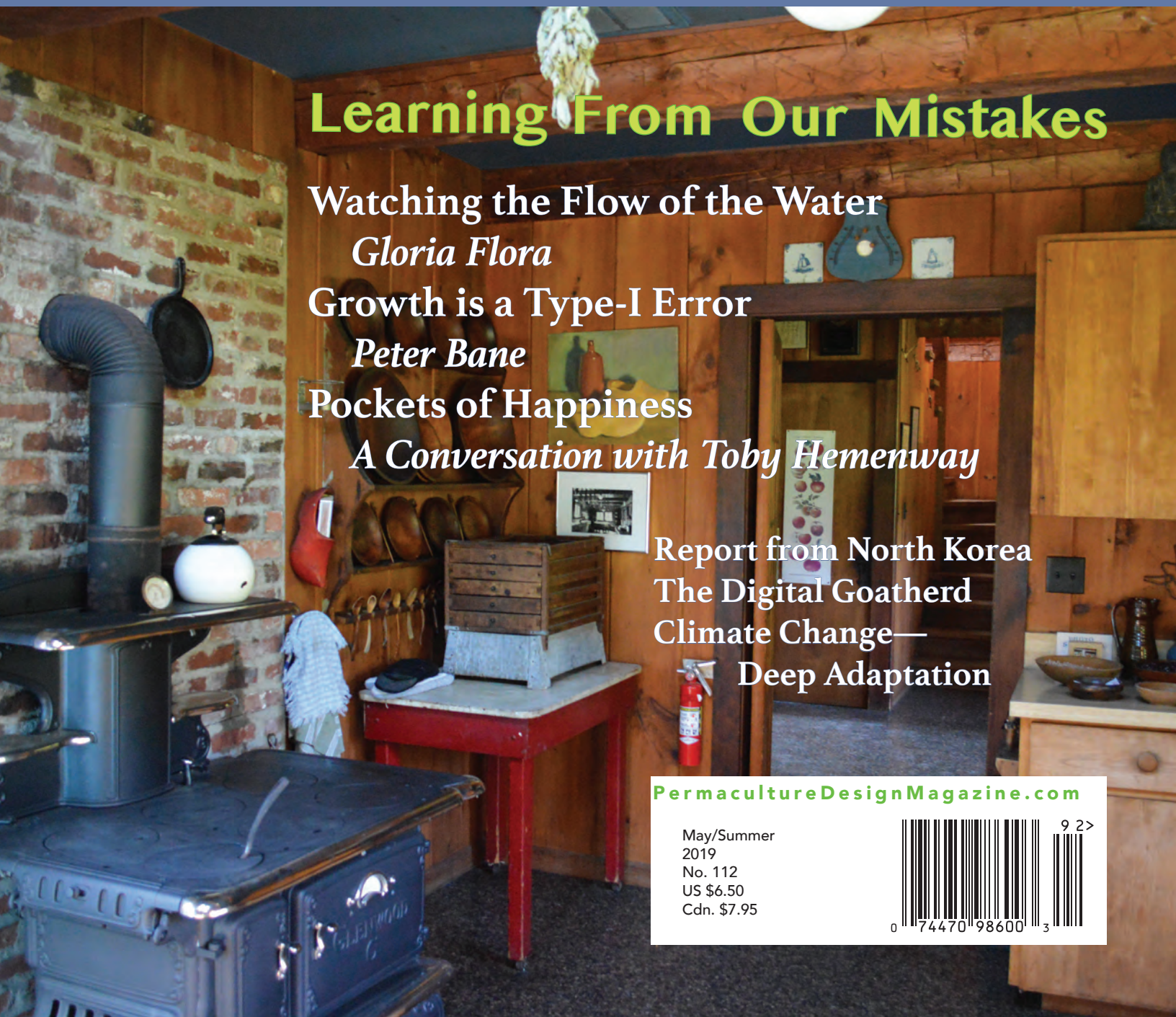
Permaculture Design

Regenerating Life Together



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Making Mistakes

John Wages

Country folks around here used to keep the ground clear around their houses—the opposite of today's aesthetic of lawns and shrubbery. I can only assume this penchant for bare ground arose from fear of snakes, which were abundant a hundred years ago. There were rattlesnakes, water moccasins, and copperheads here, and most of the old timers I knew were afraid of all snakes, not realizing that we had only a handful of easily identifiable poisonous species. My grandparents and parents automatically killed every snake they came across, whether cottonmouth or garter snake. Green snakes were especially feared for some reason. In any case, I grew up playing under a spreading oak with absolutely bare clay underneath, and wandering the dusty clay paths through my grandmother's flower beds behind her house. I must have been no more than four or five years old when I saw a bumblebee in a snapdragon flower. Instinctively, I reached out and pinched the flower shut. Wow, now I had a bee! Until the bee in turn instinctively reacted. Action and reaction—almost inevitable. Bumblebee stings are particularly painful. Yes, that was a terrible mistake, but not, I'm afraid to say, the worst mistake I ever made. Lesson learned: leave the bees alone! And, I'm still careful to always check for resident bees when harvesting squash blossoms. Sometimes bees get trapped in there on a cool evening, if the blossom closes. You can't be too careful around bees, especially bumblebees!

When we have good intentions, mistakes can still arise from lack of observation or faulty interpretation of what we've observed. This was the case with my dozen Pomeranian geese. Without thinking about the fragility of a clay bank on a pond sitting atop chalk, where the water was pH 8.3 (the natural pH of limestone), and no plants grew in the water. Only bermudagrass was tough enough to hang on on the clay dam. Geese are big, and they eat grass. Constant nipping at the shoreline grass and repeated clambering in and out of the pond damaged the dam more than one might imagine. Before I realized how bad it was getting, they had reduced the width of the bank by a foot! I never read about this problem happening to anyone else, but the situation on this chalk soil is fairly unique, and the pond more fragile than one realizes at first. Lesson: start small (ducks perhaps), pay attention, and don't get more poultry than you can keep track of. You need to know how much havoc they're wrecking!

Plants are generally less destructive than farm animals, although they can be a money pit. The first winter we were back on the land, we invested a little over $1,300 in fruit trees. Thinking I had retained intimate knowledge of the land I grew up on, even though I hadn't lived there in over 20 years, I discounted Gwen's suggestion that I might be buying the wrong trees or the wrong varieties, or was planting them in less than ideal locations. Of all those trees, the only ones that are still alive are the pears, some of the plums, one of many apples, and one Japanese raisin tree (Hovenia dulcis). The latter has never produced any edibles, possibly because I planted it under a towering pine. The apple, while going on its 18th year, has produced only a couple of apples and is only about five feet tall—poor performance due to poor soil. I underestimated how much I could improve shallow, chalky soil. Sure, if I focused my efforts on one or two areas, mulch could work wonders in a few years, but I was spread too thin, and so was my mulch. The plums have rarely produced one or two fruit per tree, because of disease that is endemic to this region, and I didn't want to spray them. Those are some expensive trees—over $150 per tree to be exact, once you subtract the losses! Lessons learned: avoid European plums in this

climate, choose planting sites carefully, and don't plant more trees than you can care for. A year of observation could have avoided most of the mistakes in planting. I guess there's a reason why one should start small and slow, working outward from a controlled front, and spend time in protracted observation rather than fruitless mass plantings.

Thanks to Rhonda's tireless editorial efforts and our writers' generous contributions, we bring you some reflections on personal design errors, as well as wider societal and cultural errors. Peter Bane brings us a taxonomy of error. Thanks to Bellamy Fitzpatrick, we offer an interview with the late Toby Hemenway. Laura Killingbeck shares her experiences with humane killing of animals for meat. Beginning with this issue, we plan to run a regular Plant Profile feature. Gloria Flora has generously offered to assume the mantle of Plant Expert for this purpose. We greatly appreciate her dedication and willingness to make this contribution.

Please look ahead to our upcoming themes. August is "Stocking Up." Tell us how you preserve the harvest–canning, freezing, drying, fermenting, root cellaring. Tell us how you store supplies and food for emergencies—what's in your bug-out bag? November is "Retrofit." Have you retrofitted an existing building for energy efficiency? More efficient water usage? Renewable energy? Tell us about it.

May the blessings of spring abound in your garden and in your life. Until August. Δ

Learning Experiences

Watching the Flow of the H_2O

Gloria Flora

IN THE 1967 CLASSIC FILM, *The Graduate,* a family friend drunkenly lays some advice on the aimless new college graduate, "I have one word for you, Benjamin, 'Plastics!'" Following suit—although I am not drunk, and you are not aimless—"I have one word for you, Permies, 'Drainage'!"

My learning experiences throughout life, also known as mistakes, are legion. But for now, I want to talk about someone else's mistakes (whew) of which my husband and I are chronic victims. Drainage.

The lovely property we bought seven years ago captured us with its irresistible siren song of excellent exposure, soils, water, and growing conditions. And on the climate change model maps, we're in the "green"—not much change expected. We knew the existing infrastructure wasn't ideal, but it's generally attractive, structurally sound, and met our needs. Given enough time and money, you can always change infrastructure, but not the site elements, so we consummated the purchase. Over time, we began to notice a little thing about the drainage. Well, not so little. Actually, several things about the drainage.

We've found that the house, shall we say, breathes with the seasons.

Construction and gravity: Lesson One

One of the most important rules around construction requires that water drains away from the structure. Where water, melting snow, or ice might pool—like around footings and foundations—avenues for water to travel around and away from the structure are essential.

Soil type further dictates design response. The less well-draining the soil, the more robust your system needs to be. A heavy clay soil might require perforated pipe, gravel, and filter cloths to create drains that effectively move water away from where it can do damage to a location where it is welcome and useful.

We have deep, well-drained soils—lovely loamy sand

The hayshed built in one of the lowest spots in the barnyard. Perfect place for a pond!

which stays moist but never sopping and allows roots to roam at will. Situated at the southern edge of the last Ice Age glaciers, rocks are few and far between. That combination of uniform, deep soil, and few rocks also means that, when wet, it's rather casual about holding heavy things upright and level—like the house. Lacking a full foundation, and obviously effective subsurface drainage, we've found that the house, shall we say, breathes with the seasons.

Although the original siting was probably functionally flat, over the decades, the house seems to have nestled into the ground a bit. A couple of the sidewalk slabs now tilt towards the house instead of away from it. And the driveway is higher than it should be as it approaches the house.

The emerging lesson is that, over time, impacts from a marginal drainage design will get worse. A lot worse. As the house approaches the age of 50, the cascading effects multiply in scope and scale. With water seeping house-ward over the decades, the subtle movements of the footings cause cracks in the drywall, nail heads pushing out, doors getting sticky, and slate floor tiles loosening and cracking. And more settlement, which means more water coming towards it.

So that's the ground level; then there's the roof.

A crowning glory gone wrong

The second rule of construction: design roofs to fulfill their purpose—the consummate protection from cold, wind, rain, storms and wildfire. The best roofs:

- Drain away from entryways and foundations,
- Sit on a lot of insulation,

Four roof lines dumping in front of four doors and steps!

- Present simple planes and minimal valleys that can be covered in fireproof roofing (essential if you live in or near forests),
- Resist wind shear by sleek design, and
- Shield the building walls with sufficient overhangs.

We're good on the last two! In part, because the windiest it's ever been in seven years is a gust of 34 mph. The overhangs are okay. However, the roof has so many different planes from multiple additions and a primary gambrel roof design. This means only shingles can be applied. Metal, the gold standard in high-risk wildfire areas like this, won't work.

But back to the drainage. Every entry, including the garage doors, are overhung by roofs that dump all manner of rain, snow, and ice directly in front of the doors! This was perhaps more manageable when the roof was covered with fat wooden shakes. (How the house avoided catching fire in this environment with a thick layer of dry kindling on the roof falls into the "One of Life's Miracles" category.) And there were gutters, albeit leaky, that sort of caught much of the rain. As for gutters, the other words I have for you are "Not plastic."

When we purchased the place, the shake roof was already well past its expected life, and the owners agreed to re-roof it in high-quality shingles. Here again, the cascading nature of poor design reared its unattractive head and became oh-so-visible with the onset of a heavy snow winter.

The old shakes had actually provided a significant amount of insulation. The new shingled roof, over marginal insulation, transferred enough heat so that thick layers of snow melted from underneath, pouring meltwater and slabs of icy snow into the gutters, which promptly ripped off the house. I have to admit that the icicles are impressive, as long as I try not to think about ice dams that can back up under the shingles. You can imagine the rest.

The snow which used to stick to the shakes now tumbles into piles in front of the doors. Those piles episodically begin to melt and drain towards the house, only to freeze again in smooth slabs of solid ice. One always has to "chain up" before stepping outside.

The ultimate solution is a new roof, of simple design and ample size. With a price tag exceeding average annual income, that is not likely to happen soon. In the meantime, particularly in winter, pulling snow off the roof with the roof rake, moving snow away from the house, chopping ice off sidewalks, creating effective detours around snow piles, and wasting electricity with heat tapes in the few remaining functioning gutters is a sink of time and energy. Every year. Over and over. The high price and compounding interest of poor design. We've tested multiple temporary catchment solutions with varying degrees of success, but jerry-rigging is not a permaculture principle.

Did I mention?

Did I mention the barn?

It's a beautiful little barn, tucked in the trees, with a solid foundation and a red metal-clad cathedral roof that sheds snow and resists wildfire. However, the drainage isn't quite right as the barn sits slightly downhill from its main entryway. Not too noticeably nor enough to cause a problem—usually.

I have to admit that the icicles are impressive, as long as I try not to think about the ice dams that can back up under the shingles.

But here's an interesting lesson in soils and seasons. We have wet autumns. If the damp soil freezes before it gets covered in snow, come spring, we'll have an ephemeral stream from melting snow merrily wending down the driveway, across the yard, and into the barn. Now schooled, we can fend it off on those rare winters with late snow. But the surrounding trees make swales and other serious earthworks problematic. Mounds to redirect flow interfere with access and snow plowing. (I am not going to talk about the 80' tree in front of the main door.)

Did I mention the hayshed?

I saved the best for last. The hayshed is built in an excellent location. More specifically, an excellent location for a pond! I'm not kidding. We keep vacillating between building an elaborate network of deep swales on three sides of the hay shed to feed into a pond over which the shed will be partially perched or disassembling and moving it. If the proposed pond were bigger, it could be repurposed as a boathouse.

We don't store hay there, but it's adequate livestock shelter for most of the year. The dampness helps to compost the thick layers of bedding we put down for the sheep so we at

least generate excellent soil amendments. Part of the problem is a solution, but I remain unamused.

O_2 flows too

But drainage doesn't apply only to water. And here's a truly happy note. One site element we demanded was excellent air drainage. Heavier cold air flows downhill. Low spots into which cold air drains are called frost pockets, which are notorious for early frosts, cold soils, and slower decomposition. You do not want to site your garden in a frost pocket unless you're prepared to limit your species and expectations accordingly. As they say in Montana, there is a growing season of 60 days, non-contiguous.

The high point on our rectangular 65 acres is in the northwest corner, with a general slope to the east, and the low point is in the southeast corner. So, air gently but persistently flows off the property. The deeply incised creek which bisects the place, likewise flowing eastward, pulls even more air downslope. Despite our average elevation of 2800' and mountain setting, we don't expect the first frost until mid- to late-October. Our neighbors, in a frost pocket 400' lower and a ¼ mile east, receive our cold air. Their first frost typically arrives the last week of August. It's hard not to feel a little guilty.

We use plantings and pathways in combination with the slope to draw air through our gardens and food forests, just as you would design a water drainage system. Good air flow can help with pollinating, distributing humidity, minimizing mold and mildew, and even guiding insects. Gentle breezes increase the resilient strength of plants stalks as well.

What we've learned

Looking at the bright side, we've learned a lot. And even bad examples can benefit a Permaculture Learning Center like ours. Until we point out the cascading effects of the drainage design flaws, most visitors don't notice. Similarly, when we first saw this place (under three feet of snow) we wondered about drainage issues but shrugged them off, thinking we could handily deal with them over time. But

A large old tree—blocking the main door.

Major ice dams destroy gutters.

over time, the collateral damage from poor drainage tends to geometrically increase. Permanent fixes can be costly, and the extra work required for responding repeatedly to seasonal issues seems like a higher and higher price to pay. PATO comes into play: Patient and Thoughtful Observation!

In addition to the construction rules above, we recommend:

- Weigh decision choices spatially and temporally. What ripple effects will your solution have on adjacent installations now and over time?
- Ensure flexibility. Is your solution adaptable to new materials or alterations in 20-50 years without losing its integrity and functionality?
- Add seasonal responsiveness. Designs need to be effective in each season and address the variable range of conditions within seasons.
- Design for resilience in the face of unplanned perturbations (climate change, flood, wildfire, drought, storms, and high winds).

Drainage is critical. PATO with a hose! Δ

Gloria Flora is a permaculturist and the Founder/Director of Sustainable Obtainable Solutions, a nonprofit with the mission to ensure the sustainability of public lands and of the plant, animal, and human communities that depend on them. She and her husband are evolving TerraFlora Permaculture Learning Center in NE Washington.

Un/Learning

Oh, the Stories We Could Tell…

Rhonda Baird

EVERYTHING AND EVERYONE is my teacher. This was made explicit in my Standard Class at the Tracker School, though I had been using it implicitly for much of my life. I've learned from others' mistakes, but I've learned the most from my own errors. And I've made more mistakes than I can count. You probably could say the same. What mistakes have you learned the most from?

What is a mistake?

A mistake is an action or judgment which is misguided or wrong. Our mainstream culture and the constant attacks and criticisms on social media can make us cautious about claiming something is wrong—or it can encourage us to make a claim about something being misguided or wrong without really offering our reasoning and actively thinking about the matter.

Call me odd, but as a Midwesterner, I wonder about the erosion of common sense. When Thomas Paine wrote "Common Sense," he was creating a common vision or understanding of what should be considered normal and right.

When I look at the synonyms for "mistake," I see that many of them are based on feedback. Ahh! There we go with systems thinking. In our permaculture understanding, we might begin to actively welcome feedback and sharing our learning with others. I imagine this is how many of our smaller communities mentored each other into creating a common-sense approach to making a living in the past.

