. Ours is a remembering of the original feelings and motivations that have always inspired the work in permaculture and our focused time with medicinal plants. And ours is a resurgence: a surging forward to self empowerment and grassroots action, a reawakening of the curiosity, excitement, and giddy pleasures of this loving, healing work. It is the edge from which we fly, and the edge where we plant our roots. And we gladly gather with you there.... Δ

Jesse Wolf Hardin is a wilderness-based deep ecologist, activist, artist, teacher, and author of 14 books available at www.OldWestScribe.com and www.PlantHealer.org. and an upcoming compilation: Wild Medicine, Wild Cuisine. He invites your participation at the 2015 Traditions in Western Herbalism Conference, Sept. 17-20, 2015 (www.PlantHealer.org/intro.html), reach him at PlantHealer@PlantHealer.org.



Phyllis Hogan teaching at Traditions in Western Herbalism Conference

Multifunctional Living Fences

Hedgerows Make Better Neighbors

Molly Phemister

HUMANS ARE AN EDGE SPECIES, refined by evolution to love the liminal and transitional zones between forest and savanna or between water and land—the littoral zones of a lakeshore or the ecotone of an orchard. Around the world, these transitional ecologies are the richest and most diverse. As urbanization dominates land use, edges become ever sharper, ever harder, and often so instantaneous as to become entirely threshold and deny any actual occupancy of the edge. A curb, a 6” (15 cm) demarcation with no clear ecological value, sorts pedestrian and motor traffic. Suburban yards abut abruptly at a wooden fence. The community ball field is maintained precisely and bounded by a parking lot and the local recycling center, a thin band of trees, and then a small shopping center. We flit from one ecological reality to another in the blink of an eye.

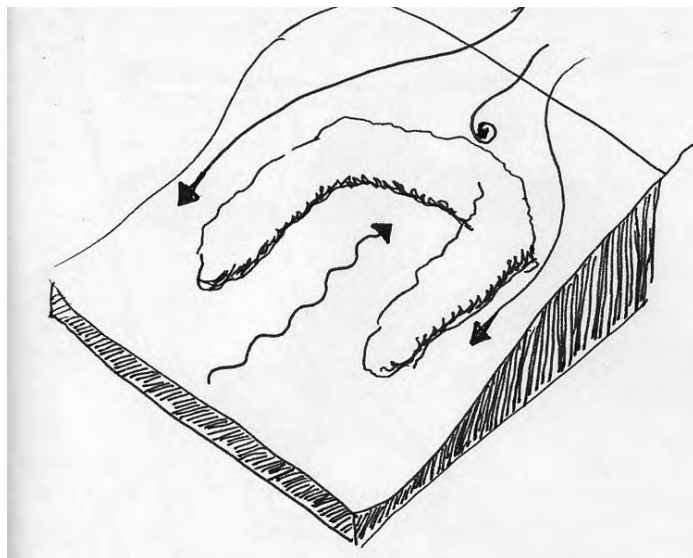
At the same time, a secondary network of urbanized edges has evolved, often forming corridors. These are more often the drosscapes that our culture turns from and pretends not to see: railway tracks, highway roadsides, and drainage ditches. This secondary network is far less manicured, often tending toward the wild and woolly. Raccoons, opossums, deer, and feral cats slip through these zones, dependent upon the neglect itself for the fecundity so ubiquitously absent from the crisp lines of the other.

Put aside your visions of electric clipper-harassed privet hedges. Box-shaped shrubbery does not a hedgerow make.

The rebirth of hedgerows

In this context, the re-emergence of hedgerows, one of the oldest forms of deliberately created and manipulated boundary lines, is both reassuring and exhilarating. Every agriculturally-based society has a field margin system. While other systems will likely provide equally beneficial designs for a future that integrates earth care and people care, my research focuses on the hedgerow systems of northwestern Europe, and touches on their earliest manifestation: the coppice lot or line.

Put aside your visions of electric clipper-harassed privet



Strategically placed hedgerows can not only divert downward flowing cold air, but also capture upward flowing warm air.

hedges. Box-shaped shrubbery does not a hedgerow make. The earliest hedgerows (there is evidence of hedgerows from 4,000 years ago in France) were lines of coppiced trees—cropped and then allowed to regrow in patterns that interlinked with the cycles of pasture, row crop, and fallow. Although most often constructed with tree species, hedgerows are thinner and more linear than anything considered a proper forest. Unlike a forest (and many silvopasture systems), which mature and then, absent catastrophe, achieve a chaotic balance of death and rebirth that collectively retain the basic “forestness,” a hedgerow is a highly manipulated ecology, undergoing a solid reset every decade or so. It is not a “natural” landscape in that its establishment and maintenance require human intervention, and yet it functions naturally, providing potent ecological and environmental benefits.

Air flow and frost pockets

One of the more intriguing aspects of hedgerows is their capacity to influence the weather. While microclimates are most commonly thought of in relation to the sun and shade of a place, air flow (wind) is also extremely important. In a city, tall buildings channel the wind, increasing both speed and turbulence. The level of the “air chaos” in cities is high because the buildings are solid masses. Wind moving at high speed over a mass creates a vacuum on the leeward side. The person on the street will experience a very still zone adjacent to the wall,



Shrub it up! For maximum wind mitigation, plant on both windward and leeward sides of a structure.

and then an area of increased turbulence further out from the building.

Hedgerows are variably porous, depending on species composition, which impacts both the size and intensity of the quiet and turbulent zones. A moderately dense windbreak can slow the wind speed as much as 15-20 miles an hour (about 25-30 km/h). Generally, evergreens are denser than deciduous species, but even evergreens are generally only 60-70% solid, and it's a trade-off: the denser windbreak will reduce the wind speed more, but for a shorter distance. A windbreak (which is essentially a tall hedgerow) of nut pines will strongly reduce the wind speed on the leeward side for a distance of about ten times

...studies have shown the hedgerows positively impact soil moisture content and other wind-related variables.

the height of the pines. In a deciduous windbreak built of, say, coppiced mulberries, the lower density will allow more wind through, but the less calm, protected zone will extend further, often 15 to 20 times the height of the hedgerow, due to the lack of vacuum on the leeward side. In either case, if they start lifting their bottom branches off the ground to create a gap, the wind will eventually duck under and nullify the gains for ambient temperature and improved soil moisture retention.

The implications for natural building design are clear: cold winter winds can be mitigated by the placement and form of plantings, but they are needed on the leeward sides of buildings, not just on the windward.

The implications for agriculture are huge. Repeatedly, studies have shown that hedgerows positively impact soil moisture content and other wind-related variables. Crop yields in the sheltered area improve more than enough to offset the removal of a portion of the field from production in order to establish the windbreak in the first place. Not only does the slowed wind speed impact evapotranspiration rates (and subsequently crop stress levels), but also more moisture percolates into the soil by means of the other major wind-related implication of hedgerows: snow drop. The hedgerow captures blowing snow, and meltwater infiltrates in the root zone. Depending on solar

orientation, snow drop along a hedgerow may last far longer into spring than in surrounding areas, lengthening the season of recharge considerably.

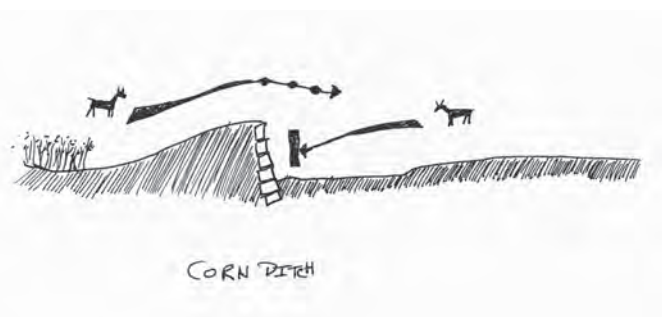
Hedgerows provide a means to extend the growing season on sloped sites by the careful consideration of frost, which settles down a hill and can be deflected by an uphill hedgerow (and collected by a downhill hedge if one is not careful!). In certain situations, the relationship of the site to the valley floor will be just right for a hedgerow or windbreak to capture the warmer air stored during the day, as it rises and dissipates from the valley itself during the nightly temperature inversions. Thomas Jefferson's Monticello was fortuitously placed in elevation and orientation, giving the estate at the top of the hill an extra week on either side of the growing season.

Laying the hedge

Not only the height of a hedgerow impacts the landscape, but also the width matters, often in unexpected ways. Traditionally, "one hedgerow" was a tally not of the width of the plantings themselves (note the intentional use of the plural—many hedgerows are more than one plant or "set" wide), but included the banks and ditches that traditionally underlay the plantings. (I'll come back to those structural components later in the article.) As more and more hedgerows appeared "on the flat" (sans bank and ditch), the meaning of "width" has shifted to focus on the maximum anticipated size of the plants themselves. The crucial increment (created by the maintenance regime more than by the genetic potential of the plant) is the width in the context of the spacing between hedgerows, or between a hedgerow and something else. For example, if the tractor is 15' wide, then a 100' wide field that is bounded by 8' wide hedgerows on either side actually has 84' of cultivable width, which will send the tractor operator into therapy in short order. It would be more sensible to plan to include an additional 9' of pollinator habit along one edge than to try to figure out how handle the extra/missing width.

So what is this maintenance regime that creates hedgerows and determines both height and width?

The basis of a hedgerow is that the selected tree species are allowed to grow as long as 15 years and are then cut. This type of hedgerow started as coppicing and then found an art form in "laying." If cut the whole way though near the base and allowed to resprout, the result is a coppiced hedgerow. Although

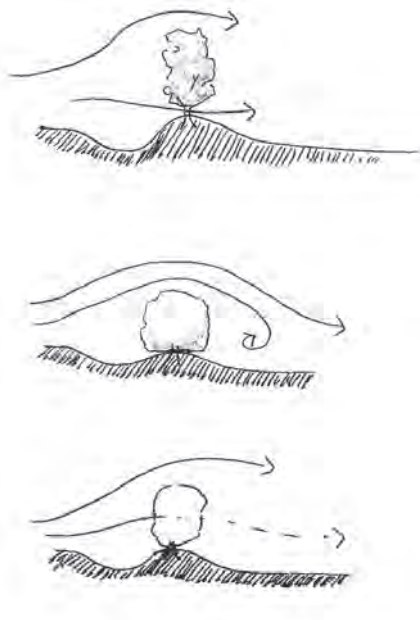


A form of cornditch is still used beside highways.

less effective as an actual barrier fence, this could be a useful strategy for keeping tasty tree crops such as linden (“lime” tree) leaves (for salads) and mulberries, both of which have a habit of growing out of reach, down at an accessible level. Hazelnuts are very commonly coppiced, even within a field, not just as part of a field-edge strategy.

Laying, however, involves cutting the tree not quite the whole way through, but instead cutting the majority of the way through a short ways off the ground, leaving a band of bark and sapwood that remains connected. (How much is something to learn via hands-on experience.) The top of the tree (“pleacher”) is then tipped over (“laid”) and tied to its neighbor using vines or rope—a technique known as “laying a hedge.” Obviously, some of the branches have to come off to make this happen—generally the side that will be down once the pleacher is laid. Various styles of weaving the remaining tree branches together results in the new growth (remember: the pleacher is still connected to its root system) either concentrating on one side of the fence (the barren side being presented to the browsing pressure in order to protect the resprouting tree) or being distributed on both. Weave patterns also vary by the livestock intending to be contained. Horses are best served by a higher, perhaps looser weave, cattle by a weave that is strong enough to withstand rubbing on and leaning against, and hogs by low and tight designs. Historically, hedgerows have been unpopular in goat territory, for reasons that are obvious to goat herders.

If you were going to do this at your own place, one method for starting involves cutting a “high coppice” (three or four feet; about a meter): a tree that will serve as a corner post, then begin laying the trees toward that post. Because leaning a laid tree uphill is significantly easier on the tree, folks with hedgerows that follow undulating landscapes (versus being on contour in a keyline plan) will want to take a few minutes to lay out a plan for starting posts at the crests (even if it’s not a corner) and for creating a few Xs at the base of the valleys. The work is slow and somewhat repetitive—ribbons to demarcate the pattern ahead of time will save “oops” moments later. Strength can be added to the finished hedgerow via upright stakes added at regular intervals. The first time you lay, you are out of luck, but



The height and porosity of wind barriers determine the degree of wind protection on the leeward side.

the branches that come back are often very straight, meaning future stakes might be growing right there in your hedgerow.

Laying a hedge happens on a 10-20 year cycle. Every four to seven years, it’s typical to trim back the branches a bit, usually aiming to angle the “faces” of the hedge to make the bottom wider than the top, especially on the north face. This allows sunlight to reach more of the plant and improves growth.

One common variant in the hedge-making pattern involves

No matter what you choose, over time, nature definitely adds species....

a mixture of laid and uncut (or “standard”) trees. Examples might include a black locust (*Robinia pseudoacacia*) hedgerow (flowers for tea, and the brash or branches make rot-resistant posts and tool handles, as well as hot-burning kindling and firewood) with occasional standard cherry trees. When planning for a hedgerow with standards, the shadow pattern of the standards needs to be taken into consideration. Dense shade, like Norway maples (*Acer platanoides*) create, will cause problems to hedgerow neighbors, especially those to the north, leading to fences with gaps, which may not hold up to determined livestock. Even without standards, the density of a hedgerow may fade without the trimming between lays. Getting the whole fence line to function as a single living unit can be tricky, especially if there are some wildly different species being grown together. Although I’m a great fan of biodiversity on a farm, planting many different tree species in a young hedgerow can make the achievement of a secure livestock fence much slower due to the differing growth patterns and rates. Well matched species can be found, but the need for careful planning is a complicating factor. No matter what you choose, over time, nature definitely adds species to the mix; these are simply incorporated into the lay and weave.



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A common design of an Irish hedge

Species selection

The exact species of tree used in hedgerows has varied by place and purpose. Osage orange (*Maclura pomifera*) trees have been popular in the US for their strength, resilience, and thorns. The buckthorns in use in England are a traditional source of the berries for sloe gin. Mulberry wood seems soft for a fence, but being tired of my treats being 30' (9 m) in the air, I'd like

to try coppicing or pollarding mulberries along a fence line. (Pollarding is like coppicing, but with a higher cut.) Mulberry brash makes tasty and nutritious fodder for sheep and goats, so pollarding would keep the tasty young branches above the browsing line. Unlike coppiced trees, which are cut only every decade or so, pollarded trees are cut at least every few years and sometimes every year. To keep this frequent injury from being a vector for disease, cuts are made to skillfully create a knot or "fist" of wood from which the new growth sprouts. This is not a hedgerow craft, per se, but related, and applicable to hedgerows if creative minds get the urge.

As much as I revel in the contemplation of which trees to include in which hedgerow and for what purpose, permaculturists will resonate with one final component of historic hedgerow systems. You're likely still thinking of the trees and shrubs in the hedgerow as the entirety of the hedgerow, but there is an earthwork component that also holds rich potential for contemporary landscapes.

I sometimes think of hedgerows as being built of a mixture of parts, any one of which can be included or excluded depending on local goals and constraints. One rocky barren swath of the UK doesn't even include plants in their hedgerow

Exploiting microclimates and edge Espalier in Montreuil

At the sharp intersection of inside and outside, there is a wall—sometimes, even without the inside, there is a wall. Across the globe, orchardists pushing their luck with the local climate have created their own vernacular language in which wall + flattened tree = fruit. Known most often by the French name "espalier," these wall+trees sometimes form little courtyards, and sometimes they just exploit an existing building face or terrace edge, borrowing the wind protection and solar heat boost. One of the more famous examples of espalier comes from the orchards of the old French village (formerly) outside of Paris: Montreuil. In the 18th century, a hive of plaster walls, each forming little courtyards, dominated as much as 75% of Montreuil's village land. Espaliered fruit trees were grown against the walls.

Between the heat gain and the wind protection from the walls, the Montreuillois were able to push the northern growing ranges of many varieties of fruit. Montreuil grew grapes, plums, pears, and cherries, but launched its fame as the center of Europe's "table-fruit world" with its peaches. Espaliered peach trees splayed out into flat fan shapes, sans central leader, along the east-facing walls, with long angled branches holding more and larger fruit than the previously popular short, horizontal branch patterns. Blank spaces of wall retained along the base and in the middle of each tree allowed for more even heat gain. Ripening as much as a month earlier, brushed free of fuzz and wrapped in tissue, Montreuil peaches sold for princely sums amongst the Parisienne elite. Δ



A peach tree espaliered against a plaster wall takes advantage of the courtyard microclimate.

tradition—just banks, thick, stone-clad walls, and ditches.

The bank

Prior to the advent of the railroads, the living portions of a hedgerow were planted atop the berm portion of a bank-and-swale unit that collectively captured water, increased the height of the hedgerow, and created a unique habitat akin to what it currently called a “beetle bank.” Banks were discouraged after the railroads found it annoying to cut across the landscape bank by bank, and planting “on the flat” became more common.

The ditch

The ditch collected water and provided the soil for the bank. In Ireland, the slope between the ditch and the bank was often precipitously steep and faced with stones, through which a thorny shrub grew. This type of hedgerow was collectively known as a “cornditch.” The goal was to keep the deer (“the King’s deer,” meaning “shoot this deer and get a free visit from the local sheriff”) out of the field where the corn (meaning “grain,” and not maize) grew. The steep and thorny face discouraged deer, and the slope up and out made it easier to chase the deer out. Later this evolved into a “ha-ha” (a trench up to eight feet or two and a half meters deep alongside a wall), but remains in use in very close to its original profile as a way to thwart deer and other animals from crossing the interstates while not trapping the unlucky souls that do get onto the highway.

The verge

The un-ditched side of the berm was known as a verge, and nowadays would serve as a “pollinator garden” or beneficial habitat zone, depending on which side of the hedgerow the grazing livestock can access.

Though hedgerows arose as a field edge and property boundary delineation technique, these earth-worked elements can morph to fit a keyline design, which makes it a logical step to know where to locate the plants of the hedgerow.

The quickset hedge

Historically, the plants were not the hedgerow—they were just the “quick” (living) component. The plants are placed in relation to these earth-worked components, and in relation to each other. Just as a keyline design places the trees on or just over the crest of a berm, so too does an historic hedgerow place the trees along the crest of the bank, although much closer together. Trees planted closely enough can thwart each other’s ability to gain girth. A 20-year-old trunk in a row of trees ten inches (25 cm) on center will be significantly smaller than the same tree growing in an open meadow for 20 years.

Whatever form they take, from large, dense windbreaks to tightly laid living fences, a well done hedgerow is a phenomenal boon to wildlife. Songbirds often nest within the hedge itself, protected by the thick branching. Owls course above long



Inside the hedgerow, soil remains thawed under leaf litter, providing a winter food source for insectivorous birds and other animals.

hedgerow lines, often preferring a mile or more of minimally interrupted hedgerow for hunting, especially if suitable standard trees provide perches for observation. The bank just under the shrubs is often late to freeze and early to thaw, attracting robins and other worm- and beetle-eating birds. Vines in the hedgerow are useful at the time of laying for tying the trees to each other. The verge beside the quickset hedge can be rife with forbs and beneficial insects. There will be a zone of calmer, warmer air around a hedgerow.

Cultural creations built of the brash removed from the hedgerow still dominate many household aesthetics in the form of spindle-backed chairs and spindle-style bannisters and posts. This symbiosis between ecology and culture, while imperfect, suggests a path toward our own permanent (agri)culture goals. Δ

Molly Phemister is a writer, farmer, ecologist, and graphic artist with degrees in landscape architecture, art, and education. Her blog is eatcology.com.

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Recollections & Lessons from a Permaculture Pioneer

Life on the Edge

Rick Valley

If you're not living on the edge you're taking up too much space.—90s bumper sticker

Humans are an edge species.—Chairman Bill

Here's to marginal living at its finest!—a frequent toast, with homebrew, Orcas Island, mid-70s

FOR ME, THE BEST PART OF GROWING UP was the time from five to twelve years old, when we lived at the edge of a metastasizing city, in an early 50s suburb. If I cut through a couple of backyards, I could be in untended land, feral orchards, wild vineyards, woodland with still-tended sugar maples, and streams that flowed naturally. I could walk and run almost to the shore of Lake Ontario before crossing a road.

Over the years, I watched as Andropogon grass encroached on mosses, only to be topped by infiltrating blackberries, which in turn were shaded by staghorn sumac suckers, which were succeeded by bitter cherry, pin oak, and sassafras. I learned to hunt the meadow edges for butterflies, scour the forest edges for mushrooms, and climb vines at the sunny forest edge for grapes. When the suburban edge swept past us, it took me years to understand the luck of having experienced that edge between feral farms abandoned due to Prohibition killing the wine business (the lake edge had a good climate for fruit production) and the war, which supplied jobs to those who left the farms.

Orcas Island



In drylands and other harsh environments, plants often grow in spherical forms that reduce edge and minimize transpiration.

Starting with a college job on Orcas Island, I got to know the shores of the Salish Sea* and its kelp beds. This was just before anti-bottom-fouling paints and over-fishing obliterated the abundance of the inter-tidal zone. To those who are unfamiliar with Orcas, it's in the San Juan Islands between Vancouver Island and North America at the extreme upper left corner of the lower 48 states of the US. At 52 mi² (13,500 ha), Orcas is about the size as Maui, but is nearly severed by several "sounds" or fjords, and hosts Mt. Constitution, the highest point between

You can say that there were strong feedback loops in place to localize long before there was a local food movement.

Vancouver Island, the North Cascades of Washington, the British Columbian Coastal Ranges, and the Olympic Peninsula. Precipitation on the island varies from 40-some inches (100 cm) on the NE slopes of Mt. Constitution to 18" (45 cm) a year on the SW-facing rocks near where we lived. Geology was equally complex, and so vegetation ranged from typical Pacific North West rainforest with cedar and alder groves, to cacti and dwarf juniper within a half-day's walk. As with the Lake Ontario shore, there had been a thriving orchard business in the past, and consequently lots of fruit trees to forage. I returned often. After I finished school, I joined a restaurant venture started by the teacher I had formerly assisted, and a business partner. In retrospect, it was my first whole-systems design project. This was ten years or so before I heard of permaculture, and before the Bullock brothers found their land on the other side of Orcas from where we had the restaurant. On the east side of the island, we had a 50 minute sports-car rally drive to the ferry landing, so that a trip to North America for supplies becomes a full day's adventure. And of course the closest legal source for licensed seafood for restaurant use was a market on the mainland near I-5—not at the ferry landing. We had a registered clam beach a stone's throw from our building and salmon jumping in the

saltchuck closer than that. The biggest asparagus plant I've ever seen was on that beach near the restaurant, mulched with seaweed every year by winter storms roaring up the reach between islands. You can say that there were strong feedback loops in place to localize long before there was a local food movement. Luckily, we could see any law enforcement coming long before they could be at our door. We were on a number of edges: ecological, cultural, and legal, and we thrived. By working overtime seasonally, we spent half the year unemployed and became seasonal migrants.

How I learned to stop worrying and love the edge

My friends extolled the advantages of travel over trying to find winter work in the US. I visited the Caribbean and its coral reefs, (Talk about complex edge!) before the market for seined shrimp and other over-fishing hammered the reefs. I followed the eastern edge of the Pacific Ring of Fire after I had encountered the edge of the continent; following the coast south drew me on perhaps as it had the first Americans. Living with a volcano or two looming above became normal, whether Mt. Hood, Popocatepetl, or Cotopaxi. The volcanoes are the melting edge of the Pacific ocean floor being forced under the floating continental masses. I lived for awhile on the equator

...[I] learned that it wasn't just the Andes that had unique agricultural species and varieties.

at an elevation that had a climate like the Salish Sea, where oxygen is scarce enough that it takes genetic adaptation for humans to survive birthing children. A pure Spanish culture was not possible, because without modern medicine, European women died in childbirth. This created a massive cultural edge, with greater than usual survival of native languages and crops. I ate quinoa and wildy colored potatoes as staples, and used coca and *mate* more than coffee or tea. When my money ran out at last I was stranded on the southern edge of the US, a more recently created cultural edge. While in Tucson gathering the money to head back north, I slept in both suburban homes and colonial adobe houses and used Spanglish at will while staying with a friend who was getting his PhD in Bilingual Education. While there, I worked for an ethnobotanist who had taught Gary Nabhan, and learned that it wasn't just the Andes that had unique agricultural species and varieties.

My time out of the US taught me I was indeed on the top of the economic pyramid and that 'los de abajo' (the poor,



This rangeland landscape with extensive beaver ponds in the riparian meadow contrasts markedly with what would be seen here without beaver—an overgrazed meadow, with a down-cutting gully and only seasonal water. Beaver are specialists at edge manipulation.

the underclasses, the oppressed) had more than enough skills, wisdom, and kindness to share. I had come back to the US and was lost; there was nothing to aspire to. My mother helped me realize that I should look into horticulture and ethnobotany for my future. When I returned to the Northwest, I wrote to Richard Schultes at Harvard, but he told me he was retiring soon and had just accepted his last grad students; I talked with anthropologist Peter French at Reed, and he told me I could surely get another degree but might never find a job. On the other hand, I could easily just do it. This approach appealed to me, as I was working in solar construction, looking to synthesize all of this into some sort of path, when I saw a poster about a "Permaculture Conference" at an old hot springs resort turned counter culture eco-educational center—I'm still working with many of the people I met there in 1981.

I came away from that event determined to start a bamboo nursery. I started growing bamboo, and saw how it was an edge plant, and could move to get more sun, water, and better soil. I watched which birds liked which sort of location in the bamboo to build their nests: bush tits hang their nests on the south side to catch the sun's warmth. In this case, the bird is using a plant it hasn't used before, because it meets the bird's nesting needs: an unclimbable sunny edge not too high above the ground.

There's nothing like a PDC to focus thought

I thought a permaculture design course was for drawing lines on paper. I was more interested in planting and building, while promoting the culture and horticulture of bamboo (another whole-system design project involving the invisible structure of the Pacific Northwest Chapter of the American Bamboo Society). I thought I was learning enough about permaculture from reading the *Activist*. Then, IPC II was scheduled at Evergreen State College in Olympia, by Sego Jackson and the folks who had started the *Permaculture Activist* and the Permaculture Institute of North America (PINA). I was offered a discount if I taught a session at the conference. There's

nothing like formulating a concise presentation on starting a permaculture nursery to help crystallize your thinking. And, at the conference, I heard Bill tell the assembly he was currently working on a chapter on “Pattern Understanding” for the *Designer’s Manual*, and he would be doing a session on pattern understanding at precisely the time I was doing my session on starting a nursery. I wanted to hear about this “pattern understanding” stuff, so I decided I’d better sign up for that PDC after the conference.

I had good preparation for the PDC, it was the right time, and Mollison amazed me with the breadth of coverage. My understanding leapt up an order of magnitude. One aspect that was appealing was seeing clearly how working with edge cut both ways—sometimes you limit edge; sometimes you increase it. Trees that multiply edge to increase photosynthesis and fog drip will, as a forest on an island in the Salish Sea, assume the boundary layer shape when dealing with the strong winds coming in from the open ocean. On a winter day, you don’t

When minimizing edge is a good idea in a garden...

Rick Valley

CAN YOU BELIEVE I HAVE, more than once, toured a ‘keyhole garden’ that was laid out in a LAWN of spreading, invading grasses? Around a garden, there usually are less than optimal conditions: weeds, herbivores, and pests would all like to share in the bounty, so it’s important to keep your boundaries firm. Bill suggested that you could indeed find plants that would be good barriers to rhizomatous grasses. For Bill’s garden in the subtropics the grass was Kikuyu grass from Kenya; for me, it was quackgrass. Mollison suggested broad-leaved monocots like *Hosta*, daylilies, and comfrey. So I started experimenting. After almost 30 years, I can say there aren’t any miracle plants, but the idea does help. Just sticking comfrey root cuttings into a patch of quack isn’t going to do much: you’ll need to pamper your new barrier plants to get them established and thriving before they will stop grasses. So, pick the best barrier plants you can. I find dwarf comfrey (*Symphytum ibericum* is one of several types) may not be as good at bringing up deep nutrients as regular comfrey, but for me they are nice because they aren’t as immortal and don’t come up later in unexpected places. (That mystery with comfrey was solved when in transplanting a bamboo one time, I opened the tunnels of a vole family, exposing a bedroom chamber, a latrine, and a larder stocked with comfrey root cut to length and stacked like firewood, with some logs already sprouting. Horrors!) Besides repelling and shading out grasses, the additional super power of dwarf comfrey is how attractive to bumblebees its flowers are.

Day lilies (*Hemerocallis*) are common in gardens, but not many people use them for food, although they are important ingredients in Chinese cuisines (the ‘dried golden needles’ in mu shu are day lily blossoms that have had their day. How cool is THAT? You can have your flower for a day and eat it AFTER it wilts, and they are EASY to pick and dry, and then you have vitamin A for the winter!) Most of the new daylily hybrids don’t taste good—flower flavor has been bred OUT, in the quest for tougher, longer lasting flowers, and in some areas the original species, *Hemerocallis flava*, can be invasive, but by searching for old cultivated varieties, you may find some good ones for eating. The best

tasting one I have found was from the 20s, which I purchased from a nurseryman in his 90s who had bred it himself. My theory is that higher vitamin A content correlates with orange color. This tasty one has a brief blooming season, but imagine if really good flavor, all-season bloom, and flower stalks long enough to make flower picking easy were combined in one plant....

Hostas are similar—edible shoots and flowers are known, but the splashy modern hybrids weren’t created with this in mind. Here is a growing edge of opportunity for permaculture nurseries: finding the best garden edge plants for your region and propagating them in useful quantities. One or two do not a barrier make.

Extrapolating from this line of experimentation, you can imagine combining these edge plants as an understory with hedge species that yield fruit and nesting habitat for birds, and beneficial insect habitat plants too. For example, umbel family plants like lovage, lomatiums, cow parsnip/pushki, earth chestnut (*Bunium bulbocastaneum*), and many others are edible and/or medicinal as well as invaluable for supporting beneficial fly, bee, and wasp species. Many of them are pretty good grass barrier plants too. Currently I’m finding that thickly planted parsnip can suppress quack grass. For the woody nitrogen-fixing shrub with fruit function, I’m fortunate that autumn olive does not spread very quickly at all in Oregon. My bees like the nectar, and my first attempt at making a meringue pie with the fruit was a success. For those of you who live in states where that plant is illegal, my condolences. You might find another member of the family that would be amenable.

The bottom line for me: I find that creating a barrier of perennial (and even including woody) vegetation can, if planned carefully for a place thru observation, comparison, and experimentation can reduce weeding, support garden allies, and provide additional harvests. Good planning will also help the microclimate of the garden with windbreak functions without creating frost pockets.

So—with a keyhole pattern inside the garden we have maximized reachable edge within, while minimizing edge on the perimeter, to minimize intrusions by grass or deer.

△

camp on the beach—you camp in the forest! In a compost pile we minimize exterior edge to create a warm, moist microclimate. We increase interior edge with chopping and layering to maximize growth opportunities for the fungi and bacteria.

Mollison told us that a successful ecovillage is one that occupies a number of edges, and hence can exploit multiple ecologies and economies. I would say this is an idea that is not followed consciously enough, not lodged firmly enough in the permaCulture. Currently, in Oregon the term ‘ecovillage’ is applied to virtually anything from a group household to cohousing, to a rural hamlet, but the primary unifying feature has been that the economic geography is left to random chance until it is evident to all that they’ll starve if they can’t work out ways to optimize economic activity. It’s not too hard to apply ecological and geographical patterns to help sort out what opportunities are available, to look forward to what edges can be exploited.

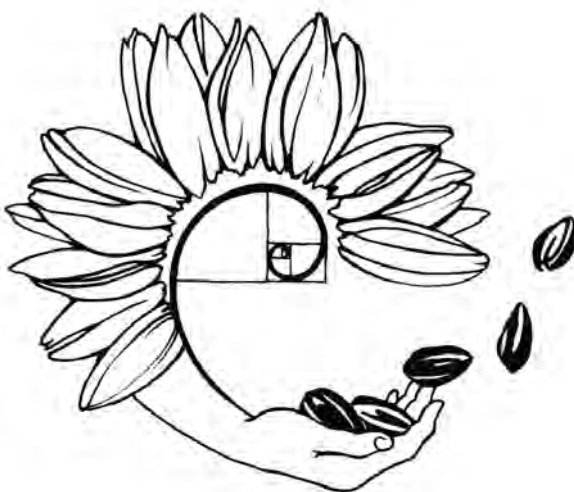
Crenellated ponds and yet more edges

Coming out of my PDC, I grabbed the first chance I could to build some earthworks. My first clients had 20 acres with a seasonal stream that entered the property on one side where two minor gullies joined together and then cut steeply across the land at a slight diagonal to separate the NW sloping side of the farm from the SE facing side. It seemed like a good spot for a pond, especially since Bill told us “a dam makes a good bridge,” and that bridge would make all-season access to the SE slope possible. Excavating close up to the property line, it somehow didn’t make sense to cut as much soil away as possible between the two little gullies, and we ended up with a waterline almost like a “B” with the straight line of the B being the dam, and the inflow being in the two lobes of the B. I left a tree on that little promontory between the lobes of the pond, too. Not long after, while working on the spillway, the breeze came up from the southwest. I watched as a dust devil spun above the pond just downwind of that little tree—a captive vortex on the edge—an hour of ephemeral magic dancing in the lower lobe of the B, in the crenellation formed by the ridge and tree between the lobes

of the gullies. An edgy lesson in following intuition: the things you do will cause unforeseen things to happen. Pay attention, you’re going to have many mysteries to learn from.

I study what beaver do; they take a simple stream flow and ‘complexify’ it. They block the flow with earth and branches, some of which root and grow, to both stabilize the dam with roots and feed the engineers and elk which cross the valley on the firm level dam. The beaver pond is deep and cool for big fish near the dam, but shallow, warm, and marshy for much of the upstream section—ideal for young fish. The upstream area is threaded with channels the beaver maintain for foraging the upper edges where they coppice trees. A mono-habitat becomes

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In compost piles, edge is usually minimized to create sheltered, high humidity conditions for optimal microorganism habitat. In this case, a humanure compost will be planted and harvested for years before being disturbed.

a complex mosaic of vastly different habitats with complex edges no matter whether your viewpoint is from above or in cross-section. Trees the beaver don't like to eat may die from flooding or even get girdled by beaver (why?). These become roosts for ospreys to hunt from and nests for woodpeckers and their following species further sharing and multiplying the wealth.

Now I look at orders of magnitude, at pixel size, whether the pixel is a corn plant or a canopy tree, and keep the macro-patterns of global climate and geology in mind, and play with edge as appropriate. I keep in mind that it's not the elements, rather the connections between the elements, that are most important.

Currently, I'm working to bring a half-acre (0.2 ha) into intensive management while working in many far-flung places. To make progress at home, I must optimize my time. I am living in what was once an orchard and later an auto junkyard, before being given a 70s landscape with rollout sod and irrigation system. The back reverted to blackberry thicket and garter snakes. My pixels are standard and dwarf fruit trees and garden beds/rolling compost piles. The edges are shaped by the rain winds out of the SW, the frost pockets created by the neighbor's fences, and the heat off asphalt driveways. The Oregon state law-guided urban growth boundary is a few blocks away, but it's proposed to shift out toward the airport soon. I'm on a cul de sac walled in by walled, gated developments, a funky remnant of an early intrusion on low-value farmland. The closest park is a former gravel pit area, created to build the freeway, and 'ecologically restored' after the steep, minimal edges of the flooded pits drowned three pairs of boys in three incidents. Now there are mild edges and access ramps for emergency boats and native plantings, as well as the threatened turtles the boys were after. I won't be here forever, not even for very long. How can I optimize the edges for those who follow? Δ

Rick has been practicing permaculture, forest gardening, and sustainable forestry in the foothills of the Cascades for more than 17 years and carries the expertise of a master nurseryman from one of his previous incarnations as the owner of a nursery business. He took his first PDC with Bill Mollison in 1986 and began teaching with the first Permaculture Design Certification courses in Canada offered at Linnea Farm, Cortes Island, BC. Rick taught regularly with the Linnea Farm Community for ten years, co-taught the first permaculture design courses in Canada, Oregon, and Belize, and introduced permaculture to the Lost Valley Ecovillage & Educational Center in Dexter, OR, where he began teaching in 1990. Rick moved from Portland, OR to the Southern Willamette Valley in 1997, and has been the primary land steward and lead permaculture instructor at Lost Valley since 2004. Rick holds a BA in anthropology from Antioch College, an MA in teaching from Reed College, and a diploma in Permaculture Design in teaching and site implementation from the Permaculture Institute of Australia.

* The Salish Sea comprises the tidal waters between the Olympic peninsula, Vancouver Island, and mainland North America. Canadians apparently got tired of hearing the Georgia Strait and other bodies of water wrongly called Puget Sound by Americans, and came up with using the name of the predominant native American language and cultural family inhabiting the shores to serve as an inclusive name for this distinctive region. Puget Sound is a sound which stretches from Seattle to Olympia, WA, and is thus a corner of the Salish Sea, as are the Hood Canal west of Puget Sound, and so on up to the narrows and Desolation Sound in British Columbia. The San Juan Islands, which include Orcas, lie between the Haro and Rosario Straits, which are also parts of the Salish Sea. Talk about edge! Extreme glacial topography on all sides!



Driveway excavation abandoned due to landslides triggered by the development—here, minimal edge interventions “slow, spread, and sink” water to create restorative ecological opportunities.

Beyond Sidewalks

Hellstrip Polycultures

Frank Raymond Cetera

WHEN I WAS GROWING UP in a rural former coal-mining village in southwest Pennsylvania (four streets and population of 220 in 2010), there were no strips between the road and the sidewalk. In fact, there were no sidewalks, except for one or two.

The land our home was built on sloped right down to the roadway. Was there technically anything stopping us from planting right up to the roadway? I would guess not because I remember lots of nearby locations where trees were growing right alongside the road edges. The Township came around on occasion and cut back anything intruding into the travel right-of-way.

When I settled in Syracuse back in the fall of 2005, sidewalks were no longer a new thing to me. I'd lived in the urban cores of small towns like Latrobe, Greensburg, and Slippery Rock. At all those locations, I had sidewalks outside my apartments. But either because there wasn't a planting strip (road-sidewalk-lot) or because I was only temporarily located at the site, I never was concerned about the use of space commonly known as a planting strip (road-strip-sidewalk-lot), technically often called the right-of-way, and colloquially popularized as a "hellstrip" due to the sometimes challenging difficulty of developing it into a thriving space.

...the garden would provide education on different cultures' food traditions...

Opportunity arises

In 2012, as my permacultural progressions became increasingly diverse in Syracuse (currently a one-fifth-acre forest garden, a single lot kitchen garden, a backyard demonstration layout at the Syracuse Real Food Coop, and a corner lot community garden growing annuals for the immediate neighbors with mini perennial nursery attached), we had an opportunity to apply for a grant from DISHES (Dining In, Support Happenings, Enliven Syracuse). When we couldn't find a suitable partner site similar to our relationship with the Rahma Health Clinic (*PcA* #91, Feb. 2014), we settled on an often unused, often misunderstood, and potentially controversial



Site preparation: weeds are slashed, and cardboard mulch laid in place.

edge: the Oswego St. right-of-way, at the corner of the mixed-use lot at 790 West Fayette St. in the Near Westside just outside Downtown Syracuse.

DISHES "is an annual event that brings together the Syracuse community to share a delicious locally sourced meal, listen to one another's suggestions for community-based innovative projects, and vote on the idea that has the most potential." A micro-grant is then awarded to the participant's favorite project, with the award money coming from ticket and donation sales. In our case, we were part of a summer-long traveling DISHES "On The Road" session, where the projects were displayed at various events and neighborhood festivals, and cookies were given away for \$1 donation votes. By the end of the summer, we had raised \$500 to grow food on the grassy edge between concrete and pavement.

Action ensues

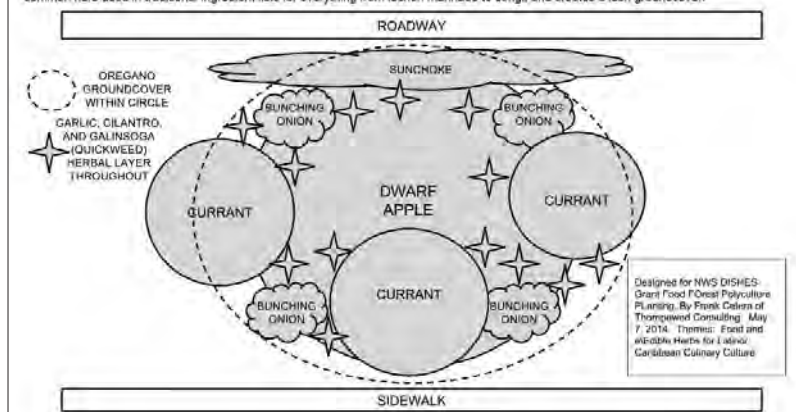
Our process thereafter was neither simple nor quick. First, the vision for this planting was to use plants that are native to the homelands of the people in the neighborhood. In this way, the garden would provide education on different cultures' food traditions and heritages, while supplying ingredients for ethnic recipes.

I proceeded to design a survey to distribute in the neighborhood. The survey questions were based upon my permaculture design experience, and the types of information I would eventually need to create this polyculture layout. The survey introduction read as follows:

"The Alchemical Nursery is designing a permaculture forest garden based on polyculture principles (a grouping of plants that

LATIN AMERICAN FRUIT AND CONDIMENT HELLSTRIP POLYCULTURE

Species for this polyculture have been selected that will compliment, and provide seasoning and flavoring, for traditional Latino and Caribbean dishes such as pastelles, ajiao, congo, and others. Since fruit is often left out of Criollo meals, except for plantain, apple and currant are included here as the overstory and understory to provide a source of fruit for creative inclusion as pastelles filling or as part of fruit salad, topping or fruit salsa for rice and beans. The sunchoke create a screen between the roadway and planting to reduce potential movement onto the roadway during harvesting, while providing an edible tuber which is similar in many ways to jicama, another commonly used Caribbean tuber (and showy yellow flowers to bring some color to the urban landscape). Bunching onion, garlic and cilantro are common ingredients in many dishes, and will grow alongside guascas, or galinsoga/quickweed, the main herb flavoring of the soup ajiao. Oregano is another common herb used in traditional ingredient lists for everything from lechon marinated to congo, and creates a lush groundcover.



work together for mutual benefit) on the corner of West Fayette and Oswego Streets in the Near Westside. Thanks to a DISHES grant, the food produced on these polycultures will be available to anyone to freely harvest, and will demonstrate concepts such as natural landscaping, biodiversity, water conservation, food production, ecological design, and permaculture. We ask you to assist us in determining the types of fruits and vegetables for the designs, which will end up planted on the site, by answering the following survey. Thank you for your time.”

The survey questions read:

THEME: LOCATION

What country are you originally from?

Do you identify with a particular region, city, or district of that country? If so, what is its name?

THEME: FOOD DESCRIPTION

Describe the cuisine/food of your culture. Is it spicy or mild—what spices are used? What types of vegetables and fruits are common? Is there a name for this type of cuisine?

THEME: PRODUCTS DESIRED

Rank from 1 (most important) to 7 (least important) what you would like available in your neighborhood? Food? Fiber? Fuel? Fertilizer? Culinary herbs? Medicinal herbs? Fun/aesthetics/beauty?

THEME: SPECIALTY DISHES

Name two favorite dishes or foods from your culture.

The surveys, both in English and in Spanish, were distributed at seven locations in the neighborhood: La Liga (Spanish Action League), La Casita, Nojaim's Market Neighborhood Navigator desk, Omi's restaurant, Westside Residents Coalition and Near West Side Initiative meetings, Westside Learning Center, Habitat for Humanity's ReStore, and Tomorrow's Neighborhoods Today

meetings; as well as promoted through online outreach including Facebook, email, and list-servs.

The Near West Side (NWS) is an edge community in and of itself, just at a larger scale than the right-of-way hellstrip polyculture location. Geographically on the edge of the newly booming downtown of Syracuse, on the edge of pulling itself out of decades of socio-economic struggle, and on the edge of many cultural intersections as indicated by the responses to the first survey question identifying countries of origin and identity—Puerto Rico, Belize, Cuba, New York City, San Sebastian, Belize City, Aguada, Aguadillo, Monterrey, the Northeast US, and Dandriga (formerly Stancreek, in Belize).

Respondents, not surprisingly, ranked food as the number one product desired. Perhaps a bit surprisingly, medicinal uses ranked second, followed by culinary, fun, fiber, fuel, and fertilizer. Food description responses contained many common items such as tomatoes, cilantro, lettuce, corn, chili peppers, apples, bananas, potatoes, cucumbers, various greens, garlic, squash, and beans; along with some less common items of interest such as pigeon peas, cassava, and jicama.

Many code enforcement issues are addressed only after a neighbor's complaint...

Tee it high and let it grow!

When I first moved into the neighborhood, not yet living there, but renovating a house purchased from the city for \$1, I decided to let my front lawn (hidden behind a hedge) and right-of-way strip both grow out and naturalize for a couple of reasons. One, I didn't want the mowing maintenance, and two, I wanted to eventually create an edible yield from the space. First, I would learn what is growing naturally at the site through observation—and I came up with a total of 13 useful species—plantain, goosefoot, dandelion, rose of sharon (flowers), cleavers, Japanese knotweed, clover, wild garlic, burdock, mugwort, dead nettle, stinging nettle, and purslane. Unfortunately, the City of Syracuse Code Enforcement officer didn't understand, and when I returned after a long weekend, my lawn had been mowed for me, and a fine for the service had been properly delivered.

I eventually got the code violation rescinded. As a thank you, I offered the Codes department free registration in the nine-week Community Training in Ecological Design course that the Alchemical Nursery was teaching in partnership with the Finger Lakes Permaculture Institute that coming winter in Syracuse. Alas, no one responded to my offer.

Back to the main feature. There are a few issues at play here. First, it appears that code inspectors create a hard edge between themselves and the properties they inspect. Many code enforcement issues are addressed only after a neighbor's

The edge of the road is an interesting place for many people.

complaint—in other words, they aren't enforced unless a neighbor files an actual complaint or report. This is no doubt because the Codes office does not have enough resources to patrol all of the properties in the city for every single violation. Are similar landscapes reported at different rates and dealt with in different ways in a more well-to-do neighborhood versus a struggling one?

I also have had two friends in my neighborhood get code violations for growing wildflowers in their right-of-way strips. Do I believe for one second that these code violations would have been issued if the properties were located in the university neighborhood versus the urban core black and Latino dominated neighborhood? This is one form of bias that likely exists in our racial and class discriminatory society.

But, does discrimination follow form, through the function of profiling and the need for increased property controls in such a neighborhood? One might argue that such a recovering community needs to be kept tightly reined in, when it comes to property maintenance so as to not attract drug dealing activity, or a general atmosphere of a lack of care that could permeate from street to street if left unchecked. And I couldn't fully disagree, which is why our demonstration project, located in the same urban core community, but along a busy commuter street on the edge of the neighborhood, is meant to showcase the potential of planting such spaces in a safe and productive way, and

to change perceptions of the urban ag culture as one that is integrated within residential and public landscapes, and not separated on individual lots or as individual ecosystems such as the current popular community gardening paradigm.

Sitting on the curb but never on the fence

The edge of the road is an interesting place for many people. They sit on the stoops and stand on the curbs. They have opinions. They watch their neighbors and the strangers who walk down their streets. They are pessimistic to your success due to the dang kids. It is necessary to take certain regulations into account such as sight lines for vehicles on corners. And you can't hide what you're doing like you can with the small chicken coop in your backyard.

And those challenges are reflected in the alteration and slow progress of our design:

"Species for this polyculture have been selected that will compliment, and provide seasoning and flavoring, for traditional Latino and Caribbean dishes such as *pasteles*, *ajiaco*, *congrí*, and others. Since fruit is often left out of Criollo meals, except for plantain, apple and currant are included here as the overstory and understory to provide a source of fruit for creative inclusion as *pasteles* filling or as part of fruit salad topping or fruit salsa for rice and beans. The sunchoke creates a screen between the roadway and planting to reduce potential movement onto the roadway during harvesting, while providing an edible tuber

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which is similar in many ways to jicama, another commonly used Caribbean tuber (and showy yellow flowers to bring some color to the urban landscape). Bunching onion, garlic, and cilantro are common ingredients in many dishes, and will grow alongside *guascas*, or *galinsoga*/quickweed, the main herb flavoring of the soup *ajiaco*. Oregano is a common herb used in traditional ingredient lists for everything from *lechon* marinade to *conгри*, and creates lush groundcover.”

The original idea to plant sunchokes as a replacement tuber for *jicama* has been changed due to their habit of creating an impenetrable visual screen. Instead, we will try *oca* and consider it an experiment in climate change and adaptation. And our goal of propagating *galinsoga* have not yet been fulfilled as these seeds are unavailable, meaning we will have to be diligent in locating and transplanting samples from elsewhere in our city. Because they are commonly seen as a weed here in upstate New York, we will have to be diligent in education opportunities and sharing. Lastly, vandalism does sometimes happen, and we had a five-foot tall apple tree snapped in half, as well as one crushed by snow plowing, so it may be an extra year or two

Ultimately, our success will also engage the edge between social justice movements.

before fruiting, and before the system can be viewed as a whole instead of just a bunch of plants and weeds along the street. We’ve also been criticized for leaving a half-finished project from 2014-2015. Of course, the criticism rarely comes with volunteering to help us with the person-power needed to finish the implementation in the original planned time frame.

And so it seems to be happening. One neighbor’s son was out in front of our houses, and very curious about what I had planted—things he didn’t know the names of and hadn’t tasted before. So he, more courageous than his conservative father in these matters of strange foods, tried everything I handed him—lemon balm, chives, sage, garlic mustard, plantain, and wood sorrel. His father, meanwhile, is becoming much more accepting and less curmudgeonly of the sprawling planted right-of-way, as he is particularly interested in getting a taste of the horseradish root he craves, which is thriving there currently too.

Ultimately, our success will also engage the edge between social justice movements. Both the 2014 and 2015 spring work days at the right-of-way strip have been well populated with about 15 people each, well beyond what we might actually expect if we tried to attract volunteers for a simple work party through the Alchemical Nursery itself. Instead, we organized



Distributing coarse municipal compost and mulch over cardboard creates soil microenvironment to convert hell into home for soil microbes and earthworms.

the work party to coincide with the end of the March Against Monsanto Rally and Parade each year. These movements share a very fluid edge, but an edge nevertheless—an edge of participation and membership, in which one might not feel comfortable going to the other’s event without a few friends along. People are less reluctant after all to be the pioneer species all by their lonesome when encountering a new group or project landscape. But once that edge, either culturally or physically, is breached—look out world, here we come! △

Frank Raymond Cetera is Co-founder of The Alchemical Nursery Project, Inc, a 501(c)3 nonprofit dedicated to eco-social regenerative landscapes and lifestyles, and Owner/Operator of Thornpawed Ecological Consulting (member of the Northeast Permaculture Design Business Guild). Frank applies his personal mantra of “lion-hearted and thorn-pawed” to community across the board including as Board President of Cooperative Federal Credit Union, Volunteer Coordinator and Treasurer of the Onondaga County Green Party, and development of the Bitternut Housing Collective. He believes that lifestyle politics should exist alongside electoral politics and does not enjoy debating about the juxtaposition. In fact, he is currently a Green Party candidate for Syracuse City Council. Follow his campaign (and donate, if you’re so inclined) at votecetera-syracusegreens.nationbuilder.com/.

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From Pioneer Species to Climax Ecosystem

Permaculture in Succession

Alan Booker

BILL MOLLISON IS RATHER FAMOUSLY QUOTED as saying that “though the problems of the world are increasingly complex, the solutions remain embarrassingly simple.”

This quote has occasionally been pulled out to support the assertion that permaculture can easily solve all the world's problems if we would just get busy and do it. But a little reflection suggests this might be over-simplifying what Bill was trying to say. More likely, he was pointing out that the solutions to the purely physical challenges of regenerating ecosystems and meeting human needs are relatively simple given a proper design approach, and that the real challenges lie elsewhere.

Permaculture has indeed established an excellent track record of creating effective design solutions across a wide variety of bioregions. The larger challenge has always been for it to overcome the resistance of the existing cultural narratives that control so much of the access to land and resources. It doesn't matter how great of a design system you have if it can't be implemented because people's stories won't allow it to happen.

The question I want to consider here is this: How can permaculture as a design system find a way to become more widely recognized as a source of important solutions, instead of being relegated to merely dancing on the edges of mainstream culture?



The PDC was a brilliant initial propagation strategy for permaculture, allowing it to spread its seed widely and pioneer a wide variety of disturbed edges. Photo by Tyler Pierce.

An engineering perspective

I came to permaculture via engineering. Although I've always been interested in local food production, it was my experience working with the large-scale systems produced by modern engineering practices that brought me to an appreciation of exactly the kind of problems that our current design approaches are creating, and prompted me to start looking for practical solutions.

After finishing a degree in electrical engineering, I moved into the telecommunications and computer-systems industry, where I now have 25 years of experience working with systems design and systems architecture. Around 2002, I began to be

...permaculture tends to have a much longer design horizon....

worried by the destruction I was seeing created by our current approach and began to study permaculture as a design system that could provide a workable alternative. I soon concluded that permaculture was different than the engineering design methods I was taught in college in several important ways.

First of all, permaculture design starts from a whole-systems viewpoint with a goal of creating holistic and resilient designs, where most modern engineering is deconstructionist and concerned mainly with efficiency, with different designers focused on individual elements in the system instead of thinking carefully about how those elements interact. Permaculture seeks to create regenerative systems with richly interconnected and highly resilient components, whereas modern engineering often creates highly efficient components connected together into impoverished and degenerative ecosystems. The result is that permaculture in general is sensitive to ecological limits, whereas modern engineering practice often fails to consider limits or simply assumes that they can be designed around indefinitely.

Secondly, permaculture tends to have a much longer design horizon, thinking about the long-term effects of the systems it creates. This long-range view relates to its explicit design ethics that are concerned with the well-being of natural ecosystems and of the people they support, while much of modern engineering practice is focused on generating short-term profit.

The Adaptive Cycle of Succession

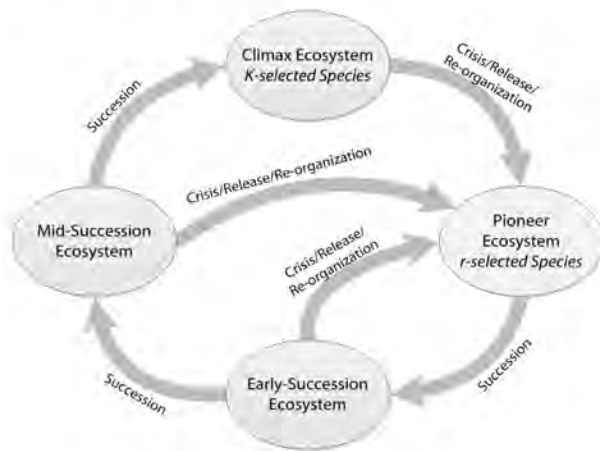


Figure 1

Thirdly, and perhaps most importantly, permaculture brings with it a regenerative narrative of how people can inhabit the planet. It sees humans as part of the natural system instead of separate, as rightly cooperating with nature instead of dominating it, while shifting from a narrative of extraction and consumption to a narrative of nurturing and working with natural systems. From the perspective of a professional designer, this shift in mindset is profound.

Seed, soil, water, and climate

As I thought about how permaculture has spread thus far, and how it might spread more widely in the future, I began to think about the problem in terms of how competition and succession occur in natural ecosystems. Although the analogy is not perfect, it offers a framework and vocabulary for discussing some of the important dynamics of how thought patterns and design systems take root and spread.

When looked at this way, competing thought patterns and design systems can be seen as various species of seeds that all compete for space and resources in the human ecosystem. When their germination conditions are met, these seeds take root and grow.

Using this analogy, the soil represents access to the land itself. Systems of land ownership and land access determine which seeds can grow. If other species have already colonized an area and locked up the ground and access to sunlight, then new species will have difficulty getting established or will be relegated to an unoccupied niche.

If soil represents access to land, then water represents access to the flow of resources—raw materials and labor—needed to allow the seeds of a new design system to grow. Just as with soil, much of the available flow of resources has been diverted to feed existing systems. The only major advantage here is that existing systems are often so inefficient that their waste streams contain major resource flows in their own right, allowing for

clever pioneer species to gain a foothold simply by exploiting their poor design.

The last part of the analogy involves the all-important question of climate. No species is going to thrive in a hostile climate for which it is not well adapted, just as no design system is going to flourish in a climate of opinion that does not favor its growth. It doesn't matter if permaculture can solve all the world's food, energy, and resource problems if the prevailing climate of opinion doesn't allow it to take root and displace the systems that caused the problems in the first place.

The usual first suggestion when the challenge of changing the climate of opinion arises is that education is the answer. If we can just provide people with the logic and facts of the situation, then they obviously will understand and change the way they think. This approach works only if the people you are trying to educate are already receptive to your message.

Unfortunately, human thoughts and perceptions don't arise so much from cold, hard logic and facts as from the stories and narratives they use to make sense of the world around them. It

...it allowed permaculture to do what weedy pioneer species do best: take root in disturbed edges....

is almost impossible to get the human mind to accept facts that contradict the world view created by its narratives. If you want to address the climate of opinion, you really have to start by first talking about how you are going to change these stories.

To complete our analogy, we need to think about climate as the storytelling and narrative environment of the human population out of which thoughts, perceptions, and values arise. It is this narrative climate that must be addressed before facts and logic have any hope of affecting the local weather patterns in which our systems of human culture grow.

Succession and the Adaptive Cycle

Thinking more deeply about the dynamics of human ecosystems and how they evolve over time, let's look at how succession occurs in plant communities as they progress from bare soil toward a climax ecosystem.

If you take a piece of land in the Southeastern US where I live and bulldoze it down to bare soil, the sequence of succession is fairly predictable. Weedy pioneer species show up first to repair and structure the soil, followed by a sequence of other species that will take the land through early succession, mid-succession scrubby meadows, mixed deciduous forest, and then finally to a climax ecosystem of coniferous forest.

The pioneer species, of course, have a very different set of strategies than the species that populate a climax ecosystem. Early attempts by ecologists to classify these strategies grouped the early pioneer species with rapid life cycles into the category of r-selected species and the species with slower, longer life cycles into the category of K-selected species.

The r-selected species take advantage of disturbed edges to quickly access the resources they need to grow. They grow and mature quickly, setting seed and dispersing it widely in hopes it will find other disturbed areas in which to grow. K-selected species take the opposite approach, investing more heavily in building the long-term structures needed to compete in the later stages of succession. They grow more slowly and occupy their ecological niche for a much longer period of time.

As the field of ecology has matured, ecologists have realized that the labels of r- and K-selected are too simple to accurately describe the wealth of strategies found in real ecosystems, but the idea has stuck around because it helps describe how ecosystems work.

Similarly, the linear successional model is an oversimplification of what happens in real ecosystems. Real systems must adapt to the complex sequence of events present in the real world, responding to disruptions on a variety of scales, any of which might reset the successional clock over some area of the landscape, whether small or large. The result is that real landscapes are often a successional mosaic demonstrating a diversity of successional stages.