Errors, miscalculations, and omissions

When we make an error, we do not get the results we were looking for. A miscalculation will mean lower yields or no yields in the garden. Too little fertility in the soil, and the harvest is poor. Too much water for too long, and the perennials will drown. If we choose the wrong species in our forest garden, disease or drought or flood or temperatures can lay waste to our investment.

I miscalculated how quickly ground cover would re-grow after I pastured my chickens in our 1/8 acre of backyard. The ground was heavily shaded by a 55-year-old silver maple. I moved the chickens and relatively bare ground was seeded (I thought). It would regrow. Nature is abundant, right? It turns out that it not really true. There is a limiting factor in terms of light and growing time (the chickens were particularly damaging in the early spring, late fall, and over winter). My four hens needed more land to cover, and the land needed more light to foster regrowth.

If I were to bring poultry into the space now, I would do two things: 1) limb up the silver maple, and 2) work with quail instead of chickens. It turns out the quail are showing up without my introducing them. I just need to find their nest. I learned there are limits in any situation, and I could have had less damage to my system if I had taken action on the feedback sooner.

A frequent beginning mistake is to overcrowd the growing beds which can lead to poor yields.

One very common mistake I warn my design students about is spacing. We are very optimistic about how many plants we can fit in our landscapes. I made this mistake, and I was gratified to hear Toby Hemenway admit to the same experience years ago in an online forum. Paula Westmoreland, of Ecological Design in Minnesota, shared some of her experience for this article:

> *"One of the mistakes I made early on in broad-acre design was making an alley width too narrow in an alley cropping system. Space was limited in one of the fields I was designing and I was trying to stack as many crops as I could into the field, so I designed 15' wide alleys for the hazelnuts and elderberries. This worked fine in the early years when the shrubs were small. The alleys could be mowed, animal tractors moved through them, or they could be planted with another crop. But as they matured, the alley became unusable space. It was too narrow to easily move equipment through and not enough sunlight to harvest another productive crop. The lesson that hit home to me was I needed to do my due diligence and design what the system would look like and how it would be managed through the full lifecycle of each of the anticipated crops."*

Some of the systems may give feedback over very long timeframes. My 65-year-old home has a basement that was dug by hand AFTER the house was built. In 65 years, it had never flooded until February of this year. Oops. Because of that, no one had ever installed a sump pump. Now, we are faced with removing all of the flooring and drywall to install a perimeter drain and a sump pump, and sealing the walls.

Building mistakes can be very expensive. I know of a permaculture person who built a very large building with the first floor laid in the cement block. There was a subtle (2") curve in one of the walls when the block was laid. This meant that each truss for the second floor had to be custom measured and built for the exact position. Tedious.

A design client of mine brought me into work with them after their house was under construction. It turns out their dream home is built 10' below a seep. There is no way to channel the water in a different direction due to the building choices they made. They live with a sump pump running constantly—actually they have a timer to turn it off at night so they can sleep. That is a Type 1 error—something that will exist as long as people live in that structure on that site. These are all examples of miscalculations. Sometimes, however, a mistake is made due to a misunderstanding.

We loved your design, but…

When we begin our work with design clients, we often make mistakes. Since we're working with someone else's dollars, time, and property, mistakes can be really scary. Understanding our clients is really important. One of my early clients was a couple on the verge of retirement. I laid out a design, but I didn't do a thorough analysis of elevation (as we all agreed based on observing what was needed). It turns out we were off. The placement of the plants in the design didn't change (because the relation to the sun was the same), but the direction of the beds to run across contour did. It was a minor mistake, but a very obvious one. I learned to always do a thorough analysis—which became easier with the publication of GIS sites with better data over the next year.

This same client also taught me about timelines. Most clients want and need a long timeline for implementation, but these were able to implement the design I thought would take them three years within the first year of their retirement. Good health, means, commitment, and skills served them well. Listening to the client helps us match up goals and capacity. Jude Hobbs of Cascadia Permaculture shared this story:

"One of the very earliest lessons I learned when I started my Landscape Design Business was not listening deeply to a client. I worked with a retired couple who were so excited about doing a whole systems design for their property… they wanted to include most everything I enjoyed bringing to a design. They loved the idea of edibles for humans and wildlife, water features, area for composting by the garden, aromatic plants, fall color, minimal lawn… you get the idea. We worked together on the design, and they were thrilled with the result. About 6 months later, I called them to see how the installation went—they said; "We loved your design but realized a lot of it would not work for us, come by and see what we have done." To say the least, I was surprised when I arrived and saw lots of lawn and concrete where a multitude of plants was to have been. When asked what happened… they said they realized they were going to be traveling a lot and also did not want to spend the amount of time it would take to maintain the gardens. Since then, I always utilize a questionnaire which includes the crucial question… how much time do you have to maintain your landscape?

As you can tell, 35 years later I remember the incident well and am mindful in the awareness of deep listening. Also, it's not about pleasing the designer but focusing on clients' needs and realistic goals."

Misguided, misunderstood, misinterpreted

When we began our forest garden, I was determined not to prune our apples and plums. I was influenced by my reading of Masanobu Fukuoka's non-interference principle. This fit with the STUN method I'd heard of from Mark Shepard—Sheer Total Utter Neglect. That seemed to fit with the lifestyle of a 30-year-old mother and organizer who was taking up a permaculture teaching and design lifestyle while also trying to homeschool and implement some significant home economic projects.

One apple grew tremendously each spring for three years—reaching 15' very quickly. I was so very excited about 16-ounce apples until a windstorm knocked it over. I realized the roots had not been growing at the same rate as the rest of the tree. Likewise, the plums were thick with foliage and covered with blossoms—by not pruning—there was insufficient air flow. Black knot, a common fungus, took hold, and I ended up losing both plum trees.

Gaffe, faux pas, misconception

When it comes to society and cultures, there are many, many mistakes to learn from. Some of them are mine. Some of them are not. I've judged the book by its cover—I've made assumptions about people based on their age, skin tone, dress. I've been the book judged by its cover—people have considered my light skin tone, Midwestern mien, and education an indication of a very particular (and misconceived) background. I try very hard to not be limited by this kind of thinking and to connect more deeply with people I encounter.

On a different level, I've invested years of my life and time I didn't have into projects which did not provide the yields I was looking for when I invested initially. About five years ago, there was a complete board changeover with a 25-year-old sustainability nonprofit in my community. I proposed to them that I put in the organizing effort to convert it to a local permaculture institute—and they agreed. However, new board members elected at the time of my proposal and

working closely with established projects didn't fully buy into the new vision. After three years of service on the non-profit board, I refocused on the regional permaculture institute, Great Rivers and Lakes Permaculture Institute. It was taking too much effort to try to re-pattern the local project.

Mistakes come in varying degrees

Some mistakes are not very costly—in terms of time, materials, and energy. Some mistakes cost dearly. I've got an experiment going in my kitchen now with kombucha. For the cost of counter space for a week, a bag of sugar, a few tea bags, the energy to boil the sugar water, and the kindness of a friend, we will see how it goes. I hope it's not a mistake, but it's not very costly to me either way.

The client with the home built below the seep has a very costly mistake to pay for if the trends toward more severe rain events continue in our area. Someone else I know continued to build out their design without permits. This resulted in a lawsuit and ultimately the sale of the property. In the process, a slew of relationships was upended. That was very costly, indeed.

We might consider the failure of people to participate in the legislative process and the utter failure of policy to make meaningful change in our society as a mistake of epic proportions. Likewise, the failure to address social unrest and cultural bias—while overwhelming—is something we all have to live with. Because we all have to live with these mistakes, it is important that we engage with them collectively.

This lush line of perennial flowers and shrubs included the apple and plum trees that failed.

Opportunity for iterative design

When the apple and plum trees came down, I had the opportunity to plant peach and sour cherry trees that suit my region better. I knew that because it took a few years of the permaculture community—and some permaculture nurseries in particular—to experiment and find out. It turns out pie is one of my favorite desserts, so why not peaches and cherries?

I worked with a client recently who wanted everything written in experiment form. All of the plantings would be trials. I believe this is very clever. He will be inclined to observe and track the performance of his investment. Further, he already knows there will be feedback in the form of failures. By tracking the implementation closely, he can determine the source of the mistake. That learning can be valuable for our region.

Recovering from a mistake can help us to transform experience into wisdom.

What if there are no mistakes?

Recovering from a mistake can help us to transform experience into wisdom. At a point in our lives, we want to support those who are learning the skills we've mastered so that they do not make the same mistakes we did. That mentoring is one of the beautiful things about community and extended family or tribe. The re-skilling of Transition Towns, the farm schools and sewing courses and gardening time with the neighbor down the street are all ways to re-establish the common sense of an adaptive future.

While mistakes can be costly, they can also provide us with resource and opportunity that we couldn't imagine without going down that path. Design and implementation provide us with many, many choices. We cannot do anything—a very safe way to control the situation. We can do something and succeed. We can do something, fail, and learn from it.

When we consider the incredible pressures and failures as our culture and ecosystems run up against limiting factors, there's no time NOT to be making mistakes. Δ

Rhonda Baird is editor of this magazine as well as an active designer and permaculture design educator. Learning from experience has helped her to become a better designer and a better teacher. It's also encouraged some humility. She can be reached at: rhonda@shelteringhills.net.

Growth is a Type-1 Error

Peter Bane

BILL MOLLISON BEQUEATHED permaculture much of its memorable language, including the widely used but ill-defined term, "Type I error."

It has long occurred to me that if Type-I errors exist—and I agree that they do, then surely they must belong to a series that includes other types. We have simply not paid any attention to these other types of errors, though undoubtedly we make them or see them all the time.

The discussion of error in permaculture takes place in the context of learning: we are encouraged by Mollison and other teachers to 'make many small errors,' from which it is hoped we will both recover easily and learn quickly, as we undertake to transform a self-destructive culture. But as I have thought about error, it also seems obvious that evaluating error is a matter of measuring cost vs. benefit, a routine calculation that all humans, as animals, must do. 'Is that apple in reach, or must I go find a ladder, or shake the tree, and if I do will someone shoot me with an arrow, or might I break a leg?' or 'Can we pull down that mammoth without being trampled?' If we do not guard our energy and ensure that its expenditure returns us adequate reward, we suffer and die prematurely. As my own teacher Lea Harrison said, "In nature, you are either perfect, or you become mulch." She was referring mostly to trees and plants, but of course, we and all other animals become mulch too.

> ***"In nature, you are either perfect, or you become mulch."***

Fossil fuels have jiggered this calculation by enabling humans who command them to make bigger mistakes and become less energetically efficient or elegant in our actions. This is one way of expressing the problem of the modern world. We have gotten sloppy because we haven't had to keep refining our harmonious integration with the living world. Rather, we have become detached from it through the mediation (welcome by most) of our energy slaves.

This digression into questions of energy is important because we are no longer merely *Homo sapiens* (if indeed *sapiens* at all), but also *H. colossus,* (1) the creature that stands astride the world. And this bears on the question of scale and consequence in error.

Types of error

I have no illusion that mine will be the last (or even the first) word in defining types of error, but undeterred by fear of correction, let me advance the following terms before I attempt to illustrate them by example:

- **Type I**—An action or choice for which one must pay a high cost continually, or which leads to a loss of capacity, or from which there is no recovery—a calamity. These three consequences may compound.
- **Type II**—A decision that leads to high and continuous costs and which cannot be salvaged but only abandoned, usually resulting in a substantial loss of investment—a complete loss.
- **Type III**—A choice that does not reward its costs but from which the efforts and investments can be partially or substantially recouped or redirected—a losing proposition.
- **Type IV**—A choice or election that works and provides a yield, but is more costly or difficult than needed—an inelegant answer or solution, and therefore one that nature (and sensible humans) would abandon or convert sooner or later. These errors are sometimes committed consciously for want of time or resources to achieve better results. Retrofitting the system may involve elements of redesign that bear additional costs or costs that might have been avoidable.
- **Type V**—A course of action that neglects a potential yield. Rarely fatal or even costly, these are often subject to mid-course adjustments that improve system performance or harvest the neglected benefits. Most successful adaptations

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embody Type V errors as a potential for growth or learning. When one discovers a Type V error, the occasion is often a benign or pleasing event.

Though occurring on gradients of decreasing cost and increasing benefit, the above types appear to me to break into two groups: the first two and the last three. Indeed, the gradient between Type IV and Type V is rather flat, a matter of a few degrees rather than a sharp rift. Generally, experience leads people to limit errors to the last two types, the balance between them being a function of haste and available resources.

Let us illustrate the various types of error.

Recklessness and folly

Type I and II errors inherently involve a good measure of folly in proportion to the scale of energy engaged. They can occur at quite small scales, and may even be insidious. As a personal example, in my early 40s while helping to build Earthaven Ecovillage, I volunteered to work with a crew converting wood waste into chips using a rented machine. Though wearing ear protection, it was inadequate to the circumstances, something I as a novice woods-worker on a non-professional crew neither understood nor was warned about. Those few hours of work led to a loss of high-frequency sensitivity in one ear that plagues me to this day, and which becomes more pronounced with age. Though not fatal, and even stemming from good motives and some prudence, I experienced a loss of capacity from which there can be no recovery (a hearing aid would be a weak adaptation), and for which I must pay continually in strained conversations. In retrospect, I can say that my decision to join in this activity without better preparation was reckless.

At large scales, Type I errors become mythic. The classic example is that of the Trojan Horse, a legend that has shaped all of Western civilization for three millennia. The elements of error (and folly) are all present: 1) the Trojans had a choice; their fate was not ordained, 2) they were warned against their course of action repeatedly, and 3) there were feasible alternatives: they could have left the Horse outside the gates, or could have cut it open to find the Greek invaders hidden within. In the event, they took the Horse within the gates, abandoned caution for drunken celebration (because the Greek armies simultaneously withdrew out of sight), and succumbed to assault the next day. Troy fell, the city was destroyed, and the defenders massacred. There was no recovery; they paid in every currency imaginable.

Though debate continues to rage among techno-optimists, I regard the building of nuclear weapons and the proliferation of nuclear power plants to be a Type I error because of the certainty that nuclear waste pools will continue to damage life for eons to come. In 70 years of scientific advance, the problem has grown, but the solution has remained out of reach.

30'x10' kit hoophouse wedged into a too-small fenced yard. Strawbales provide insulation. Carpet pieces provide windbreak. An example of hodge-podge growth and a Type IV error resulting from incremental design.

I do not think I am alone in suggesting that the growth economy meets the definition of a Type I error.

Widespread and rapid extinction of species is clearly a Type I error, the costs of which have so far not been quantified. One may argue that the exhaustion of phosphorus from vast areas of farmed land and its discharge into the oceans is a Type I error. It is still possible to imagine that this might be converted into a Type II error, a label which categorizes most of the other system characteristics of Industrial Agriculture.

Complete loss

On an equally grand scale, industrial agriculture, based on high fossil-fuel inputs, monocultures, dependence on chemical nutrient and biocides, and at the same time employing very few people, is a costly and losing proposition. Destructive in its operation, among its most serious externalized costs are the downstream effects of eating bad food devoid of nutrients. Because agriculture is central to the world's economy and impacts almost all of human and animal life, the challenge it poses to society lies in the rate at which our investments in it can be converted. In other words, will it collapse from degradation of land, bankrupting of farmers, or a loss of essential inputs before farming is

converted into a primarily organic and biological system again? Industrial Ag would seem to be a Type II, or at best potentially a Type III error, though we have to ask what parts of it would be retained and repurposed other than the abused land itself?

On a medium scale, Type II errors abound in this energy-drunk era: Carbon Capture and Sequestration appears to be one of them—it is highly entropic and unlikely ever to work. The US Supersonic Transport program (SST) and the Anglo-French Concorde were another.

Most US Americans, and perhaps people in other countries, probably look on the Vietnam War as a Type II error. It seems to have accomplished nothing good, and at a huge cost. After 30 years of escalating involvement in a civil conflict, leading to almost 60,000 US deaths and several hundred thousand other casualties, plus millions of Vietnamese deaths and hundreds of billions of dollars spent for destructive purposes, the US withdrew, and after 40-some years, has begun to repair or normalize relations with the government of Vietnam, its former enemy. The US fought to keep South Vietnam from falling under the control of the government in Hanoi. This effort failed. Whether the error can be limited to Type II or may yet prove to be of Type I, is in my opinion unknown. I believe the historical consequences of the war continue to wreak havoc on US society through the continuation of culture wars that have become increasingly politicized, rendering the state and the society significantly dysfunctional. The end of these is not in sight. The corruption of the Presidency that began with secretive Executive War under Kennedy and Johnson continues to this day with ever greater consequences through time.

As a society, we are paying more every year for disasters....

As we try to assess error and to learn from our mistakes, it is well that we keep in mind the ground of our own existence. Most people in the world's wealthy countries are embedded in, and substantially dependent upon the growth economy. Politicians swim in it like fish in the sea. As we try to work our way down the scale of error from I to V, there is, like an enormous gyre in the ocean, an attractor pulling us up the scale simultaneously. That attractor is the growth economy in all its manifestations: fossil fuel dependence, centralized systems, fiat currency, mass media, pollution, and climate change.

I do not think I am alone in suggesting that the growth economy meets the definition of a Type I error. It has clearly led to a loss of capacity: exhausted soils, diminished forests and fisheries, species extinction, depletion of fuels and minerals, and some would also propose, to a loss of privacy, a corruption of culture, and without a doubt to climate instability, war, and displacement. As a society, we are paying more every year for disasters, our politics are swamped by a fear of refugees, the cost of adapting to sea-level rise is unimaginable. Can we recover?

What might convert a Type I to a Type II error is the possibility of "abandoning" the commitment to a growth economy and retrenching from it. This is not easy, for the rewards of the growth economy are addictive, the forces that benefit from it powerful, and the alternatives obscure and even demonized. There are signs that individuals and small groups have begun this work throughout the Western world, however. Some permaculture folk are among this cohort. Persuading larger numbers to follow and, even more importantly, making the substantial redirection of investment—in thinking, in education or training, in economies and material ways of life, and in community engagements, are the key issues we face today and in the coming decade.