Thinking about human culture and human design systems in terms of succession can help us envision how to build a better situation in the future. If change most often comes in the form of succession, maybe we can use an understanding of succession to help build a better climax human ecosystem.

Permaculture's pioneer species

Bill Mollison and the other creators of the permaculture education system in the early 80s faced an interesting problem. They knew that the conditions were not right for permaculture to be directly adopted by the mainstream culture because the narrative climate was not yet ready, and the resources required to directly grow new perennial cultural systems such as those proposed by permaculture were mostly locked up by the existing human ecosystems. They instead designed the first seed of permaculture, the Permaculture Design Course (PDC), to be a weedy pioneer species that could take root along the edges of the existing system instead of trying to directly out-compete a mature, albeit toxic, cultural ecosystem.

The genius of this approach was that it allowed permaculture to do what weedy pioneer species do best: take root in disturbed edges and begin the process of repair. Permaculture propagated quickly, rapidly iterating through many design life-cycles, and adapting and improving itself quickly. It could spread quite easily to almost any location or bioregion where there was disturbed soil to seed, provided the storytelling climate would allow it, and there was some minimal access to the flow of resources. Thus, permaculture design pioneered into just about

every bioregion of the world over the first few decades of its life, all the while refining and improving its design approaches for each new bioregion.

The basic 72-hour PDC curriculum serves as an effective introduction to permaculture thinking and can be delivered quickly and cheaply, without the massive requirements for infrastructure and resources needed to deliver something like a four-year college degree. At its most basic, all that is really required is a good teacher and a place for everyone to sit.

This approach allowed permaculture to take off and spread with amazing efficiency. But every design decision has consequences and, in the case of the PDC, some of the side effects of this initial strategy of propagation are starting to become more obvious. The first is perhaps the ironic fact that, while permaculture is a design science that proposes creating long-term, stable systems based on perennial agriculture and resilient cultural structures, its pioneer-species roots have not been well adapted to handling competition with the later-succession, more-established systems it seeks to replace.

So far, permaculture has been most successful in establishing itself in areas with widespread environmental, social, or economic damage, where these disturbances have made people more open to change. In many of the cases where permaculture



Pioneering edges can allow for rapid and widespread trans-mission, but long-term success and stability are difficult when resources are locked up by an existing ecosystem. Photo by Tyler Pierce.

systems have gained a foothold in the middle of a “functioning” developed culture—one that provides its inhabitants with food, shelter, a working economy, and so forth, even if this support is of low quality and does not support optimal health—it has been because of a “micro-disturbance” caused by a single person or small group rejecting the mainstream narrative climate and deciding to fundamentally change the way they manage the bit of land they happen to control.

Another interesting side effect has been created by the practice of giving the title of Permaculture Designer to anyone who completes the basic PDC. In many ways, this approach has been both a blessing and a curse.

Calling somebody a designer when they finish a PDC is a good strategy when working with pioneer systems. It empowers students to take control of their own environments and gives them permission to get out in the field to experiment, make mistakes, and learn. In the pioneer stages, you need to get things done quickly and have room to clean up any messes later. Because you are typically working at smaller scales first, the stakes are not so high. Often a suboptimal design, with all its faults, can make things dramatically better than simply doing nothing.

The problem comes when you try to take this approach into more established areas. Because you are most often working at a much larger scale, problems with design can have correspondingly larger consequences. Calling someone a qualified designer after nothing more than a PDC can result in a loss of credibility when you need to work in established systems with professionals who have years of education and many more years of real design experience.

The simple fact is that somebody whose sole design credential is a 72-hour PDC is not prepared to design life-critical systems or take on the responsibility for planning large-scale infrastructure upon which many people depend. To take on the challenge of re-designing the vast and complex technological systems that underlie our existing urban, suburban, and agricultural landscapes will require a different strategy.

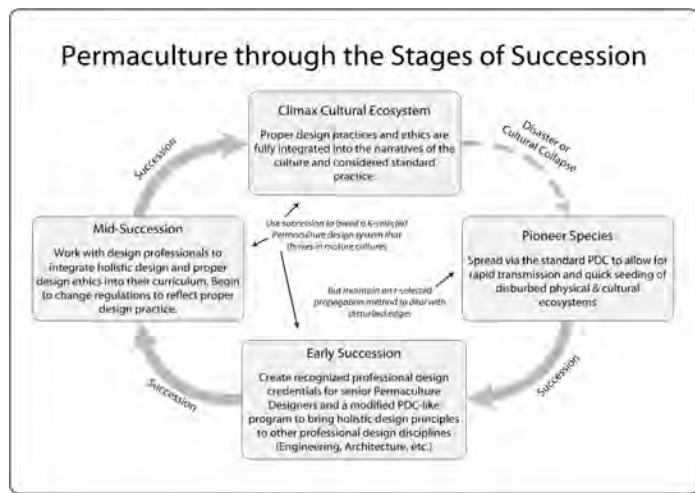


Figure 2

Regenerating mature cultural ecosystems

When I first discussed this idea of how permaculture fits into cultural succession with two friends who are also both engineers and PDC graduates, one of them asked the obvious question: Can we directly transition the existing mature cultural ecosystems into something healthy and regenerative, or do we have to wait for these broken design systems to finish depleting and destroying their land and resource bases and collapse, before we can replace them with something better?

The problem is that just because we plant the seed of permaculture into newly-opened soil does not mean that those seeds will win the successional race and pass their design system forward into the climax ecosystem that follows. If we introduce permaculture as a reparative system into collapsed social ecosystems, can it maintain itself as things stabilize? Or, will it be succeeded by something else that recreates the problems

...we will need not only great designers, but also powerful storytellers.

that caused the collapse in the first place? The current seeds of permaculture carry a strong holistic design DNA, but their history best suits them for pioneer systems, and they are likely to be out-competed and displaced by the time a community gets to its mid-successional phase.

Further, unless the narrative climate of the larger culture changes, these disturbed edges are likely to go through a series of successions that sees them pulled back into the design patterns of the old, broken system. We see this already, where we have examples of beautiful permaculture landscapes, full of fertility and abundance, being torn down or paved over when their creators are no longer around, simply because nobody in the community has a narrative that values abundance.

Regardless of whether we are trying to heal an existing cultural landscape or establish a better future in the newly opened soil of a failed system, we will have to figure out how to adapt permaculture design to compete successfully in mid-succession and late-succession cultural ecosystems. This means we will need to figure out how to create new seeds for permaculture that are well adapted to grow and thrive in the later stages of the successional mosaic, creating systems that scale to support millions of people.

We will also need to find ways to create a new narrative climate that favors holistic, regenerative design over the current model of extraction and consumption. What makes this more difficult is that we don't just have an informal climate of bad design narratives to deal with in existing systems. The destructive stories have over time become ossified into laws, regulations, and college curricula, all supported by people

whose livelihoods depend on these approaches and who will defend them against change.

The laws and regulations found in most developed areas may make positive change more difficult, but they were often birthed out of legitimate concerns and do in fact help to protect the community. If you talk to someone who has worked in zoning or ordinance enforcement for any major city, they will have some horror stories to share about the extremely dangerous things people try to do on a regular basis. Regulations may be lax or almost non-existent in pioneer systems, but they play an important role in systems further down the successional path.

The most difficult task may actually be figuring out how to effect these changes in the narrative climate of the larger culture to not only allow the seeds of permaculture to take root, but to have it actively favor them. Since lawmakers have a hard time getting too far ahead of what their communities are ready to accept, this shift in narrative climate will have to come first. Once people in a community carry a story that values holistic, regenerative design, the laws and regulations will follow. To do this, we will need not only great designers, but also powerful storytellers.

...we will have to start by addressing the problems of scale that exist today.

Permaculture in early and mid-succession

Figuring out the right strategies to allow permaculture to better adapt to the later stages of succession will take a lot of thought and a certain amount of trial and error. The permaculture community already has a number of excellent designers at work in a variety of settings trying to work it out, and we are starting to get some feedback on which strategies seem most successful.

As I've thought through the problem from the perspective of someone who has spent a lot of time inside the professional design landscape of the existing system, I've realized that what will most likely have to happen in order to make significant progress is for the permaculture design community to create a credential for advanced designers that can be respected and accepted by other design professionals. Whether we like it or not, credentials become a proxy for trust once a culture gets to a certain scale.

Perhaps part of the long-term solution is to find ways to correct the problems of scale that created many of these problems in the first place. Just because we need to design systems that support large populations doesn't mean we can't design collections of smaller, interconnected ecosystems, each of which functions on a more human scale. To get there, we



Monoculture systems of K-selected species, such as this pecan orchard, may appear stable upon casual observation, but require large amounts of energy to maintain, while depleting the ecosystem they inhabit. Photo by Tyler Pierce.

will have to start by addressing the problems of scale that exist today.

One possible approach would be to supplement the current PDC with a system of permaculture education that produces world-class holistic designers with a credential that can be recognized and respected worldwide. A program like this to create a Professional Permaculture Designer (PPD) would probably require at least four or five years of rigorous design training and hands-on experience. There have been a few attempts in this direction, including the Permaculture Diploma program, but they have never gained wide acceptance or been easily accessible to prospective students.

To give you an idea of the requirements typically in place today, the laws in most US states require that the design of critical infrastructure be overseen by Professional Engineers (PE). Obtaining a PE generally requires completing a four-year degree in an engineering field from an accredited university, passing a preliminary exam, apprenticing under a qualified PE for several years doing hands-on design work, and finally passing a written exam. The training process for a PPD would have to be similarly rigorous, but the actual education process and curriculum would need to look very different.

What about using the existing university system to train PPDs? Bill Mollison, who had taught in the university system and understood its structure very well, absolutely refused to entrust the permaculture curriculum to the universities because he was convinced they would tear it apart and destroy it. From what I've seen of the current system of mainstream academia, I would have to agree.

Universities and colleges as they currently exist are arranged around a deconstructionist view of intellectual inquiry, with narrowly defined departments and fields of study. Although they're slowly getting better at allowing cross-disciplinary

research, they still are not equipped either academically or politically to handle a holistic design science like permaculture. This will have to change over time if we hope to get to the root cause of many design problems, but it probably isn't the right tool for getting started. Although some colleges have recently begun reorganizing their programs in an effort to become more holistic in approach, the permaculture community will likely have to create its own structures to support this kind of learning process.

The closest analog in the current system to how a PPD would need to work is probably the architect. An architect creates the overall design for a building but works with other

What we need to do is harness this design expertise in the service of a better narrative....

design professionals in cases where the details of the design are complex. A large building project might require a civil engineer to handle the building's foundation, a structural engineer to make sure the structure is sound, an HVAC specialist to design the heating and cooling systems, along with a number of other specialists. The architect oversees the project to make sure all these subsystems fit together and meet the overall design goals of the building.

What architects do for buildings, PPDs would do for entire human ecosystems. The PPD would act as the holistic systems engineer, working with other design professionals to make sure complex infrastructure is sustainable and regenerative in those cases where it is required.

Even at this stage, there would still be a great need for standard Permaculture Designers who have completed the normal PDC. They would simply work on a different scale, applying permaculture principles to such design problems as residential, homestead, and small farm systems.

In order to make this work, the permaculture community would also need to be much more proactive in engaging with existing professional design fields. If the engineers, architects, and scientists don't understand holistic, ecological design principles, then we really have an uphill battle.

The problem isn't that our engineers and scientists lack expertise in the nuts and bolts of design; rather, their design goals have been created out of a toxic narrative that doesn't consider the long-term impacts of what it creates or bring holistic design principles into the picture. What we need to do is harness this design expertise in the service of a better narrative and a better set of design ethics.

These changes will probably require that we create a number

of variations on the standard PDC, each of which meets all the fundamental PDC requirements but focuses on a specific audience and set of needs. This seems to already be happening organically in many areas, as PDC teachers respond to the unique circumstances of their individual communities. I have already started thinking about how to customize a PDC to fit the needs of the engineers and engineering students in my community who have expressed interest. Over time, this could evolve into an extended PDC that would act as an additional professional-level design credential for existing engineering and design disciplines.

If narratives begin to change, and people start to realize that ecological design provides a better standard of living with fewer negative side effects, they will demand design professionals with this sort of training. As these professionals gain experience applying their individual design disciplines inside an holistic context, we would eventually be able to feed these advances back into the formal curriculum taught in colleges and universities.

A healthy climax ecology

Even if we never manage to fully realize a system in which permaculture design and ethics are incorporated uniformly across the human landscape, we can still think about what such a system would look like. Having the end goal in mind is important to help inform the tactics and strategies used earlier in the game.

The only reason such a goal might be at all possible is that the climate of opinion can be changed if powerful enough stories take root. If the narratives that govern a human ecosystem change, the resources that were locked up by the old system can suddenly become fertile ground for new seed. The question is whether such a transformation is possible without going through the disruptive cycle of crisis, release, and reorganization.

In order to be healthy and stable, a climax ecology would need holistic and regenerative design woven deeply into the fabric of its narratives. Proper design practices and ethics would simply be part of standard practice, so deeply embedded that there might not even be a specific term describing the idea that they are there at all. The ideal end-game might be one where good design is so well integrated into the culture that the need for the word permaculture slowly fades away. Δ

Alan Booker is a permaculture designer, teacher, and consultant who also has over 25 years' experience as a systems engineer working with system design and systems architecture. He is the Executive Director and Lead Instructor of the Eldenbridge Institute, which teaches Permaculture, Nature Connection, Health & Nutrition, and Community Design.

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The Logic and Practice of Humanure Composting

Just Do It

Stan Wilson

CHRIS LOPES UP THE TRAIL from our Pattee Canyon cabin to the compost bins just below the trees where the old outhouse stands. I watch him. He is emptying the humanure buckets, a task that traditionally has been mine. An old back injury has reared its head on this warm, fall weekend and left me confined to a chair watching Chris do the work I love so much. It occurs to me that I have never watched the work of tending our humanure system before. Chris does not do things as I do.

He walks from place to place gathering all of the buckets then emptying at once. He stops at the outhouse I refurbished for humanure and gathers up that bucket, then makes his way across the property. He follows the trail that leads from the compost bins to our school bus that is parked just up the hill from the cabin and back into a grove of pine trees. He gathers the buckets outside the bus and retraces his steps to the bins, empties each bucket, wipes them out with straw and sprinkles sawdust from the outhouse into each, lining the bottom so that the initial load doesn't stick. Finally, he carries each bucket back to its place. I tend to gather each bucket individually replacing them one at a time. As I watch him, a question that has often been asked of me formulates in my mind: How do we get from flushing away our waste to this hands-on approach?

Learning new ways

Chris came to us a young man who had spent his life flushing his waste down the toilet, eating from a sterile grocery store, and spending his evenings playing video games. Then, he met my daughter and spent a winter living in her yurt with her. Now he has long hair, doesn't shave, and is more likely to spend his evenings making salsa than playing on his X-Box. It took him time to become comfortable emptying the humanure buckets. That path took him from hauling water and chopping



Chris hauling the bucket—some legwork is required with simple humanure systems.

wood to picking berries and gleaning fields and, finally, to taking on the final act of caring for his own shit, emptying the humanure buckets, covering the latest offering to the compost bin with straw, and tending the bin itself. Emptying the buckets is the most labor intensive of the work. I do things very simply, and my way takes little actual labor. I don't use a compost thermometer to check the heat of my bins. Instead, I rely on sight and smell. Tending the bins means making sure they stay covered. If I smell excrement or see any uncovered material, I add more straw. A variety of factors can disturb the bins:

Suburban life epitomizes the greatest disconnect between people and the natural cycles....

squirrels, rodents, birds, and the bear who regularly snacks on my nearby kitchen waste compost bin can uncover bits of it, so I regularly make it a part of my trip to the outhouse to check. Once the bin is full, I put an old tarp over it to help keep the heat in and then let it sit for a year or so. When I uncover it, I find a bin full of straw remnants and deep, dark earthen smelling compost ripe with rich humus. I could pay more attention but why? Humans have been composting for thousands of years and the earth for millions—we seem to know how to do it. My instincts tell me to trust this age-old process, and so I do. However, none of this answers the question, how do we get there?

Chris got there by marriage, and I suppose he dug deeper into our initially foreign lifestyle because it felt right to him. I got there because I have never liked flush toilets or sewers. Both my curiosity and my drive always led me to get closer to what I feel in my bones to be the truth of humans and our earth. We are all connected. However, neither Chris's nor my own journey to regularly dumping buckets of shit into a pile to build the soils we grow our food in may be satisfactory for the average suburban American.

Suburban life epitomizes the greatest disconnect between people and natural cycles that our petroleum-fueled, industrial paradigm inflicts on our society and the natural world. Suburbia demands that we leave our homes every day and burn fossil fuels that become ever more scarce, to drive to jobs that do little more than pay for the disconnect that such a culture demands.



The final humanure compost, if handled correctly and composted thoroughly, is no different or smellier than regular compost.

Suburban culture is a culture of denial insisting that the enormous waste of resources the lifestyle creates is sustainable, or that sustainability is not even pertinent. Even more than fossil fuels, suburbia wastes water. It is not just the billions of gallons of water used to keep lawns green in climates that have little water or the water that is wasted to wash the vehicles that litter the driveways of suburbia—it is all those toilets. It would be a tragedy if the water wasted were only non-drinkable water, but that is not the way water treatment systems work. The water that flushes our waste is no different than the water that comes out of the tap—billions of gallons of potable water is wasted every day so that Americans do not have to see, smell, or touch their own shit. On a planet where millions lack adequate access to potable water, this is a catastrophe. The water that flushes and treats our waste is rarely returned to the supply of drinking water. In Missoula, our water comes from the aquifer formed by glacial Lake Missoula. When a family up in the South Hills flushes their toilet, the potable water is treated and piped into the Clark Fork River, never to fill a glass or teakettle again. Human excrement and urine is turned into a form of pollution (sewage) and flushed into a system where not only is the excrement wasted, but also so is the water. In the drought-prone, and in many places like

suburban California, drought-stricken, West, how does such waste make any sense? The question is rhetorical because the answer is obvious: it does not.

Another disaster of suburbia is the monumental loss of topsoil. Of course, suburbia is not the only cause of topsoil loss. Industrial agriculture has done its share over the decades to destroy soils as well. However, suburbia not only is responsible for much of the loss, but also is responsible for so much other waste that it serves as a telling representation of what is wrong writ large in American culture. Suburban developments chew up agricultural lands and turn them into manicured lawns that gulp water and demand chemical fertilizers, weed killers, and other toxic inputs to live.

All that is true, but how does a suburban American get from their plastic world of consumption and waste to a more sustainable future where their home saves water and builds soils? My answer sounds unsatisfactory. Environmentalists who rage against consumption and waste drive off suburban homeowners by blindly demanding that their entire lifestyle

The truth is that societies change at the margins.

must change completely and must change now. That is not only unrealistic—it is cruel. Demanded change without a reasonable blueprint for change is simply abusive. The truth is that societies change at the margins. Not every household in America will begin composting their own waste or tear up their lawns and plant gardens. However, when a few begin to do so in a manner that is safe and appealing, others will follow. We all pay for our sewers and for our water, so when a family uses less, they make resources available for other changes.

These changes can happen in suburbia. Joe Jenkins who wrote the *Humanure Handbook* lives in a suburb outside of Pittsburgh. He developed a simple, clean, safe system of composting human waste in the 70s when community standards in suburban America were not supportive of such an endeavor. Jenkins changed because he saw that he needed to. He conceived a method that would allow him to do so while not alienating or offending his community. Jenkins made changes at the margins, which is how he got from the flush toilet to the humanure bucket.

Deep composting

It is 2008, and my family and I are in a suburban Long Island neighborhood teaching permaculture to a small group of well-to-do New Yorkers who want to learn a more sustainable way to live. Composting is an easy subject for them to latch onto, and we all enjoy building a chicken wire and pallet compost

bin. I find it interesting that in five minutes I find a place to get both straw and sawdust for free on their island when none of them could even imagine either being available in what they know is a bastion of suburban sensibilities. Humanure is another matter. Their concerns are typical of both middle class audiences and more alternative groups across the country: smell, spread of disease, appearance. In an attempt to really reach middle class Americans, I've learned to take both disease-related and aesthetic concerns seriously. The middle class spends a lot of money trying to keep their homes clean and neat—any system that challenges their ability to do so will not be taken seriously. I lead the group to our refitted school bus that serves as classroom and home, and we gather at the back door, which I open. One man asks after listening closely to my talk, "What about the smell?" I invite everybody to move in closer and inhale deeply; they all agree that all they smell is Long Island. I then show them the bus' humanure system, just inches away from them. We talk some more, then my host agrees to let me build a humanure-composting bin at the edge of his large backyard out of view of his neighbors and well away from any houses. We then empty my bucket and cover it with straw. The load looks like a pile of straw and has no odor. A group of suburban homeowners who have very real concerns about the concept of humanure walk away knowing that they can reduce water use, build soils, and grow, then eat the organic foods they fertilize with their own waste. This is a scene that has played across

...we learned that Americans want to learn another way of living.

the country in suburban neighborhoods, inner cities, and rural communities, on small farmsteads, and even on communes and ecovillages across the country as part of my family's two and a half year permaculture-based sustainability tour. At the end of our stay on Long Island, at least one household agreed to compost at least some of their own waste.

To offer a bit of explanation, my wife Delyla, my then 17-year-old daughter Megan, and I refitted a 40' diesel school bus and launched a permaculture-based sustainability teaching tour called the Skills for the New Millennium Tour, or as we came to prefer, the Skills Tour, and drove across the country offering a menu of skills we had learned over years of income-forced DIY living to anybody who chose to invite us. Between February 2008 and July 2010, we appeared at festivals and concerts, at church groups, at universities and social forums, and in living rooms across America. We taught rainwater collection, grey water, how to build solar systems, what to do with old batteries, many other skills, and yes—humanure composting.

We worked with inner city youth groups, Baptist church

ladies, anarchists, and suburbanites. The bus featured a solar system, grey water, a tube garden, a worm bin, a humanure toilet, and even three hens that were all part of a rolling closed-loop system that served both the passengers of the bus and the many thousands who attended workshops in large towns and small rural communities up and down both coasts and back and forth across the heartland. Rednecks, hippies, housewives, college kids, and immigrants from all over the world, and every section of American culture learned from us and taught us as well. They learned what they wanted to learn; we learned that Americans want to learn another way of living. One of my personal highlights came in Arizona when a Mexican laborer saw me collecting our posters after an appearance and thanked me. I thought he was thanking me for picking up after ourselves, but instead he looked at me and said with a smile, "Thank you for teaching your people to live like my people."

Sense and sensibility

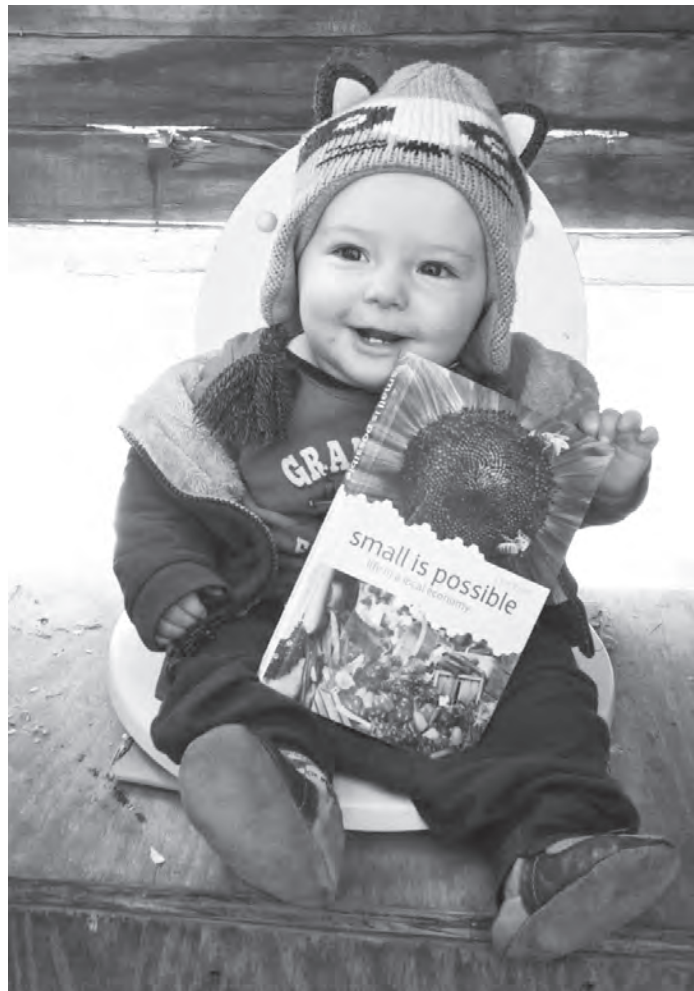
There are many valid concerns about the use of humanure, including the spread of disease and how to utilize it in a garden. People's sensibilities play a role in their concerns. The idea of eating food grown in human waste is too much for many people. I may find it absurd that people will spend money on non-human animal fertilizers and eat the food they grow in it but shy away from human waste, or that they will trust products like Eko-Compost that are biosolids from sewers cooked so hot that they are inert. As well, these products still contain the remnants of the variety of pharmaceutical substances Americans regularly pump into their bodies and therefore into their sewers, but that is where many Americans are. Some people will use a human waste product only on their lawns, ornamentals, and non-fruit bearing trees, but not on fruit trees, bushes, or on their gardens. Others will use it on their fruit trees and bushes, but not on their gardens, while some folks are willing to use it everywhere. I find it ironic that Long Islander's blanch from eating food grown in feces. In the 1800s, Long Island and Staten Island were the breadbaskets of New York City and the growing urban areas of New Jersey. Until the early 1900s, much of those farms bought human waste from collectors who mucked out septic tanks in the cities and then raw sewage from the cities after sewers were



The author and his humanure compost bin

installed. This waste called night soil was not even composted. It was spread on the farm fields as green compost. Humanure differs from night soil because humanure is human waste composted, then used on the fields. It is an improvement over night soil and is safe to use. It is the sensibilities of the average American that have changed over time, not the safety of human waste used in agriculture. Suburbia epitomizes that change in sensibilities.

When I watch Chris, with his suburban background, caring for our humanure system, I reflect that neither he, I, nor those Long Island suburbanites are that far apart. I too had my suburban upbringing, filled with all the sensibilities of that culture. I rejected those values sooner than many, but I still had to reject them before I could move on to accept ideas like composting my own shit in order to grow food. Much of my conversion is generational. I came of age during the 70s, the era of Earth Day, the first Rainbow Gathering, and the rise of the alternative technology and energy movements. The 1973 Arab Oil Embargo made people feel the pinch of limitation for the first time since the Depression. While many reacted with fear, some saw a challenge to be met, not by a drive to find more oil,



Nolan, the next generation, will need to close the loops, to transform cycles of waste into cycles of renewal. Humanure, while often neglected or marginalized in practice, is key to sustainability.

but by the drive to find ways to live not so dependent on limited resources. A desire to find a simpler way to live led many to take up organic gardening, rural homesteading, and increased self-reliance. Publications like *Mother Earth News* and *Small Farm Journal*, both launched in the 70s, spread the lessons of Helen and Scott Nearing whose *Living the Good Life* initially fell on deaf ears but found fertile soil in the 70s and proved a bible to young Back-to-the-Landers seeking a new way to live based on older, simpler, and more sustainable models.

Unfortunately, the 80s brought Ronald Reagan, who chided a simpler way of life and preached his City on the Hill message of the goodness of the American Dream and an ever-expanding economy without limits, driving those ideas percolating in the

It would take a generation for the seeds... to finally germinate....

70s deep into the underground of American culture. Reagan cut funding for alternative energy research. Whatever progress could be made was done so by outliers operating well outside the bounds of society, and what little money once went to alternative research was redirected to Reagan's buddies in the energy industry. In the age of "Greed is Good," "Small is Beautiful" became not only a joke but also anti-American. It would take a generation for the seeds forced underground in the 80s to finally germinate. They did sprout, however, and now find fruition in Farmer's Markets, Community Supported Agriculture, the spread of organics, and suburban Long Islander's desire to learn about humanure.

Chris is done with his labors and washes his hands before picking up his baby. I realize that his son, my grandson, Nolan, will grow up in a world where growing his food in his composted waste will be as natural as relieving himself. When I was a kid, before Nike had made a shoe, and there was something that simply needed to get done, our parents would look at us and tell us to "just do it." It occurs to me that the best way to leave behind the prison of our consumptive life and its false trappings of prosperity is the same. Just do it. △

Stan Wilson toured the country from 2008 to 2010 with his wife Delyla and daughter Megan in a biodiesel-powered permaculture demonstration bus. The Skills For The New Millennium Tour taught a wide range of skills designed to "cultivate revolutionary ways of living" including Stan's favorite topic, humanure. Stan is currently a Master's student at the University of Montana studying the role of human waste in agriculture over time. He hopes to write and publish a book, The History of Shit.

Deep Roots for Dynamic Accumulation?

Robert Kourik

WHAT PERCENTAGE OF PLANT NUTRIENTS come from shallow soils, as opposed to nutrients obtained by roots from deeper soils? Do deeper roots gather more nutrients than those closer to the surface? Let's take a look.

Mining roots

The new dynamic accumulator list (as presented in *Permaculture Activist* #93) shows that some plants are more efficient at absorbing some nutrients when compared to others. What it doesn't show is whether this is due, as many gardeners assume, to deep roots, or to more efficient accumulation taking place in the surface soil around a plant.

It's a common assertion that the ability of one type of plant to gather more of a specific nutrient than another type is due to the presence of deeper roots that "mine" nutrients that the shallower roots can't reach. This assumption, however, doesn't hold up to scientific scrutiny.

The upper horizon of the soil is also the place where the most nutrients are liberated. Soil flora and fauna act as nature's little fertilizing machines, using the natural decay of humus and other biological processes to liberate unavailable minerals in a soluble form that can be absorbed by tiny root hairs—a process known as "mineralization."

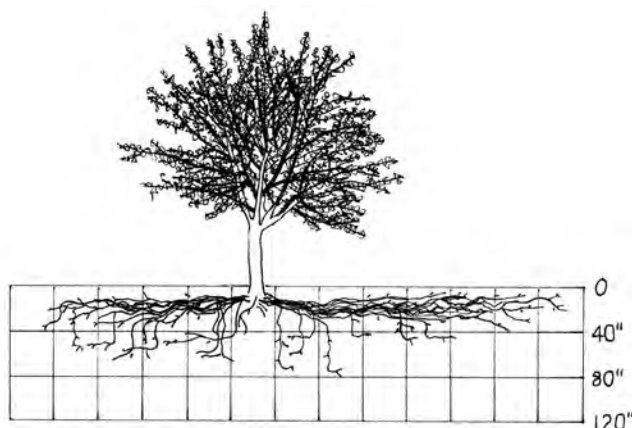
Dr. John Weaver of the University of Nebraska in the 20s and 30s, and of vegetable root-drawing fame, spent a lot of time researching the absorption of nutrients from different layers in the soil. One of his studies showed that the absorption of nitrates in potatoes at the 1.5-2' (45-60 cm) zone was only about half of the absorption found in the upper 1.5' of soil.

In another study done with corn, roots in the deeper soils (down to three, four, and five feet) gathered less nitrate at the lower levels, and fewer roots were present. Dr. Weaver's summary is revealing: "This shows, I believe, that deeper roots aren't as likely to absorb [the element nitrogen, object of the study] as roots closer to the surface, even though the absorption of moisture is the same at all levels, because the root mass is so much greater in the upper six-inch layer."

Width and depth ratios

We can also investigate the width of a plant's root system in comparison to its depth. The diameter of the root structure of most trees is much wider than that of their foliage canopy. What surprises me is how shallow the roots are in most plants when compared to the width of the root mass.

This width/depth comparison is another way to consider how many nutrients are absorbed from deep soils as opposed to shallow soils. It seems to me that width is more important than



This 23-year-old plum had 72% of its roots in the top 12-24" (30-60 cm).

depth, because many more cubic feet of soil are being explored and utilized.

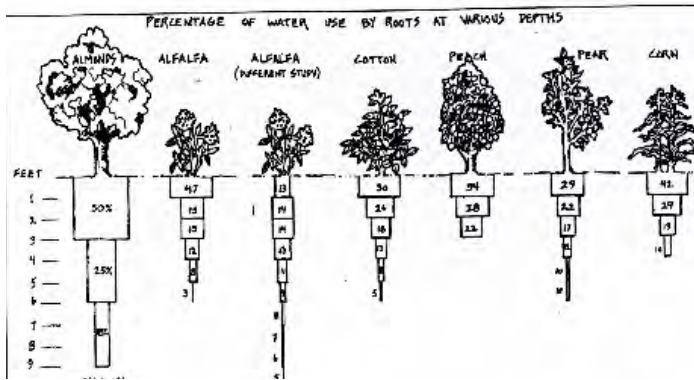
Weaver and his cohorts concluded: "These data also suggest that [mostly horizontal extending roots] may play a more important role in uptake of water and nutrients than is indicated by their density alone. Evidence for significant nutrient uptake by deep roots is more difficult to quantify and often is circumstantial...."

Comfrey: deep-rooted accumulator?

Now let's take a look at one of the most famous deep-rooted, supposedly dynamic accumulators—comfrey (*Symphytum officinale*). When it comes to the accumulation of NPK and silica, the anecdotal opinion is that comfrey is a bioaccumulator plant with long roots that mine minerals and nutrients from very deep in the soil. (There are many unsubstantiated reports of comfrey roots reaching as much as ten feet into the ground.) (1)

As to comfrey being a dynamic accumulator due to its deep roots, it's hard to find any data. I was able to find a study that showed that the immobilized tannins prepared from lateral roots of comfrey chelated (pulled out) 3.5 times more lead from the soil than those from the main roots, which have lower tannin levels. (2) This study also suggested that plant roots with more tannins might accumulate more lead. (2) Yikes—comfrey as a lead-accumulator plant! Be sure to check your soil for lead content if your house was built before 1978, when lead paint was banned.

I suggest that roots accumulate nutrients nearer the surface than is often thought. In my own garden, for instance, the topsoil is 18" (45 cm) deep on top of a clay pan, and the comfrey still thrives. Not many people I know in my area have ten feet of good topsoil. (Actually, I do know one person. And she won't marry me!)



Water needs

Watering is another variable. According to Weaver, most plants absorb moisture from the upper soil horizons. The practical applications? One needn't water as deeply as might seem necessary, because plants may only need decent moisture in the upper 8-24" (20-60 cm) of topsoil. In almost every case, the top two feet equals more than 50% of the water used in most of these agricultural studies.

The most important take-away for me is that the mass and number of roots, rather than their depth, contribute predominantly to moisture absorption. Deeper soils support fewer roots to absorb the moisture (and thus the nutrients).

Humus

Most soils also contain more humus near the surface, because the highest population of the soil organisms that decompose raw fiber and minerals into humus tend to hang out in the most aerobic zone of the soil: in and just beneath the looser top layers.

As an impressive example, consider the Douglas fir (*Pseudotsuga menziesii*). Even this large tree has no significant single taproot. Instead, its roots explore a very large volume of soil near the surface to gather moisture and nutrients, while stabilizing the tree. Similarly, in a 29-year-old apricot tree, most (82.5%) roots are found in the upper 8-24" (20-60 cm).

While there are deep roots in all these examples, the majority of them are in the upper 20-40" (50-100 cm) of the soil. Therefore, the mass of roots is seldom ten feet deep (a "fact" proposed by many permaculture designers and herbal authors). Furthermore, where the roots are found is where the nutrients are gathered. My proposal is that the upper mass of roots is so much larger, that deep roots cannot absorb as much or more of any nutrient.

In all the research for this book, I was able to find one example of what appears to be dynamic accumulation. In soil beneath sugar maple (*Acer saccharum*) and eastern hemlock (*Tsuga canadensis*) trees in northwestern Connecticut, researchers found that "Sugar maple had more fine roots in the deep soil than hemlock and a greater potential to absorb Ca in the deep soil...we [have shown] that a relatively small

amount of Ca uptake in the deep soil beneath sugar maple is able to sustain high amounts of available Ca in the surface soil." (4)

Therefore, in spite of some seemingly contradictory research, I think there are scientific reasons to no longer conceive of the deep roots as the only source of dynamic accumulation. Soil life liberates many nutrients in the upper levels (8-12", 20-30 cm) of roots. Because there generally are so many fewer roots in the deeper soils, the upper root system (8-12") is probably responsible for most of the dynamic accumulation.

The practical applications? It's simple—focus on the care of the upper 8-12" of the root zone. When watering, remember that comfrey and most other garden plants only need decent moisture in those upper 8-12" (assuming that the topsoil is at least that deep). Tend to the aerobic microbiology in the very upper zones of the soil. Keep it ever so slightly moist and well fed with compost, organic fertilizers, and mulch. (All of the preceding studies, it should be noted, were done without mulch.) Avoid turning, churning, and displacing the soil layers. In short: treat your soil with a dynamic accumulation of kindness. Δ

In addition to Designing and Maintaining your Edible Landscape—Naturally, Robert Kourik is author or co-author of 15 books and numerous articles on gardening, focusing primarily on organic, natural, integrated systems, permaculture, and appropriate horticulture methods. A pioneer in the field of edible landscaping, he has plied his talents in northern California since the 70s and was a frequent contributor to the Permaculture Activist from the 80s. Read his blog at <http://robertkouriksgardenroots.blogspot.com>.

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References

1. Grier, Rachel. <http://livingthefrugallife.blogspot.com/2009/04/comfrey-wonder-plant.html>.
2. Chin L, Leung DW, Taylor HH. Lead Chelation to Immobilized *Symphytum officinale* L. (Comfrey) Root Tannins. *Chemosphere* 76: 711-715 (2009).
3. Greater Yields with Drip Irrigation. An eBook available from my web site: www.robertkourik.com.
4. Dijkstra FA, Smits MM. Tree Species Effects on Calcium Cycling: The Role of Calcium Uptake in Deep Soils. *Ecosystems* 5: 385-398 (2002).

Walking the Line

Jeanmarie Zirger

WHAT ABOUT SERIOUS CULTURAL EDGES? Do we as permaculture activists even want to go there? Well, at some point in history, someone is gonna do it. So why not us? This is about People Care.

I'm an edge-walker. I've been one since I was a pre-schooler. I'm 71 years old now, and I have a pretty good assessment about what I'm about to explain in this article. And as edge-walking goes, I have a lifetime of activity there.

As a little boy who was drawn to the swamps and bogs near his home, I learned at an early age that the action was at the edges. Summer days spent gazing at damselflies and water lilies, while sitting on cool damp soil established my affinity for life on the edge. In those pre-pubescent years, I didn't know, or care, about prescribed gender roles. I was free to live according to the impulses that coursed thru my little body. Except that I somehow intrinsically saw myself as a girl—and no one else agreed. Fortunately, in those times, there was no need to assert my feelings or beliefs to anyone in particular. The damselflies didn't care one way or another.

Transgender is as natural as flowers in spring. But it does not fit well in a paternalistic system of human cultures.

But entry into grade school at age six brought on a whole new paradigm of finding my place in the cultural scheme of things. There were cultural gender expectations that I was required to meet. My birth certificate had an 'M' in the sex field; therefore, I was supposed to do M stuff in my day-to-day activities—and for culture's sake, I had to dress appropriately. At the time, I didn't realize my responsibilities there! So, when I naturally was drawn to the girls during recess from classroom work, trouble reared its head. The teachers had an issue, my parents had a resulting issue, and the concept of transgender was not yet in the popular press. I had a problem!

This is where the closet becomes important! A gender disphoric child, chastised and abandoned by parents and teachers, needs to find a fast and effective refuge. "When in Rome, do as the Romans do." Adopting the tactics of a

chameleon, I figured out how to present myself in public as the public expected me to present. And I got really good at being a 'bad little boy.' But the little girl hardwiring in my brain would give me no peace. So what does a vulnerable child do? Well, you get by as best you can. You attempt to navigate around the edges of cultural gender expectations without upsetting things. You find a secret place where you can be who you know yourself to be. For me at age six, it was the swamp.

This is the crux of a transgender/transsexual lifetime. And it begs the question: is this alienation from the dominant culture necessary? Does it keep the dominant culture safe from entropy and chaos? Do transgender/transsexual people have a critical role to fulfill in the optimum relationship between humanity and the universe?

I say YES. Transgender is as natural as flowers in spring. But it does not fit well in a paternalistic system of human cultures. Trans people cannot be put into neat little boxes of attributes that warrior leaders can exploit. The dominant culture sees transgender people as undefinable and therefore untrustworthy. Oooo my, the analogy to swamp beings seems so appropriate: are they terrestrial or aquatic? Dare I even ask if wetlands can be essential to the ecology of a place?

EDGES... are where the real action is. Edges are where reality can defy simple explanations. Edges are where change happens, where the continuum is enabled. Edges are where we as permaculturists often find ourselves. Are we up to the task? Are we open to investigating the things around us that seem to oppose organized and accepted culture? Can we expertly go where no man has gone before? Can we accept and honor sexual/gender minorities as diversity so essential to human nature, even though the culture we live in is unaccepting? Hey, we seem to be ok with not knowing the taxonomy of every plant in our homesteads, while observing that as a system it seems to work quite well... as long as we don't disturb things.

I consider myself extremely gifted to be out here on the edges of culture. And as long as no one gets in my face for being gender queer, I can go about giving my life energy to support and perhaps enhance the things around me.

'Edges' seems a better English word than 'boundaries' to describe unknown possibilities... just ask Kermit. Δ

Jeanmarie is a 2011 PDC grad (Indiana), and a 2013 certified Permaculture teacher course grad. (Colorado). She is also a former vocational school instructor, Industrial electrician, beef cattle rancher, and "back to the land" hippy girl. Retired from her most recent occupation as a motorcycle shop owner. Her permaculture work is informed by a little bit from all of those occupations.

Valuing the Marginal

Designing for Children & Elders

Roman Shapla

MY CHILDREN WERE FORTUNATE ENOUGH to live next door to a remarkable man. At 90 years of age, he had lived through monumental changes in the world. He grew up without electricity, refrigeration, or modern appliances. As a child, he explored the world's largest cave system armed with only a ball of twine. And he was well into his 20s before he saw an automobile. He knew what it was like to grow all of the household food, forage wild greens, hunt small game, and trade surplus with neighbors. Fermenting and preservation were commonplace, while processed food and packaging were rare. This gentleman had experienced the turbulent upheaval from a slow, localized, land-based culture to a techno-industrial, suburban, fossil fuel economy. And, as I always reminded my children, his teary recollections and fond memories of those times would provide them with the inspiration they needed for their own struggles. His memories were a peek into a transition tool box. His past was a glimpse into their future.

Far too often, the elderly and youth occupy the edges of our society. Their worth is not considered when planning, or valued when important decisions are made. This is unfortunate as both younger and older folks have an incredible amount of insight, input, and energy to share.

Along edges, diversity grows and multiplies, while strengthening the entire system.

What is edge?

The interface between things is where the most interesting events take place. These are often the most valuable, diverse, and productive elements in the system.—David Holmgren

In my attempts to help those who had fallen through the cracks, I spent a few frustrating years majoring in social work. However, this field, well intended as it is, provided only what we referred to as 'band-aids.' There was no substantial effort to address root causes, and any discussion of solutions was off the table. Make no mistake—social band-aids are vital, but the lack of solutions led me to explore anthropology and ultimately the science of permaculture. Solutions-based approaches to problems



Caden Baird with his mother, Rhonda Baird, at his second permaculture design course. Photo by Laura Carlson.

generate solutions in a positive loop. This can be easily applied to our inclusions of groups that occupy the margins.

I have always felt the one thing that sets permaculture apart is its appreciation for 'the edge.' The importance of edge has long-been appreciated by those studying permaculture, and the benefits are numerous. Along edges, diversity grows and multiplies, while strengthening the entire system. Although plenty of permaculturists design for ecological edge to maximize yields, edge effects can sometimes be overlooked when addressing the social sphere. But we can cultivate social abundance, just as we do ecological yields, by directing the same energy and investment into the edges and margins of our invisible structures.

Designing for social edge

How can I reach out to people on the edges of society?

—Looby Macnamara

Just as with designing physical spaces to meet our sustenance needs, we can look to the edges of our social space to address

the potential that lies within the margins. Human potential is often buried underneath feelings of disempowerment and dependence. This pattern is easy to observe among children and the elderly. A student once asked me why permaculture was so important. I replied that I had always considered it ‘the science of empowerment.’ Taking (back) control of our needs, providing for our friends and family, celebrating the do-it-yourself spirit, being part of the movement to design permanent cultures—each of these steps empowers the individual. This could be precisely the tonic needed by those living among the shadows of the edge. Invisible structures are responsive to the same natural forces as their material counterparts. Permaculture gives us the tools to guide those forces in a positive direction in order to shine light on the marginalized and, in turn, be a part of their creative contributions.

Evaluating our current predicament

Children

I started offering permaculture-based materials for kids over a decade ago when I noticed a lack of options for children, single parents, and low-income families. I spoke with the organizer for an upcoming permaculture design course and was informed that there were no child-care options on purpose. Off the record, I was patronizingly reminded, “You know, Mollison’s third ethic was ‘Set limits to population.’”

Setting aside the legitimate topic of overpopulation, and despite one’s personal opinions, we are still left with the real issue of designing for children in our systems.

Teenagers

Looking at the issue from general to details, a pattern begins to emerge: even within the marginalized, there is still a group occupying the margins—teenagers. Through a combination of factors (biological, societal, traditional, self-determining), teens are especially pushed to the periphery of the larger community. With my day job, I often have the opportunity to interact with teens doing community service. It may take a while, but they always share with me their complaints about society. These legitimate grievances point me toward social needs that are not being addressed. Most of the time, they are just happy an adult is listening to them and taking them seriously. If we are thoughtful enough in our planning, we can channel teenage angst and despair, jujitsu-style, into a positive force of change.

Elderly

Some linguists draw a connection between the words ‘elder’ (*Sambucus*) and ‘elderly’ (old, experienced). According to folklore, *Sambucus nigra* symbolized protection, grief, or death and were planted on graves to protect the spirits of the deceased. A villager could point to a graveyard/forest and say, “Those are our elders.”

Elders are still respected, valued, and play an active role in daily life in many cultures. Sadly, this custom seems to diminish the more industrial society advances. It’s never too late, however, to reevaluate our treatment of the most experienced

members of our community.

The aging person’s contribution to the village should be encouraged. Older persons seem to enjoy the company of others; they are valuable sources of experience and ideas, good observers, and enjoy knowing what is going on around them.—April Sampson-Kelly

Some practical tips for consideration

Children

Adults are sometimes intimidated about designing for children. In reality, it’s one of the easiest tasks in the world, because there is really only one rule: Make it fun! A child’s environment should first and foremost encourage play. Once this is established, the more complex ideas can be slowly introduced.

Safety—omit problematic plants, and make sure the depth of water features take the child’s abilities into account.

Sturdy—can structures withstand roughhousing and chaotic play?

Start small—set others up for success by designing manageable areas.

Be flexible—don’t be too rigid in your planning and teaching. Allow the natural spontaneity of children to enhance the learning experience.

Teenagers

Adults can empathize with teens because they themselves have occupied that margin between childhood and adulthood. Find each individual’s talent or passion and work from there.

Teenagers are the last great untapped source of energy.

—Steve Van Matre, *Earth Education: A New Beginning*

Respect—treat teenagers as peers, not as children. While some may have the tendency to condescend to teens, many teenagers cite this as a source of frustration and angst.

Empowerment—allow teenagers to take the lead on a



Caden Baird, age 7, helping demonstrate garden bed establishment in March 2015. Photo by Rhonda Baird.

project. Adults can still shadow or supervise if necessary, but giving teens autonomy and responsibility can develop self-worth.

Supervision—Teens often flourish when partnered with a younger child. Give them the opportunity to work with a kid on a task or activity. Be clear in presenting this as ‘taking them under the wing’ and not burdening them with babysitting duties.

Tone—pay careful attention to your tone and choice of words. Heather Flores gives a simple rule of thumb: ask yourself, “Would it be considered rude if you spoke to an adult in the same manner?” If so, stop doing it.

Elderly

Tending a garden has proven to be therapeutic for elders. Many retirement homes now include gardening in their operations. Not only does this provide occupants with fresh air and sunlight, it also produces fresh fruits and vegetables for the cafeteria.

Companion animals—groups like Hen Power combat loneliness by connecting pet chickens with seniors (dubbed ‘Hensioners’).

Raised beds—make gardening more accessible for those with back issues, as well as the ‘alter-abled,’ by constructing tall, raised beds that do not require bending over to cultivate.

Fast flora—plant fast-growing selections (e.g., bamboo, nasturtiums, sunflowers, radishes).

Minimal maintenance—letting nature do most of the work



Raised beds like this Garden Tower from the Garden Tower Project, allow people of all abilities and ages to grow. Photo by Rhonda Baird.

is not just permaculture in a nutshell, it's also appropriate to the energy levels of many of the elderly.

Rest—by furnishing shelter and seating, you can accommodate for periodic breaks, while providing shade or respite from the rain.

Listen—*I've made it my task to seek out my elders and learn things to help me get through the world with some sense, some panache, some style, some grace, and some courage.*—Utah Phillips

Conclusion

In *Teaching Permaculture to the Elderly*, Mihail Kossev builds a bridge between these marginal groups, “Old age can be just as playful as childhood. Cross-pollinating both edges of the human generations is quite effective. Integrating a children's workshop with elders participating will prove to be a very successful integration.”

In the invisible sphere, children and elders can be viewed as sectors of experience, playfulness, wisdom, and energy. Let us consider the potential of all age groups and abilities in future designs. In doing so, we're helping to create a stronger, healthier social harvest.

The Little Boy and the Old Man
by Shel Silverstein

*Said the little boy, "Sometimes I drop my spoon."
Said the old man, "I do that too."
The little boy whispered, "I wet my pants."
"I do that too," laughed the little old man.
Said the little boy, "I often cry."
The old man nodded, "So do I."
"But worst of all," said the boy, "it seems
Grown-ups don't pay attention to me."
And he felt the warmth of a wrinkled old hand.
"I know what you mean," said the little old man. △*

Since 2007, Roman Shapla has been director of the Children's Permaculture Guild, which provides free classes and resources to kids. In addition to publishing *Kurent: A Journal of Permaculture for Children, Parents, and Educators*, he has created permaculture curriculum for elementary students, and is the Education Programs Coordinator for a children's museum in Oregon. Roman is currently looking for land in the Cascade Bioregion to establish Monkeyflower Farm School, North America's first K-12 school designed along permaculture principles. He can be reached at kurentjournal@hotmail.com.

Resources

1. Clayfield, Robin and Skye. *Manual for Teaching Permaculture Creatively*. Earthcare Education. 1994.
2. Flores, Heather C. *Food Not Lawns: How to Turn Your Yard into a Garden and Your Neighborhood into a Community*. Chelsea Green. 2006.
3. Grieve, Maude. *A Modern Herbal*. Dover Publications. 1971.
4. Hoffman, David. *An Elders' Herbal: Natural Techniques for Health and Vitality*. Healing Arts Press. 1993.
5. Kossev, Mihail. *Teaching Permaculture Across Age Groups*. <http://permateachers.eu/teaching-permaculture-across-age-groups/>. May 16, 2014.
6. Macnamara, Looby. *People & Permaculture: Caring and Designing for Ourselves, Each Other and the Planet*. Permanent Publications. 2012.

Gardening Natives

Dara Saville

THE MAGIC OF WILDERNESS allures herbalists everywhere. There is nothing like walking through misty woodlands on a cool spring morning with beloved plants emerging from their winter slumber or strolling through familiar desert canyons singing summer's song with a cacophony of colors dotting the landscape. Herbalists, like all lovers of nature, are drawn to the forests, mountains, canyons, stream banks, and meadows where wild plants grow. Walking through places where you know the individual plant beings all around you is comforting and welcoming. They beckon for our return again and again. Wildcrafting herbal medicine is an important practice for many herbalists which connects us to the wild hearts of the plants we love. Yet many of us are finding local ecosystems in flux, with habitats changing as weather patterns take unexpected twists that deviate from our anticipated norms. Here in the desert Southwest, that trend has meant less reliable rains, increased fire danger, and shifting plant communities. In the last decade, I've seen once-robust plant colonies shrink, and water-loving plants disappear from many locations in the surrounding high desert wilderness. While I've always been conservation-minded, this observation has prompted me to shift the focus of my work with plants and students. In order to promote more sustainable practices, I have migrated toward a love of urban weeds, wild commoners, and the cultivation of medicinal herbs in an urban garden that reflects the wisdom and beauty of the surrounding wild lands.

For the desert valley herbalist, a sustainable herbalism practice incorporates both the principles of bioregionalism and also water-wise gardening. As a bioregional herbalist, I rely

**Companion planting,
as taught to me by the
wild plants themselves,
is a main tenet
of my approach....**

heavily on plants that offer themselves to me in my daily life; those that call out to me as I walk the urban sidewalks, trek across desert sands, and hike through wooded mountainsides. For example, wild lettuce (*Lactuca serriola*) demonstrates a quiet acceptance of our need to pave, manage, and control nature by growing out of the cracks of parking lots, as well



Wisdom from the semi-wild garden as Greek mullein brings earth and sky together.

as a stubborn resistance to be tamed or dominated by it. Her medicine offers comfort for the nervous system, pain, persistent coughs, and sleep disturbances. Chaparral (*Larrea tridentata*) sits quietly under the boiling desert sun, holding the secrets of ancient wisdom acquired through long life and difficult living conditions. She also provides a potent surge of healing power in the face of the most tenacious infections. Figwort (*Scrophularia lanceolata*) has become a reliable friend of the mountain meadows, always there for me, even in the hottest and driest of summers. Her medicine has moved many past stagnant plateaus in healing severe or chronic wounds. I harvest these and other abundant plants from my local bioregion with great reverence and gratitude. Every wilderness excursion, whether it is to exposed desert plains or mystical mountain lakes, leaves me feeling humbled by the vastness of life around me. I am consistently filled with awe for the mysteries that abound.

While working with these and other common plants from the

surrounding wild lands, I also feel an equally potent bond with my backyard botanicals. Attempting to take the pressure off wild populations of more sensitive plants, I have created a medicine garden that incorporates what I have learned from my walks in the countryside and recreates some aspects of the wilderness in my own urban land. Companion planting, as taught to me by the wild plants themselves, is a main tenet of my approach to creating urban habitat for mountain herbs in a hot desert valley. During my visits to favorite mountain locations, I have observed the relationship between plants and their local habitat preferences. I often find mullein (*Verbascum thapsus*) growing with yarrow (*Achillea millefolium*) in open hillsides or with bee balm (*Monarda menthaefolia*), along intermittent stream beds. These plants grow in harmony side-by-side in my garden as well. Other plants, such as arnica (*Arnica chamissonis*), simply need more shade to attenuate the higher ambient temperatures of the lower elevations of my desert valley garden. To recreate the dappled light of the forest, I've planted arnica underneath a shade ramada covered with mature clematis vines (*Clematis ligusticifolia*). The soil also has been adapted to carry more organic matter through yearly mulching of tree leaves and other decomposing plant debris. Water delivered by drip irrigation supplies the vital fluids of the once wetter years when monsoonal rains consistently provided afternoon downpours in late summer. Garden-tending practices are also influenced by the wild habits of plants. Allowing them to complete their reproductive cycles, practicing minimal intervention until harvest, and allowing plants to migrate around the garden according to their own will creates a wild-spirited environment driven in large part by the plants themselves. It is also a lesson for me in letting go, watching things unfold, avoiding the temptation to try to control nature, and most importantly accepting my place in the wild landscape. Even the rocks used as stepping-stones to provide passage through the semi-wild botanical haven have been collected from wild places. Some contain the fossilized hints of an even wilder ancient past when



Wilderness wisdom—ocotillo reflects the form of a distant desert mountain, illuminating the interrelation of all things.

Permian oceans ruled the landscape. My Southwest medicine garden is home to a variety of native mountain dwellers, many of which are sensitive in their local wild habitats here in central New Mexico. Recreating higher elevation wilderness in my backyard are arnica, angelica (*Angelica grayi*), bee balm, pulsatilla (*Pulsatilla patens*), skullcap (*Scutellaria spp*), western St. John's wort (*Hypericum formosum*), self heal (*Prunella vulgaris*), lobelia (*Lobelia cardinalis*), rudbeckia (*Rudbeckia lacinata*), hops (*Humulus americanus*; aka *Humulus lupulus* var. *lupuloides*), choke cherry (*Prunus virginiana*), geranium (*Geranium richardsonii*), goldenrod (*Solidago canadensis*), yarrow, valerian (*Valeriana spp*), raspberry (*Rubus spp*), penstemon (*Penstemon strictus*), and elder (*Sambucus nigra*), among many others. I use these plants in remedies on their own or combined with ceremonial harvests of wild counterparts to imbibe the preparation with the true spirit of wilderness.

...the more time you spend with medicine plants, the less you need them.

This is how I have recreated the desert mountain habitats within a lower-elevation urban environment. However, the medicine does not stop there. As you might already know, planting a medicinal herb garden has rewards well beyond the harvest. The deepest and most profound medicine comes from the time spent together. Medicine whispers are perceived by the heart and produce effects that can scarcely be explained by words. The reciprocal relationship that one develops with the plants creates a cycle of symbiotic caring and nurturing of the soul, as we are reminded of the interconnection between all beings. The awakening of the senses through smells, colors, textures, and plant songs produces a sensation of vitality and love of life that invigorates the one who sits quietly enough to receive this gift. Many a plant can produce these effects but, for me, yerba mansa (*Anemopsis californica*) is an herb that provides all of this and more. I've planted this desert bosque beauty extensively in my garden not only because of the powerful medicine it provides, but also due to its sensitivity in the wild. This small herbaceous perennial suffers from flood plain development and current land management practices. Oversized thick mulch chipped from downed trees is left in place and inhibits the growth of smaller groundcover plants, while urban flood control policies prevent the Rio Grande from meandering and flooding, which in turn decreases the wet boggy habitats that yerba mansa favors. In my garden, however, I can easily provide for her needs, and I'm amply rewarded with her potent medicine and unparalleled beauty. As many of you have no doubt already realized, the more time you spend with medicine plants, the less you need to use them. You get

your medicine by simply being together. One evening, as I was finishing my work in the garden, I saw the energetic glow of yerba mansa—not that I could see it, per se. Rather, I felt in my heart colors I had never seen before. I had been immersed in the pleasing pungent scent of yerba mansa roots for hours as I harvested raspberry shoots and globe mallow roots (*Sphaeralcea angustifolia*) from her immediate vicinity. Just touch the soil where yerba mansa grows, and you become deeply affected by her healing aroma. As dusk fell that evening, her white flowers emitted a radiant glow, and she beamed so luminously, I felt for a moment as if we were one.

...I am aware that all [the plants and habitat] are vulnerable to changes in weather and climate.