Getting out of a bad deal

Confronting the challenge of disengagement from the growth economy means coming to terms in one's personal life with a Type II error: much of the training, commitment, experience, and set of relationships that sustained

involvement in the growth economy must be abandoned. For some, this can come about through unemployment or retirement, chosen or forced. Recouping those investments and converting some of them to new uses and new purposes redefines the error, on personal terms, as a Type III venture. On par with the hunting party that missed the herd and came back with injuries, or the production of the Edsel, or perhaps a marriage to a drunk, Type III errors are serious but not fatal. One may be scarred, but recovery is possible. Those who wait too long to cut their losses from Type II, however, may be swept away or lose everything, e.g. the citizens of Paradise, California, proving that errors can move either down or up the scale.

These are not easy choices, but they are necessary and will prove salutary. They are hard to sell—people identify with long-held views and despise loss. Recognizing failure and vulnerability is part of the painful process of recovery from addiction, and while such awareness must come from within, individuals can be supported once they undertake to change.

Ordinary choices

As designers, we would like to work, for ourselves and others, on converting Type IV to Type V errors, on moving our designs from workable but clumsy, to elegant and potentially synergistic. This is the trajectory from amateur to professional work.

As I search my own circumstances for an example of Type IV error, I might point to our 2016 relocation of a 300 sf hoophouse from Indiana to our Michigan farm. The moving wasn't hard, as plastic cover, steel hoops, and plywood endcaps came apart quickly and went together without too much fuss, and we put the house down in the right place—a fenced garden area where its central location afforded best connection to surrounding gardens, our housing, and the hub of farm operations. This was the part that worked, but the setting wasn't ideal. We compounded earlier errors. While the hoophouse supported our spring seedlings, the former garden where we put it had been created haphazardly because we had windrowed compost there adjacent the driveway. That choice in turn was expedient rather than considered, accessible to the dairyman who delivered the material, and shaped by the nature of his machinery. The compost became a garden after we threw a fence around it, the size limited by an accidental combination of the number of posts we had on hand and the length of wire fencing left after enclosing the main garden.

Entered from the west, and without an east door, the hoophouse in its original placement faced the main garden, but now turns its back on the new house (visible at rear) and attached greenhouse. The gate can barely be cleared and the garden space to the right is difficult to access.

The new hoophouse barely fit within the fence, so getting into the compound posed access challenges, made insulating, re-covering, and maintaining the hoophouse extra work, and generally exacted an energy cost for each use of the space. We needed to re-set the wooden fenceposts, which would then have required additional welded-wire fencing, and perhaps small earthworks to level and sculpt the approaches. These hurdles deterred us from making an optimal solution, so for three years we have stumbled and squeezed, avoided and averted, cursed and crouched to deal with a less-than-satisfactory, yet still useful and even necessary facility.

The redesign will involve a second gate on the east end for a better circulation, connecting the hoophouse to our new home and main greenhouse which lie east of it. It will also require a bigger enclosure and one better proportioned to its contents. We can then achieve better insulation for the hoophouse itself, and a reworking of the water system. To accomplish this redesign, we'll have to pull apart some existing infrastructure (fence, posts, and gate), modify the east end of the hoophouse, and will then be able to make permanent improvements to the surrounding beds, trellises, and walkways. Much, though not all of what we originally put into the garden, fence, and hoophouse, now needs to be reworked.

These are some of the costs of growth without design, or with belated design. We can bear them—the system has provided a yield, albeit with aggravation. But can our society continue to bear the costs of growth? Can it bear them now? The more of us who can retrench from the insupportable costs of the growth economy, the larger become the possibilities for surviving its inevitable demise. Δ

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Ten Mistaken Ideas About Permaculture

Fruitful Misconceptions

Bart Anderson

This article is a reprint from issue #55, when we first visited this subject in June 2005. It is interesting to see how relevant the ideas are today, despite the intervening 14 years. We hope you are inspired.

MY FEW YEARS IN PERMACULTURE seem to have been spent going from one mistaken idea to another. I make a generalization, run with it for a while, then begin to see its shortcomings. Hopefully the next generalization reflects a deeper understanding of the matter.

My father encouraged me in this course, as embarrassing or painful as it may be at times. "Learning things isn't hard," he told me. "What's hard is unlearning them." Don't sit and stew—keep moving and hold your preconceptions lightly.

In that spirit, here a list of mistaken preconceptions gathered from my encounter with permaculture.

1.Permaculture makes no sense.

Several years ago, a magazine with an odd cover caught my attention at the local organic food store. A roughly drawn spider hovered ominously over her web in the top right corner; in the center was what appeared to be a section of a topographic map.

An article inside had the title "Pattern: Key to the Universe." What odd cult had I stumbled upon? Intrigued, I bought the magazine. But when I tried to read it at home, I could make absolutely no sense of it. Strange jargon, fierce arguments between factions, bucolic images of gardens and plants. It was like nothing I'd ever seen before. I put the magazine aside and became involved in other things.

Years later, I realized that this mysterious magazine was the July 1998 issue of *Permaculture Activist.* When I read the articles now, they make perfect sense; in fact, this was a great issue! Several of the authors have since become my teachers.

2. Permaculture is a sect.

The next time I crossed paths with permaculture, I had left my job and was investigating a career change. Permaculture seemed to occupy the same intellectual space as my interests: sustainability, gardening, and living in accordance with nature.

I was skeptical. Just another sect, I thought, with an outrageous guru and a Ponzi-type training scheme. Hundreds of dollars to learn the basics—and what does it prepare you for? To become another permaculture teacher! Uh-huh, I'd heard this before.

I had been trained as a journalist and had come of age during the weirdness of the 60s and 70s, so I wasn't going to cut this odd little group any slack. I thought my suspicions justified as I read more articles and web postings. Quotes from Bill Mollison were trotted out just as those of Chairman Mao had been in the political 60s. Some of the voices were gentle and spiritual, while others seemed as arrogant and dogmatic as any Marxist-Leninist. The permaculture publications with their long, deeply felt articles reminded me of the underground newspapers of an earlier era. They did have a ragged power, I had to admit—nothing slick and superficial about them.

Coming from an engineering environment, I was critical of permaculture's lack of concern about efficiency, priorities, and costs. "This is a young person's movement," I thought, "a reincarnation of the counterculture."

Nevertheless, the philosophy fascinated me, and I kept reading. I picked up the jargon: zones, Class 1 errors, food forests. It was eerie how often permaculture resonated with the things I'd been doing and thinking for decades. I wrote a list of positive points about permaculture:

1. It is open; it is available. For what other field can one say that?
2. There is structure and a community.
3. You don't have to swallow everything. If there is a person, practice, or field that is not for you, so what?
4. The main thing is that permaculture appears to be tolerant and open.
5. There are a number of people I like, or at least find interesting.

Whenever a class or talk on permaculture was given in the bioregion, I attended. I quickly learned that no one was getting rich from permaculture. Teaching permaculture appeared to be as lucrative as being a monk.

Finally, I took the plunge and took the December, 2003 Permaculture Design Course at Lost Valley, Oregon. There wasn't a hint of the dogmatism I feared; people had strong opinions, but they were thoughtful and balanced. During the course, I wrote: "I feel alternately excited and wary. Isn't this the way people feel when they fall in love? You want to think that the beloved will solve all your problems... and as you grow older, you realize the danger of that feeling, so you draw back. But aren't both aspects true? You are in love, and you want to maintain your independence (and your sanity). You are aware of the warts on your beloved, her bad moods, her difficult ways... and yet you love her still."

3.Mollison was permaculture's guru.

A big puzzle about permaculture lies in its central figure, Bill Mollison. Permaculture is permeated by his ideas and

aphorisms. His books are key texts for the serious student, and his videos bring in the public.

I couldn't figure him out. His autobiography, *Travels in Dreams,* dispelled any notion of his being a sanctimonious guru. In no way politically correct, he was like a Charles Bukowski of the environmental movement. Never boring, never predictable. I imagined that, like many visionaries, he may not be an easy person to work with.

In September 2003, I had a chance to hear Bill talk for a day in Sebastopol in Northern California. At noon, I was about to leave, out of exasperation with the meandering remarks and the gratuitous insults against vegetarians, New Agers, college students, etc. I felt like throwing something at him.

Fortunately, I stayed for the afternoon portion of the talk, when Bill began talking about substantive issues. He is an inspiring speaker, both funny and moving. Many times, I felt tears coming to my eyes. He gave me the feeling that what I did was important, that I could be his mate in the struggle for a just and environmentally sound world.

4. You've got to homestead.

The homestead has a powerful emotional appeal. For most of my adult life, I'd been under the sway of this vision.

I had begun dreaming about homesteads in the early 80s while working the graveyard shift in a run-down hotel in Palo Alto, California. A copy of Wendell Berry's essays had fallen into my hands, and I read them straight through, pausing only to talk to the homeless people who would come into the lobby to get junk food from the vending machines. Riding my bicycle home in the morning, I'd stop under some brush in a woody section of the Stanford campus, lie on my back, and wish that I could live in nature as the farmers and homesteaders did. The only problem was that I had no money, no skills, and no partner.

Soon afterward, I found myself in England with my wife-to-be, house-sitting a small cottage on the Norfolk coast. I learned about a new scheme called WWOOF (Willing Workers on Organic Farms) and spent many days volunteering on organic farms in the region. To my delight, the farms lived up to my dreams: cozy kitchens with wood-fueled Aga stoves, teakettles boiling, and bread baking. It was the self-sufficient life so well described in the books of John Seymour and Gene Logsdon.

When we returned to California, the dream went on the back burner, since we had little money and no career. In the spirit of the times, I learned computers and gradually found jobs that paid well. The vision of a small homestead kept me going as I toiled in the corporate cubicles.

When I parted from my employer 20 years later, I thought, "Now I can fulfill the long-deferred dream." This time I had some money, some skills, and a partner. Permaculture provided an intellectual framework for what I wanted to do. With theories and a mission, it matched my growing environmentalism. It seemed like homesteading in overdrive. Full steam ahead?

I dutifully read the permaculture books and began gardening in earnest in our community plots. Take it step by step, I told myself. I kept Bill Mollison's admonition in mind: "Develop the nearest area first, get it under control, and then expand the edges."

But a funny thing happened: The more steps I took toward the homestead ideal, the farther away it receded. It would be tempting to blame land prices or my wife's lack of enthusiasm for the project. The truth was, my wife was right.

At this stage of our lives, a big garden and assorted DIY projects were all we could handle. We were older and uneasy about new projects that would require unlimited energy. I'd seen in England how much work a homestead entailed, and I had to admit that it wasn't for me. There were too many other things I wanted to do: hike, study, be with my family. Then too, I'd come to love where we lived. The hills, rivers, and bay were beautiful and easily accessible. The cities offered cultural opportunities. Family and friends lived close by. The thought of uprooting ourselves, as we would have had to do, held no appeal. Slowly the long-held dream evaporated.

We're just neighbors, choosing to care for each other.

5. Real permaculture means self-sufficient rural holdings.

Having distanced myself from homesteading, I began to look critically at permaculture's focus on developing rural properties. It seemed as if you couldn't begin to do permaculture without a quarter acre in the country.

It is true that small rural properties are ideal for demonstrating permaculture concepts and techniques. David Holmgren's well documented Hepburn Demonstration Gardens is a case in point. In contrast, it's harder to explain zones or install swales in our condominium complex.

The problem is that a rural smallholding is unrealistic for most of us. To make homesteading successful requires a big commitment. Earning a living is difficult in the present economy, with its high prices for land and low prices for produce. Even long-time farmers are leaving the countryside in droves. And finally, the rural US can be a lonely place for urban people, especially after the 2004 elections. *[Editor's note: What was possible in 2004 that is not possible now? Or is more possible now?]* The rest of us should do anything we can to support the brave homesteaders trying to make a go of it.

I'm not arguing against homesteading, but against a fixation on it, as if it were the only way to practice permaculture. It's worth noting that Bill Mollison felt that permaculture ideas could work at "any scale... from the tiny one-room flat in Stockholm to the unthinkably large, a 4-million-acre cattle station in Northern Territory" (1).

In fact, he advocated the "establishment of plant systems

for our own use on the least amount of land we can use for our existence…" (2). And rather than waiting for the ideal homestead with the Aga stove and dried herbs on the wall, he said to get started now: "Wherever we live, we should start to do something" (3).

The challenge for me was to see how much I could do where I was. Could I make up in intensity what I lacked in acreage?

I was inspired by the permaculturists who lived in urban settings, such as Russ Grayson, the Australian permaculturist and journalist, who has posted an essay, "Towards an Urban Permaculture," on his website, *pacific-edge.info.*

Also in Australia was self-described eco-hermit Margaret RainbowWeb, gardening her 150-square-meter plot in Adelaide and creating her glorious website *(www.users.on.net/~arachne),* with its profusion of permaculture essays, spirituality, good sense, how-to articles and memories from World War II England.

Other urban permaculturists had equally imaginative solutions. Among the many: Robert Waldrop in Oklahoma City, the group Food Not Lawns in Eugene, Graham Burnett in England, and Green Fairy Farm in Berkeley.

Lack of land seems to bring forth energy and creativity. Some things are harder to do in small spaces, but others are easier. I've found that I'm never at a loss for interesting things to do. Why did I ever think I needed that quarter acre in the country?

6. Permaculture is raising food.

Permaculture rightly emphasizes the raising of food. I was inspired to grow as much of our food as possible, almost as a moral imperative.

We had started gardening in a community garden several years previous, but now we acquired more beds and began planting year-round. Permaculture encouraged us to go beyond seed packets and neat rows of annuals and to experiment with new crops and techniques. We planted more perennials and relied on heavy mulch rather than digging. It was a period of discovery and frustration, satisfaction and burnout. I wouldn't have missed it for the world.

We learned there is an immense difference between light gardening for the occasional tomato and intense gardening for a large fraction of your diet.

What do you do with all the fresh produce that now streams into the kitchen, in spurts of abundance? Crops need to be harvested and you have to do something with those shopping bags of lemon cucumbers, raspberries by the quart, and all the horseradish you'd ever want. We weren't used to eating this way! And neither are most Americans, judging by the complaints from CSA members that they are overwhelmed by the fruits and vegetables that keep showing up on their doorsteps.

At the simplest level, we had to rearrange our kitchen so that the knives and cutting board were handy for chopping produce. We learned to use vegetables before they became soggy and rotten, and, if possible, to eat them the same day we picked them.

Preserving and processing food became a necessity, not a hobby. My wife taught me to can and make jams. The lemon cucumbers became pickles. We realized that soups and salads were wonderful ways to use up problem vegetables.

Each new herb or exotic vegetable became a research project, as we surfed the internet for more ways to cook collards or use lemon verbena.

I acquired a great respect for the skills of the traditional housewife.

But as fun as these new projects can be, it is a wrench to change from old habits. Others in the household may not share your enthusiasms, and you encounter constant little frictions with mainstream society.

Food preparation is a deep issue that permaculture doesn't address adequately. I know of only two permaculture books that deal with it: Mollison's *Ferment and Human Nutrition* and Robin Clayfield's *You Can Have Your Permaculture and Eat It Too.* Fortunately, there is a wealth of information outside of permaculture on food preparation. In addition to the traditional approaches, there is the new emphasis on eating fresh local foods, for example in the Slow Food movement. Nutritionist Joan Dye Gussow goes deeply into this subject in her book *This Organic Life: Confessions of a Suburban Homesteader*. Permaculture is not just about raising food—it's also about making the best use of it. What good are organically grown vegetables if you don't eat them?

7. You've got to garden.

Although I'm committed to gardening, I can understand why other people might not be. Gardening brings many rewards, but it does require continual effort. There are the frustrations that come with learning any new skill. Even people who'd love to garden may not have the time or access to land.

Unenthusiastic gardeners might do better to give up their plots and buy vegetables from local farmers at farmers markets or through CSAs.

As Mollison says: "We can also begin to take some part in food production. This doesn't mean that we all need to grow our own potatoes, but it may mean that we will buy them directly from a person who is already growing potatoes responsibly" (3).

Perhaps it makes sense to teach food systems rather than just gardening, as Russ Grayson advocates. By understanding the conventional food system and learning about alternatives, permaculture students could choose their food sources wisely.

8. You do permaculture with groups labeled "permaculture."

After attending a Permaculture Design Course (PDC), I wanted to get involved with permaculture groups so I could learn more and contribute in some way. I looked for groups in my area, but none seemed to be active.

I didn't want to drive for hours every time I attended a meeting or class, so I began considering local groups that might share the values or interests of permaculture. Bonanza. As soon as I realized that a group didn't have to be labeled

permaculture, I found dozens of opportunities.

Some groups are so close in spirit to permaculture that they might easily be seen as extensions of a PDC. For example, Green Teams meet regularly to discuss ways of reducing personal waste and consumption. Discussion courses on sustainable living, simplicity, and deep ecology are based on anthologies published by the Northwest Earth Institute.

A new phenomenon is the emergence of interest groups preparing for Peak Oil and the end of cheap energy. Those groups under the umbrella of the Post Carbon Institute are especially interested in relocalization and other permaculture ideas.

Other groups focus on a special interest like native plants, organic gardening, solar energy, or primitive technology. Still others, like watershed groups, have a bioregional or environmental emphasis.

What is unique about permaculture is its comprehensive worldview and its theme of positive action. Because permaculturists can see how things fit together, they are well suited to contribute to other groups and to benefit from them. For example, permaculturists aren't content to grow pretty flowers. They want to know what other plants they grow well with and whether they can eat them. And they want to tell other people about it.

In fact, veteran permaculturists seem to have long lists of interests and involvements. Perhaps networking with other groups should be recognized as a key permaculture skill.

9. Permaculture knowledge is labeled "permaculture."

There's only so far you can go by reading the usual permaculture publications. For more depth, I found I had to go outside the permaculture world.

After all, permaculture concepts had to come from somewhere. Why not go to the sources? For example, one can study the science of ecology and the practices of traditional cultures. Ecologist H.T. Odum, whom David Holmgren admires, is especially worth reading.

For a complete permaculture curriculum, in which directions could one go? I've found several to be fruitful:

The sciences. Ecology occupies the most prominent place, followed by a raft of others: botany, soil science, microbiology, botany, hydrology, geography, and so on.