While this moment with yerba mansa was a powerful one, it was not an isolated occurrence. As the growing season progresses, plants evolve into new stages of development, and more wild-spirited revelations connect me to the larger landscape beyond. I feel the warmth of the afternoon sun in the golden spires of Greek mullein (*Verbascum olympicum*). I smell the rich legacy of New Mexico's herbal heritage in bee balm's leaves. I hear the heartbeat of all wild animals in the wings of the hummingbirds hovering over autumn sage (*Salvia gregii*). I transcend time and place, hypnotized by passionflowers (*Passiflora incarnata*). I see the divine colors of the high desert sunset in yerba mansa petals. A sunflower stalk (*Helianthus annuus*) reaching for the clouds speaks of eternities of plants inside each one of her seeds. As the awareness of our 'inter-being' penetrates me, I am invigorated by all the energy of the universe that is present within us. At once I feel connected with the earth, the sky, and the cosmos beyond. I sit contentedly in my peaceful garden and stare endlessly into the heart of life. While in my garden, I am completely enraptured by the physical beauty of the scene and enveloped by the ancient wisdom of plants. What better medicine is there anywhere?

Anyone can create such a healing garden that will connect oneself with the beauty and wisdom of wilderness. In fact, it is our imperative to do so not only for our own sake, but also for the benefit of wild lands in a changing world. Sustainability is a hot topic in all areas of our lives these days. For herbalists, that means arming ourselves with the knowledge of our local ecosystems and knowing the status of plants in our surrounding areas. Living in a marginal environment with volatile weather and long-term drought, I have come to understand the quiet beauty of desert plants in their rugged life journey. While ethical wildcrafting practices are important everywhere, they are of



Yerba mansa (Anemopsis californica) brings the elegance of wilderness to the urban medicine garden.

paramount importance here, where even hearty horehound is vulnerable to persistently dry soils. I am fortunate to live at a crossroads of ecosystems that includes the Rocky Mountains, Colorado Plateau, the Great Plains, and the Desert Basin and Range. With all this plant diversity that surrounds me, I'm filled with awe for the learning possibilities that nature provides every time I enter the wilderness. Regardless of having access to an incredible variety of plants and habitats, I am aware that all are vulnerable to changes in weather and climate. Deepening our relationship with common local plants and cultivating our own urban 'wilderness' helps sensitive plants to continue to thrive in shifting environments and provides a platform for sustainable herbal practice now and in the future. While this may be the origin of my desert valley herbalism practice with weeds, commoners, and cultivated herbs at the heart of my work, it has evolved into much more than that. It has become a practice that sustains me in body, mind, and spirit. For I have experienced the beauty and wisdom of the wild landscape reflected in my own backyard. Δ

Dara Saville is a New Mexico herbalist and gardener, director of Albuquerque Herbalism (www.albuquerqueherbalism.com) and a regular contributor to Plant Healer Magazine (www.PlantHealerMagazine.com). She teaches annually at the Traditions in Western Herbalism Conference (www.PlantHealer.org/intro.html). The following essay is excerpted from The Healing Terrain, a book available from the Plant Healer Bookstore (www.PlantHealer.org).

Whole Earth, Whole Birth

Marly Hornik

MY FIRST CHILD WAS BORN AT HOME, an experience that was initially terrifying and ultimately powerful beyond imagining, changing my life in the most beautiful ways. I began the process of unplugging from the machine of ‘normalcy’ (I was never that great at it anyway) and discovering my true self. Upon becoming pregnant with my second child, I soon realized that there was a specific river she wanted to be born near, and she wanted a Lotus birth. Having already discarded convention, I did not mind the location request, rather preferred it, but was a bit squeamish about Lotus birth—an informed birth choice in which the newborn’s umbilical cord is never cut. I was grossed out by the idea of having a big, squishy placenta sitting next to me interminably (or roughly 7-10 days, according to the handful of women who had done this). But I had learned to trust in my nearly two-year-old son, Scott, and that had produced many blessings for both of us, so I surrendered. My husband gracefully accepted my determination, if not quite exactly supported it.

**...I know within me
that [a Lotus birth] allows
a different kind of human
to unfold.**

Of course, like many new things that appear complex, Lotus birth proved incredibly simple and nearly indistinct, compared to greeting a second baby. I was already adept at Elimination Communication, or the practice of non-diapering, so trying to snug something under or around the attached cord was a non-issue. In the July heat, I chose to salt the gorgeous placenta liberally to facilitate drying. Some people choose to sprinkle the placenta with essential oils. By the time the umbilical cord detached quietly on its own, sometime during the second night of my daughter’s life, the placenta was roughly the size and texture of a rawhide tea saucer. I tucked it in a safe place for burial by that river, and moved on to my next challenge: tandem nursing a newborn and a two-year-old!



Marly, Scott, Sara, and John a few minutes after his birth

After now two Lotus births, I still find it challenging to express why I feel it is so significant for the development of a truly sustainable culture. Despite the complete lack of any empirical data comparing Lotus birth to cutting the umbilical cord, in terms of human health and happiness for mother, baby, or matured adult, I know within me that it allows a different kind of human to unfold.

Eliminating violence from the start

When we are born, we know nothing of gender disparity, nuclear proliferation, racism, violence, hierarchy, greed, environmental devastation, or any of the other factors of our current plight as a people that may impact our safety or happiness. We arrive in our perfection, our wholeness, to be in relationship with the air, the breezes, the soft touch of water, the sun and moon, starlight, and all that we are connected to as living beings, living cells of a living cosmos—all that resonates inside of us as joyful. We arrive as one glorious package—baby/umbilical cord/placenta—sensing, feeling, and discovering ourselves within this new reality of beauty and possibility. Hopefully, we can hear crickets chirping, water tumbling and flowing, or the cries of winter ravens. We feel the sunlight rushing toward Earth, whales sounding, and the rings of Saturn spinning. Yes, really. From our center grows the Tree of Life: our umbilical cord is the trunk, and the placenta branches forth into the tree’s fullness (the unmistakable, magnificent form we each were encased in in our mother’s womb). Then, for some reason so unquestionable it appears to be simply The Way It’s Done, we are cut in two. Our internal field of deep harmony with all that exists is severed. Not only that, but despite the medically established fact that we have yet no functioning

immune system, we are now exposed to infection through an intentional wound that must be treated with alcohol or potent herbal medicines we may react to—diverting our nascent life energy immediately from sensing and feeling to pain, loss, and survival. If our caregivers are impatient, we may even suffer significant blood loss. Huh? This is how we welcome our beloved children?

In many indigenous traditions, the placenta is known as the First Mother—not because it nourishes and protects the baby in the womb, but as a physical representation of the mother who gives birth to the possibility of the child. The same mother imbues one seed with the knowledge to become a corn plant, another a mullein flower; the same mother bestows both life-force and the ‘essence-ial’ truth to each living being. All intact indigenous traditions recognize and honor this mother. Can this be coincidence? Are we that proud, to reject the truth of humble, Earth-centered cultures that have persisted for millennia? And what is the impact on us of severing our connection to Her immediately upon birth?

“A child born in this way would absorb all the energy of the sun, moon and cosmos!”

Validation by the elders

In September 2014, I attended, with my family, the third Kuya Raimi Killa at the *maloca* Nabi Nunhue (House of the Jaguar) near Pasto, Colombia. An extended ceremonial gathering to honor the sacred feminine virtue, the esteemed guests are indigenous grandmothers and traditional midwives from across the Americas and beyond. After many days of teachings and wisdom, I asked if any of these women had heard of or experienced Lotus birth. None had. But Guambino grandmother Mamita Miriam Aranda, a widely recognized traditional midwife who sits on the Colombian council of indigenous grandmothers, a woman who is a spiritual leader for her community, in addition to having many times been called to a hospital by doctors requesting her help with a birth, was very excited. “A child born in this way would absorb all the energy of the sun, moon and cosmos!” she exclaimed. My intuition was confirmed; any woman,

anywhere on Earth, without tradition, elders or ancient knowledge, has a way of welcoming the incoming spirit of her baby that has great power, yet can be applied easily. The problem is the solution: cutting cord makes baby cry and could make baby sick, not-cutting cord is easier, baby stays happy and healthy, and gets free bonus of all energy of sun, moon and cosmos.

What is the significance of this to creating a permanent culture? What is gained by welcoming the spirit of a child? This is important to look at with the most information possible, in order to understand what may seem self-evident, or of assumed benefit or non-benefit. How would our children be different if we allowed them self-determination and trust in timing the completion of their birth, in allowing them the space to be with their First Mother until they are complete in Her nourishment?

Personal experience

When our daughter Sara, our first lotus-born child, was three, I became pregnant again. My husband and I did not inform her or Scott. Near the end of my first trimester, Sara informed me that she had seen a baby in my belly and wanted to know if I was aware of it. So much for our secret.

Not long after this, we sat in the forest one afternoon, Sara, Scott, and I. We played a game where, eyes closed, we identify a particular tree that is calling to us, through feeling. Scott quickly opened his eyes and pointed to a white pine several yards back through the trees, and I encouraged him to go to it and sit silently, to develop his natural ability to communicate intuitively with other life-forms. I turned to Sara; she was silent but with eyes open. I asked if there was a tree she was strongly drawn to. She replied yes, so I invited her to go to it. She turned, looked right into my eyes, and said, “It’s in Africa.”

Months later, when Sara was four, we were skiing to a playdate when I realized I had forgotten something. We were still in clear sight of the house, so I asked Scott and Sara to wait there together while I ran back. When I returned, Sara had skied off ahead on her own and was out of sight. Secretly proud and impressed, I also felt she needed to know that disregarding my instruction wasn’t OK. I took a piece of chocolate from my pocket and gave it to Scott, who predictably raced ahead to show her. When we all caught up to each other, she asked for a piece. I explained that I had wanted to give her some, but she wasn’t there waiting when I handed it out, as I had requested. She looked forlorn and said, “Oh, that’s what you were saying. I couldn’t hear you because a half-fairy, half-angel was standing in front of me and talking at the same time.”

This is a glimpse into some of the countless incredible



Scott and John the next morning

moments of life with Sara. There was also the time she discovered where rainbows go in winter, or when she spontaneously painted a great tree with a dragon flying around it and three beings by the roots—an exact representation of Yggdrasil, the Norse tree of life, with the three sisters at its base giving loving protection from the ever-attacking forces of disharmony. There is her remarkable ability for forgiveness and generosity, eclipsing every other member of our family. When she grows up, she plans to be a half-fairy, half-angel. I believe she will, and that is precisely the point.

In addition, neither she nor her brother, John, can ever succeed at getting sick. The most they seem to manage is several hours of mild congestion, and three or four lackluster coughs. She once contracted *Coxsackie* virus at a bowling alley, but it left within 24 hours, though it typically hangs on for two weeks or longer. This enhanced immunity is similarly reported by other parents of Lotus-born children. While Scott struggled with whooping cough for seven months several winters back, Sara seemed to float above it, coughing lightly for only three weeks despite being his constant companion. The data is not exactly pouring in, but certainly any advantage that we can give our children's health is a huge deal, considering the stronger sicknesses people are facing worldwide, and the declining efficacy of medicines—especially when that potential advantage is really so simple to provide.

John's relatively young age makes it a bit difficult to describe what appears to me extraordinary about him: subtle developmental milestones in which he appears to be far beyond his years—but this is typical of many home-birthed, breastfed, bed-sharing, pouch potatoes (babies in slings and carriers instead of bouncy chairs). There

was the rather surprising moment at a Native American prayer gathering when John was six months old and pretty much never left my breast. In the center of a crowd of 150 people was a floor drum with four elders seated around it, each drumming with a large beater; all the people in the room sang together to the rhythm they played. John leapt from my arms into the lap of the elder closest to us, grabbed the beater from her, and played in perfect time for about five minutes, at which time he suddenly noticed I was not holding him and began to cry.

Similarly, around ten months, he accompanied me to a gathering where rattling in unison was part of our activity. He dozed off quickly, but upon awaking, literally the instant his eyes opened, he grabbed the rattle his grip had released on and was rattling in perfect rhythm with the group. At a Ca'anupa ceremony when he was 19 months, the elder came to bless him with the sacred pipe by tapping his left, then right shoulders and finally his heart with the stem, but John just grabbed it, brought it to his mouth, and smoked it.

The fact that both of my Lotus-born children contain this profound, completely self-generated connection to spiritual matters and non-physical awareness seems not at all coincidental to me. And it feels as if a great circle is being remade, in which our true, innate capacity for relationship with Mother Earth as a living, feeling, sensing being, and all that implies, is available to us. Intuition, guidance from angelic beings, resonance with the rhythm of life, attraction to ceremony and sacred objects as a means of nurturing ourselves and all of life, these are returned to us as authentic, viable tools for decision-making and assessing the true impact of our choices on the Earth—instantaneously, not through decades or even generations of research and experimentation. And, quite possibly, for healing the tremendous damage already inflicted over centuries of worshipping the intellect and ego. I can't think of a reason not to choose Lotus birth, as it offers the hope and possibility of a totally different and beautiful way for our future generations to relate to the Earth, with so little asked of us in the manifesting. Δ

Marly Hornik is a founding member of Owl Ridge Earth Ways Community. She applies a mix of permaculture, intuition, sacred offerings, and spiritual guidance to create abundance and joy for all, while homeschooling their three children in partnership with her husband, Rabs. The children insisted upon, and thoroughly enjoyed, choosing pseudonyms for this article. She can be reached at mermaidmama@outlook.com.

Design for Disaster

Grief

Lonnie Howell

Bryce David Howell ~ 9/30/09 - 10/10/10

*I give you this one thought to keep
I am with you still—I do not sleep.
I am a thousand winds that blow,
I am the diamond glints on snow,
I am the sunlight on ripened grain,
I am the gentle autumn rain.
When you awaken in the morning's hush,
I am the sweet uplifting rush,
Of quiet birds in circled flight.
I am the soft stars that shine at night.
Do not think of me as gone—
I am with you still in each new dawn.
Traditional Native American Prayer*

FROM PEOPLE TO PLANETS, from cells to stars, from gardens to galaxies; nothing is permanent. Many cultures of the past (and present) understood this reality and lived knowing that they too would unpredictably return to the Great Mystery. They held rituals to break through the barriers of grief and to restore the community's continuity in relationships. They shared their grief openly, and publicly, in order to prevent

We moderns tend to avoid examining the edges of what makes us uncomfortable or fearful.

mental disorders. The bereaved were embraced and listened to. When one member of a tribe or village was suffering, all were suffering. Although lacking in our modern world, village mourning ceremonies and grief rituals are still common in cultures from contrasting areas of the world. In his book, *The Healing Wisdom of Africa*, Malidoma Somé explains that indigenous people do ritual grieving “as a cleansing practice that purifies the psyche just as a bath purifies the body.” He further reflects on, “the dangers of unexpressed grief, quoting an elder who once said that a man who can’t cry is a social time bomb.” If this is true, then we in the West should all be strolling around wearing helmets and bomb suits on a daily basis! Malidoma

continues later in the book, “In indigenous Africa, one cannot conceive of a community that does not grieve. In my village, people cry every day. Until grief is restored in the West as the starting place where the modern man and woman might find peace, the culture will continue to abuse and ignore the power of water, and in turn will be fascinated with fire. Grief must be approached as a release of the tension created by separation and disconnection from someone of something that matters.”

In our current culture, we live in fear of death, and stoically hide or suppress pain. Stoicism is usually encouraged and even rewarded. We moderns tend to avoid examining the edges of what makes us uncomfortable or fearful. As in many other facets of life, we continually seek instant relief by using and abusing pharmacological or mood-changing substances. We also frequently distract ourselves with technology and entertainment to avoid what we are really feeling. Often, we do not take the time or find the havens to grieve in. In fact, most employers offer bereavement leaves of just two to five days (if any at all)! This job ‘benefit’ is a pathetic but accurate representation of our culture’s values. Furthermore, we generally have a difficult time knowing what to say or do for survivors; avoiding them, offering generic and clichéd advice, or accidentally offending them with awkward comments. In many instances, our lost loved ones are not spoken of at all, or rarely acknowledged. We also tend to place the souls of the deceased in a separate, ethereal realm, ‘up there, looking down on us,’ propelling them even further from the reality of existence.

Having lost a father and a son, I’ve been riding the waves of grief for half of my adult life. When I was 24, my father, Dean, was hit by a car and killed. He was 49 years old. Just under ten years later, my son, Bryce, passed away on 10/10/10. He was just one year and 10 days old, and losing him shook



Bryce David Howell (Sept. 30, 2009 - Oct. 10, 2010)

the very foundations of my consciousness. I am still very much in recovery from these losses. In addition to my own tragic experiences, I have been to an unfair number of funerals and services, witnessing the agony and confusion of people young and old. What I've observed and learned over the years has made me realize that most of us grieve in unhealthy and unnecessary ways. Without having proper support and permission from society to fully drop into grief, we end up going through the motions of the commonly accepted services,

...we must learn how to acknowledge the reality of impermanence....

followed by solitarily handling the whole of the heartache. In this age of separation, we lack the practices that were common just a few generations ago. We live in a time of isolation and distraction, where most of us no longer have the communities and human connections to embrace and support us when we fall into the deep chasms of grief.

I discovered permaculture design on a day when I was in deep anguish over the tragic events in my life; succumbing to grief in an alternate reality. I had noticed the word in various texts, but only when I started to read about it online did I begin to regain meaning and hope for the future. During that dismal day, I enrolled in a PDC in Boulder, CO, an 8-month Through the Seasons course. The idea of creating 'permanent' culture was something I'd been yearning for all along. Deep down, I knew that this design science could in some way motivate me not just to exist, but to get out of bed and live again with some passion and vision to create a brighter future. I also knew that permaculture could somehow help dress the deep open wounds that I had been unsuccessfully attempting to mend.

Over the last few years, the more that I've studied and practiced permaculture, the more I've been able to observe and realize the frequency and reality of death. It occurs in nature just as often as birth. In most instances, it precedes birth in both figurative and literal forms. It has been theorized that our sun itself was born out of an unfathomable, violent supernova explosion! We can find this relationship anywhere if we take a closer look at the diverse environments we inhabit. Cycles, decay, and death are always present where there is life. It is one of the least talked about, but most common, aspects of the terrestrial experience. Even permaculture is impermanent! And although our loved ones will not grow back next spring, it's comforting to know that they were a part of this miracle that we call life and have returned to a realm that we once called home and where we will all return to join our ancestors.

If we are to truly live in regenerative communities with perennial cultures, we must relearn how to acknowledge

the reality of impermanence and reincorporate practices and rituals to express our grief. If we do not, our lives may lack worth, and our relationships and communities will be prone to degeneration. At one point or another, we will all experience some form of loss. We need the permission and ability to grieve in productive ways; to be held in sympathy by our families, friends, and neighbors for as long as it takes to heal. We also need to support our fellow humans who are suffering. There is grand wisdom in exploring these edges with ourselves and others. Think of grief as the Zone 5 of our emotional terrain. It is a place that we modern humans rarely visit, but we have much

Grief Support Diary		Personal Patterns						
AM		M	T	W	Th	F	Sa	Su
	Hours:							
	Sleep Environment:							
Quality of Sleep	Disturbances:							
	Dreams?							
Weather								
	I am grateful for:							
Gratitude								
Nutrition	Meals							
Energy	AM							
Level	(1 - 10)							
Emotional								
Mental	(+ / -)							
Physical								
Activities	AM							
Triggers?	AM							
PM		M	T	W	Th	F	Sa	Su
Weather								
	I am grateful for:							
Gratitude								
Nutrition	Meals							
Energy	PM							
Level	(1 - 10)							
Emotional								
Mental	(+ / -)							
Physical								
Activities	PM							
Triggers?	PM							

to observe and learn from in that space.

As my studies have deepened, I've applied permaculture principles to existential personal experience, and in particular to the grief process. I've made conscious efforts to put these principles into daily practice, which has helped ease some of my burden and will hopefully assist others. Many of these ideas may be abstract, but I believe that there are practical applications as well:

Respond to change

This principle comes first because after a loved one crosses over to the other world, we must respond to a new reality. A

person that we may have interacted with daily in Zone 0 is no longer present. We are unwantedly forced into responding to this enormous change and lack of control over the loss. How we respond to this change will be essential in living the rest of our days to their fullest. Adaptation may seem impossible at first, but slowly it can and will happen.

Observation

Staying present and observing our thoughts, memories, and feelings without judgment can be a challenge while grieving. However, through observation, we can discover times of day or seasons when we feel the worst (or best) and begin to track these times to increase self-awareness and emotional intelligence. We may also discover the many triggers that thrust us into fathomless sadness. We can observe the aspects of life that warm our hearts and make living more bearable and even enjoyable. We can observe our relationships and how others who were directly affected are responding to the loss. We can also attempt to observe coincidences, signs, and unexplainable spiritual experiences that can occur when we are present and open. Simply sitting and using our senses daily can ground us into the present moment without remaining stuck in painful memories or gloomy future projections.

Catch and store energy

Energy will come from many sectors following a death. Be sure to catch and store the outpouring of love by accepting help and nourishment. Don't be afraid to be honest when someone asks you if there's anything that you need, because that may be the only way that they are able to feel connected to you and assist you. Meals may show up frequently during the initial few weeks before gradually slowing down. Request meals that can be frozen for future use, after the rough seas calm. Receive sympathy, embrace often, and welcome a shoulder to cry on. Also, create space and time to release your own stored grief energy. These releases can be channeled into productive activities like splitting firewood, maintaining landscapes, building structures, or assisting neighbors.

Yields

Yields may seem like an impossible concept but they can fruit in many forms. When the time is right, share your experience with as many others as you feel comfortable. Enhance the memory of your loved one with inspired creativity through art projects, songs, stories, or memorial projects and funds. Help others and find ways to give your surpluses back to your communities, local and beyond. Live knowing that you will also pass some day and make the most of your time here.

Self-regulation and feedback

Honesty and open communication are keys to healthy

relationships and personal well-being during the grief process. It is common for couples' relationships to deteriorate and even end after tragic losses. Know when you need direct support or solitary time and space. Speak with people that you love, professionals that you trust, and seek feedback on how you are functioning from onlookers' eyes. Always keep in mind that you should be kind and gentle with yourself when applying self-regulation. Recognize the fluidity of thoughts and strive to be at peace with not feeling contented all of the time.

Use and value renewable resources

Find grief support groups, trusted spiritual teachers, and therapists that you resonate with. Use sleep, nutrition, and exercise to manage grief, fatigue, and stress. Quality sleep and nutrient-dense foods can help your brain and body improve emotions and energy. If you are willing to do some research, there are many studies and resources available that link food to mood. Exercise can also be a great way to release stagnant feelings and sweating helps detoxify the body. Find a form of movement that you not only enjoy but look forward to. Spend time outside! Sunshine on the face and the sights, sounds, and smells of nature are powerful healers and mood enhancers. Feel nurtured by the beauty of our biosphere and value its bounty. Finally, our children are our most valuable "renewable resource"! Modeling how to grieve openly and honestly, and educating them about impermanence can have major impacts on how they grow and function in their own lives. From my own experiences, children seem to be more connected to The Other World at very young ages and may lose that connection over time. They tend to understand death more than they are given credit for, and can articulate many profound things. Don't just try to teach children; learn from them!

Waste not

Rather than wipe your tears as they flow, let them cleanse you as the salt water of the ocean helps to cleanse the earth. Integrate what you've learned about mortality into your daily routines so that nothing is taken for granted and the miracle of being alive is realized. Be sure to re-gift your surplus love and life wisdom to others. Also, and this may be a taboo subject, but research and consider a green or "eco-burial" to reunite bodies with the earth. All living organisms can be recycled into new life, and we are no different. With some creativity, a burial can be part of a regenerative habitat restoration.

Patterns

Notice the ever-present patterns in your grief process. Discover which patterns benefit you and which do not. Also notice patterns within your daily cycles. There may be old habits that are no longer serving you and may be inhibiting your healing. As Aranya writes in *Permaculture Design: a Step-by-Step Guide*, "Unwanted habits are just patterns that can be replaced, but we need to do so with more powerful ones

for this to be successful. Deciding to give up a thing is not enough; we have to want something else with an even greater passion.” He continues, “We are our own greatest asset, so when designing for ourselves one of our focuses should be on health; disregarding this will reduce our effectiveness at everything we set out to do.”³ Inspired by Aranya’s *Personal Patterns Phenological Diary*, I have created a similar template to record our personal patterns for grief support. You can track how things like sleep, weather, food, and activities make you feel. I have added a bi-daily gratitude practice and a section for tracking the unexpected experiences that can arise which trigger grief. This tool can be an effective way to identify patterns during our grief journeys to assist with self-care. Finally, observe the pattern of birth—>life—>death—>rebirth, ever-present on our planet. Patterns that are modeled in nature can have a grounding.

Integrate

Become or remain integrated in your community after time has passed and things start to settle down following a death. Be sure to give thanks to all of the people that have supported you. Integrate a daily meditation of gratitude (as mentioned in *Patterns*) for all of the positive aspects that still exist in your life. This will contribute to living with meaning and intention. Do not hold grudges against those whom you may have thought would help or speak with you more often, as they most likely are uncomfortable with the situation. Be open and inclusive to others that are suffering and holding on to any form of grief. Stay integrated with your family!

Small and slow solutions

You will discover the true meaning of “one day at a time” after a loss. Our brains need time to process the death of a loved one and accept our new realities. Grief cannot be rushed. There is no instant alleviation. There is no one right way to grieve, and the process looks different for everyone. Realize that you may never feel “normal” again, but that you will be able to cope with daily life in more manageable ways as time wears on. Meditation can be an extremely effective tool to slow down.



Memorial garden

Relax into the present moment at hand and provide yourself patient compassion every step of the way. One of the best pieces of advice that I’ve received was on the day that my son died, when a friend looked me in the eyes and softly but confidently said, “Know that you will be ok.” It was a simple yet powerful statement that addressed the fact that it was going to take time to heal but that I would survive and thrive.

Diversity

Study other cultures from around the planet and how they conducted grief rituals and funeral services. The realization that we are all human and we all suffer no matter how different we may seem can be very comforting and enhances empathy. When you feel ready, attend a grief support group meeting to connect with fellow humans who may have diverse beliefs and backgrounds but truly know and understand what you are going through. Seek the wisdom of others who have lost loved ones and add this diversity to your “coping shed”. Remember, death is a commonality among all living beings. Treat life as sacred and see the beauty in the diversity of universal cycles.

Edges

Our fear and avoidance of edges may be the root of our struggles within emotional, mental, and physical well-being. Keep in mind that edges are places of tremendous energies and fertility. By increasing our edges and exploring our complex interfaces among ecstasy and misery, we can discover much hidden beauty and personal productivity. Harvest the edges of your comfort zones. Follow the burning passions in your hearts. Take chances and experience new endeavors that you may not have had the courage or motivation to try prior to grieving. Our time here is precious and passes by without control. We are all ‘living on the edge’ with every breath. Embrace these edges, and do not fear the Great Mystery! Δ

Even the seasons form a great circle in their changing, and always come back again to where they were. The life of a person is a circle from childhood to childhood, and so it is in everything where power moves.—Black Elk

Lonnie Howell is a mentor and life skills coach at a therapeutic young men’s program in Colorado. He received his PDC and Advanced PDC certifications in 2012 and 2013 from High Altitude Permaculture. Lonnie lives with his wife, three children, one angel, two dogs, and many red wiggler worms. He has volunteered with the Grief Support Network in Boulder (<http://griefsupportnet.org/>). Lonnie can be reached at lonnie.howell@gmail.com.

References

Aranya. 2012. *Permaculture Design: A Step-By-Step Guide*. Hampshire, England: Permanent Publications.
Somé, M.P. 1998. *The Healing Wisdom of Africa*. New York, NY: Penguin Putnam Inc.

Waging Weed War with Water

Green Chinampas

Jeanmarie Zirger

A FEW YEARS AGO in the pages of this magazine I wrote about my project of clearing a wooded area in order to develop a series of full-sun, open hugelkultur terraces (deep raised contour beds of woody debris) for eventual market gardening (“What to Do With All the Wood?”, *Permaculture Activist* #83, February 2012)

In that article, I described the process of harvesting muck from the shallows of a small lake for the backfill of the terraces. The next sequence in my earthscaping design involved expanding gardens into the lake shallows. I wanted to harvest more of the lakebed muck for a set of chinampas, small narrow peninsulas that are only inches above the high water line, and which would be planted and harvested by hand. The concept of chinampas was developed hundreds of years ago by Mesoamerican peoples in the shallow lakes surrounding present day Mexico City. The Aztec farmers are reputed to have fed a population of over 200,000 people primarily from these floating gardens.

The dynamics of a chinampas growing system capitalize on a number of advantages that arise from the edge between land and water. One is the more temperate microclimate created by the mass of water. In the Valley of Mexico, due to its high elevation, winter can bring light frosts that the chinampas avoid. A second

My design also has a dynamic aspect linked to the seasonal cycles of moisture.

benefit is the ease of transporting produce by boat from the growing zones to markets across the water; this wasn't a primary concern for me as I live next to the beds on the landward side. A third advantage seemed more central to my needs: water will percolate through soil horizontally for short distances, depending on the structure of the soil particles. If a plot of land can be surrounded on three sides by water, and the soil surface is only a bit higher than the water around it, there should be a constant source of subterranean moisture available to plant roots. No irrigation equipment should be needed. Increasingly hot and dry summers in western Arkansas pose challenges to gardening that the chinampas might ameliorate. In building these water gardens, I incorporated wood slash from a previous clearing operation into the base of my chinampas, speculating



Years of erosion deposited sediment at the pond's edge, making a rich muck that supports cattails and various marginal plants.

that this would improve the ability of water to penetrate to the center of the growing beds. The long sticks of wood act like little capillaries for the water to travel along.

My design also has a dynamic aspect linked to the seasonal cycles of moisture. A watershed-sourced body of water, such as this lake, is normally at high water level during the spring planting season. This is also the time when new plants have small root systems. As the summer season develops and the water level drops with decreased rainfall and increased temperatures, the plants will have had time to develop deeper roots. And at harvest time in the late summer or autumn, the water level is typically still at less than normal, enabling wheeled harvest equipment to traverse the plot without sinking into soft soil.