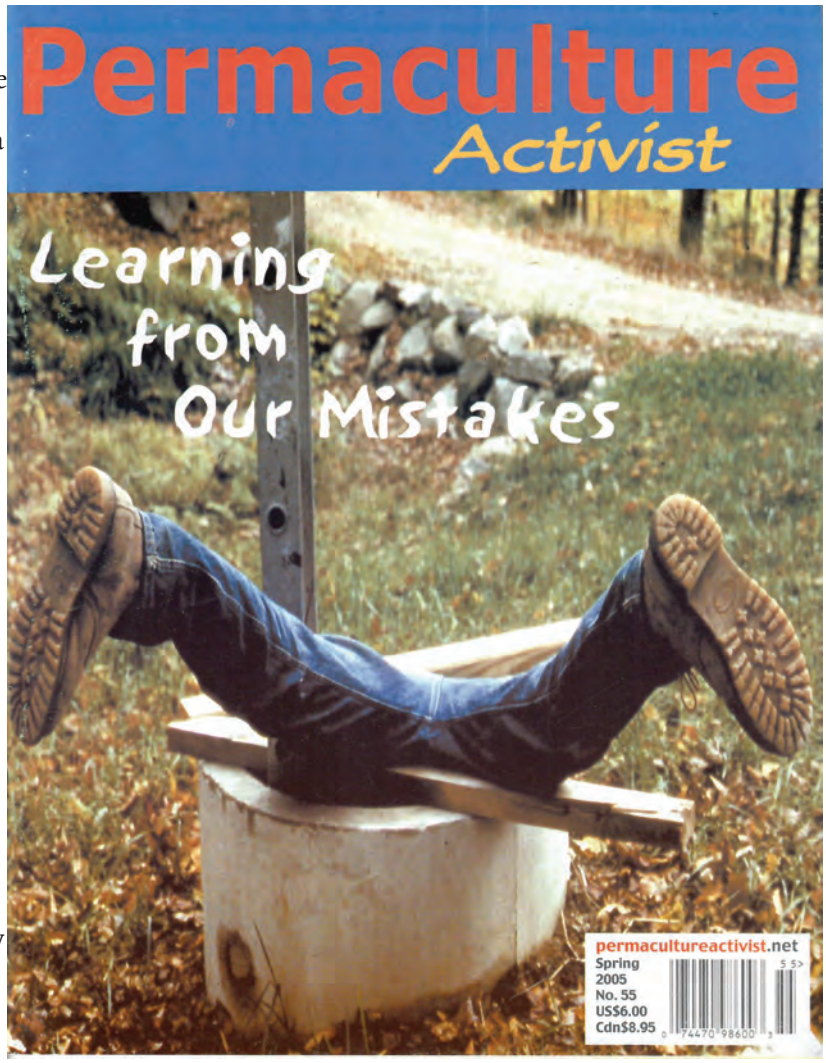
Traditional cultures. These are an inexhaustible source of knowledge and inspiration. One can learn directly from people in those cultures, or indirectly through studies such as anthropology, archaeology, and history.

Environmental thinkers such as Thoreau, John Muir, Aldo Leopold, and Wendell Berry.

Applied disciplines, crafts, and professions. Usually, permaculturists will be interested in those practitioners labeled "sustainable," "environmental," or "green." Examples are engineering, architecture, and business.

Social sciences. Although usually not emphasized in permaculture, the social sciences may play a bigger role in the future, if David Holmgren's recent book is an indication. The fields would include politics, economics, sociology, and history.

Literature. Scarcely touched by permaculture so far, literature offers the possibility of presenting permaculture ideas in a memorable form. Science fiction is rich with potential, as are the realistic novels from the 19th century set in an agrarian society.



10. Real permaculturists are PDC teachers, homesteaders, or designers.

If one wants to become further involved with permaculture, what options are there? The ones most discussed are PDC teacher, homesteader, and designer. All of these are honorable professions. None of them appeals to me.

Could I suggest that these three are fixations? That in reality the choices are much greater, and most people would be happier not to go into these fields fulltime?

What they have in common is that they represent a break from the old—a completely new start. Maybe we should remember Bill Mollison's admonition to start from where we are. Given our talents, skills, and background, how can we

apply permaculture concepts where we are, rather than make a dramatic leap into a completely new field? As a machinist, marketer, or microbiologist, there's some way to leverage one's experience, though it may require a shift to a new job or related profession.

"We can take a permaculture approach to any (reasonable) job or profession," says David Holmgren, "but to jump to the conclusion that permaculture is a job, career, or profession is false" (4).

My bent is towards research and explaining things. Rather than do this for a computer company, as I had been doing, I have decided to do it for gardening and the sustainability movement.

There are so many things to be done, so many possibilities to explore. Making mistakes is not such a steep price to pay if we are moving forward. Δ

In 2005, Bart Anderson lived with his wife, Paula, in a small condominium in the San Francisco Bay Area. He worked as a high school teacher, hotel desk clerk, newspaper reporter, and technical writer in the computer industry. He also maintained web sites dealing with Peak Oil, permaculture, and gardening.

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Food, Food Security, and the Environment

A Viewpoint on North Korea

Rosemary Morrow, New South Wales Regional Friends Meeting

IN OCTOBER 2018, I was extremely fortunate to visit North Korea as one of a study group of people, mostly Australian Quakers. We had been asked if we had special interests, and I mentioned that I would like to visit collective farms to see how they work as I have a special interest in food and water security. At the same time, our program included visits to the South Korea-North Korea border, the Vegetable Research Institute, a seaport, and three collective farms. These visits enabled us to see more of the country outside Pyongyang.

We were given a start in this country because, about 10 years ago, American Quakers (American Friends Service Committee–AFSC) had been allocated a farm to assist. They helped with pumps and other infrastructure. This created friendship and trust which we wanted to build on because they were our concerns as well. None of us saw the North Koreans as "enemy."

We all knew that the Australian government was bound by the present sanctions imposed by the United Nations at the instigation of the US. It was also a time when the US President had met with the leader of North Korea. So, there was a loosening of anxiety. We were aware that North Korea and South Korea both wanted a lessening of the tensions that had dominated most of their negotiations since 1953 when an armistice was declared at the end of the American war on Korea. However, to feel safe, North Koreans need the US to declare the war of 1953 has finally ended—57 years later.

There was a sense of hope.

Just as we left Australia, we learned that almost 1,000,000 landmines on the border were to be removed, and while we were there, work started on it. There was a sense of hope.

Our concerns

During the 90s, while I was visiting Vietnam, there was a terrible famine in North Korea. I was aware of it daily, and so regarded the present embargo and consequent suffering as unconscionable. In Hanoi, at that time, AFSC took a copy of my book as a present to the North Korean Embassy.

On this occasion, we wanted to meet people, try to develop relationships based on trust and friendship, and see the country while finding out if there were some way in which we could become involved in the future that would build ties, for us as Quakers, for Australia and North Korea.

Threshing work in North Korea. Photo by Sejin Pak.

Short history

North and South Korea share a long history of civilization and occupation. Paleontology reveals thousands of years of continuous culture and agriculture. However, today the people are fairly homogeneous with few indigenous groups.

According to tradition, the kingdom of Silla was founded in 57 BCE by Pak Hy-kk-se, who was miraculously born from an egg. His name Pak was perhaps derived from palk, meaning "bright," since sunlight shone from his body.

The Korean peninsula has been invaded many times since its original settlement, and the first peoples of the peninsula are said to have also colonized and established Japan. Invasions came from the Mongols and others sweeping across or from China.

Japan occupied Korea from 1910 and during WWII and their brutal regime is still remembered. At the end of the war, Japan was expelled, by the US from the south and by the USSR from the north. Each of the major powers set up a government in the part of Korea they controlled, with the border at the 38th parallel, but all Koreans yearned for a united country. In an attempt at reunification, North Korea invaded the south in 1950. A United Nations force, mainly American, pushed the North Koreans back to the 38th parallel, but then advanced through the country almost to the Chinese border. The whole country and every city was bombed almost to rubble. It was devastation.

The rebuilding effort took an enormous amount of sacrifice and lives. Wonderful, non-replaceable temples and treasures were completely destroyed. There was massive over-bombing, similar to Vietnam during their American war and Afghanistan today. The people labored unimaginably hard to rebuild bridges, roads, dams, factories, hospitals, and schools, and in fact, the whole country had to be reconstructed. The effort as we saw it, was amazing, and my admiration for the people is great.

Much of the rebuilding demonstrates elegant and far-sighted town planning and is now coming to maturity and maturing into gracious architecture and landscapes. Architecture critic, Oliver Wainwright, described Pyongyang as "a lovely gracious, clean, quiet city with exceptional town planning and transport systems." He has chronicled his trip in a book, *Inside North Korea.*

After this experience with the US, and, as in France and other countries with a history of frequent invasion, North Korea decided they would never be occupied again. So today they see nuclear weapons as their best deterrent, together with maintaining a large army despite the cost. However, it is a People's Army of service and works with the citizens on many integrated civilian projects, such as dam building and farming.

What is fascinating is that these principles reveal the potential for developing a modern sustainable future.

The landscape

North Korea is a mostly mountainous country in a cool temperate climate and, by Australian standards, good rainfall. The winters are very cold and long. The growing season is short, and rainfall is sometimes unreliable. Flat arable land is at a premium. The landscape has many varied ecosystems from coastal to high mountains.

Juche and setting goals

To rebuild, the country has adopted "Juche," the national policy developed by Kim Il Sung, which would be instantly recognized by permaculturists from Paris to Buenos Aires.

Once you read past the communist rhetoric in his speeches, it is striking the number of comments which support or demonstrate permaculture principles. In fact, I could be led to think the planners had access to permaculture principles and texts. And we saw much of it in practice.

Translated as "self-reliance," Juche, is the official state ideology of North Korea, described by the government as "Kim Il-Sung's original, brilliant, and revolutionary contribution to national and international thought" (3). It postulates (4) that the Korean masses are to act as the "masters of the revolution and construction" and that by becoming self-reliant and strong a nation can achieve true socialism. The practice of Juche is firmly rooted in the ideals of sustainability through local resources, agricultural, cultural, and industrial independence and a lack of dependency.

Juche is extraordinarily like the permaculture concepts of transition, bioregionalism, and localization where local resources are used and renewed, and local people have an internal circular economy. It resembles the goals of Transition Towns. It can evidently be used with strong results in a country under punitive sanctions.

Below are some statements from Kim Jong-un's widely discussed 2019 New Year's speech, where he spoke of the policies and successes affecting the country. Many of these will be familiar to permaculturists and others interested in sustainability and resilience. What is fascinating is that these principles reveal the potential for developing a modern sustainable future.

The agricultural sector, by actively introducing scientific farming methods, increased the rank of high-yield farms and work teams and reaped an unusually rich fruit harvest in spite of unfavorable climatic conditions.

A shortcut to developing the self-sufficient economy is to give precedence to science and technology and make innovations in economic planning and guidance.

Provinces, cities, and counties should develop the local economy in a characteristic way by relying on their own raw material resources.

And he goes on to say, the country should:

- introduce seeds of superior strains, high-yield farming methods, and high-performance farm machines on an extensive scale, do farming scientifically and technologically
- boost the production of livestock products, fruits, green-

Broadscale farm in production outside the city. Photo by Gary Yong Gee.

house vegetables, and mushrooms.

• launch scientific fishing campaigns and reenergize aquatic farming.

• build on the success achieved in the forest restoration campaign—we should properly protect and manage the forests that have already been created, improve the technical conditions of roads, conduct river improvement on a regular basis, and protect the environment in a scientific and responsible manner.

• Every sector and every unit of the national economy should enlist their own technical forces and economic potential to maximize and launch a dynamic struggle to increase production and practice economy, so as to create a greater amount of material wealth.

Visits to three collective farms

As we traveled through the rural areas and visited farms we saw:

Collective farms: We visited three, and easily recognized others in the distance. We saw strongly developed self-reliance in local areas (bioregions) and the use of local resources to meet local needs—both permaculture principles.

The rice straw stooked for drying after cutting is hard work but very picturesque.

The full and complete use of natural resources so that one resource's surplus serves another use, e.g. the use of maize husks completely ground up to serve as the substrate for winter mushroom grown to help with protein during the harsher winter months.

Energy conservation: The hotels and other buildings had low energy light bulbs and automatic light shut-offs in different areas. People's individual purchases and use of solar panels outside their apartments was everywhere.

Clean air, quiet cities: The seamless efficient public transport system relies on electric trams, buses, and trains and personal transport of electric bicycles and motorcycles, and results in clean air and a quiet city. North Korea appears to have jumped the air pollution and industrial and health effects of polluted air through integrated electric transport. They do have brown coal power stations. However, the cities have clean air and water—freedom from air pollution. They were well aware of the air pollution problems in China and were determined to avoid it.

City street tree planting is not simply one row of trees. There are two or sometimes three rows of trees giving protection for pedestrians, cyclists, and motorcyclists separated from street traffic, and shade in summer and on the footpaths for pedestrians all year.

Ultimately, the city sits in parklands since there are so many extensive public open areas close to urban housing. The postwar planting has matured, and the hand of the designer can be seen in species choices with their colors and forms.

Bicycles, and sometimes animal-drawn carts, are seen in rural areas.

Fields are small by Australian, but not Asian, standards. Agriculture still requires seasonally heavy labor operations with hand transplanting, harvesting of rice and maize, and then hay-making, but the soldiers return to assist the villagers.

Bicycles are quite common in rural areas. Photo by Gary Yong Gee.

There is a recognition that science can help with production, and what we saw was appropriate and locally applied.

In fact, all able-bodied people appeared to be in the fields at this critical rice and maize harvest time.

The grouping of rural activities on collective farms enables the most efficient use of energy, e.g. threshing and storing and feeding husks to animals in nearby stables, similar to ecovillages.

The rice and maize harvest is threshed collectively These seasonal activities which engage everyone probably have cultural songs, dances, and stories attached. I wasn't able to find out in the short time we had.

Agriculture and collective farms

There is a recognition that science can help with production, and what we saw was appropriate and locally applied. The farms had individual households grouped together, and each household has a highly productive garden of slightly different crops, and so a village becomes complementary in vegetables. Although there are fertilizer factories,

all household waste, including human sewerage, is returned to the fields and so is all crop wastes. Only at one farm, the soils looked hungry. There is very, very little intractable or non-recyclable waste. The lack of plastic and packaging in general is evident because products are produced close to the points of consumption. The residents of farms are given production goals, and when they do well, everyone receives a bonus at harvest time. However, cash payment as salaries is small because the Collective and State meet human needs through:

- free education
- free dental and medical treatments
- heavily subsidized transport
- free entertainment
- free housing
- free food from the farm, i.e. vegetables, fruit, meat, milk, and possibly more.

I don't know about work clothes and shoes. Once these costs are removed, the need for cash is less, and also residents can have small private garden plots and sell the produce. Of the produce from a collective farm, 60% is first used to meet the needs of the residents for food, water, and animal production, and the remaining 40% is sent to the cities. Encouragement of selective local seed-saving is important for biodiversity and local resilience and is carried out scientifically, i.e. understanding the genetic selection.

For some of us, clear air, good transport, efficient use of resources, lack of waste and plastic and advertising is what we would like to acheive.

The practice of returning to the village and assisting with these seasonal activities was strong in Asian cultures until relatively recently, although it is now changing as countries modernize and introduce machines suitable for small fields.

Although some drays were ox-drawn, there were also tractors. With two rice crops a year, one collective harvested 8 tons/hectare/year (7,137 pounds/acre/year). This seems high and may not be the average, but it has been achieved. For rice and staples, self-sufficiency is about 80%, and this is a respectable figure. Numerous countries in the world would like to achieve this. Although the 2018 figures were not available, the FAO report on Food Security and Nutrition showed a decline in food insecurity for 2017 (www.fao.org/3/I9553EN/i9553en.pdf).

North Korea has much to offer agriculture. Photo by Roger Sawkins.

People told us it was a good harvest in 2018, so it is likely that food security is even closer. Fields lie outside the village center.

Strong connections to permaculture

We repeatedly saw the following permaculture strategies and techniques applied in North Korea:

1. crop succession, e.g. beans after rice
2. interplanting of vegetables
3. crop rotation across fields
4. large quantities of animal and human manures
5. sophisticated irrigation planning
6. a range of cultivars
7. animals grazing stubble
8. people gleaning after the rice harvest
9. all organic waste returned to fields or fed to animals

However, the principles least used in North Korea are:

1. back up of major functions, in terms of water security and harvesting
2. value the edges and marginal in terms of rivers, creeks, and hillside restoration
3. value biodiversity: there was not an extensive range of cultivars and varieties
4. animals not used to assist in managing the systems
5. hillsides and mountains are often denuded

What we can learn and contribute

North Korea has much to offer agriculture and ways of living for many countries of the world: sharing resources, moving towards organic growing, commitment to good public transport, and elegant landscaping. For some of us, clear air, good transport, efficient use of resources, and lack of waste, plastic, and advertising is what we would like to achieve.

Permaculture can offer refinement in some of these achievements. The rivers and hills in rural areas are degraded. The rivers are used as quarries, and the hills are denuded,

My Experience of Communism

By enormous chance, I had been lucky enough to visit the former USSR and Czechoslovakia in 1979, and then Vietnam in 1986, and Albania in 2003 and, also Cambodia, while under, or newly freed from, communist governments. Being a development agriculturist/permaculturist, I was profoundly interested in traditional models of farming, as well as whether these new collective ones had promise, and to understand the impact on food security, the environment, society, and culture.

In brief, collectivization required farmers to unite in working land usually taken from mandarins or colonial landowners and redistributed to local people. People carried out farm tasks together and shared machinery. In some cases, as in Vietnam, the traditional villages were emptied, and the farmers moved into various forms of barracks. Individual enterprises were strongly discouraged or forbidden. This could work well if knowledge and decision-making about agriculture were sound and the management discerning. Where it was not, and when management came from the central government in the form of setting targets, crops failed, and there was no enthusiasm. Sometimes, there were large grandiose projects such as building levee banks which failed. In Albania, the country was littered with failed powerhouses, tractor factories, aquaculture structures, and so on. It is generally considered that individual farmers make better decisions than collective ones. However, Cuba has a fine record of moving from famine to food security when the US placed embargos on it. And, where fields are very small, it makes sense to rationalize and share machinery, animals, and tasks.

From a permaculture viewpoint, ecovillages use this more economic use of resources. Many farmers, especially the Vietnamese, hated living in barracks and longed to return to their individual homes in villages where there had already been a high degree of cooperation. Some had small businesses behind buildings and quietly grew food for themselves and others. We heard that similar micro-enterprises started and thrived in North Korea, and were subsequently legitimized.

In Asia, collectivization builds on strong cultural traditions and although collectivization can be difficult for people, it is not too foreign because:

- Asian societies are largely communal and the good of the whole community or the family is often considered more important than expressing individuality. This can be difficult for people from individualistic societies to understand.
- There are long traditions of working together at transplanting, harvesting, and even building homes. Everyone is expected to participate. Soldiers are sent back home at these times to work in their native villages, and children are often on school holiday. This creates a sense of belonging and purpose and real knowledge of rural life.
- Many traditional Asian farms, due to long centuries of invasion, are grouped around a common village core for security. Outside this core are the orchards, and farmers go daily to their fields to tend rice or other staples. Δ

yet efforts are still being made to grow annual crops. The range of species and cultivars is small, and the small gene pool could be problematic with climate change or a disease epidemic.

Water harvesting, bush regeneration, Land Care, and use of more perennial systems would grant farmers risk reduction and stability for seasonal variation.

Seed selection and saving on a regional scale and at farms can provide important variation to national crops.

The people work very hard and to such a degree it is not good for everyone's health. Small machinery would go far to remove the costs of this. There is small appropriate machinery available throughout Asia.

Exchange of principles and technologies would benefit much of the Western world and also North Korea. It would be valuable for everyone.

Human rights

I was unable to determine clearly the situation for human rights in North Korea. However, compared with about 1/4 of the world's countries such as China, Saudi Arabia, Congo, Philippines, and others, North Korea is far from the bottom. As a Quaker, I work for and defend human rights. But compared with so many other countries, I wanted to use this article to draw attention to the importance of quality of life in terms of life's basic needs for clean air, food, water, work, education, employment, homelessness, and an unpolluted environment for a healthy future of land and people. As North Korea makes its own future, their children's lives will be healthier, and the nation's health bills less than almost every other country where I work. Δ

Further Information

fas.org/sgp/crs/row/R41749.pdf. An excellent overview of food security in North Korea.

countrystudies.us/north-korea/49.htm. North Korean agriculture.

www.fao.org/3/a-I7695e.pdf. Elaborate description of various collective farms and how they work.

www.pbs.org/wgbh/nova/article/inside-north-koreas-environmental-collapse/. Geologists, ecologists and soil scientists describe the poor health of rivers, forest, wildlife, and so on in North Korea.

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Pyongyang, North Korea. Our trip enabled us to visit beyond the city and get a glimpse of the agricultural and cultural adaptations of the country. Photo by Roger Sawkins.

After some years in Lesotho, Africa, as an agricultural scientist, Rowe became dissatisfied with agriculture—seeing it as land destruction. So began a search for something which could put together the human need for food as a resource and rebuild the environment. After trying environmental science which didn't supply human needs, and horticulture, where current practices tended to be bad for the environment, Rowe found permaculture. And life changed. Although not a permaculture evangelist, she has not found any science or art which covers restoration of the natural world and supplies human needs as well. So began her life's journey—to take it to people who can't normally access it. Being a Quaker, she sees that the ones who need it the most are those suffering from war and devastation. Today, she sees the primary role of humans, as modelled by permaculturists, as restorers of soil, water, species, and life processes. This article appeared in The Australian Friend *(March 3, 2019) and has been adapted here by permission of and with the assitance of the author.*

Building an Epistemic Community

Un/Learning Frameworks

Andrew Langford

EDITOR'S NOTE: This article is an excerpt from Andrew Langford's book EcoSocial Design*, available at leanpub.com/ESD. Andrew Langford is the co-originator of the British Permaculture Academy and Gaia University (www.gaiauniversity.org).*

IT IS COMMON FOR MANY OF US to be scared of theory, to think it is a tool for people who are more intelligent and more educated than we—this is not true—good theory, theory to change the world, needs to be understood by the many (the hoi polloi). Indeed, that's a very good test—if you can't understand it after making a reasonable effort, perhaps aided with some mentoring support, it is suspect. Theory that is too difficult is generated by the Patrix and is best avoided.

So, the thrust of this lesson is about how to make a reasonable effort and how to eliminate any internalized blocks (I'm not bright enough, I'm too stupid…) we might have about not being smart enough to understand.

The great advantage (of developing our confidence around theory) is that, as Kurt Lewin once said, "There is nothing quite so practical as a theory." (It's worth checking out Kurt Lewin).

That's exactly right—to be effective when being practical we need a theory (or least a theory in the making, such as a conjecture or hypothesis). We may not be able to say what it is (articulate it) so sometimes we need to track back and deduce our theories from what we did and do, and then we can talk/write about them, ready to share them with others. This sharing of theories is a potent way to build collective intelligence.

Abstract conceptualization skills

To do this, you will need to call on and hone your skills around what is called 'abstract conceptualization.'

Abstract conceptualization is the process of making sense of the world through strong references to our own and other people's thinking, theories, models, research, data, and metaphors. We find these in the literature and/or through conversation with other engaged actors and/or we devise them ourselves.

Choose which ponds of bias you swim in…

Where we look for other people's thinking is an important factor here—for example, looking amongst actors who are themselves engaged in ecosocial world-change work, will likely turn up very different results than might arise from looking to people focused on maintaining the neoliberal destructivist project.

Patrix intrusions

However, we still need to be alert for Patrix thinking—that's thinking that somehow supports the continued life of memes to do with oppression and internalized oppression. These are not at all easy to spot, and this Patrix outing activity needs alertness and practice.

Whilst we make significant efforts to avoid blatant examples in Gaia U materials, we are, like everybody else, swimming in a Patrix sea (this is a reference to fish not being able to 'see' the water they swim in) and we need all of our alert intelligences, ours and yours, on-deck to assist with this delicate and essential process.

know-how	how knowledge/wisdom are created, validated or considered plausible
know-what	where the focus of knowledge making attention goes (who directs the making)
who-knows	who owns or has access to the knowledge produced and who decides what's good/bad
what-for	for what purposes is the knowledge made and used (oppression or liberation?)

Validation of thinking and theory

In any case, attention to validation or plausibility of theory/thinking is important. Validation and plausibility are the subject of the next few pages in this book.

One description of a progression of thinking, from initial insight to theory, is shown below.

An insight, a sensing—something that we observe that we think is significant, that we can begin to describe and which we are interested to try out in various forms and in various situations to see how valid or plausible it is.

A conjecture—something stronger now, something that appears valid and is strongly plausible (we believe it makes sense), and yet we don't really have the evidence to be fully confident in either describing the thinking itself or the cir-

cumstances in which the thinking is an appropriate guide to action for ourselves and others.

An hypothesis—stronger still—good evidence is available, collected, and cross referenced. The thinking can be shown to be consistent with that of other people whose work is in good standing with what we might call the epistemic community (the community of people who 'know' about this field), and the community is now ready to take on further work using the thinking in order to more thoroughly test its capacity for guiding constructive action (interventions)—permaculture design, for example, is at least at this level (with some elements now attaining the dizzy heights of the next level, a theory…).

A theory—now at the strongest level, the thinking is considered valid or plausible by a broad consensus (not necessarily or desirably unanimous) in the epistemic community and is used confidently by many actors to guide choices around actions and interventions at a strategic and visionary scale.

And then, of course, there may be a revolution in thinking, in which case established theory might have to give way to something fresh and different. This thinking revolution is the original meaning of paradigm shift.

Our thinking community

In Gaia U and our emergent fields of regenerative ecosocial design, transition to community resilience, REconomy, and more, the questions:

- Who is the epistemic community?
- Who is in good standing in it? and
- Where are the peer-reviewed materials?

are, as yet, incompletely answered questions.

Thus, we all need to take special care to do what we can to show our validations of our thinking.

For validation and plausibility, we ask a series of overlapping questions:

What is my own best thinking, can I describe it (articulate it), and how does it connect to other insights and conjectures that I have developed?

Who else's thinking (insights, conjectures, hypotheses, and theories) supports mine? Claiming a piece of thinking to be good because you arrived at it intuitively is not quite adequate—you need to track your own thinking processes and triangulate (cross-reference) your thinking with that of other people, especially people whose thinking and action inspires you. Writing out the story of how your thinking developed and acknowledging your references (conversations and discussions you've had, authors you have read, workshops you have attended, videos watched…) also helps by enabling us to share our thinking and to get the benefit of feedback.

Does the broader literature support my thinking (what useful concepts, ideas, and models for understanding what's going on have already been developed by people who are/were working in the field?)?

Thus, we will draw upon theories from books for explaining events, we'll recall familiar models, diagrams, and graphs and invent new ones, we'll construct illuminating metaphors, apply systems of criticism, ask other people about their thinking and otherwise consider what other tools of knowledge and wisdom there are and how we can bring them to bear.

Throughout the validation/plausibility testing process, we will also pay attention to what we observe going on (mentally, physically, emotionally, and spiritually) in ourselves and others—this will enable us to report on the process of knowledge development as well as the content of the knowledge itself.

"There is nothing quite so practical as a theory"
– Kurt Lewin

This work is mostly a delight as we improve our critical skills, although it can sometimes be intellectually and emotionally challenging. Having supporting allies helps a lot.

Epistemology refers to how knowledge and wisdom are made (and by whom) and how a community judges if new thinking is good enough to use or, at the other end of a continuum, has passed its sell-by-date (has gone bad) and should be let go.

An epistemic community is a group of people who agree on the hows, whos, and whys of knowing in a particular field.

A key design concept currently emerging in Gaia U and the wider world-change community is that we are developing an (ecosocial) epistemic community. (Gaia U Latina partner, Grifen Hope—is credited with introducing the concept of epistemic community into our organizational design pot).

An epistemic community is conventionally defined as:

"… a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area."

Is this right for us?

Before we fully adopt this concept, we might well want to redefine what it means to be a 'professional,' to describe how we go about recognizing expertise and competence in our domain (and ask ourselves 'just what is our domain?'), and think about how it is possible to be humbly authoritative without being elitist and exclusionary.

However, the general notion that we are seeking to be a community of competent, ecosocial, world-change practitio-

ners with increasing influence in policy AND action at all levels seems a worthwhile goal.

Gaia U is undertaking to facilitate, with others, progress towards this goal.

Leverage

It is crucial that we consider and design our theory of knowledge (-making). Why? Because knowledge-making is strongly interrelated with the politics and sociology running in a culture at the time the knowledge is made. See if you agree at the end of these next few pages.

For an example, consider cultures that are in 'forgetting mode' such as Britain after World War II (or the US after the Korean war and the war in Vietnam). A political and social practice of resolutely looking forward came into being (and still exists) that made it very difficult for veterans to process their trauma, for researchers to analyse events leading up to the war that did/do not correspond to the political positions of the time, and for policymakers to learn from the errors of their pre-war international policies.

Cultures in denial like this don't often support knowledge-making unless it glorifies or otherwise validates their primary way of thinking.

So, for us to work at taking charge of our own knowledge-making and the methods we use is a powerful liberating strategy. This allows us to imagine that another, ecosocial culture is possible.

Politics & sociology

The politics and sociology of knowledge means considering issues such as know-how (how ideas are created, validated, or come to be considered plausible), know-what (where the focus of attention goes), who-knows (who creates, validates, owns, or has access to the knowledge) and what-for (for what purposes is the knowledge used). We'll develop these four aspects below.

On the next pages, we offer some lightly sketched thoughts arising from considerations of the politics, sociology, and philosophy of knowledge.

A good deal of further work needs to be done before we can imagine that we have a reasonably comprehensive description of an appropriate knowledge-making system for our ecosocial epistemic community.

Therefore, what we include here are markers, a few flags in the ground, placed there to remind us that we need to come back and figure out, together, what are the culture, theories, methods, models, metaphors, myths, and intentions of our epistemic ecosocial community and what is the worldview that renders this plausible and valuable.

Back in the 90s, when the permaculture community in England was seeking to bring forth their version of The Permaculture Academy, we met several times to reflect on, amongst other things, what pedagogy of permaculture we should adopt (if any).

Pedagogy meant, to us, the methods and practices of learning and teaching, and we were looking for something congruent with the way of thinking (of nature, systems-oriented, social…) proposed by permaculture.

First, we described to each other how we were learning to be permaculture designers (by discovery, by action, through emergence, by experience, by playing, by comparing stories, by asking each other for advice and mentoring…), and then we looked to see if we could find any reference to this approach to learning in the literature.

We were keen to find something for several reasons:

- We could then more easily describe our approach to people already in the educational field and therefore show ourselves to be legitimate (and possibly gain access to the very substantial resources already committed to the field)…
- We would have access to, from the beginning, the valuable insights that experienced researchers had developed and articulated around the chosen pedagogy, so we'd be able to hit the ground running…
- The method/theory would be bigger than any of us as individuals, so we'd be less likely to get caught up in opinionated conflicts (which is often an issue amongst pioneer groups)…
- Our un/learning community would have a shared language with which we could hold those all-important meta-conversations about how our un/learning was going and where, as individuals, we felt strong and/or challenged and where we saw the opportunities for growth.
- We wanted to use an approach that was congruent with the topic, the task and the context which we understood to be bringing permaculture design thinking and the projects it spawned into being in a culture that had no real sense that such projects were needed.
- We were also prepared not to find anything useful and to make up our own if necessary!

Over time, we did indeed find several highly useful models and theories and, in true permaculture design style, we assembled these into a complex, adaptive, and potent ecosystem that forms the basis of the 'pedagogy' in Gaia University today.

This has been of powerful utility, as it has enabled us to describe our 'espoused theory' (of transformation and un/learning through engaged action) in some detail and then construct our un-institution (Gaia U) to be congruent with this theory so that, by and large, our espoused theory (what we say we do) matches our theory-in-action (what we actually do). It is an unusual level of congruence to find in the world today.

Note that the pedagogical ecosystem is in continual refresh mode—when new materials of relevance show up, they are added and, meanwhile other materials that prove

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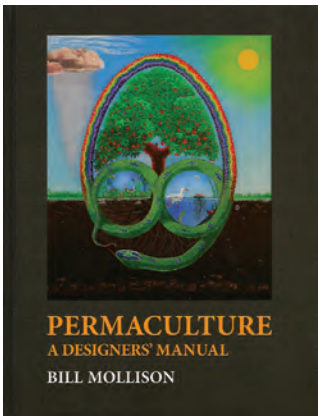

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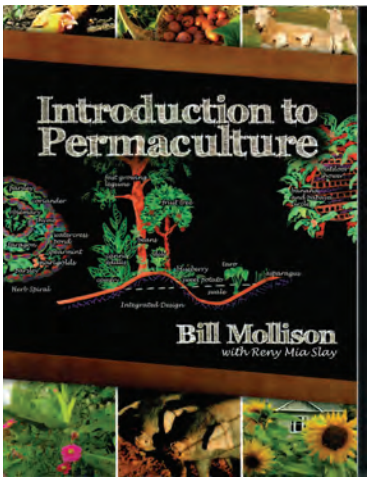

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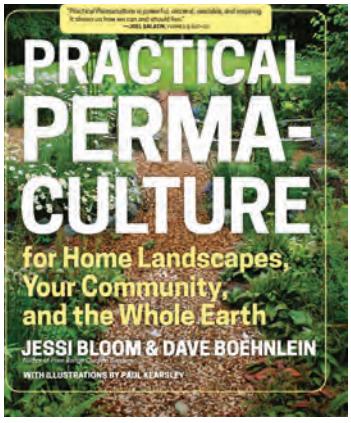

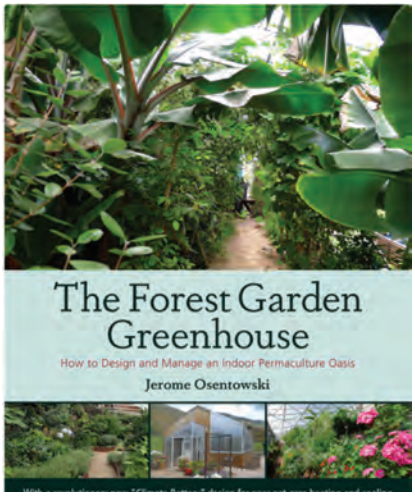

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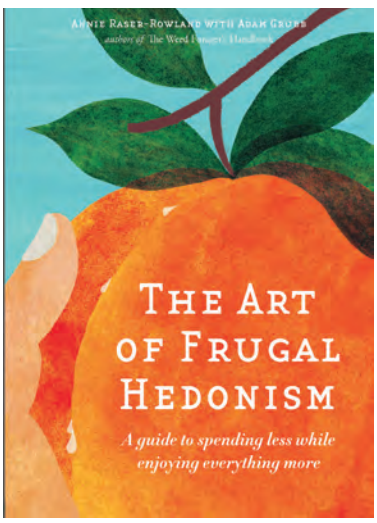

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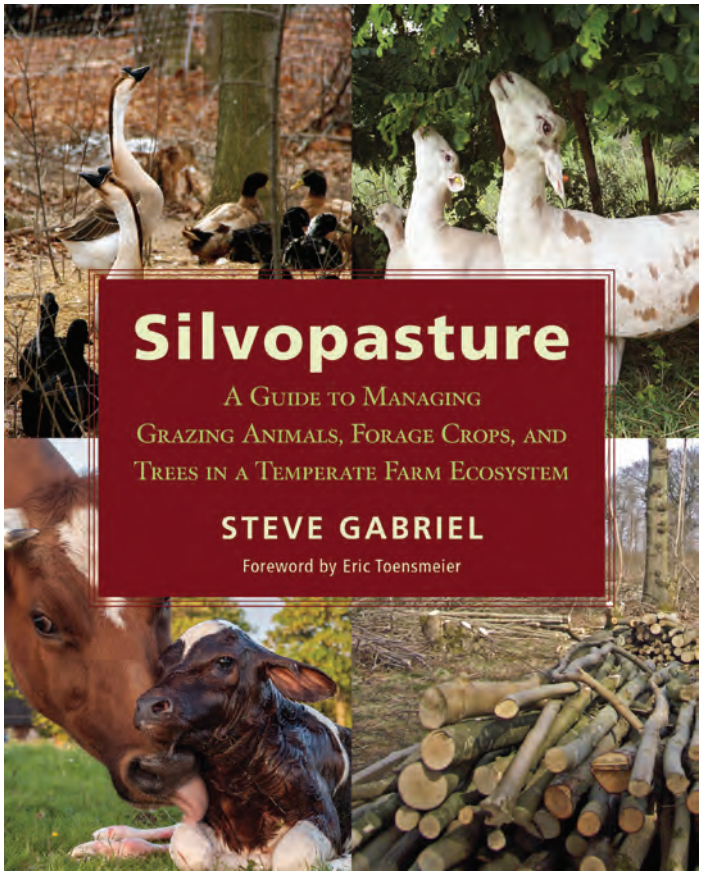

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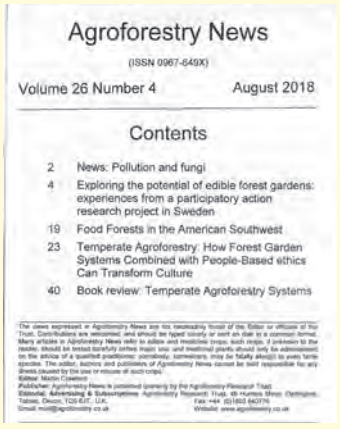
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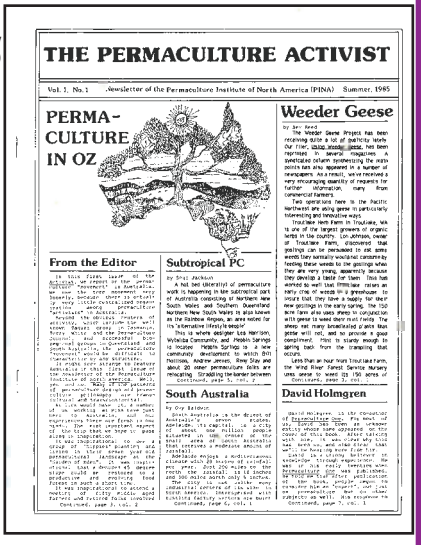
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unfounded are shed.