What I already had on hand for this project was the accumulated topsoil that had, over the years, washed down into the edges of the lake. This sediment supported a diverse population of aquatic and marginal plants that had volunteered in the marshes and shallows. Over the past year, I have also imported residue from a nearby post and pole mill. This material consists of the bark and slash that results from peeling pine logs to make fence posts and building and utility poles. Similar to the output from wood chippers that clear utility rights-of-way, the bulk of the material is suitable for mulching pathways and plantings. But in the mix were also cut-off ends of posts, limbs, and other slash that was rejected in the process of post peeling. I did not at first have a use for the big chunks but I took what they loaded. It was free for the hauling, and a smart trader does not look a gift horse in the mouth. I wanted that pine bark mulch

and was willing to accept the other residue.

As above, so below

As I ruminated over the idea of building chinampas, it occurred to me that I could make them just as I had done when building the hugelkultur terraces: using wood slash as a base. This would not only reduce the need for large amounts of imported soil, but would provide the benefits associated with hugelkultur substrata. And in the case of the chinampas, the wood slash strewn about in a random interwoven manner provides a sort of reinforcing mesh to help hold the wet soil in place when it's submerged. When I built the terraces in 2011, I used the residue from the timber harvest for the hugelkultur base. For the chinampas, all I had to do was sort out the logs and limbs from the bark chips in the post mill material—*voila*, two birds scored with one stone.

This promised to be quite economical. I had put together an hydraulic dumping box trailer for use with my truck to haul material from the post mill. Beyond that, the only dollar cost I had invested was the motor fuel to haul and dump the mill waste. But the devil is in the details.

The muck to be harvested for the chinampas was just that—MUCK. There is no way that my little backhoe could navigate in the mud flats without sinking, even though the water level was down nearly two feet from the summer drought. I employed a CAT track-hoe to work from the dry edges allowing us to reach out nearly 20' (6 m) to scoop up the rich muck and dump it onto the wood slash that I had placed beforehand. The track-hoe could also traverse out farther from the normal edge by crawling out on the wood slash that I had in place for the chinampas. It took less than six hours of machine time to build up two and a half chinampas approximately 16' (about 5 m) wide, 3' (1 m) deep, and 30' (9 m) long. I did not use any form of retaining structure around the perimeters to hold the muck in place since I was relying on the interwoven wood slash to provide structural



Sorting and moving materials with machinery allows one person to work with little support.

stability. And as it turns out, wood that is constantly submerged in fresh water does not rot. So my hugelkultur base of wood slash should provide structural stability for the life of the system. Whatever wood is in the soil but above high water line will eventually rot and contribute spongy humus-like material to the topsoil.

The construction began in midsummer, when I gambled that the water level was at its lowest for the year, and the chance of rain was very low. I needed the water level as low as possible to facilitate machine harvesting of the muck as well as to allow me to walk out onto the mud flats to set the wood slash in place. So here was a case of the problem of dry weather and low water levels becoming the solution for machine access to this project.

In mid-September, after the structures had been built, I harrowed and graded the chinampas topsoil and planted a cover crop of winter wheat and Ladino clover. After a few rain showers, these plantings sprouted. If the geese will cut it some slack from their heavy grazing, I could get a food crop as well as having the bare soil covered over winter. Because I'm not yet ready to develop the market garden aspect of my design, I will continue to plant seasonal cover crops to build soil structure and fertility. I also intend to develop harvesting machinery to use the

So my hugelkultur base of wood slash should provide structural stability for the life of the system.

aquatic vegetation in the channels for composting.

The Canadian geese that have adopted this lake as one of their home bases seem to like the chinampas as a nesting site. So far, I've seen two hatches (11 goslings total). On the chinampas, they're close to the water's edge and have the cover crop for food and security. The downside to being nearly a bog is that I cannot get my tractor and disc harrow on the Chinampas to plant an early summer cover crop. It gets costly to hire a wrecker to pull out a stuck 4WD tractor!!! As the waterline recedes in summer, and the chinampas can support the tillage equipment, I will most likely plant *Crotalaria* or *Sesbania* in mid-to-late June. They can be bush-hogged in the autumn and plowed into the topsoil just prior to planting the winter cover of grass/legume mix. And, at some point down the road when the soil is crumbly and full of wee beasties, I can stop the tillage, and the Land Institute will have available some perennial cereal grains to put in place.

Selective restoration

The chinampas project has massively disturbed the natural

marsh ecosystem that existed here for many decades. My intentions are to intervene in the restoration of a more natural edge at the chinampas and water interface. The rest of the shallows around this lake are populated with a sequence of aquatic and semi-aquatic marginal plants. *Nymphaea* (water lilies) inhabit the deepest water out to around 5-6' (2 m) of water depth. Lotus and cattails fill the intermediate depths, and bog plants such as water iris, and lizards tail colonize the shallows. These were all exterminated in my chinampas location as a consequence of dredging muck for backfill. I will relocate these species from elsewhere on the lake edges to kickstart reclamation of the marsh ecosystem surrounding the chinampas. The slope from top to bottom of the built chinampas approaches 45 degrees—rather more than what naturally occurs when topsoil washes down to the water's edge gradually over many years. The steeper slope of the chinampas edges will need a



A track-hoe was the right tool for the job, requiring less than six hours to build the chinampa beds.

...who wouldn't prefer the majestic aerial leaves and sensuous fragrance of the lotus...?

modification of the normal distribution pattern that occurs at the undisturbed waterline around the lake. And too, I will tend to favor the shorter species there in an effort to reduce shading and root competition adjacent to the surface of the chinampas. Heck, who wouldn't prefer the majestic aerial leaves and sensuous fragrance of the lotus over the stoic regimentation of the cattails? A bog can be beautiful too!

Lacking instrumentation situated on the chinampas and in the upland, terraced plots, I can't remark about a potential temperature variance. Presumably the proximity of the chinampas to a large body of water should help to keep soil as well as surface air temperatures somewhat moderated compared to the uplands. So there is potential for a slightly extended growing season. But my own experience tells me that a cold 'nor-easter' blowing in from across the lake will zap the tender species in the blink of an eye. A downside to having plantings extend out into the water on the chinampas is the effect of wind on tall plants. My assumption is that the chinampas' role in my market garden design will be reserved for the shorter plants that prefer a steady moisture level in the root zone. A few years of cover cropping on the chinampas should give me some indication

of the best practices in using these water gardens.

I certainly welcome any feedback from readers with more experience in chinampas growing systems. Slow and small does not preclude the advantage of anecdotal evidence gleaned from seasoned veterans. △

Jeanmarie is a 2011 graduate of the PDC offered in Indiana under the tutelage of Peter Bane, Keith Johnson, and Rhonda Baird. She is relatively new to permaculture design but no stranger to gardening, earthsaping, and fair share (equal rights activism), while operating with her other foot in the current but failing cultural paradigm. She has been on a sustainable lifestyle path since her first exposure to Mother Earth News in the 60s. Contact her by email at JMZ6875@gmail.com.



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Food Justice & Edible Schoolyards

Patricia Sprague

AT MASON RIDGE ELEMENTARY SCHOOL in the 60s, my classmates and I sang “O beautiful for spacious skies, for amber waves of grain, for purple mountain majesties, above the fruited plain!” We sang with the solid fervor of youth, and I felt so lucky to live in our unquestionably magnificent country. Proof was as close as the view out our public school classroom window to fields of soybeans and waving wheat in St. Louis County, Missouri; I knew the lyrics had to be true. This and similar songs celebrating America’s abundance inspired me. But on my daily school bus ride, I often wondered how the children of a very poor family, just a little further down our modest county road, managed to live. I could see hardship in their clothes and unclean hair. One of them was frequently sick, and sometimes when they boarded the bus, I wondered what, if anything, they had eaten for breakfast. I began to doubt the songs we sang with such passion.

Now, decades later, these questions persist. What happened to the ideal land of good and plenty we used to sing about, and that we hoped was true for everyone? We are increasingly the land of deepening food scarcity for our poor and the land of ample food of low nutritional value. It doesn’t make a good song, and it seems an intractable problem, a social-political-economic conundrum. Yet how can we do better? The good news is that some folks are definitely not settling, and they are actively building something better.

Edible school gardens spring up

The Edible Schoolyards Project (edibleschoolyard.org) is one such example, using school gardens to help foster food justice. There are approximately 3,600 garden classrooms in the US affiliated with the Edible Schoolyards Project (ESY). I’m most familiar with the ones I’m researching in Pittsburgh,



A third grader adds his team’s compost to the pile at the end of garden class. Photo credit: James Souder.

Pennsylvania—Edible Schoolyards of Grow Pittsburgh. Children, garden educators, and classroom teachers are the heart of ESY, learning about food, nutrition, and the environment, while often also integrating science, math, literature, history, geography, and the arts. ESY encourages the traditional “eat your vegetables,” but by attraction. Kids are often more willing, even eager, to try new vegetables when they have planted, grown, and prepared the food for themselves and their classmates.

Edible Schoolyards are where members of the community come together to reclaim and transform parts of their

Change originating and rooted in the community tends to blossom, while imposed change... tends to wilt.

schoolyards, to plant, harvest, prepare, and eat the fresh food of their labor. It can seem like a new idea, but the generation of Americans that fought World War II and tended sustainable and successful victory gardens would probably find this concept very familiar.

There are wide-ranging benefits associated with ESY. Communities that transform schoolyards are also practicing food justice and modeling food justice for all who observe. When people come together to grow fresh food locally, more folks are at the table—literally and figuratively. Students and adults who establish sustainable gardens illustrate where power resides: ordinary citizens at the table making tangible, collaborative improvements in and for their community. How do they do it?

Like an ecosystem, it goes something like this. Local leadership generates interest in and momentum for a school garden. Folks identify changes wanted and needed, questions are explored: How do we involve children from the start? Where is a suitable garden site? What tools do we need? How do we plan the beds and plant them? Community roots grow deep as local leaders gain the confidence and participation of other community members, as they share leadership and learn together. Change originating and rooted in the community tends to blossom, while imposed change—often irrelevant, sometimes arrogant—tends to wilt. Shaped by principles of community participation, Edible Schoolyards promise to tackle new

problems with these established tools.

This reminds me that another song we often sang at Mason Ridge School was “Milk and Honey.” The lyrics, originating from Bible verse, celebrate ideals of community working together for a better life and a better place. When a community of local teachers, administrators, parents, students, volunteers, activists, garden educators, and neighbors shape a space into a vibrant, inviting garden, they build a strong base for more positive change. Could this be that place we sang about, the “world of good and plenty,” the “place where the hopes of the homeless, and the dreams of the lost combine”?

Stemming the erosion of food security

Food justice means healthy, affordable food for all, sustainable food systems, and fair working conditions for food workers. Food injustice is the slow and steady erosion of these values. According to the USDA, 15.8 million American children do not have enough nutritious food to maintain good health. For the first time in US history, American children may have a shorter life expectancy than their parents unless steps are taken to address excessive weight gain, according to the NIH. In America today, our food is faster, more processed, and grown further away from our tables than ever before.

Add to these challenges the erosion of neighborhoods (think high poverty, no grocery stores, high incidence of violence)

When neighbors see, smell, touch, and hear something tangible, important, different, and better, will more join in?

the stress of poverty (think basic security being persistently in question) and the possibility of epigenetics (think genes modified by interaction with the environment) all playing a role in food insecurity. Our poor are experiencing rising food insecurity, while at the same time we have an epidemic of childhood obesity—the erosion of food justice affects the body and soul. Can we stem that erosion and build food justice?

It is true that poverty and unsafe neighborhoods dwarf concerns over long-term health. Changing behaviors that may result in a longer life seem frivolous if making it through today is uncertain. But in some troubled neighborhoods, Edible Schoolyards participants are nonetheless working toward food justice, cultivating young and old leaders, sharing leadership and power. Building on one success at a time, they are yielding a sustainable harvest for the body and the soul. When neighbors see, smell, taste, touch, and hear something tangible,



Mrs. Raiford's third graders measure, plant, and water nasturtium seeds, a colorful edible flower. Photo credit: Courtney Thrall.

important, different, and better, will more join in? Even in distressed neighborhoods, can community solidarity, growing in parallel with good, fresh food, make a difference? We cannot know in every case, but community members of many Edible Schoolyards sites affirm that, oftentimes, the answer is yes. Δ

Patricia Sprague has been a rural high school Health Education teacher; an organic farmer in Germany, a consultant to the Djibouti Ministry of Health, a conflict resolution trainer in urban schools, a produce stocker in a member-owned cooperative grocery store, and a lifelong organic gardener. She holds a BS in Education, an MS in Community Development, and currently is a doctoral candidate in Duquesne University's School of Education. Patricia's doctoral research examines the effects of school gardens on students at the nexus of food justice and social justice in Edible Schoolyard Pittsburgh, a program of Grow Pittsburgh.

Agroforestry and Forest Garden Network

The network, based in the UK, invites more participants from North America to participate in sharing their forest garden with others. It is up to members to choose and arrange any visits from the list that they are interested in – please follow instructions given with each invite.

For more information, contact:

Agroforestry & Forest Garden Network
A.R.T., 46 Hunters Moon, Dartington, Totnes, Devon,
TQ9 6JT, UK
Email: mail@agroforestry.co.uk
<https://www.agroforestry.co.uk>

From the Regions

Building Community in Michigan **SoMI Perma-Mixer**

Bryan Mets on behalf of the SoMI Perma-Mixer Organizing Collective

RECENT EFFORTS TO CREATE more connections across Southern Michigan culminated in the development of the South Michigan (SoMI) Perma-Mixer. Initiated by Jesse Tack, cofounder of Abundant Michigan, Permaculture Ypsilanti (AMPY), and Bryan Mets, former member of AMPY, and member of Oakland County Permaculture Meetup (OCPM), the mixer is a periodic event designed by a collective of organizers from community groups in the region. The organizers defined initial goals and built the event to help achieve them. Those goals were to create a regularly occurring regional event that fosters relationships, builds a knowledge base, bolsters the permaculture community of SoMI, and gives back to the host site.

The first Perma-Mixer was held in October 2014 at Dawn Farm in Ypsilanti. Hosted by AMPY, the event included over 50 participants who toured the collaborative community garden and greenhouse projects and learned about AMPY's Restoration Agriculture-based nursery and orchard. The goal of the Restoration Agriculture project is to create an economically sustainable community resource for local food and plant production. Participants installed swales and American persimmon trees to enhance the site. The event ended with presentations by community leaders about their group projects, how they organize, and what they could improve. A large group of participants wanted to keep talking after the event ended, so they headed to a local cafe for an impromptu group dinner.

A few results from the first mixer included the formation of Abundant Michigan/Permaculture Macomb (AM/PM), a community group to serve the residents of Macomb County, and

a collaborative effort to bring Mark Lakeman from Portland's City Repair to Detroit and Kalamazoo.

The second Perma-Mixer was hosted by OCPM and occurred over Memorial Day weekend 2015, at the Strawbale Studio in Oxford. The theme for this event was "Think, Have, Need," and an interactive opening activity was added. Participants were asked to express their background in permaculture through kinetic indicators. Permaculture teachers found themselves flapping their wings and scratching like chickens, before being asked to give the group a collective definition of permaculture. This definition was used as the basis for a round of ice-breakers. Each participant met three new people and discussed a different theme with each: what they were "think"ing about, what they "have" to bring to the community, and what their community "need"s.

Because the Strawbale Studio is a natural building incubator site, a natural building coppice planting and hedgerow collaboratively designed through a process led by Mark Angelini of Roots to Fruits Ecological Landscaping in Clarkston, served as the installation project. Although coppicing is a productive and ecologically sound management technique for building material, timber, and firewood, there aren't many examples of coppice systems in North America. This installation will serve as an example and provide an empirical understanding of the technique for the community. Over 200 trees were planted including black locust, chestnut, grey alder, American plum, white birch, willow, serviceberry, hawthorn, hazel, and osage orange.

After a potluck lunch, local experts held discussions, talks, and demonstrations. Topics included a broad range of interests including Natural Dying, Creating a Rubric for Better Forest Gardens, Ecovillages and Community Living, Teaching Permaculture Design to Children, and Community Plant Breeding. Strawbale Studio proprietress and longtime community leader Deanne Bednar led work groups to add clay slip to one of the natural buildings onsite.

Major needs during the event were a local group for Wayne County residents, collaborative ways to improve outreach, and members with legal and code experience. These ideas will help guide future development in the region as we build collective energy and enhance regional resilience.

If you're in the region, join us for the third SoMI Perma-Mixer this fall, hosted by VanKal Permaculture at Western Michigan University's Gibbs House in Kalamazoo. Find more details on our website (<https://somipermamixer.wordpress.com/>) and Facebook page (<https://www.facebook.com/pages/South-Michigan-somi-PermaMixer/824847560868667/>)! △



The chicken dance: an ideal ice-breaker. Photo courtesy Sheryl Netzky.

Reviews

Rocky Mountain High

Review by John Wages

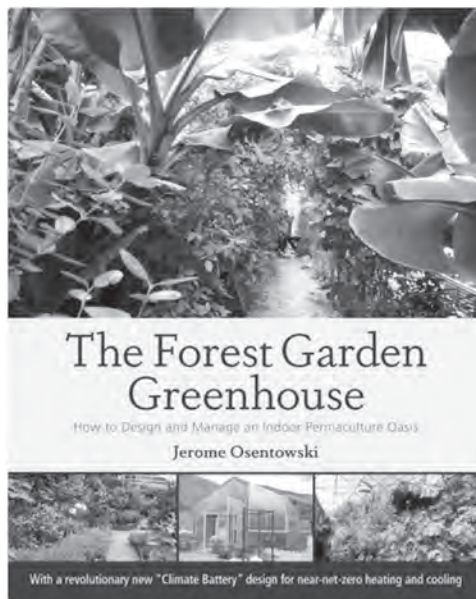
JEROME OSENTOWSKI

*The Forest Garden Greenhouse:
How to Design and Manage an
Indoor Permaculture Oasis*

Chelsea Green: White River Jct., VT
304 pp. paper. color photos. \$34.95.
Available Sept. 16, 2015.

FOR THE PAST 40 YEARS, Jerome Osentowski has been experimenting with systems for growing food year-round in the high mountains of Colorado. He has built five greenhouses, which sustain lush subtropical and tropical forest gardens at 7,200 ft. in USDA zone 4, and provide a centerpiece for the Central Rocky Mountain Permaculture Institute (CRMPI). CRMPI is distinguished for holding the longest running annual PDC in the US.

The Forest Garden Greenhouse describes his flagship greenhouse, Phoenix, in admirable detail, in “A Tour of the Ark,” which acknowledges here, as he does elsewhere, the influence of the work of the New Alchemy Institute in the 70s. Phoenix evolved from an earlier structure, Pele, which was unfortunately destroyed by a fire in 2007. Phoenix is a tropical greenhouse (Zone 11, minimum temp. 40°F) with mangos, ginger, citrus, dragon fruit, passion fruit, papaya, and bananas, of course. These not only grow, but also fruit prolifically. Remember that this is a climate where winters are long and cold, where even winter vegetables do not survive without protection. Phoenix is season extension taken to the extreme. Side bars describe in detail each of the four other CRMPI greenhouses. Mana, attached to an existing building, maintains a Mediterranean climate, supporting a fig and pomegranate overstory, with cucumbers, rosemary, artichokes, and other species. Mana yields figs five months out of the year—a remarkable feat at this altitude. The voice of experience recommends not starting with a tropical greenhouse, which is



the most difficult. In climates with long periods of cold, cloudy weather (think New York, Nova Scotia), a Mediterranean climate will be more easily attainable. For those who wisely prefer to start small, Shree is a simple, lean-to, attached greenhouse. Built for under \$200, Shree seems within my reach and a good place to start experimenting with these techniques.

This book begins with a bit of history of the author and CRMPI, then presents an overview of season extension techniques. The complexity varies from simple row covers to all-season, solar heated and cooled greenhouses like Phoenix. Depending on your goals, you might not need to build a Phoenix or a Mana. If all you want is to grow salad greens all winter long, then simple hoop houses might be sufficient. Even for these less ambitious readers, this book is a fine read. It demonstrates what can be done, in a less than hospitable climate, using almost exclusively solar energy.

A chapter deals with greenhouse design, focusing on orientation, foundation, glazing, and most importantly solar orientation and insulation. By internalizing the design principles worked out by the author over the last few decades and following some explicit guidelines, one can maximize solar gain, minimize heat losses, and store heat in the ground for use on cold winter nights. Heat is stored in a “climate battery,”

a long network of tubes buried in the soil beneath the greenhouse, connected to fans that can pump air into or out of the greenhouse. During the day, warm, moist air from the greenhouse transfers its heat to this soil-based battery; at night, air is pumped out of the battery, to heat the interior of the greenhouse. Ample and high-quality illustrations, including several photos of installations, complement the descriptions of the climate battery.

This book devotes a whole chapter to soil. Conventional greenhouses often suffer from soil depletion after a few years. A permaculture approach nurtures the soil food web and creates conditions for soil regeneration. Although the author uses compost, worms, sheet mulching, and compost tea to achieve the most robust soil food web possible, he doesn’t neglect mineralization. Naturally, on Basalt Mountain, he makes use of basalt and granite fines, among other amendments.

“Creating a Forest in Your Greenhouse” describes in detail how to cultivate biodiversity and install components with supportive relationships—all in the context of a greenhouse microenvironment. “Flower towers” provide pollen and nectar for pollinators, mason bee blocks provide affordable housing for native bees, trap plants help control more intractable pests, and animals provide numerous services like rodent control (snakes, cats) and pollination (hummingbirds). The author emphasizes the importance of not treating the greenhouses as isolated systems and keeps them as open as possible, to allow snakes, birds, pollinators and other insects to move in and out. He relates how passionflowers initially had to be hand-pollinated in order for them to bear fruit; now, hummingbirds and insect pollinators enter through the vents and pollinate the crop effectively. Maximizing the connections with the outside world increases resilience of the greenhouse ecosystem. Anyone who asks, “Is this *really* permaculture?” should read this chapter first.

The author repeatedly emphasizes the importance of observation and responding to change. Plantings in these types of

greenhouses are largely experimental. If a plant is not compatible with its neighbors or doesn't like the site where it's planted, change the arrangement.

Despite the use of advanced materials like a steel frame and double-wall polycarbonate glazing, the author has salvaged most of the materials used to build the greenhouses. In fact, Chapter 5 shares some of his salvaging secrets and stories of remarkable successes at locating greenhouse materials at low or no cost. Tempering these anecdotes

measurement of parameters like thermal capacity and charge/recharge rates of soils, and the effect of the rate of air exchanges, and the book relates much of that data, extending its relevance far beyond its Colorado home.

Data obtained since the early 90s demonstrate that a climate battery can deliver air at 72-75°F after having been charged over the warm, sunny months. Even in the long Colorado winter, this stored heat is sufficient to heat the greenhouse as long as temperatures

with runoff from the greenhouses and other structures, water is not limiting, even in this semi-arid climate (around 20 inches of precipitation per year). And, building these balanced structures, while described by the author as "low-tech," requires skill in calculation (solar gain, heat loss, etc.) and construction. The design team includes Michael Thompson, an experienced architect. While their use to extend the growing season in Colorado has been a resounding success, can this success be replicated in diverse zones and at a scale where it can really make a difference, as the climate changes? Only time will tell, but early indications suggest much more is possible. In the era of converging crises—energy depletion and climate change, the climate battery may be applied more and more to homes as well as greenhouses.

These discoveries and inventions probably merit intellectual property protection under current law. To his credit, the author intends to make climate battery know-how available to all, as an open-source technology. This determination exemplifies the third ethic of permaculture: to share the surplus.

The *Forest Garden Greenhouse* is destined for a second and third printing, at least. As a guidebook, it is indispensable for anyone aspiring to grow food year-round. In regions with sunny winters, many of the author's techniques should translate well, with minimal adaptation. In zones of cloudy, cold seasons, particularly if combined with hot summers, extensions of these techniques, applying the principles of the CRMPI all-season greenhouses, should enable winter growing of just about anything the gardener wants. Don't forget the hammock! Δ

...the climate battery may be applied more and more to homes as well as greenhouses.

of lucky finds, the author notes how important it is to organize and inventory salvaged materials. Properly "cataloged, stacked, and covered," they can be used 5, 10, or 15 years later, as needed in various projects.

Osentowski has built redundancy into the heating systems. He uses the mass of rock walls and water tanks, the sauna, the active climate battery, and plant biomass, supplemented by active heating when necessary. Overheating seems not as much of an issue—he mentions that one could use retractable curtains that are used in commercial greenhouses, or biological approaches like vining plants. Limiting heating would be much more important in hot climates and would probably require active cooling with a climate battery inside the greenhouse, as well as a heat sink outside.

Whether greenhouse technology developed for high-altitude, cold mountain climates could be adapted to hot, humid zones was foremost on my mind, as I picked up this book. Fortunately, the in-ground heat sink can cool, as well as heat. Not only does the climate battery work in reverse, as one might expect, but also CRMPI is actively engaged in collaborations to install similar greenhouses in hotter climates, although few details of these projects are presented (a second edition?). Considerable observation has gone into the work over the years, with the

do not drop below 10°F. Below this threshold, supplemental heat sources should be used to avoid depleting the climate battery. Judicious and timely use of a wood, electric, propane, natural gas, or other heater enables the climate battery to support most of the heating needs of the greenhouse through the winter. The CRMPI greenhouses currently use wood pellet stoves.

Despite the long, cold winters, CRMPI's site is usually sunny for long periods (about 300 days out of the year), which allows time for the climate battery to recharge after releasing heat on cold nights. This somewhat unequal advantage enjoyed by CRMPI should be considered and designed for, by anyone contemplating this design in climates with much winter cloud cover. While the steep side of a mountain, initially almost soil-less, is not generally considered an ideal site for a homestead, the location does have plenty of water, both on the uphill side, and in a creek below. Combined

Back Issues

Back issues of the *Permaculture Activist* / *Permaculture Design* are available. See page 60 for details. A complete set (issues #1-#96), which includes General and Species Indices to the first 90 issues, costs \$450 to US addresses.

Back issues of *Agroforestry News* are also available. Currently, we have in stock two complete sets of issues #1-91. Contact sales@PermacultureDesignMagazine.com for pricing.

New Alchemy Institute Archives Online

The Green Center has completed a redesign of their website, a rich vein of eco-tech information developed by the New Alchemy Institute during the 70s and 80s. Their arks on Cape Cod were the forerunners of the CRMPI and other modern bioshelters. Issues of the *Journal of the New Alchemists*, along with presentations and videos, are available at newalchemists.net.

Explore the possible.

From the Ground Up

Review by Peter Bane

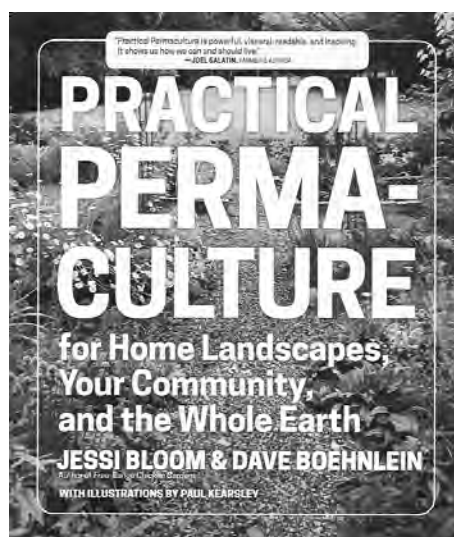
JESSI BLOOM & DAVE BOEHNLEIN

Practical Permaculture for home landscapes, your community and the whole Earth
Timber Press. Portland, OR. 2015.
336 pp. full color. illustrated. \$29.95.

PERMACULTURE IS GROWING up, and its rock stars are increasingly reaching a younger crowd. This hefty and attractive book, with its bright and attractive authors should be a solid hit for Timber Press, which like several other publishers have been edging into the permaculture market for a couple of years now. This too is a sign of the maturing of permanent agriculture and the ever more popular movement that propels it.

Bloom, who wrote the handsome and helpful *Free Range Chicken Gardens* not long back, and Boehnlein, along with illustrator Paul Kearsley, anchor their work in the Pacific Northwest, and this book has a strong West Coast flavor, though it draws examples and photographs from Central America, Japan, and eastern locales in the US.

Written as a primer for the novice practitioner or permaculture student, this book should serve well as a text for the permaculture design course, but because of its flashy and graphic-rich presentation should have a wide appeal for the garden market and those curious about “permaculture.” Unlike many beginning texts, this one does not bowdlerize or dumb-down its writing. The strength of the concepts and the quality of the information are very high. Only the selection is constrained by space. Any of the topics addressed—and they cover the permaculture waterfront—could have been given more extensive coverage, but the authors have done that seemingly simple and actually quite hard job of selecting just what needs to be said for clear and whole understanding of each subject, while omitting only some layers of detail that the reader can and will encounter later. I felt, as a long-time teacher, that I could trust the knowledge the authors conveyed. What



comes through is a quite pure and well-refined grasp of the profound depth and power of permaculture design, ranking this introductory work with the best in its field.

The graphic quality of the book achieves a knockout home run, but I must admit that this is not an unalloyed benefit; it comes at a cost. The photographs are excellent, well chosen, of high resolution, and nicely colored. The Chinese printing is flawless. Kearsley, who is a gifted illustrator, provides quite impressive diagrams for the many abstract permaculture concepts, for designed landscapes, and for some systems, such as greenhouses, for which photographs cannot quite capture the complexity of integrated components. All this, and a showy layout with many subheads, colored pull quotes, and glib captions, makes for a dazzling display. But as a reader who wants to be in charge of my own experience, I felt often overwhelmed or distracted by the sheer visual saturation. This is a loud book without many quiet spaces, and I wanted to focus in on the authors' voice(s), which are well worth hearing. Some readers won't share my predilection, but others may.