For example, in the shedding category, there is the popular theory that proposed that people could/should be classified as Visual, Auditory, or Kinesthetic learners (learning styles) that was front and center in our lexicon at one time but has now been sidelined.

This is because further research, our own experience, and our recent understanding around growth mindsets show that we are all quite capable of functioning flexibly in all modes. Growth mindset does, however, require that we deconstruct any distresses that come up when dealing with learning opportunities that arrive in a way that re-stimulates (triggers) us.

Meanwhile, as part of our 'taking-on' of new thinking, we have added Theory 'U' as an up-to-date way of describing the trajectory and process of transition. More new thinking will come….

After working through this element you should be able to articulate (speak, write, draw…) how your own models/theories of learning and unlearning compare and contrast with what's offered here.

Your own stories can be further developed according to your interpretations of, for example, "What modes of experiential learning were strong in each story for you?"

You can expect to describe your own thinking and show how it connects/disconnects with the thinking of others in a way that illustrates your capacity to draw out, critique, and reassemble (with additional materials that work for you) the concepts in here and to make references to your sources of thinking (other generators of concepts, models, theories, your own experience, for example).

Think of this approach as 'iterative reading' and/or 'iterative thinking' in which you revisit the models and theories over the course of years as you:

- Test them for validity and plausibility (is there any truth in them according to your own experiences?).
- Judge them consistent or not with later thinking (are they contradicted by later research and what does a contradiction like this mean? – e.g. does the contradictory research come from a perspective that you think of as valid, and thus you need to let go of the original thinking, and/or is the contradictory research from a flawed perspective and so you can—indeed, must—ignore it…), and
- Ask if they, the theories and models, are useful.

Andrew writes: When thinking about useful as a criterion, I am reminded of the ancient Theory of Miasma, popular throughout Europe, India, and China until finally superseded (proved inaccurate) in the late 1800s.

"Miasma was considered to be a poisonous vapor or mist filled with particles from decomposed matter (miasmata) that caused illnesses. The Miasmatic position was that diseases were the product of environmental factors such as contaminated water, foul air, and poor hygienic conditions. Such infection was not passed between individuals but would affect individuals who resided within the particular locale that gave rise to such vapors. It was identifiable by its foul smell."

Whilst this theory was finally replaced by current germ theory (which accounts for disease proliferation both by physical contact and by other means of germ distribution), at least the miasmatic theory provided early sanitary engineers with a clear motive and theory to use when designing sewage systems that prevented foul smells refluxing back into dwellings and otherwise avoided exposed, undrained, and contaminated collection of water.

Whilst the theory has moved on (and will move on again), the actions that it sponsored (in many cases) were positive (although there were also examples of the theory being used to avoid taking action to improve the conditions that caused contagion).

Therefore, be alert to the possibility that you might currently be working from theory that may later prove to be incorrect (or, unbeknownst to you, has already been declared invalid), and yet may still yield useful results. This is very common. Δ

Andrew is a strong advocate for participatory learning and decision-making and is skilled in a variety of facilitation methods, including Future Search and Open Space Technology. He is the author of Designing Productive Meetings and Events, a field manual for UN Agenda 21 facilitators, and a recognized teacher of Re-evaluation Counseling, which promotes the discharge of internal distress and resolution of rigid, patterned thinking as primary routes towards the emergence of healthy, intelligent human cultures.

In Gaia University, Andrew champions action-based learning arising from thoughtful and protracted engagement over more common cerebral academic approaches. He oversees the development of an IT infrastructure based largely on open source platforms and supports the Gaia University community in the activation of complementary currency and project networking systems based on agile, leading-edge designs.

A Conversation with Toby Hemenway

Pockets of Happiness

Bellamy Fitzpatrick

The late Toby Hemenway was an author, educator, and activist of permaculture, a system for designing human habitations and meeting human needs based on working with and as a part of one's ecology. Before his death by pancreatic cancer in 2016, Hemenway was well known and appreciated for such books as Gaia's Garden, the bestselling permaculture book in North America, and pictures such as 'How Permaculture Can Save the World and Humanity, but not Civilization.' We appreciate in particular the critical gaze he brought to the permaculture milieu, taking such heterodox positions as saying urban life (1) and agriculture must be abandoned, that permaculture allows us to decentralize to the point of eliminating the State, and that permaculture should not be thought of in terms of a social movement.

What follows is an interview I conducted with Hemenway in March 2014, with my erstwhile co-host Rydra Wrong during my time hosting the podcast Free Radical Radio. As is referenced below, I had just had the good fortune of hearing Hemenway speak three times–two times at the 2014 Eco-Farm Conference in Pacific Grove, California and again at the University of Santa Cruz—and I was pleasantly surprised to see him boldly state in his 'Toward a Horticultural Society' lecture at UCSC that agriculture was a mistake, that it contributed to a way of life that tended to generate authoritarian human relations and ecological devastation, and that it had to be abandoned in favor of another path. I immediately spoke to Toby after the third lecture and arranged the interview transcribed below. The transcript is very lightly edited due to poor audio quality in the original recording making a few of Hemenway's phrases indecipherable—these edits are noted by brackets. Bellamy Fitzpatrick

Bellamy Fitzpatrick: Before coming to permaculture, you worked as a geneticist, correct?
Toby Hemenway: Right.

BF: Some might consider one a natural extension of the other, since they're both concerned with understanding and working with natural systems; but we think there's a kind of value difference where with the scientific approach of genetics there's a push towards reductionism, understanding something by reducing it–and I would argue there's a kind of element of control, an aim at control—whereas with permaculture, at least we like to think that we're working with natural systems, and it's more participatory. So, what was that transition like for you, and do you feel similarly or differently to what I just described?
TH: Right. Well, I definitely would agree with that, that a lot of scientists have the control of nature as really the goal in a lot of ways. Like a lot of people, they have a lot of baggage to unpack, whereas now we… I really had the good fortune to be a teenager in the sixties, which sort of derailed me, often in a good way. And I had a real conflict with a part of me pretty early on that I didn't really want to contribute to this culture, and then part of me… I was raised as an East Coast WASP, so, I mean, there's a Hemenway street in Boston and there's [another place bearing his family name and] that just left me with a lot of stuff to kind of question. But I loved nature, and I wanted to make my living or at least spend my life trying to understand it—but I'd also been bred to want a high status job, so I had that conflict, and molecular biology was the way to do both. You know, I could study nature, but I could also say, "Well, I'm a molecular geneticist, and isn't that fancy and cool?" But I nearly didn't really make the goal, as I kept dipping in and out of science a bunch of times to do brick-building and woodworking… And then I got hired by a little biotech start-up […] which was really… it was a lot of fun. [I was working with] brilliant scientists, and [there was] just a wonderful environment. And we were trying to use the body's natural defenses to fight disease—but then we discovered something useful, and it turned into a drug company in itself and like, that's when I really started to go, "Okay, you know, this isn't going to work; this job is going to make me miserable." Fortunately, we had just moved to the country, my brand new wife and I, outside of Seattle, and so I was playing hooky from work, looking at books on homesteading, and Bill Mollison's *Permaculture: A Designers Manual* had just come out. Discovering that was like, it suddenly put all these pieces together that I'd never been able to make sense of, why I liked all of these different things that never fit together, and permaculture made them fit together. And it was just a huge relief, and it gave me a framework for getting out of, you know, the rat race […] permanently. That was 1993, and I've never been back… Once I was able to do that, it was actually a very natural and easy transition for me—but I had to have a tool kit to give me a place to go, and permaculture gave me that.

BF: That makes a lot of sense. So, I guess the follow up to that would be… Can you talk a little bit about the perspective that you're adopting? I mean, when you're interacting with a permaculture system, do you find yourself thinking of things in that reductionist way, that kind of scientifically minded perspective, or has permaculture started to bring you over more to a perspective of emergence and systems rather than individual organisms?
TH: You know, permaculture has really helped me make that shift. I started getting interested in whole systems thinking when I was in college, but there was very little of it that was really acceptable. And, so, learning the scientific tools kind of helped me in a way–learning that reductionist tool, so I've got that toolkit—but understanding holistic thinking and whole systems thinking in complex adaptive systems and emergence and all of that really gave me a whole new toolkit that I was kind of poised to adapt. I think my mind is just wired to think more in whole systems, so it was kind of a

great relief to stop killing stuff to learn about it.

BF: Yeah (laughing)!
TH: I realized that there were other ways that could preserve the living entity and preserve the ecosystem, and you could learn from that. It was kind of a great relief to get better at whole systems thinking, and permaculture gave me a whole set of tools for doing that.

BF: When I went to see you speak, I was really excited by your horticultural society thesis. I was coming into things from the anti-civilization anarchist perspective that very much vilifies agriculture, you could say—sees it as the basis for work, as the basis for hierarchy—and in your speech you were making a lot of the same points. In particular, I liked the bit where you said once you have a surplus, you need lords to parcel it out, you need police to protect it, you need bureaucrats to measure it, and so forth—and I think without qualification you could say that your thesis there was really deeply radical. So, how do you imagine that transition taking place, as important as it is, when we know there's so much vested interest backed by force in the form of modern nation-states and globalized agribusiness? Do you think that society can peacefully transition, have an epiphany, and recognize the insanity of the present setup—or what's it going to take?
TH: That's the big question. You know, I believe in the power of intention, so I try to envision a peaceful and sane transition, although I think, statistically, there is only a modest chance of that happening, and I think with events going the way that they are that the chances are probably getting even smaller. But my own… the thing that I believe in is starting from where we are now. You know, this is where we are so… what I'm trying to do is to create alternatives. I don't really envision an orderly transition so much as I find it the only thing that I can justify working for. And what I'm trying to do is to set up the conditions for that transition to occur. I feel like I am better suited to doing that than… well, I *understand* how to do that more than I understand how to dismantle corporate rule. I think there are other people who are better at that other stuff. I certainly understand the desire and the rationale behind forcible removal of these destructive systems… I guess that's a code phrase for insurrection or violence or whatever you want to call it, but it's just that my own ethical stance can't… it doesn't really let me go there. Violent revolution doesn't have a really good history, unfortunately. I think in America we look at our revolution, and that one turned out relatively well in that… granted we just replaced one elite with another, but it wasn't a bloody awful mess. Most of them aren't so good, so I am trying to create the conditions for a more peaceful transition even if that's not the way that it goes. I would like to create what I call pockets of happiness, you know, places where there is less misery, places where there are good things going on. And I feel that the more good places we can create, then the less bad places there will be. There are going to be a lot of bad places, but I'm going to try to be in a good one and I'm going to try to create, well, enough places for you, and for everybody else, and for everybody listening and for everybody… every one of my clients who wants to be in one of those places. But there are still going to be plenty of places where we won't want to be out there as well. I can't work for that… I have to work for more positive work.

Rydra Wrong: I was reading one of your essays… and you talked about it a little bit earlier… about how, I think, when you were in your teens you said something to a friend about how you didn't want to contribute to society anymore, or ever again, and I was wondering, besides what you're doing, what else do you see people doing that you would say isn't contributing to civilization or to this agricultural system and capitalist system that we have, that is, something positive?
TH: Right. Well I think… I'm not all that much on what you would call self-sufficiency, but I think… I don't think that that takes advantage of the connections between people that can be really powerful, so, one of the things that I think can really help is community self-reliance. Creating networks of people who are… who understand that it doesn't take that many people to create a small autonomous unit that is less dependent on these larger systems, and that if you can get anywhere from ten to two hundred people or so together that you can really take care of each other's needs pretty well. So, in that direction where people are understanding the power of networks and the ability of a group of people to meet one another's needs and not be so dependent. And a lot of those systems can kind of look like… what would they look like now? Like a hundred people can selfinsure to have medical coverage and things like that. While we need to create those kinds of institutions but make also…. in a sense kind of turn our backs on the […existing institutions]. Creating a community network is a really important step. It's harder to do it alone, and I think groups of people are a great deal more powerful. And there are things you can do without attracting a lot of attention to yourself, you know, "Hey, we're just a CSA, we're just some sort of a sharing co-operative," you know, but it can be very radical and subversive groups of people.

BF: I'm curious. I guess I want to pry you a little bit. You said you understand why… or you understand the rationale, I think you said, behind the dismantling approach but your own ethics won't let you go there. So, you're holding two almost contradictory things in tension: you're not opposed to other people doing it, but you don't quite want to go there yourself… Can you flesh that out a little bit?
TH: Yeah, well, I'm a believer in using every appropriate tool that's in the toolbox. That's really one of the things that I've learned about from permaculture is that we have a lot of different tools and many different ways of accomplishing things. And I think at this point that we don't know what's the best tool for dismantling corporate rule or eliminating civilization here. I don't think we've got enough data; it hasn't really been done before, so we don't know what the best tool is. And it may be that—whatever you want to call it, insurrection or monkey wrenching or whatever you want to call that—is the most effective way to do it. It's just one that I'm not particularly suited for. And I'm worried about it in that there are institutions… I mean, the US military loves violence, the US government loves violent opposition, and corporations love opposition. They want to be opposed directly and competitively, and they're really good at fighting

back—so I'm concerned about just how viable that is, but I also feel like it's a tool in the toolkit. Other people are certainly trying it, and I don't have enough information to say "No, that's not going to work, that can't possibly work." It might work. It might be the way to do it. On the other hand, maybe working with local government is a way to do it, there may be other ways to do it… or creating self-reliant communities is a way to do it. There are lots of different good tools that we could be using, and, until we get some data as to which one is making the most progress, I think we might need to keep trying a lot of different ones.

BF: I guess that gave us a bit of a segue there: I wrote you in an email that I was a bit surprised, after you were saying things like we need to move away from civilization and that agriculture was a mistake, seeing also that some of your own personal work did involve working with local government in certain specific situations, so… I guess I want to pry you again and say: do you see that as a contradiction? Does working with local government legitimate and reinforce the idea of government, therefore the idea of civilization, mass society, and agriculture? Or do you see this as a pluralistic, pragmatic kind of approach of "Let's do whatever we can," and, I guess, taking your rhetoric, use all the different tools and see what works? Is that your line of thinking, or…?
TH: It's somewhat like that. I think that you can work on the system without being from within it. What I mean by that is that people are at various levels of awareness, and when I look at these institutions like government or the military… I had a chance to work with a group of soldiers a while ago, and I think I got to a few of them. So I see individuals rather than… or I see these institutions as being made up of individuals, and if you reach enough individuals, you can kind of change the center of gravity. People are at different levels of awareness, and you've got to meet them at the level of awareness that they're at. Again, in permaculture, we talk about meeting people where they are. The systems thinker and biologist George Hoffman talked about "adjacent possible." So, what that means is, in human terms, where is it possible for you to go in one step from where you are now? And you can only move one step at a time in your consciousness or physically or whatever it is so—where you are now, what is possible? What are the steps that are possible? What are all the different ones? Then, when you move one step, a whole group of new adjacent possibles arise that weren't possible from where you were. So, what I'm trying to do with… if there's someone who feels like their next step to freedom is to be growing some of their own food, I'll help them grow some of their own food, and if someone in government…if they are… sometimes these folks are unconscious, and you have to kind of manipulate them without them knowing that. So my town, Sebastopol, California has a mayor who—he's gay, and he […is] pretty far down the [countercultural] path—so I think he's got adjacent possibles that I like. He is not really enthralled with the current culture, so he is someone who we could work with and say, get community gardens in town [or fund other projects] or… If there is a public official who is not… say he's businessoriented, then you might say something like, "Well, how about if we pass the cottage industry bill that will allow people to become entrepreneurs more easily?", meanwhile then people can actually grow a little produce that they can sell or raise animals that they can sell or sell raw milk or something like that. That's going to help them detach a little bit. The business-oriented mayor may still be stuck wherever he is, but we can work on him and help him move other people without him knowing it. That is what I mean by using a lot of different tools. You have to reach people where they are and try and move each one a little bit, and as a whole then you start to shift the center of gravity of the culture and start to wake up enough people. Because what I think we need is a critical mass of people who understand that they have been enslaved and there are other ways of living. Right now there is not a critical mass, there are very few people. My job is trying to wake a lot more people up.

BF: Do you view yourself mainly as a kind of propagandist, then?
TH: As a propagandist? Well, I think that would be one way to describe it (laughing), though it may not be exactly the word I would use. I'm an advocate for a lot of what is on the anti-civilization agenda. I'm trying to make people aware of, what I consider as, some real facts. And one of the ways that I do it is by getting people to look at agriculture and look at the damage that it is doing and start there. I even work with farmers sometimes and talk about how farming really has a terrible ecological cost—where there is a farm, there is not an intact ecosystem. And people start to get that. I find very concrete methods like getting people to look at agriculture and to look at the facts to try and shake them up a bit […] through methods that they can't really argue with yet.

BF: During your horticultural society speech, you talked about the fact that horticultural peoples historically have been kind of written out of history, there's a kind of revisionism that's happened and even ones that you were naming like the Jomon in Japan… I was looking into that a bit and saw that they're often referred to as a huntergatherer society. What do you think motivated this kind of revisionism of erasing the collective memory of horticultural peoples? Is it just a kind of chauvinism with the assumption that agriculturalism is a superior form of society, so we don't even need to pay attention to these people; or is it that agriculture induces this kind of cultural fear that this must be the best of all possible worlds, otherwise why would we be doing it? What do you think happened there?
TH: I think that some of that is happening. That a lot of it is just cultural chauvinism, that agriculture just seems so superior, you domesticate things then you realize you've got a lot more control over your environment, and that's wonderful, and why would you just stick with horticulture when you can move all the way to agriculture. There's just an assumption that agriculture has got to be superior. But also, history gets written by the victors, and it gets written from their point of view, so I don't know if it's really a conscious effort to discredit alternatives. But I am actually increasingly starting to take the view that there has been a concerted effort

by elites to maintain the slave state for the last ten thousand years. And it may not be completely conscious, but it's just that they know when they've got a good thing going. I've just been listening to an audio book about the High Middle Ages, and what I'm hearing from looking at all these petty rulers all over Europe in the thirteen and fourteen hundreds… they're all psychopaths! Most of the nobility in these various States, all they wanted to do is fight the other nobles around, and they didn't care about what was happening to the people, they didn't care about the welfare of the people… other than for taxes and being able to raise militia. So, this power structure has fostered the rise of power-mad, I mean, literally mad people, and those are the ones who get to write history. So, I think there has been a concerted effort to keep most people weak and poor, and part of that is to tell this story that agriculture is great and, you know, the lions are going to come and eat you if you don't build a big fence, and if you don't raise a lot of food you'll starve… So, there has been this kind of revision of history that wiped out any other way of doing it—and part of it is this Myth of Progress, and part of it is that it really benefits the people who run the show.

BF: You said that you were influenced by Marshall Sahlins when I saw you speak, and he talks about the "original affluence" of gatherer-hunters who were able to provide for most of their needs with a fraction of the labor—and he also imagines that the transition to agriculture was very much forced. I think it was Stanley Diamond who said there were only conscripts not converts when the transition to agriculture happened. From your own research, do you imagine a scenario like that, a kind of brute force that was then later solidified through cultural symbolism and myth and rationalized ultimately, as you said, with the Myth of Progress?
TH: Yeah, if you look at how agriculture has been propagated just within modern history, it has usually been pretty violent. And, you know, since the methods that are used now were probably the methods that were used in the past…. And also when you look at the genetics and the spread of agricultural people, it's not just agriculture that spread, it's the agriculturalists that moved into new areas. So, they subjugated—or exterminated or outbred or whatever it was—people who used to live there, just as, if you look at the way European agriculture moved into the New World, it was pretty ugly. And I think that is the way agriculture has moved. And there are records of forager societies or gatherer-hunter societies who were invited to take up agriculture, and they looked at it and said "No, thanks. We're not really interested." They saw where it was going. They saw what they were doing by doing that. So, yeah, I do think that it has been spread usually through conquest. And it just lends itself to conquest. Agriculture is really portable. It doesn't matter what the native environment is you just, you know, plow it over and plant your preferred crops there. It doesn't matter what culture or what ecosystem used to be there once you get rid of it and put agriculture there.

BF: One thing when you were advocating for the viability of the horticultural societies and the examples that you used, you talked about how they were culturally rich and produced works of art and… so, I guess that was one place where I saw you deviating significantly from the typical anticivilization anarchist perspective. In a lot of that work, there's an equation of agriculture and hierarchy with the symbolic culture, that art kind of steps in to take the place of the immediacy and spontaneity and richness of a freer life, and we end up engaging in things like art as a kind of crutch to take the place of what used to be a more present life. But you seem to differ there and think that art is, and symbolic culture generally is, a sign of richness and fulfillment. Does that make sense? Can you talk about that a bit?
TH: Yeah. I certainly agree with people like John Zerzan who talk about the symbolic life being the essence of civilization. I think those are really good points, that once you begin to engage in symbolic thought, there are problems that can arise. It can separate you from the real world or the natural world or immediate experience or whatever you want to call that, but just as someone who has been very interested in evolutionary biology for a long time… we have evolved the part of the brain that does symbolic thought, and it's the center of our ability to create meaning. So, it's there. I don't think we can get rid of it. And I consider it an adaptation. The part of the neocortex that does symbolic thought arose… and one of the things it does is integrate sensory data: we have all this sensory data, and the advanced neocortex does stuff with it so we can plan, and we can foresee things that are not existent, we can do things that maybe some other animals can't do. And that allows us to move into new places, to generate novelty, and evolution is really big on novelty. So, I have a hard time saying symbolic thought is bad, and evolution has come up with a dumb idea. Maybe it has. It might turn out to be a blind alley, like antlers that are too big to function, or something like that. But I guess part of my point is that symbolic thought doesn't eliminate our connection with the natural world. It can, I think, add to it. And we still have all those senses, the ability to connect directly is still there. We have this additional layer that is on top of it. And I think that the senses can be just as distracting. You know, we all know people who are addicted to sex, or food, or drugs, or some [other] immediate experience, and it can be to the extent where they don't want to experience anything else. So, any kind of input, I think, can be badly used, can be a destructive force for disconnecting people [from the world]. I think our challenge is to be wise and to understand that symbolic thought can be dangerous, and it can also be used to manipulate us as well. We can be distracted not just by bread, but also by circuses. So, we need to be aware of symbolic thought's potential and its real possibility to be abused. But we can't get rid of it. It's there. It's a part of the brain […] it's going to do that, it's going to turn out symbolic thought. So, we need to learn how to work with it in a way that doesn't rob us of immediacy but somehow adds to it. So, that's just my thinking as a biologist, to say, we've got this part of the brain, and rather than trying to dispose of it or ignore it or, something like… destroy it… we're stuck with it so, how do we make the best use of it? But I definitely agree that it can put a layer between us and the community of experience, and we need to be careful about

that.

BF: To follow up on that, how then do you look at the very large span of human history… you could say more than ninety percent of it was… of our time, of being essentially genetically the same, was without a rich symbolic culture, was without… at least, insofar as we can tell from the fossil record, without paintings and probably pre-lingual. Do you still imagine there being a rich symbolic inner life for those humans even if they weren't producing artifacts that represented it?
TH: I think as soon… we started using tools, about 2,000,000 years ago, we started manipulating fire about 800,000 years ago, and symbolic thought is way more recent than that. So, I think that we did have an inner life, but there was actually a physical portion of the brain that appeared about… somewhere between about 70,000 to 30,000 years ago. So, there was an actual physical change around then. Our genetics are the same, basically… something occurred at this point, so that to me is kind of a big mystery. Why did that happen and what changed in us, why has this ability for symbolic thought come along? I guess one way that I look at it is that we have made mistakes, we have been misled by symbolic thought and fooled by language and, you know, disconnected from the world. So, this is part of why I advocate an exploration of a horticultural society rather than an agricultural one. Because it looks to me like we seriously lost our way about 10,000 years ago. We went down this blind alley of agriculture that turns out not to be viable ecologically, and it turns out to be a terrible waste of human ability as well. 99% of people are slaves, essentially. So, when you get lost, you go back to the last place you knew where you were on track, and about 10,000 years ago humanity wasn't doing so badly, so, let's look at that fork in the road and see what other directions we can think about going. And if that fork turns out to be wrong, then maybe you have to go further back. So, I think that just being aware again, of the potentiality of symbolic thought to disconnect us from the world—that's a very important piece. So, I'm grateful to the various philosophers, people like Zerzan, who have pointed that out to us.

BF: I guess that leaves me wondering whether that new feature of the brain that you're describing had to do with neuroplasticity, and maybe was something that was always coded for as a potential development, but then there was some kind of cultural shift that encouraged that plasticity to manifest itself in a particular way. And maybe, in a sense, we've overdeveloped it, become overly focused on the symbolic, and then addicted to it—and then you have all the attendant problems of civilization coming out of that.
TH: That's certainly a possibility. Evolutionary biologists talk about having an exaptation, that something evolved that wasn't necessarily designed to do that, but we started using it to do that and it wound up taking us, perhaps, down a very destructive path—or it's a tool that we haven't learned how to use yet. It's a very interesting possibility.

BF: I'm going to quote you from *Gaia's Garden.* You described yourself imagining "the Southwest," as in the Southwest of the United States, "covered in a rich food forest such as this one. Each house could be a nucleus for an expanding net of green canopy and deep soil, eventually linking in to a continuous carpet of lush abundant nature." To me, that's a really beautiful vision, and it seems to be your idea of a more mature horticultural society. So, in this world where you have what it seems like you're describing—more or less, homesteads that are linked in community—is there room in this vision for cities as we know them, real urban life? And the fact that, you know, urban life means, first, massive amounts of concrete and other impermeable cover and population densities such that the city basically has to feed off the surrounding countryside… It's difficult for me to see how the cities could really fit in to that, and, if that's the case, what does it really mean to be doing urban permaculture?
TH: That's a really good question. I think that these large cities, cities of more than a half a million or so, are really just artifacts of the fossil fuel age. I think it's really difficult… you know, ancient Rome at its peak was maybe a million people, and there haven't been many cities of that size. So, I think those large cities—unless we discover some magical new energy source, and I kind of hope we don't—really, megacities are going to disappear. So, I'm hoping that problem will take care of itself. But I also see cities as a product of agriculture. You can't sustain large populations without a storable surplus that agriculture gives you, and without a sort of slave state. What I would think of is more kind of village-states and townstates that are interconnected, you know, little autonomous entities like that. I think that once you get into the city size, meaning, you know 100,000 or 500,000… pretty good size… that those do become… for one thing, people in them become disconnected from nature because there can't be enough wild nature in the city, so that creates serious pathologies. And those cities do become parasites on a larger area of the countryside around them. So, I would rather not see large cities, but I think, "Okay, right now we have them, so let's try to make them less destructive as we go down the path of what to do next." That's why I am very interested in urban permaculture. It can at least shrink some of urban areas' footprints, and then large cities themselves, I think, are just not going to be able to exist as sources of energy become too expensive to run them.

BF: So, you don't see it as reinforcing the delusion that cities are okay and are a viable way of life to participate in? Because that was actually, for Rydra and I, a big contradiction that we eventually had to come to grips with. We came to live in a city and tried to do organizing and that sort of stuff, to make cities more livable, with tenants' rights work and that kind of thing—and then eventually we decided "Well, wait, why are we doing this? We don't even really believe that these cities should exist, so what does it mean to try to make people more comfortable in them?"
TH: I think there is a lot to that. Part of it is just immediacy. I think there is a lot of misery in cities and a lot of people who need some kind of help. And we could just say, "Well, the more miserable people are, the quicker cities will come

down," but, again, I have some trouble with that. But I also tend to work in much smaller [towns]… you know, I live in a town with 7,000 people, I teach mostly in smaller towns of 50,000 and that sort of thing… I used to live in large urban areas, and I too have just… they're just not for me anymore. I want to try to make cities more tolerable for people, but my own personal work is more in rural areas and villages and in modest-sized towns. There's more of a future in towns of 50,000 than there is in cities of 500,000.

Looking back four years later on this conversation, there is much in this interview that rings true to me today. At the time of this interview, I was more open to the possibility of an insurrectionary anarchist praxis, but now, rereading this conversation, I find Hemenway's critique of such a praxis on the basis of the relative preference of the parasitic classes for violent confrontation almost mirroring my own assessment, including his unwillingness to totally dismiss its viability. The same goes for the discussion of symbolic thought, which gave me the impetus to change my own perspective on the issue.

Our main point of disagreement is Toby's allegiance to Humanist ethics. He twice mentions a need for meeting people where they're at, *along with noting his efforts to make small shifts in the right direction culturally. He makes it clear that, like me, he is a pessimist about the prospects of a mass movement or other widespread cultural change away from our biocidal way of life; but, unlike me, he feels ethically bound to pursue social activism all the same, as though widespread change might still be possible.*

Each of us must choose what they consider virtuous according to their own intuitions, analyses, and relationship with the world, but I find Hemenway's views on this front a bit unrelatable. At the very same conference where I met Toby, during one of the panels that led to a discussion of ecological catastrophe, someone in the audience raised his hand to speak and said, quietly but firmly, "I think we all need to acknowledge that the time for 'meeting people where they're at' is over." I could not agree more. It may have been possible a few centuries ago, when the Industrial Revolution was just gaining steam, the division of labor and corresponding deskilling was still relatively low, and the human population was less than one seventh its current size, to have popularized a change in consciousness, even among the reigning elite, that would mean we would be in a profoundly different ecological scenario today. It may even have been reasonable to hold out hope as late as David Holmgren did in his Future Scenarios of 2009, where one of his possibilities was a shift to green technology followed by a gentle, deliberate detechnologization toward a sane, low-impact society—he has since said he no longer believes this likely, echoing other ecological pessimists like James Lovelock, Pentti Linkola, or the anonymous anarchist author of the pamphlet Desert *(2).*

It will never be popular to both assert that our way of life is horrendous and must be abandoned and to suggest that it is most likely not possible to reform or revolutionize it on a mass scale into something livable, that we must instead move toward a praxis based on counting on only the sane, ethical, and very small minority we have among us. The disingenuous niceties of neoliberalism are that every human being is valuable, rational, and has worthy and considerable ideas; that everyone is to be granted equal human rights and entitled to consume as much as they can wrestle from the economy; and furthermore that market innovation and technological advance will eventually solve all problems as they emerge. Most political activists of any stripe, in spite of their criticism of neoliberalism, have absorbed some form of this human rights ideology, progressive optimism, and egalitarianism—in a word, Humanism—to the point that a praxis that does not somehow claim to value and account for all human beings, no matter how improbably, is intolerable.

In most circles, it is anathema to venture antiHumanist claims and observations: that the majority of human beings in civilizations have, for the most part, submitted to authoritarian demands whether in their reactionary or revolutionary guises, and so cannot be relied upon for a sensible change of consciousness; or that the human is an animal among animals, and that it, like many creatures, is capable of monstrously overbreeding and therefore of inevitably experiencing a corresponding mass die-off. Voicing such ideas is likely to immediately result in being labeled a misanthrope, a retrograde Malthusian, or a nihilist. For such accusers, it is tacitly acceptable that the whole outer world of the biosphere be thrown on the pyre and for the whole inner world of consciousness to be increasingly flattened and stupefied while we sacrifice our own lives in continuing to exhort the ceaselessly expanding human herd, evermore distracted and consumerist, to suddenly act contrarily to the way it has always behaved.

It is therefore Hemenway's idea of "pockets of happiness" with which I most find affinity, and where I locate the project of Backwoods. *We aim to act from where we are and with whom we already have projectual affinity—we aim to meet people where we are. We endeavor to find habitats with which we can symbiose and encourage others to do the same by communicating our values and sharing skills. We believe that the best we can do, and all that we need to do, is take back our lives with those who will join us, live as virtuously and joyfully as we can in this gray world, and say unflinchingly what we believe is true to whomever will listen. In doing so, we both live as best we can and uncompromisingly radiate that course to others who will hear us. The only way to end civilization is through such an individuated taking back of lives; conversely, if civilization cannot be unmade in one's lifetime, the only sensible thing to do is such individual and small group dropping out to create "pockets of happiness."*

We at Backwoods *are tremendously thankful for Hemenway's influences on permaculture and anarchism, and I consider myself very fortunate to have had a chance to speak with him at length.* Δ

Notes

1. His last book, however, was on urban permaculture *(Permaculture City)*—Hemenway had some ambivalence about urban life, as comes out in the interview.
2. Anonymous. *Desert.* St. Kilda: Stac an Armin Press, 2011. This short book is also available at theanarchistlibrary.org.

This interview is presented here by the kind permission of Bellamy Fitzpatrick, and first appeared in *Backwoods* magazine (No. 1, Spring 2018). Contact *Backwoods* at PO Box 238, Poestenkill, NY 12140.

Helen and Scott Nearing Revisited

What They Got Right

Michael Welber

I LIVE IN A CITY in which the planners of a new parking garage described it as having "sustainable elements." A parking garage.

Sustainable and sustainability have become the new "green" and generally mean as little as that adjective did. By definition, anything that relies upon fossil fuels, pumped water, electricity, or cement or concrete is not sustainable.

Reading about the proposed garage brought to mind a book that became very popular in the "back to the land movement" in the 70s, even though the volume was published in 1954: *The Good Life* by Helen and Scott Nearing. However, the book's subtitle is what makes it still current: *Helen and Scott Nearing's Sixty Years of Self-Sufficient Living.*

And nearly self-sufficient they were. Moving first in 1934 to the hills of Vermont and later to the coast of Maine, the Nearings almost achieved total self-sufficiency: eating in-season food from their garden, building their own homes, and cutting their own fuel from their woodlots.

Helen and Scott Nearings' house. Photo by Claire Brigugglio, courtesy of The Good Life Center.

It was a lesson that they probably could have discovered earlier by observing their site for longer.

"We… decided on a self-sufficient household economy. Its values would include 'simplicity, freedom from anxiety or tension, an opportunity to be useful and live harmoniously,'" they wrote. "As things stand today [1954] it is not this combination of values, but rather their opposite (that is, complexity, anxiety, waste, ugliness, and uproar) which men associate with the urban centers of Western civilization."

Re-reading the book revealed that not only did they achieve their goal but they also, much before the word permaculture came into common use, relied upon many fundamental permaculture principles.

Observation

The Nearings were refugees from New York City. Scott was a radical writer and speaker driven from employment and speaking opportunities because of his politics. This in the 30s when communism became widespread in the US because of the devastation wrought by the Great Depression.