The book is laid out in six sections, first introducing permaculture concepts, then presenting the design process with its complex layering (and this is very well done), and thirdly focusing on key elements in the home system: soil, water, waste, energy, shelter, food/plants, and animals/wildlife, each given a solid treatment.

The fourth section describing 50

useful plants for permaculture landscapes, while choosing some unarguably good species, is largely filler that does little more than put before the novice readers some names that he or she ought eventually to learn more about. It isn't illustrated. It appears to reduce the incredible diversity on which permaculture's promise rests to a mere handful of players, and it confusingly mixes species higgledy-piggledy from temperate, tropical, and arid regions of the world. Among 18 trees, I found four that would grow in the two-million square mile Mississippi Valley without the protection of a greenhouse. Perhaps kumquat would survive in Louisiana, technically adding a fifth species. Why is the indispensable and profoundly multifunctional cattail (*Typha* spp) not represented, nor other wetland species? The brief descriptions are intelligent; cultivation requirements are given; the listings emphasize the Latin binomials. I might quarrel with some of the climate zone categorizations: some true tropics would seem to be recommended for areas that do experience frost. All in all, if you skip this 20-page chapter, you wouldn't be missing much.

On the other side of the ledger, the fifth section on Invisible Structures, while basic, is a breakthrough for this publisher, which primarily does high-quality color work on botanical subjects. Permaculture is about far more than plants, and the deliberate inclusion of social and economic elements in design is a strong plus for this book. Kudos to the authors who undoubtedly advocated strongly for it. Descriptions, examples, and some design criteria for livelihoods, alternate currencies, cooperatives, CSAs, and many, many more elements greatly strengthen the book's core argument. Readers of this section will also need to go beyond the text to deepen their knowledge, but the presentation of ideas and concepts here, unlike the weak fourth chapter on plants, follows the book's generally strong writing and illustrating style, making it quite accessible.

Though not given a bold heading in the table of contents, the understated sixth section offering references and further reading, is very well done. The selection of books is up-to-date, comprehensive,

insightful, and genuinely helpful for the journey the serious reader of Practical Permaculture will undertake. There is a decent index and a good list of websites and resources, rounding out a fine work that greatly strengthens the permaculture community. This work could do much

The Urban Frontier

Review by Peter Bane

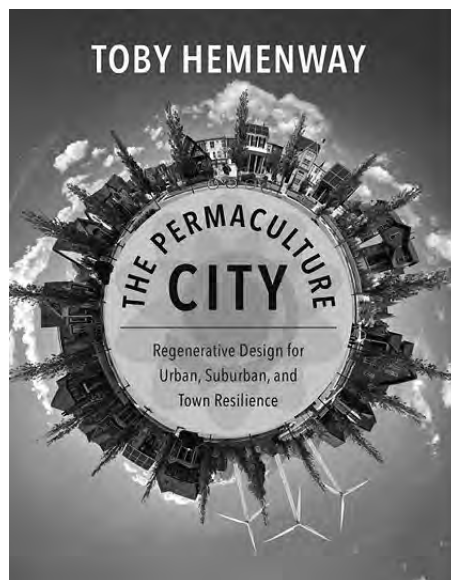
TOBY HEMENWAY

The Permaculture City
Regenerative design for urban,
suburban, and town resilience
Chelsea Green. White River Jct., VT.
2015.
252 pp. paper. illus. color plates.
\$29.95.

AFTER A SUCCESSFUL RUN of 15 years as North America's best-selling permaculture author, the writer of *Gaia's Garden* has brought out an important and intensely practical book on regenerative design for urban dwellers. Recapitulating and updating the best paradigmatic work on urban design from Jane Jacobs, Kevin Lynch, William H. Whyte, and others, and integrating this with a close-grained view of the permaculture possibilities in small yards, neighborhoods, and collective enterprises, Hemenway has laid claim for permaculture—a grassroots and decentralized movement—to the bottom-up transformation now well underway in American cities. Goats are chewing their way into zoning ordinances, greywater is trickling under the mulch, and temporary autonomous zones are sprouting in city intersections as neighbors reclaim the exchange space of the street for human life.

With high style and professional wordcraft, he presents an appealing vision in ten well-ordered chapters. Memorable phrases sneak up on you without warning, "...the La-La land of L.A.'s water system," or a comparison of reducing plant biomass to liquids fuels as akin to "buying rare books and using them for toilet paper." Toby's tone is neighborly and familiar. In addition to being able to use the term "flexible heuristics," in a comprehensible sentence, he wants everyone to understand, and takes care to

to replace the dated and tropic/arid-centered *Introduction to Permaculture* by Mollison and Slay as a first text for new students. The price is lower, the rich color tableau of real-life examples is persuasive, and the caliber of the writing and understanding conveyed lack nothing



explain complex concepts with examples and analogies.

The book is no bible, but a crisp examination of permaculture applications rich with how-to guidance. However, it stays focused laser-like on design thinking, and in this way accentuates permaculture's core strength. The author offers the same step-by-step, thoughtful, and logical direction for organizing the garden or a larger, inclusive food system, as he does to water around the home, small spaces for living, energy use, wealth and livelihood, and placemaking. Indeed, these later chapters represent the real new turf in the book. While Toby's thinking has evolved since he first wrote *Gaia's Garden* in the late 90s, the chapters on techniques and design for the small urban garden are very familiar ground for him. They represent a safe entry point for new readers, and I understand why they are given prominence, but I had to push myself through this relatively elementary material to get at juicier bits in the later chapters.

The subject of gardening is previewed by a strong introduction to design thinking and to the management of microclimates.

Hemenway posits four key design

from the original except its distinctive Tasmanian voice. Over time, I expect this work to carve out a solid niche within the intellectual ecosystem of North American Permaculture. Δ

methods, which he identifies as Highest Use, Zones, Sectors, and Needs-and-Resource Analysis. This latter is called Needs-and-Yields, or Niche Analysis by other permaculture authors. Highest Use is essentially a method for determining strategy (timing) based on the entropy cascade, and of course incorporates an ethic of conservative use. I found the separation of Zones from its historic Siamese twin, Sectors, to be instructive but also artificial as they are complementary, and their intersection gives critical insights to the placement of elements. I don't disagree with these choices, but I think they emphasize the scientific half of permaculture while slighting the art. Pattern is the missing piece that would bring balance, and one of these days, Toby will turn his researches and blogs at patternliteracy.com into a book worth waiting for.

Hemenway stretches the definition of sectors beyond what previous writers on the subject have accepted. Sectors, he points out, are influences external to the site, and of course this is acknowledged by permaculture designers. The classic definition, however, assigns direction to sectors as incoming from somewhere physically on the compass. More in the manner that economists might refer to the manufacturing sector or the service sector than in the manner the Air Force might refer to the NNW high-altitude sector, Toby refers to zoning and local ordinances, or family relationships as "sectors." He seems quite determined to turn "sectors" and "zones" into flexible heuristics, but it may be a while before these novel rubrics gain ground with his colleagues. I for one will want to see whether any design advantages are to be gained in cutting sectors loose from directionality.

The water chapter is a good compilation of best practices from the permaculture world, organized concisely for easy entry and economical application. An unexpected outing of

himself as a greywater hero in Portland, Oregon comes to light in the section on waste management. Apparently his “pre-legal” backyard system was used as a model in a relatively painless transformation of Oregon’s state law that enabled the city to legalize greywater reuse. This image stands in amusing contrast to Toby’s self-confessed persona as a sometimes wonkish introvert, content to ride in the back seat and study science. Who imagined this descendant of an indentured servant to be a bandito!

I particularly appreciated the chapter on energy with its five tools for energy analysis well introduced: efficiency, emergy, life-cycle assessment, transformity, and EROEI—energy return on energy invested. Each gives a complementary and powerful view of energy flows around us and through the economy and nature. This goes to the heart of permaculture, which grew from Holmgren’s reading of Odum and the challenge of transforming industrial society onto a renewable energy basis. All designers and many citizens will have to become fluent in these terms as the future rises before us; Toby does us all a great service in laying them out clearly. Here his science background shines through at its very best. References for this section are particularly helpful and should allow the serious reader to go much deeper. The explicit data on various forms of energy consumption at the household level were also welcome, though my instincts tell me the number for natural gas use is on the low side, whether or not it comes from the EIA (US government).

The chapter on Livelihood gives a brief, cogent explanation of money as

an introduction to fresh and expanded thinking on the many forms of wealth and how to remain prosperous amidst a shrinking dollar economy. It’s good to see increasing focus on invisible structures in permaculture writing, and especially in a book aimed at a broad popular audience such as this one. The real story can’t be told without this thread, nor can social change gain much ground until more people become conversant with new economic thinking.

Sliding at the book’s end into a lovely discussion of urban design that draws from Jane Jacobs as much as any other, Toby describes her formulas for sustaining diverse urban districts and emphasizes that they are fundamentally permaculture thinking from before the word was coined. Jacobs, of course, was writing about what we now call complex, adaptive systems, a new term for evolving, self-transcending reality: urban neighborhoods, ecological gardens, neural networks, and much more.

Along the way, he sets up the argument for urban dwelling: towns and cities have always organized the countryside and its resources and will do so into the foreseeable future. Nation-states may fall with the decline in energy, but city-states are an historically durable form. Dig in, he says, and improve the world around you. Good enough advice for many, but the disruptions being thrown up by economic contraction, climate change, and a legacy of unintegrated social and cultural transformation during the late 20th century (think religious fundamentalism, corrupt media, and rampant technology) will make some places less tractable than

others, whether urban or rural. The author himself would seem to be seeking that Goldilocks spot, or in Odum’s words, the point of maximum power: not too close to the city and not too far away from it either. Maybe a Community of 7000 in Christopher Alexander’s terminology, one integrated into a healthy city region, like Sebastopol in the greater Bay Area. I concur, but only time will tell.

I disagree, however, with his claim that you are likely to take your problems with you when moving. Just as Toby left behind the neighbor’s meth lab when he migrated out of rural southern Oregon to Portland, others will find compelling reasons to abandon places that they cannot easily transform or manage. As climate change bites, all local difficulties will be heightened, but some will be intractable.

The book uses a number of charts as well as drawings and photos to illustrate its ideas, most of which are well done, but the Intimacy zone and sector chart on page 205 would have been better with all the type oriented toward the bottom of the page instead of toward the center of the circle. You have to turn the book upside down to read—quite an unnecessary imposition. Take note, book designers. The radial orientation could easily have been retained with the words in the lower half of the circle simply inverted.

An excellent work that should advance permaculture’s credibility and acceptance, *The Permaculture City* provides a great guide to local action and big-picture thinking at the same time. The references are primarily to real books! And the fine writing honors the reader’s time and attention. Highly recommended. Δ

International Permaculture Conference 12—*Designing the world we want*

IPC-12 is a two-day conference to be held in London in September as part of the international permaculture convergence (IPCUK) (<http://ipcuk.events/conference>). IPCUK will bring together leading experts and practitioners from around the world. We have everything we need to create a sustainable world and future. Together we will create a vision of a near future society that is caring, sustainable and fair, and explore how we can collectively design strategies and pathways to make it happen. Conference: Sept. 8-9, 2015, The Light, Euston Road, London. *Designing the World We Want*—two days packed with presentations, workshops, academic papers, exhibitions, music, and art. Convergence: Sept. 10-16, 2015, Gilwell Park, Essex. *Designing the network we want*—for people from around the world using permaculture in their everyday lives and communities. Edge events: throughout the UK and Europe. From tours and courses, to talks and more.

We have everything we need to create a sustainable world and future.

Look in the Mirror

Review by Peter Bane

TAO ORION

Beyond the War on Invasive Species

A permaculture approach to ecosystem restoration

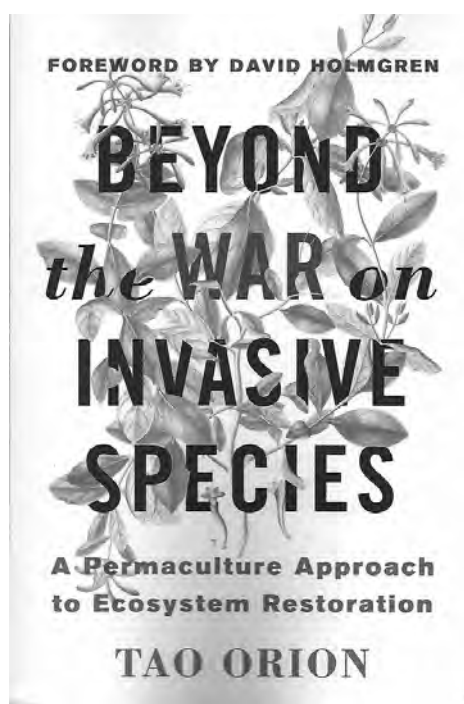
Chelsea Green. White River Jct. VT., 2015.

246 pp. paper. charts. \$22.95.

FOR ITS EXTENSIVE SCHOLARSHIP, clear voice, and impassioned, hopeful message, this book is a joy to read—a slim but beautifully written teaching text which uses permaculture and ecosystem science as a lens for viewing the transformation of landscapes, Orion's book, with an incisive foreword by David Holmgren, had me alternately enthralled, in tears, and exclaiming out loud.

Writing from the far side of a paradigm shift already well advanced, Orion delivers a soft-spoken and measured but devastating critique of both environmentalism gone astray and the chemical industry that has seduced otherwise sensible people into abandoning both their values and their capacity for rational thought. The paradigm shift this book so brilliantly illustrates is a concept central to permaculture design itself: that humans are not separate from nature but inextricably embedded within its processes, to which we can respond consciously—acting as choreographers and gardeners but not gods—or unconsciously, as most modern humans willfully insist on doing. Permaculture long ago announced its position: we are working with nature, not against it.

Following their 2005 book *Edible Forest Gardens*, Dave Jacke and Eric Toensmeier delivered some broadsides on the subject of so-called “invasive” species for the benefit of the permaculture movement and crossover readers of their then new and impressive two-volume work. Plants, they argued, maintain no general staffs, do not launch campaigns, or raise armies. They may be dispersive, as autumn olive, sending its seeds across the terrain by bird messengers, or expansive, as bamboo and other



stoloniferous grasses, which reach for new territory with underground runners, but they act in response to environmental conditions—often undergoing rapid change—and not with aggression. The two men were right, of course, the term is emotionally charged, scientifically imprecise, and has been ginned up by a well-funded and ethically challenged industry jonesing after government funding for ecosystem “restoration.”

Orion goes beyond this important caveat. She plunges into the fray to reclaim the word “invasive” itself, by redefining the term. Yes, she says, plants and animals “invade” new territory when ecological niches emerge to allow them to flourish. But the newcomers always follow the rules of nature, and they follow rather than precipitate disruption: they exploit unused resources until these diminish; they modify their surroundings to improve conditions for themselves and other species; and they cooperate with insects, fungi, soil microbes, animals, and other plants to prosper. In the process, they almost invariably alter disturbed conditions toward greater stability, and set the stage for their own departure.

Spinning tale after tale of demonized invaders from beyond the culture wars, Orion casts a new light on dozens of vilified species: honeysuckle, star thistle, kudzu, garlic mustard, Japanese

knotweed, Asian carp, zebra mussels, salt cedar, spartina grass, giant reed (*Arundo donax*). Each has a vital contribution to make, not least for the teaching it offers about ecosystem dynamics; none has brought about the extinction of any natives, even where populations have been temporarily displaced. These stories are captivating.

From a low-key beginning where she explains the ecological niches that salt cedar is now occupying, and how its biology allows it to thrive in the increasingly saline Colorado Valley—that salinity an artifact of human hubris and ignorance (overdrawals from the river, too many dams, inadequate flushing)—to a soaring and visionary crescendo in which she paints a picture of new local economies emerging around tree-of-heaven and its high-value silkworm fiber, the author keeps the reader fully engaged as she weaves a rich and subtle basket of ideas capacious enough to swallow whole the folly of nativism, psychological projection, and the inadequate models of nature that underpin the pseudosciences of invasion ecology and biology.

Some of us old enough to remember the news reports from Vietnam will hear echoes in Orion's exquisite storytelling of the evidence of persistent madness that drives our war-obsessed patriarchal culture: ‘We had to destroy the village in order to save it.’ Just plain wrong, she asserts. And dare we add: criminally stupid. Scorched earth cultivation is a routine preparation for “restoration” in an industry with which the author is intimately familiar. Herbicides (about 100 million pounds a year in the US of active ingredients and ten times as much of dubiously “inert” ingredients), large earthmoving machinery, and sometimes fire itself, are applied to expunge the “undesirable” vegetation (and along with it the habitat it creates, and the animals and insects sheltering among the plants). By these processes, ecosystem healing is frustrated and delayed. Rarely are the native plants which supposedly belong in the tortured terrain able to survive the harsh conditions that follow purging of the “devils.” Can we smell further back to the insanity of the Inquisition?

If a sober assessment of the real causes of disturbance, displacement,

species loss, and indeed the accelerating collapse of Earth's living systems is undertaken, the real culprits will be found with industrial agriculture, forestry, and urbanization. The real invasives are monocropped almonds, corn, soybeans, cattle, etc., and the monocultural attitudes that promote them and denigrate diversity. In what may be the book's most moving passages, Orion draws on the work of Joanna Macy who reminds us that the sheer horror of the evil we have wrought in our treatment of Earth must finally break through the denial and become grief before real healing can take root.

People are regularly castigated on web forums for comparing political atrocities and outrages of the present era with the Holocaust. But its monumental evil pales in comparison with the destruction of the capacity of planet Earth to sustain human life. And that anthropogenic holocaust is barreling down the track at us today, almost all of us implicated its continuation. But take heart: Margaret Thatcher was a consummate liar (and her partner in crime, Ronald Reagan, a fraud). There are indeed alternatives.

The second half of this book illustrates permaculture principles and ecology in action with stories, visions, and prospects for turning our greatest problems into profound and hopeful solutions. The book concludes with a list of species names

(the actors in this drama), that we might know them properly, and another table of about 150 plants and animals that give evidence of having moved or been moved around the world before the Columbian Exchange. Knowledge is power.

Although she makes no ad hominem attacks and demonizes no groups, Orion pulls no punches in criticizing the selling of toxic chemicals under claims of "no harm." She is equally fierce in confronting the misappropriation of research funding toward poisons and away from real economic botany and ecology. Our universities, created to serve the people, are ever more coopted by corporate money, just as all levels of government are increasingly so tainted. It will be necessary for people of our society to assert the primacy of life over profit, or we shall all surely perish.

Orion writes with confidence and subtlety. A few pages into the book, I was ready to follow her wherever she wanted to go. Her ability to think big and at the same time to weave details into a compelling narrative displays the very finest of holistic thinking and feeling, qualities which those of us committed to its best possibilities recognize as the hallmark of permaculture education. The author is not only a fine writer, but a gifted teacher, and gives every sign of being a skilled designer of landscapes.

Permaculture early on and persistently has attracted some of the projection that accompanies the colossal travesty of monocultural land management: the evil other, pushing the world toward chaos. As Holmgren points out, we never objectively created any problems with our modest experiments in diversity, but were treated as untouchables merely for having the audacity to suggest that humanity might be better served by increasing the number of species upon which it depends, rather than diminishing that palette as agribusiness and industrial forestry continue to do. This same open-mindedness and embrace of change confronts bureaucratic obsessions with control in every field of human culture: planning and zoning law, neighborhood policing, and endless wars on drugs, terrorism, and freethinking of every sort. Let us continue to shove these recalcitrant and fearful campaigns into the dustbin of history where they belong.

Beyond the War on Invasive Species is titled to turn heads; its subtitle more honestly characterizes its adult business. One of the best works in its field in this or any year, Orion's work should be considered indispensable for every permaculture bookshelf. Throw it at your local weed councils. They won't be injured; only their feelings may be hurt as they awaken from the death spell. Δ

Short Film Series from *Permaculture UK*

PERMACULTURE UK ANNOUNCES A SERIES OF SHORT FILMS, *Living with the Land* (<http://www.permaculture.co.uk/living-with-the-land>), in partnership with Permaculture People, to coincide with the IPC-12.

The films showcase the people and projects that practice real, working alternatives to the ecologically unsound and principally unsustainable practices of conventional agriculture and mainstream housing in the UK. These inspiring, best-practice permaculture projects and people explore topics such as large-scale, regenerative agriculture, forest gardening, urban permaculture, and natural building.

The films are published every week on the *Permaculture* magazine website, and social media. These are freely available to view and to distribute. The nine films cover: Forest Gardening, Natural Building, Regenerative Agriculture, Urban Permaculture, Organic Gardening, Vegan Farming, Foraging, Education in Nature, and Off-grid Living.

In the first installment, Martin Crawford, pioneering forest gardener, introduces us to his beautiful forest garden full of food, fiber, and medicinal plants in South Devon (www.permaculture.co.uk/videos/living-land-forest-gardening).

Centered around a key interview with Martin, the film uses drone shots for never before seen vantage points of his garden. High-tech indeed! What stood as a flat field in 1994, is today a multi-layered, ecosystem of trees, shrubs, and ground covers, producing fruits, nuts, and medicinal products. Forest gardening is a designed agronomic system based on trees, shrubs and perennial plants mimicking the structure of a natural forest.

As this issue of *Permaculture Design* goes to press, the third in the series has appeared. "Farming with Nature" features Rebecca Hoskings, (co-producer of the BBC film, "A Farm for the Future") explaining how she has transformed a windswept and exhausted coastal farm into an abundant landscape with healthy animals, prolific wildlife, and fertile soil. As Rebecca explains, "Holistic planned grazing is all about mimicking the natural migration of a wild herd across the landscape. This is the fastest way to build soil fertility on a large scale."

EVENTS

International Permaculture Convergence

London, UK

Permaculture Conference

Dates: September 8-9

Location: Euston, London, UK

Description: A 2-day conference bringing together permaculture, sustainability, transition, resilience, and regeneration networks. Presentations, workshops, stall, exhibitions, academic papers and posters, objects, keynote speakers, workshops, open space sessions, and a lively skillshare and expo area.

Contact:

<https://ipcuk.events/conference>

Permaculture Convergence

Dates: September 10-16

Location: Gilwell Park, Essex, UK

Description: A 5-day convergence for Design Course graduates. 100s of workshops, activities, open space, international organising, strategy, networking and dancing. This is the same location the 2014 British Convergence was.

Contact:

<https://ipcuk.events/convergence>

Edge Events before and after the conference and convergence: <https://ipcuk.events/edge/events>

Not going to IPC-UK?

There are lots of ways to observe and interact and support: <https://ipcuk.events/donate>.

Social Media

To help get this out to people please use #IPCUK for tweets and join the Facebook IPC convergence and conference events.

8th Annual

Northwest Permaculture Convergence

Washington

Dates: August 28-30

Location: River Road Park & Recreation Center, Eugene, OR

Description: The NW Permaculture Convergence is a unique opportunity to share what we are learning to reduce our environmental footprints, build resilient communities and take care of more needs closer to home. For the first time, this event will be held in a suburban neighborhood. There will be site tours and on site hands on projects, keynote speakers, workshops, open space sessions, and a lively skillshare and expo area.

Contact: info@northwestpermaculture.org; <http://northwestpermaculture.org>

Midwest Permaculture Gathering

Minnesota

Dates: September 4-7

Location: Clarks Grove, MN

Description: Gathering of the Guilds! This is a COMMUNITY CREATED EVENT. We will provide the infrastructure and logistical planning-YOU provide the knowledge. ALL SKILL LEVELS ENCOURAGED. This gathering will offer local permaculturists, farmers, gardeners, activists, and others a chance to spend a weekend sharing skills, making connections, and learning.

Cost: \$55, \$65 at the gate

Contact:

gotg2015@centerfordeepecology.org
<http://gatheringoftheguilds.org>

Permaculture Design Course

Western Canada

Dates: August 16-29

Location: Winlaw, BC

Description: This is the basic (72 hours minimum) permaculture design course. 13 days. This intensive course combines theory with practical hands-on learning. Topics include: permaculture design techniques & principles, site analysis, soil fertility, organic gardening techniques, herbs & medicinal plants, fruit & nut trees, water uses and ecological buildings.

Instructors: Gregoire Lamoureux & guests

Cost: CAN\$1050

Contact: Gregoire Lamoureux
spiralfarm@yahoo.com

<http://www.kootenaypermaculture.com>

22nd Annual

Southeast Permaculture Gathering

North Carolina

Dates: August 6-9

Location: Celo, NC

Description: Join us for Thursday Workshops and a fantastic gathering! We meet every year to learn new skills, serve the Earth, create community & celebrate life. During our Gatherings, we participate in Affinity Circles, "Open Space", and various Classes & Workshops. We have a diverse schedule of events, for both adults and kids.

Cost: \$150, options for workshops and children

Contact: 828.669.7552

registrar@southeasternpermaculture.org
<http://southeasternpermaculture.org>

Permaculture Teacher Training Oregon

Dates: September 7-11

Location: Southern Oregon Pc Inst.
Ashland, OR

Description: Permaculture design and implementation is vital and building and honoring your skills as a permaculture teacher is an investment not only in your work, but in the communities you will work with. Learn how to teach permaculture concepts and practical applications to a variety of students with diverse learning styles. Prerequisite, Permaculture Design Certificate (PDC) course. You will develop short curriculums and speak in front of a group to practice their presentation skills. We also cover the economics of starting and running an educational center and nonprofit.

Instructors: Chuck Burr

Cost: Early \$690 ends Aug 7,
Regular \$790.

Contact: Chuck Burr
541-201-2688

courses@sopermaculture.org
www.sopermaculture.org

*Send Event and Calendar Listings for Issue #98
(November 2015)*

**Decolonizing Permaculture
by the September 1st
deadline to (NOTE: new address!):
events@permaculturedesignmagazine.com**

Earth Activist Training Northern California

Dates: January 9-23, 2016

Location: Cazadero, CA

Description: A two-week permaculture design certificate course with a focus on organizing and activism, and a grounding in earth based spirituality. Learn how to heal soil and cleanse water, how to design human systems that mimic natural systems, using a minimum of energy and resources and creating real abundance and social justice.

Explore the strategies and organizing tools we need to make our visions real, and the daily practice, magic and rituals that can sustain our spirits. Participatory, hands-on teaching with lots of ritual, games, projects, songs, and laughs along with an intensive curriculum in ecological design.

Instructors: Starhawk, Charles Williams

Cost: \$1,650-\$1,950 sliding scale, includes food and lodging

Contact:

earthactivisttraining@gmail.com
www.earthactivisttraining.org

25th Annual

Permaculture Design Course Oregon

Dates: December 3-15

Location: Cottage Grove, OR

Description: This is a two-week course in land-use design based on the sustainable living philosophy of Permaculture. Topics to be covered include permaculture theory, food diversity, soil enrichment, water use, erosion control, natural building, organic gardening, forest farming, and more. Comfortable lodging and outstanding meals are included in the course fee.

Instructors: Jude Hobbs, Rick Valley, Marisha Auerbach

Cost: \$1,350, includes meals and accommodations

Contact: Aprovecho Institute

<http://www.aprovecho.net/programs/>

**Be sure your Event
is covered. Join the
Calendar and Events
Reminders List.
Send notice to:**

events@
permaculturedesignmagazine.com

Two Options

Permaculture Design Course California

Dates: September 19-October 2

Location: Occidental, CA

Description: This is a two-week certificate course in land-use design based on the sustainable living philosophy of Permaculture. Topics to be covered include permaculture theory, food diversity, soil enrichment, water use, erosion control, natural building, organic gardening, forest farming, and more. Comfortable lodging and outstanding meals are included in the course fee.

Instructors: Brock Dolman and guests

Cost: \$1,650; \$1,550 if registered three weeks in advance.

Contact: OAEC

707-874-1557 x 101
www.oaec.org

Permaculture Design Course Colorado

Dates: Aug. 15-16, Sept. 19-20, Oct. 17-18, Nov. 21-22,;
Jan. 16-17, Feb. 20-21, Mar. 19-20, 2016

Location: Fort Collins, CO

Description: Through an engaging mix of lecture, hands-on group activities, and real-world design projects, participants will gain a comprehensive understanding of ecological thinking and how to apply it in a variety of contexts.

Instructors: Adam Brock, Patrick Padden, Kelly Simmons

Cost: \$1,250

Contact: info@thegrowingproject.org,

<http://www.thegrowingproject.org/permaculture-design-course.html>

Kinstone Academy Wisconsin

Location: Fountain City, WI

Contact: 608-687-3332; info@kinstonecircle.com; www.kinstonecircle.com

Permaculture Design Course

Dates: August 5-16

Description: This course provides a comprehensive introduction to permaculture, exceeding the international standard. Special attention is given to climatic zones represented by course participants. **Instructors:** Wayne Weiseman; **Cost:** \$1,380

Advanced Design Course

Dates: Sept. 12-18

Description: Gain the skills and confidence needed to take your design skills beyond your own backyard. We will teach you how to design property infrastructure, the built environment, work with animals and plant, and merge all elements into a designed landscape. This course requires a 7-day session and an independent design. PDC certificate required.

Instructors: Wayne Weiseman; **Cost:** \$995

Permaculture Teacher Training

Dates: Oct. 12-18

Description: There is a pressing need for experienced and well-trained instructors. We have identified areas of training and effective methods of bringing permaculture design to our students. Key skills and proficiencies are covered. Students must have their PDC certificate to participate. **Instructors:** Wayne Weiseman **Cost:** \$895 before 8/31; \$995 after.

Permaculture Design Course California

Dates: October 25 - November 7

Location: Quail Springs

Description: Immerse yourself in permaculture in action with this 14-day learning journey! Share in the joy of community learning together and changing the world. Take home the ability to design and apply natural principles to create stable and resilient systems that provide food, water, shelter and energy needs while regenerating ecology, community and economy.

Instructors: Warren Brush, Lindsay Allen, Brenton Kelly

Cost: \$1,150-\$1,450, discounts for pairs, refresher, families, partial scholar. by application

Contact: 805-886-7239

info@quailsprings.org
www.quailsprings.org

Permaculture Design Course Chicagoland

Dates: Oct. 22-25; Nov. 5-8, 20-22

Location: Naperville, IL

Description: People have become increasingly concerned with the resiliency of our food, water, energy, and economic systems and are looking for personal and community security. Explore permaculture design in the Chicago suburbs and at McDonald Farm. Our course covers the design principles, practical skills, and invisible structures which will lead to greater resilience for all communities. This course is aimed at professional planners, architects, and public servants interested in permaculture design, public welcome.

Instructors: Peter Bane, Rhonda Baird, Keith Johnson

Contact: Michelle Hickey;

The Resiliency Institute

contact@theresiliencyinstitute.net

theresiliencyinstitute.net/pdc/

Advanced Permaculture Design Great Lakes Region

Dates: November 8-13

Location: Akron, OH

Description: Take your permaculture training to a professional level. Build confidence practicing advanced design frameworks with earnest colleagues and top-notch practitioners. We will cover water collection and management, earthworking, and plant palettes in depth with an emphasis on patterning in design.

The focus of serious Pc design in this era is the construction of self-reliant local economies, and this course will offer guidance in deepening community capacities across visible and invisible fronts. Learn resource inventories and how to identify unfilled niches in your region. We will practice land surveying and professional level graphic design for presentation, and address organizing a consultancy.

Instructors: Peter Bane, Karryn Olson-Ramanujan, Jono Neiger, and guests.

Cost: \$900, \$800 if paid in full by Oct 1. Non-refundable deposit of \$200. Payment plans available for help with tuition. Meals and lodging included. PDC required.

Contact: Peter Bane

812-335-0383;

pactivist@mindspring.com

Back Issues of *Permaculture Design*

- | | | |
|---|---|---|
| I,1 July '85 Permaculture in Oz | I,2 Nov. '85 Fruit & Nut Trees | #38*Feb. '98 Economic Transformation: Speculation, No Middle Class, Coops |
| II,1 Feb. '86 Garden Design | II,2 May '86 IPC-2 & Pc Courses | WOOOF, Global Warm'g, Hol. Fin. Plan'g, Land Use, Adopt-a-Hive |
| II,3 Aug. '86 2nd Int'l Pc Conference | | #39 Jul. '98 Knowledge, Pattern & Design: Pc Way of Seeing, Native Consn |
| II,4 Nov. '86 Fukuoka, Keyline, Genetic Conservation, City Farms, Oceanic Pc | | Sand Dunes, Language-Worldview-Gender, Patterning Process, |
| III,1 Feb. '87 Networking, Natural Farm'g, D-Q Univ., Children's Permaculture | | Land-Use Planning, Teaching Pc, Vietnam, Holmgren on Pc |
| III,2 May '87 Wild Land Restoration | III,3 Aug. '87 Annual Planting Cycle | #40*Dec. '98 New Forestry: Regl. Devl., Horselogging, Menominee Reservatn, |
| III,4 Nov. '87 Trees for Life | IV,1 Feb. '88 Marketing Pc Products | Forest Investing, Restoratn, Old Growth, Homestead Tenure, Forest |
| IV,2 May. '88 Urban-Rural Links , Economics & Community Development | | Soils, Forest Farmg, Woody Agric., Rainforests, Windbreaks, Coppice |
| IV,3 Aug. '88 Social Forestry , Gabions, Jap. Org. Ag., Producer/Consum. Coops | | #41*May '99 Natural Building: Oregon Cob, Cordwood, Bamboo, Thatch, Ethics, |
| IV,4 Nov. '88 Multi-Story Tree Crops , Greening Dominican Repb., Runoff Gdns | | High Winds, Origins of Conflict, Greenhouses, Ponds, Adobe, Road |
| V,1 Feb. '89 <i>Permaculture: A Designers Manual</i> , Tree Bank, Water in Pc | | Bldg, MicroHydro, Living Bldgs., Under \$20K Houses, Dreams |
| V,2 May. '89 Plant Guilds , Roof Gardens, Small Livestock | | #42 Dec. '99 Self-Reliance & Community Cooperation: Co-Intelligence & Self- |
| V,3 Aug. '89 Rainforest Conservation in Ecuador, Gaia, Weed Gardens | | Orgn., Archetype Dsgn, Sovereignty, Samoa, Mondragon, Natural |
| V,4 Nov. '89 Earthworks & Water Conservation: Small Dams, Ponds, Keyline | | Hous'g, Comm. Gdns., Zone 0, Solar Electric Tractor, Beekeeping |
| VI,1 Feb. '90 Household Greywater Systems , Soil Imprinting (\$5 each to here) | | #43*June '00 Food & Fiber: Hunger, Ferments, Seasonl Salad, Heirlooms, Fencing |
| VI,2 May. '90 Insectary Plants , more Greywater, Land Use for people | | Self-Fertile Gdns, Rice Revolt, Cold-Climate Food, Edible Insects, |
| VI,3 Aug. '90 Water: Forests & Atmosphere, Catchment, Pond Design | | Chilies, Food Origins, Garlic, Ethnobotany, Wild Food, Bamboo, Hemp |
| VI,4*Nov. '90 Urban Permaculture: EcoCity Conf., Soil Detox, Suburbs & Pc | | #44 Nov. '00 Earthworks & Energy: Spreader Drain, Horse Swales, Earth Dams, |
| #23 May '91 Politics of Diversity , Greenhouse Market Gdn, Pc in Nepal | | Machinery, Carpet-lined Ponds, Constr. Wetlands, Biogas, Windmills |
| #24 Oct. '91 Creativity in Design: Case Studies, Index to Issues #1-23 \$5 | | #45 Mar. '01 Medicine & Health: World & Self, Healthy Home, Designing Care, |
| #25 Dec. '91 Design for Community: CSAs Restoring Forests, Garden Ecology | | Ayurveda, Agents of Decay, Comm. Health Centres, Women Trad. Med. |
| #26*May '92 Soil: Our Past, Our Future, Fertility, Worms, Cover Crops | | 4th World Apothecary, Healing Weeds, Medicnl Crops, Hawaiian Bot'ls |
| #27*Aug. '92 Integrating Pc: Deconstructing Utopia, Grassroots Organizing, | | #46 July '01 Good Work & Right Livelihood: Pc Golf Course, Downsize Cost of |
| Garden Polyculture, Pattern Learning, Living Fences | | Living, New Forest Economy, Energy Currency, Buddhist Mktg, End |
| #28*Feb. '93 Structures: Comm'ty Dsgn, LETS, Industry, Strawbale/Timber-framing | | Wage Slavery, What's Surplus?, Urban Community, Enterprise Facil'n |
| #29/30* Jul. '93 Networks: Media Revv, Rural Reconstructn, Leaf Concentrate, Comm'ty | | #47 June '02 Watersheds: Water4Sale, Basins o'Relations, Watershed Devl, Gabions, |
| Food, Palestine Pc, Do-Nothing Educ, Feng Shui, Pc Academy | | Urban Runoff, Beavers, Skywater Ctr, Consvn. Investmt, Peat Bogs, Rabbits |
| #31*May '94 Forest Gdng: Energy & Pc, Mushrm Cultvn, Robt.Hart's F.G., Spp for | | #48*Sept '02 Making Changes: Co-Intelligent Activism, Webs of Power, Urban |
| No. Cal., Alders, Agroforestry: Belize & China, Honeylocust, N-fixers | | Food, How to Change, Teaching for Change, Global Transform'n, |
| #32*Apr. '95 Animals & Aquaculture: Animal Polyculture, Sm-scale Cattle, | | City Repair, Escaping Job Trap, Argentine Recovery, Costa Rica Pc |
| Goat Dairy, Keyline, Feral chickens, Bee Plants, Constructed Wetlands | | #49 Dec. '02 Where is Permaculture? Land-Rent Reform, 10 N. Amer. Sites, Cuba Ag, |
| #33 Dec. '95 Cities & Their Regions: Green Cities, L.A. Ecovillage, MAGIC Gdns, | | Rainbow Vall. NZ, Cacti/Succulents, Animal Self-Meds, Challenge2Pc |
| CoHousing, Micro-Enterprise Lending, Suburban Conversion \$5 | | #50 May '03 Ecosystems: Holmgren on Pc Mvmt, Hazelip & Syng. Ag, Chestnuts/ |
| #34 June '96 Useful Plants: Bamboo Polyculture, Medicinals, Pest Control, Root | | Pigeons, Oak Savannas, Root Crop Polycultures, Alders, Fungal Ecosys. |
| Crops, Oaks, R. Hart's F.G., Russian Plants, Regl. Plants, Sources \$5 | | Humans & Wilderness, Indoor Ecosystems, Humid Tropics |
| #35 Nov. '96 Village Design: Pattern Language, Consensus Democracy, Conflict, | | #51 Jan '04 Trad'l. Knowledge & Regeneration: Cataclysm & Collective |
| Historic & New Villages, Planning for Tribe, Village Economics \$5 | | Memory, Genome Wisdom, <i>Waru Waru</i> , Biosculpture, |
| #36*Mar. '97 Climate & Microclimate: Climate Change, Windbreaks, Low-Tech Sun | | Inuit Medicine, Fermented Stimulants |
| Locator, Drylands, Cool Slopes, Straw-Clay Bldg. Round Beehive, Water Catch. | | #52 May '04 Aquaculture: EcoAquac, Fish4Health, Dowsing, Pond Design, |
| #37 Sept. '97 Tools & Appropriate Technology: Dowsing, Workbikes, Scythes, | | Greywater Biotreatment, N. Amer. Polyculture, Manage for |
| Japanese Saws, Nursery, Ferrocement, Greywater, A-frame & | | Native Spp, Integrated Village Fisheries, Vietnam |
| Bunyip Levels, Ram Pump, Solar Toilet, Log Yoke, Cookstoves | | |

Back Issues of *Permaculture Design* (continued)

- #53 Aug. '04 **Education:** Lifelong Learning, Edge-ucation, Albany Free Schl, Indigenous Ed. & Ecology, Ecocentric Pedagogy, School Gardens & Dances, Ecology of Learning, Brain Gym
- #54 Nov. '04 **Fire & Catastrophe:** Design Beyond Disaster, New Opportunities Globalizatn, Invasion Biology, Street Orchards, Community Food Security, Floodwaters Rising, Disrupted Climates
- #55 Feb. '05 **Learning from Our Mistakes:** Petrol Dependency, Village Design, Australian Lessons, RTFM!, Trial&Error, Forestry Experiments, Owner-Bldr, 10 Mistaken Ideas in Pc
- #56 May '05 **Tree Crops & Guilds:** Pine Nuts, Tree Vege, Acorns, American Chestnut, Honeylocust Silvopasture, Broadscale Agroforestry, Bamboo, Willow, Social Forestry
- #57 Aug. '05 **20th Anniv.:** Challenges & Changes, USA Pc, Hawai'i Retrospect, Permaculture, Pc's Soft Edge, Gaia U, PINC, Oil Depl, IPC-7, Retrofit Suburbs
- #58 Nov. '05 **Urban Pc:** Urban/Rural Futures, City Zones & Sectors, Growing Food, Detroit Visionaries, Reblgd. New Orleans & Everywhere, Transforming a Military Base, Workers Co-op, Energy Descent.
- #59 Feb. '06 **Peak Oil:** Eco-Collapse & Trauma, Thom Hartmann, Pathways for Energy Descent, How Cuba Survived, Oil & Food, Biofuels, Algae for Fuel, Relocalize
- #60 May '06 **Land Use Past & Present:** Sust.Ag an Oxymoron?, Negev Bedouin, East. Woodlands AgroForestry, Pc Heals in India, Arocanti, Pop. Growth/Land Hunger, Mexican Reforestation
- #61 Aug. '06 **Unseen Kin-doms:** Observation as Design Tool, Soil Food Web, Bees, Mycelial Internet, D-I-Y Mycorrhizal Inoculum, Cover Crops as Bee Forage, Earth Energies, Local Currencies, Dead Zones
- #62 Nov. '06 **Art of Permaculture:** Painting, Writing & Pc, Ecoartists, Art, Activism & Cmty, Street Theatre, Art & Bioremediation, Living Willow, Body as Zone 0, Art of the Found, Water Magic
- #63 Feb. '07 **Building & Technology:** How to Dwell? Natural Bldg & the Law, Bldg Code, Strawbale in China, Cob in Armenia, Integrated Solar Heating, Cooking, Pumping, Nation-Scale Pc in Brazil
- #64 May '07 **Waste = Food:** Throwaway Econ, Strategy of Salvage, Peak Soil, Pigs & Waste Mgmt, Bikes, Soil & Garbage, Farm as Organism, Opportunistic Plants? Simple Biodigester, Vermiculture
- #65 Aug. '07 **Climate Change:** Shrinking Seas, Forests' Role in Climate, Urban Forests, Making Trees Pay, Rainwater Harvesting, Indoor Gardens, Water Filtration, De-Stabilizing Climate
- #66 Nov. '07 **Animals in Design:** Jumbo Shrimp, Pawpaw Patch, Alpaca, Insects as Food, Integrated NH Farm, Pastured Poultry & Rabbits, Urban Livestock, Predator Restorat'n, Bees, Complementary Animals, Agrichar
- #67 Feb. '08 **Kids in Pc:** School as Ecosystem, Pc Education, Gardening Kids, Pc to H.S. Students, Tlaxcalan Kids Make Seedballs, Fostering Research Skills, Bottled Water Boycotts, Feeding 8 Billion.
- #68 May '08 **Plants on the Move:** Rethinking Non-Natives, Forest Migration, Black Walnuts, Saving Seed Savers, Grow a Community Gdn, N'hood Greening, Healthy Honeybees, Biofuels & Food Prices
- #69 Aug. '08 **Permaculture at Home:** Hawai'ian Cmty, London Forest Gdn, Suburban Renaissance, Calif. Campus, Phila. Orchards, Drinking Roofwater, Floating Island Bioremed., Bike Transport, Miss. Pc
- #70 Nov. '08 **Ethics at Work:** BAU is the Enemy, 13 Princ. of People Care, Pc in Business, Ecovillages, White Man in India, Uganda Boarding School, No Waste, Qual. Control, City Farming w/Runoff, Amaranth
- #71 Feb. '09 **Earthworks:** Hopewell Mound Water Mgmt, Belize, Keyline, Road & Dam Bldg., NW AgroFor, Pc&Landscape Arch, Earthbag Bldg, Low-Watt Fridge
- #72 May '09 **The View from Abroad:** War, Oil & Snails in Nigeria, Green Tech Future, Ethiopian Water Mgmt., Shrinking Forests, Food Exploration in Caucasus, Maya Agroforestry/Biochar, Pc to Trinidad,
- #73 Aug. '09 **Bioregionalism:** New Paradigm, Rocky Mtn. Wildlands, Wild Elephants, Organizing Houston, Heirloom Seeds, L.A. Gdns, Reclaim. Commons, Transition Hohenwald, Tenn., BioCongress Saga
- #74 Nov. '09 **Energy Descent:** In the Home, Transition Communities, Pc in Mexico, Biochar, US Consumption Dropping, EcoTechnic Future, No More Throwaway Economy, Making Fuel Alcohol
- #75 Feb. '10 **Local Food:** A City & Regl. Food System, Working Family on 5Ac, CSAs & Wild Foraging, City Backyard Gdng., Food Bank Gdns & Orchards, Salt Collecting, Regional Staples, City Grains.
- #76 May '10 **Soil Fertility:** Permaculture Way of Soil, Biochar, Sheet Mulch, Hawai'ian Soil Farming w/ Worms, Demystifying Humanure, Urine Fertilizer, Crop Rotations, Mushrooms Build Soil
- #77 Aug. '10 **Eco-Nomics:** Measuring Many Forms of Capital & Quality of Life, Bob Swann & Invisible Structures, Bioshelter Market Gdn, Green Collar Economy, Pc & Finance, Pc Inst., Cert. & Diplomas
- #78 Nov. '10 **Water Wise:** Restoration Engineering, Watershed Relations, Colorado Runoff Gdns, Cisterns in Saudi Arabia, Energy Use & H₂O, Trad'l. Mexican Catchment, Rooftop Garden, Home Water
- #79 Feb. '11 **The Urban Frontier:** Indoor Denver Farm, Rooftop Food, Home town Returns, Urban Ecovillage, City Bees, Urban Pc Projects, Start Pc Farming: Mark Shephard, **Index to issues #24-40.**
- #80 May '11 **Designing for Disaster:** Collapse Mitigation, Global Storming, Responding to Major Events, Stabilizing the Climate, Self-Care, Ensuring Food Supplies, Living Through Drought
- #81 Aug. '11 **Hidden Connections in the Garden:** Neighborhood Gdn, Urban Ag on Empty Lots, Food=Land Access, Indigenous Practices, Seeds, Deep Raised Beds, Greenhouses, Urban Wild Edibles
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- #83 Feb. '12 **The Economy of Wood:** Polewood, A Northwoods Economy, Basketmaker's Landscape, Ligurian Alnoculture, Wood as Fuel, Clearing Woodland, Black Locust, Perennial Staples - Pt. 2
- #84 May '12 **Home and Hearth:** Domestic Permaculture, Natural Building, Roundhouses, Hearthfire, Retrofits, Home Economy, Homeschooling, Drylands Pc, Nova Scotia Homestead
- #85 Aug. '12 **There Goes the Neighborhood:** So. American Neighborhood Projects, N'hood Pattern Language, Community Solar, Food Security, SENS House, Moving Groups, Fracking & Common Rights
- #86 Nov. '12 **Health and Nutrition:** Naturopathy Centre, Seasonal Eating, Plant Medicine, Mushrooms & Vit. D, Herbal First Aid, Campus Forest Gdns, Beer, Growing Wise Children, Fenugreek
- #87 Feb. '13 **Weeds to the Rescue:** Managing Weedy Spp, Favorite Weeds, Weed Wisdom, Paulownia, Grafting onto Weed Trees, Polycultures, Burdock, Reputation of Weeds, **General Index to PCA #41-58.**
- #88 May '13 **Earth Skills & Nature Connection:** Mentoring, Cultural Repair, Connecting Youth to Nature & Self, Living with Wild Animals, Observation Skills & Design, Oyster-tecture, Personal Forest.
- #89 Aug. '13 **Practicing Democracy:** Slow Democracy, Seed Libraries, Rhode Island Prosperity, Lessons from the Iroquois, Community Gardens, Entrepreneurship, Social Pc, Pastoralism, Sweet Cicely
- #90 Nov. '13 **Appropriate Technology:** Technology & Culture, Zone 4 Tools, Rocket Mass Htrs, Solar Pump, Solar Food Dryers, Social Sharing Software, Oil Presses, Woody Ag Trials, Scythes, PV Dbl. Cropping
- #91 Feb. '14 **Seeds:** Arizona Seed-Sheds, Seed Saving Primer, Leucaena, Volunteer Plants in the Garden, Seeds of Cheese, Seed Banks, GMOs in Uganda, **General Index to Issues #59-74.**
- #92 May '14 **Stacking Functions:** Primer; Biochar; Commty Gdn.; Pc of Oaks Nature, Culture, Self; Fodder Banking Central America; Rule of Three; Colo. Flooding; IPC-11; **Spp Index to PCA #41-74.**
- #93 Aug. '14 **Experimentation-Science in Pc:** Method & Theory; Dynamic Accumulators.; Experimentation; N-fixing Vege.; Biochar & Soil; People's Science; Malawi; Pc & Academia; Soil & Biodiversity Tests
- #94 Nov. '14 **Seasonal Cycles of Work:** Festivals & Forestry; High Desert Homestead; Market Seasons; Wisconsin Gdn. Cycles, Seeds; Energy by Seasons; Homestead Resilience; Forest Gdn. Research
- #95 Feb. '15 **Perennial Crops:** Perennial Cultures; Hybrid Swarms, Hickory-Pecans; Perennial Sugar; Haiti; Perennial Veg.; Perennial Cereals; Guild Patterning; Hardy Kiwi; Foraging; General Index
- #96 May '15 **Building the Solar Economy:** The Gross Society; Bioshelters & Greenhouses; *Passivhaus* Design; Citrus; Community Advocacy; Solar Business; Perennial Grains, Pt. II; Peer-Driven Pc Organiz.

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Permaculture Design Course Midwest

Dates: Jan. 15-17; Feb. 5-7, 19-20;
Mar. 4-6, 25-27; Apr. 8-9

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Description: Study permaculture design over six weekends with a wonderful team of experienced and apprentice teachers bringing together their experiences around village building, homesteading, farming, business development, and much more based on permaculture practices in the region. Lectures, engaged discussion, field trips, films, and practical, collaborative play-time all combine to provide a solid foundation the practice of permaculture to create a more resilient future.

Instructors: Rhonda Baird, Peter Bane, Keith Johnson, and guests

Cost: \$1,050 before 12/1; \$1,200 after; lodging not included. Saturday lunches provided. Limited work-trade, scholarships avail.

Contact: Rhonda Baird
Center for Sustainable Living
csloffice@gmail.com
www.simplycsl.org/pdc

Permaculture Design Course Mid-Atlantic

Dates: August 3-15

Location: Sandy Lake, PA

Description: During this 12-day intensive course, enjoy great food from local farms and country living at Three Sisters Farm, a 25-year old demonstration of permaculture, and visit other local examples of permaculture in action. Learn the design process and co-create a design to enhance Three Sister's Food Forest. Experience hands-on applications of permaculture and team learning while sharing your own expertise. Acquire practical skills that can be integrated into your life and inspiration to create a more sustainable world around you!

Instructors: Darrell Frey and guests

Cost: \$1,200, includes fees, food, camping. \$200 dep. by June 1.

Contact: Darrell Frey,
threesisters@bioshelter.com
www.bioshelter.com

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Permaculture Design Course Tennessee

Dates: September 18-29

Location: Summertown, TN

Description: We need to change our inner landscapes. The culture of our minds. We need vision. We need a positive, solution focused mindset. We need to be inspired and we need to take action. We need to regenerate and heal our landscapes, our personal lives, our relationship with nature and our culture & communities. We need resiliency training. We need to learn how to connect with nature so we may learn how to mimic it in the design of our present and future. That's what this course is all about.

For 10 days you will be learning the tools, guiding principles, and strategies that create lush productive landscapes, reduce your energy use, and create more stability and security for you and your loved ones. You will create a village, and find community with a group of caring individuals sharing the knowledge and enthusiasm that come from joining forces and focusing on solutions. All levels are welcome. Whether you are new to these ideas and wondering where this path will take you or if you have been in an a related field and need new inspiration.

Instructors: Cliff Davis, Jennifer Albanese

Cost: \$1,650 after August 15

Contact: Spiral Ridge Permaculture
info@spiralridgepermaculture.com
www.spiralridgepermaculture.com

Permaculture Design Course Florida

Dates: 1 weekend per month, October 15-March 2016

Location: Clearwater, FL

Description: Permaculture design offers regenerative techniques, tools and design principles to enable you to live abundantly while caring for the environment and the people around you. Grow food with less work and expense, create stronger economic networks, and increase your overall quality of life, while using less, and helping the environment.

By cooperating with nature and her energies, we are able to design human systems, from backyards to neighborhoods, farms or even cities to be more abundant, more long lasting, more ethical, healthier for all life in the system, and more enjoyable. It is a cutting edge approach to living that helps both people and the environment.

Instructors: Koreen Brennan and guests **Cost:** \$990 until August 20

Contact: Cathy, 727-495-6145, cathy@growpermaculture.com
http://www.permacultureguild.us/urban-permaculture-design-course-fall-2014/

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Permaculture Practitioner Training Tennessee

Dates: August 15-October 31

Location: Summertown, TN

Description: Experience what it is like to live by the ethics and principles of permaculture on a day-to-day basis. Watch the evolution of design from ideals to implementation. Learn many aspects of homesteading and practical permaculture skills on a working permaculture farm. **Instructors:** Cliff Davis, Jennifer Albanese

Contact: Spiral Ridge Permaculture
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Schumacher College Opens New Programs for Postgraduate Study

JOIN US for a new postgraduate program that looks at food production from a natural systems perspective. The program: Ecological Food Systems.

This residential and transformative program combining teaching, research and practice that equips you to become a leader in the global food revolution. True to permaculture approaches of integration, the program is delivered in collaboration with Plymouth University, The Organic Research Centre, The Campaign for Real Farming and the Centre for Alternative Technology.

We are also offering a course in July for Agroecology: Food for the Future is offered by Miquel A. Altieri and Clara Nicholls April 27-May 1, 2016. They will offer instruction about food production the natural way—using a blend of agroecological science and indigenous knowledge that is already working worldwide.

Schumacher College has an enviable

reputation for cutting-edge learning. Our work is to inspire, challenge and question ourselves as co-inhabitants of the world, to ask the questions we all struggle to find answers to and to find sound knowledge, intuition and wonder in our search for solutions.

We bring together the leading thinkers, activists and practitioners internationally, to deliver a unique brand of small group learning experiences. This learning takes place in the classroom, the gardens, the kitchen—it is part of everything we do.

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With a focus on interactive, experiential and participatory learning, we offer the practical skills and strategic thinking required to face the ecological, economic

Networking

and social challenges of the 21st Century. All of our courses are deeply grounded in an ecological and holistic worldview which, once experienced, will completely transform the way you live and work in the world.

Coming here is a rich and diverse experience which allows you to mix with like-minded students, teachers and activists who are striving for positive change in the world. Schumacher College is a place where you will meet friends and allies from all walks of life and from all parts of the globe, who share an interest and a passion about the planet we inhabit.

There are a number of programs which might be of interest to permaculture practitioners.

You can find out more about Schumacher College and its programs by contact us at www.schumachercollege.org.uk. Δ

Calendar

August 3-15. Sandy Lake, PA. Permaculture Design Course. Darrell Frey. threesisters@bioshelter.com. www.bioshelter.com.

August 5-16. Fountain City, WI. Permaculture Design Course. info@kinstoneacademy.com. 608-687-3332.

August 7-9. Celo, NC. 22nd Southeast Permaculture Gathering. <http://www.southeasternpermaculture.org>

August 10-21. Basalt, CO. 2nd PDC of the summer at CRMPI. <http://crmpi.org>

Aug. 15-16, Sept 19-20, Oct 17-18, Nov 21-22, Jan 16-17, Feb 20-21, March 19-20. Fort Collins, CO. Permaculture Design Course. info@thegrowingproject.org

August 16-29. Winlaw, BC. Permaculture Design Course. Gregoire Lamoureux, spiralfarm@yahoo.com, <http://www.kootenaypermaculture.com>.

August 28-30. Eugene, OR. 8th annual Northwest Permaculture Convergence. info@northwestpermaculture.org.

September 7-11. Ashland, OR. Permaculture Teacher Training. Chuck Burr, 541 201-2688. courses@sopermaculture.org.

September 8-9. Euston, London, UK. IPC UK Conference. <https://ipcuk.events/confer->

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September 10-16. Gilwell Park, Essex, UK. International Permaculture Convergence (IPC UK). <https://www.permaculture.org.uk/IPCUK>

September 12-18. Fountain City, WI. Advanced Permaculture Design. Plants in Permaculture. info@kinstoneacademy.com, 608-687-3332.

September 18-20. Newton Abbot, Devon, UK. Transition Network International Conference 2015. <https://www.transitionnetwork.org/conference-2015>.

September 18-20. Summertown, TN. Permaculture Design Course. info@spiralridgepermaculture.com

October 1-4. Fountain City, WI. Permaculture Earthworks/Access & Circulation Workshop. info@kinstoneacademy.com. 608-687-3332.

October 12-18. Fountain City, WI. Permaculture Teacher Training. info@kinstonecircle.com. 608-687-3332.

September-October. Naperville, IL. Weekend Permaculture Design Course. Michelle Hickey, The Resiliency Institute. contact@theresiliencyinstitute.net.

October 15. On-line. Orientation for Diploma and Degree Candidates. Gaia University. info@gaiauniversity.org. www.gaiauniversity.org.

October 15-March 2016. Clearwater, FL.

Permaculture Design Course. Cathy, 727-495-6145, cathy@growpermaculture.org.

October 18-24. Kingston, NM. Natural Building Colloquium. www.BlackRangeLodge.com.

October 25-November 7. Quail Springs, CA. Permaculture Design Course. info@quailsprings.org, 805-886-7239.

Fall 2015. Online. Orientation for Diploma and Degree Candidates. Gaia Univ. info@gaiauniversity.org. www.gaiauniversity.org.

December 3-15. Cottage Grove, OR. 25th Annual Cascadia Permaculture Institute's Permaculture Design Course. <http://www.aprovecho.net/programs/>

Jan.-Apr. six wks. Bloomington, IN. Permaculture Design Course. Rhonda Baird,

csloffice@gmail.com.

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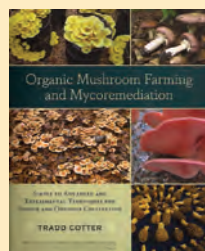
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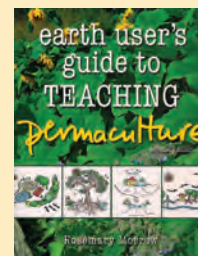


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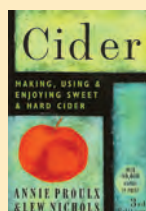
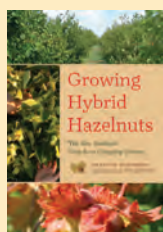


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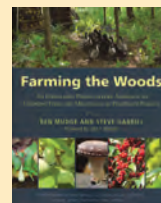


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