Out of work and embittered by the political climate, the duo decided to get out of New York, wash their hands of what Scott referred to as "bread labor" for money, and homestead somewhere. After extensive research, they selected a site in the hills of Vermont, a place that presented enormous challenges for self-sufficiency though they didn't know it at first. One year they had killing frosts in June, July, and August. It was a very short growing season. While not ignorant of gardening techniques, both realized they had much to learn.

That need for learning became apparent rather quickly in Vermont by virtue of observation. For example, the site they chose had heavy sod and was not acceptable as a garden location. "The next spring, we learned the reason for the heavy sod and black soil. A spring opened in the high side of the garden… flowed copiously while the snow was melting, and the spring rains were falling." It was a lesson that they probably could have discovered earlier by observing their site for longer.

In addition, even though Vermonters tend to be solitary, taciturn, and very suspicious of outsiders, the Nearings did find their advice helpful. "The neighbors saved us a good deal of time and trouble with welcome advice," Scott and Helen wrote. "Arthur Young counseled the newcomer in farming to 'look over his hedges and see what his neighbors

The kitchen with the stove as well as the handmade cabinets and bowls from the Nearings' house. Photo by Claire Briguglio, courtesy of The Good Life Center.

do with their land.'"

Review your work and modify

When the couple moved to Vermont, they purchased a property that included a rundown farmhouse and other equally decrepit outbuildings. Again, without much experience, they began constructing a stone house (not wood) and later, stone outbuildings including one in which they boiled sap to make maple syrup and maple sugar.

As one might expect, they made some errors. For example, after they completed one building, they discovered "different rates of expansion for concrete and wood… leaving cracks between the frame and the concrete wall. We remedied this in later construction…."

Permaculture ethics

The Nearings were committed vegetarians and were appalled by the killing of any animal for food. Though they ate eggs, obtained from a neighbor in exchange for vegetables or syrup, they totally opposed keeping any animal. Nor would they use manure on their gardens. That meant that, among other things, they took to heart the ethic of Care of Earth, even though they knew nothing of permaculture by name.

They used only the compost that they made by constructing numerous piles of food scraps, hay, and wood branches as well as other material as fertilizer. Nothing else. Nor did they apply any insecticides in any form. The duo faithfully rotated their crops, planted cover crops, and mulched. As a result, they were able to fulfill their goals of raising as much of their own food as possible, given their soil and climate, and using wood for fuel and cutting it themselves.

In addition, the Nearings relied, as much as possible, on local sources. As the book describes it, they "1) Put[ting] up our own buildings with stone and wood from the place, doing the work ourselves. 2) Making such implements as sleds, drays, stone boats, gravel screens, ladders, and 3) Holding down to the barest minimum the number of implements, tools, gadgets, and machines which we might buy from the assembly lines of big business."

Few people were as true to their core values as Helen and Scott Nearing. Both would be chagrined to learn that a city might describe a parking garage as sustainable.

In fact, the opposite is true. Consider their "Rule 2: Buildings should be adapted to their environment and Rule 3: Local materials are better adapted than any other to create the illusion that the building was part of the environment from its beginnings."

Share the surplus (and Care of People)

In Mending the Wall, Robert Frost wrote, "Good fences make good neighbors." The Nearings wrote, "We were cooperators in theory and were anxious to put the theory into practice. From the beginning, we worked with our neighbors, sometimes on their side of the fence, sometimes on our side."

When the Nearings moved there, Vermonters and also Mainers, or at least those who lived in rural areas, stuck to themselves and were suspicious of those who moved to the area, especially radicals from New York. It was not the Vermont of Senator Bernie Sanders. In some ways, that hasn't changed much. New Englanders can be cold and stand-offish. They are slow to accept outsiders.

They always gave away any surplus even though they were completely dependent upon the food they grew…

But the Nearings were committed communists. They wanted to share, to work with others as a community. At the beginning, they found the going to be challenging. Some of their efforts at community were rebuffed completely. For example, they wanted to barter "our products [maple syrup and sugar] for those we could not or did not produce." Not everyone in the area was ready for that.

"We will make our cash crop from maple syrup and will work out a cooperative arrangement whenever possible." However, some of their Yankee neighbors didn't want to share and cooperate and insisted on going it alone. As time went on and people became accustomed to these newcomers [even after 20 years], things improved. They were able, for example, to borrow the tools they needed for construction. [If they needed any of these], "we would rent or trade them from local people instead of buying and owning them."

Also, they always gave away any surplus even though they

were completely dependent upon the food they grew, whether they ate it immediately or stored it for winter consumption. "Any garden or other surpluses will be shared with neighbors and friends in terms of their needs."

"Rix Knight had extra pear trees. In a good season, he distributed bushels to those of us who had no pears. Jack Lightfoot let us pick his spare apples and let others cut Christmas greens, free of charge."

The garden growing well at the Nearings' home. Photo by Claire Briguglio, courtesy of The Good Life Center.

Sustainability?

Their life was, for the most part, truly sustainable. There were a couple of exceptions: they owned a truck to deliver their maple syrup, and they used some modern building supplies such as nails in the construction of their buildings. Their running water was taken care of by a running water toilet flushed with a pail and a pump in the kitchen. The water came from a nearby spring, clear and cold.

"Each spring we made syrup and planted a garden."

They even practiced what permaculture refers to as zones, making sure, for example, that the kitchen garden was near the front of the house.

It took eleven years to complete their twelve major buildings and many minor constructions. It still amazes that they thrived in such a difficult climate. The season was very short, just over 105 days, and they didn't get many sunny spells.

Despite that, they lived by these principles:

"1) We wanted to live twelve months in the year from a garden which enjoyed barely three months of frost-free weather.

"2) We wanted to eat fresh, unprocessed food

"3) We wanted a variety of garden products which would furnish a rounded diet.

"4) We wanted to reduce canning and preserving to a minimum.

Through the years we have been able to reach all four objectives."

What's so interesting is that, in many ways, things haven't changed all that much. We think we're living in a particularly difficult moment in history, but so did they.

"Our life in Vermont may be justified; 1) as an instance and example of sane living in an insane world 2) as a means of contacting nature, a contact in many ways more important than contacting society."

"Life in a dying, acquisitive culture can be individually and socially purposeful, creative, constructive and deeply rewarding, provided that economic solvency and psychological balance are preserved."

We can still learn from the Nearings, who published their book more than 60 years ago and undertook their efforts nearly a century ago. They were and remain exemplars of a self-sufficient life, one that we should look to when climate change threatens our very existence. Fortunately, *The Good Life* is still in print. It's an inspiration. I have read it three times and will probably read it again. It's a terrific guide to novice gardeners but also provides inspiration for those who are experienced. There's always something to learn and the Nearings continue to provide valuable insights long after their deaths. Δ

Michael Welber recently moved to Bloomington, Indiana, buying a house with a giant front lawn and converting it to a small orchard and raised beds for gardening. He committed to organic practices and permaculture but has much to learn. He's committed to organic practices and permaculture but has much to learn.

Resources

1. The Good Life Center. www.goodlife.org
2. Nearing, Helen and Scott Nearing. *Living the Good Life: How to Live Sanely and Simply in a Troubled World.* New York: Schocken Books (1970).
3. Nearing, Scott. *The Making of a Radical: A Political Autobiography.* New York: Harper and Row (1972).

The attached greenhouse at their homestead. Photo by Claire Briguglio, courtesy of The Good Life Center.

A Map for Navigating Climate Tragedy

Deep Adaptation

Jem Bendell, BA (Hons), PhD

Can professionals in sustainability management, policy and research—myself included—continue to work with the assumption or hope that we can slow down climate change, or respond to it sufficiently to sustain our civilization?

As disturbing information on climate change passed across my screen, this was the question I could no longer ignore, and therefore decided to take a couple of months to analyze the latest climate science. As I began to conclude that we can no longer work with that assumption or hope, I asked a second question.

Have professionals in the sustainability field discussed the possibility that it is too late to avert an environmental catastrophe and the implications for their work?

A quick literature review revealed that my fellow professionals have not been publishing work that explores, or starts from, that perspective. That led to a third question, on **why sustainability professionals are not exploring this fundamentally important issue to our whole field as well as to our personal lives?**

To explore that, I drew on psychological analyses, conversations with colleagues, reviews of debates amongst environmentalists in social media and self-reflection on my own reticence. Concluding that there is a need to promote discussion about the implications of a social collapse triggered by an environmental catastrophe, I asked my fourth question on **what are the ways that people are talking about collapse on social media?**

I identified a variety of conceptualizations and from that asked myself **what could provide a map for people to navigate this extremely difficult issue**?

For that, I drew on a range of reading and experiences over my 25 years in the sustainability field to outline an agenda for what I have termed "deep adaptation" to climate change.

The result of these five questions is an article that does not contribute to one specific set of literature or practice in the broad field of sustainability management and policy. Rather, it questions the basis for all the work in this field. It does not seek to add to the existing research, policy, and practice on climate adaptation, as I found that to be framed by the view that we can manage the impacts of a changing climate on our physical, economic, social, political, and psychological situations. Instead, this article may contribute to future work on sustainable management and policy as much by subtraction as by addition. By that I mean the implication is for you to take a time to step back, to consider "what if" the analysis in these pages is true, to allow yourself to grieve, and to overcome enough of the typical fears we all have, to find meaning in new ways of being and acting.

That may be in the fields of academia or management—or could be in some other field that this realization leads you to.

First, I briefly explain the paucity of research that considers or starts from social collapse due to environmental catastrophe and give acknowledgement to the existing work in this field that many readers may consider relevant. **Second,** I summarize what I consider to be the most important climate science of the last few years and how it is leading more people to conclude that we face disruptive changes in the near-term. **Third,** I explain how that perspective is marginalized within the professional environmental sector—and so invite you to consider the value of leaving mainstream views behind. **Fourth,** I outline the ways that people on relevant social networks are framing our situation as one of facing collapse, catastrophe, or extinction and how these views trigger different emotions and ideas. **Fifth,** I outline a "Deep Adaptation Agenda" to help guide discussions on what we might do once we recognize climate change is an unfolding tragedy. **Finally,** I make some suggestions for how this agenda could influence our future research and teaching in the sustainability field.

As researchers and reflective practitioners, we have an opportunity and obligation to not just do what is expected by our employers and the norms of our profession, but also to reflect on the relevance of our work within wider society. I am aware that some people consider statements from academics that we now face inevitable near-term social collapse to be irresponsible due to the potential impact that may have on the motivation or mental health of people reading such statements. My research and engagement in dialogue on this topic, some of which I will outline in this paper, lead me to conclude the exact opposite. It is a responsible act to communicate this analysis now and invite people to support each other, myself included, in exploring the implications, including the psychological and spiritual implications.

Locating this study within academia

When discussing negative outlooks on climate change and its implications for human society, the response is often to seek insight through placing this information in context. That context is often assumed to be found in balancing it with other information. As the information on our climate predicament is so negative, the balance is often found in highlighting more positive information about progress on the sustainability agenda. This process of seeking to "balance out" is a habit of the informed and reasoning mind.

Yet that does not make it a logical means of deliberation if positive information being shared does not relate to the situation being described by the negative information. For instance, discussing progress in the health and safety policies of the White Star Line with the captain of the Titanic as it sank into the icy waters of the North Atlantic would not be a sensible use of time. Yet given that this balancing is often the way people respond to discussion of the scale and speed of our climate tragedy, let us first recognize the positive news from the broader sustainability agenda.

Certainly, there has been some progress on environmental issues in past decades, from reducing pollution, to habitat preservation, to waste management. Much valiant effort has been made to reduce carbon emissions over the last 20 years, one part of climate action officially termed "mitigation" (Aaron-Morrison *et al.* 2017). There have been many steps forward on climate and carbon management from awareness, to policies, to innovations (Flannery, 2015). Larger and quicker steps must be taken. That is helped by the agreement reached in December 2015 at the COP21 intergovernmental climate summit and now that there is significant Chinese engagement on the issue. To support the maintenance and scaling of these efforts is essential. In addition, increasing action is occurring on adaptation to climate change, such as flood defenses, planning laws, and irrigation systems (Singh *et al.* 2016). Whereas we can praise these efforts, their existence does not matter to an analysis of our overall predicament with climate change.

Rather than building from existing theories on sustainable business, this paper focuses on a phenomenon. That phenomenon is not climate change per se, but the state of climate change in 2018, which I will argue from a secondary review of research now indicates near-term social collapse. The gap in the literature that this paper may begin to address is the lack of discussion within management studies and practice of the end of the idea that we can either solve or cope with climate change. In the *Sustainability Accounting Management and Policy Journal (SAMPJ)*, to which this paper was originally submitted, there has been no prior discussion of this topic, apart from my own co-authored paper (Bendell *et al.* 2017). Three papers mention climate adaptation in passing, with just one focusing on it by considering how to improve irrigated agriculture (de Sousa Fragoso *et al.* 2018) (1).

Organization and Environment is a leading journal for discussion of the implications of climate for organizations and vice versa, where since the 80s both philosophical and theoretical positions on environment are discussed as well as organizational or management implications. However, the journal has not published any research papers exploring theories and implications of social collapse due to environmental catastrophe (2). Three articles mention climate adaptation. Two of those have adaptation as a context, but explore other issues as their main focus, specifically social learning (Orsato *et al.* 2018) and network learning (Temby *et al.* 2016). Only one paper in that journal looks at climate adaptation as its main focus and the implications for organization. While a helpful summary of how difficult the implications are for management, the paper does not explore the implications of a widespread social collapse (Clément & Rivera, 2016).

Away from management studies, the field of climate adaptation is wide (Lesnikowski *et al.* 2015). To illustrate, a search on Google Scholar returns over 40,000 hits for the term "climate adaptation." In answering the questions I set for myself in this paper, I will not be reviewing that existing field and scholarship. One might ask "why not?"

The answer is that the field of climate adaptation is oriented around ways to maintain our current societies as they face manageable climactic perturbations *(ibid).* The concept of "deep adaptation" resonates with that agenda where we accept that we will need to change, but breaks with it by taking as its starting point the inevitability of societal collapse (as I will explain below).

Our non-linear world

This paper is not the venue for a detailed examination of all the latest climate science. However, I reviewed the scientific literature from the past few years and where there was still large uncertainty, then sought the latest data from research institutes. In this section, I summarize the findings to establish the premise that it is time we consider the implications of it being too late to avert a global environmental catastrophe in the lifetimes of people alive today.

The simple evidence of global ambient temperature rise is undisputable.

Seventeen of the 18 warmest years in the 136-year record all have occurred since 2001, and global temperatures have increased by 0.9°C since 1880 (NASA/GISS, 2018). The most surprising warming is in the Arctic, where the 2016 land surface temperature was 2.0°C above the 1981-2010 average, breaking the previous records of 2007, 2011, and 2015 by 0.8°C, representing a 3.5°C increase since the record began in 1900 (Aaron-Morrison *et al.* 2017).

These data are fairly easy to collate and not widely challenged, so swiftly find their way into academic publications. However, to obtain a sense of the implications of this warming on environment and society, one needs real-time data on the current situation and the trends that it may imply. Climate change and its associated impacts have, as we will see, been significant in the last few years. Therefore, to appreciate the situation, we need to look directly to the research institutes, researchers, and their websites, for the most recent information. That means using, but not relying solely on, academic journal articles and the slowly produced reports of the Intergovernmental Panel on Climate Change (IPCC). This international institution has done useful work but has a track record of significantly underestimating the pace of change, which has been more accurately predicted over past decades by eminent climate scientists. Therefore, in this review, I will draw upon a range of sources, with a focus on data since 2014. That is because, unfortunately, data collected since then is often consistent with non-linear changes to our environment. Non-linear changes are of central importance to understanding climate change, as they suggest both that impacts will be far more rapid and severe than predictions based on linear projections and that the changes no longer correlate with the rate of anthropogenic carbon emissions. In other words—'runaway climate change.' The

warming of the Arctic reached wider public awareness as it has begun destabilizing winds in the higher atmosphere, specifically the jet stream and the northern polar vortex, leading to extreme movements of warmer air north into the Arctic and cold air to the south. At one point in early 2018, temperature recordings from the Arctic were 20°C above the average for that date (Watts, 2018). The warming Arctic has led to dramatic loss in sea ice, the average September extent of which has been decreasing at a rate of 13.2% per decade since 1980, so that over two-thirds of the ice cover has gone (NSIDC/NASA, 2018). These data are made more concerning by changes in sea ice volume, which is an indicator of resilience of the ice sheet to future warming and storms. It was at the lowest it has ever been in 2017, continuing a consistent downward trend (Kahn, 2017).

Given a reduction in the reflection of the Sun's rays from the surface of white ice, an ice-free Arctic is predicted to increase warming globally by a substantial degree. Writing in 2014, scientists calculated this change is already equivalent to 25% of the direct forcing of temperature increase from CO_2 during the past 30 years (Pistone *et al.* 2014). That means we could remove a quarter of the cumulative CO_2 emissions of the last three decades, and it would already be outweighed by the loss of the reflective power of Arctic sea ice. One of the most eminent climate scientists in the world, Peter Wadhams, believes an ice-free Arctic will occur one summer in the next few years and that it will likely increase by 50% the warming caused by the CO_2 produced by human activity (Wadhams, 2016) (4). In itself, that renders the calculations of the IPCC redundant, along with the targets and proposals of the UNFCCC.

Between 2002 and 2016, Greenland shed approximately 280 gigatons of ice per year, and the island's lower elevations and coastal areas experienced up to 13.1 feet (4 meters) of ice mass loss (expressed in equivalent-water-height) over a 14-year period (NASA, 2018). Along with other melting of land ice, and the thermal expansion of water, this has contributed to a global mean sea level rise of about 3.2 mm/year, representing a total increase of over 80 mm since 1993 (JPL/PO.DAAC, 2018). Stating a figure per year implies a linear increase, which is what has been assumed by IPCC and others in making their predictions. However, recent data show that the upward trend is nonlinear (Malmquist, 2018). That means sea level is rising due to nonlinear increases in the melting of land-based ice.

The observed phenomena, of actual temperatures and sea levels, are greater than what the climate models over the past decades were predicting for our current time. They are consistent with nonlinear changes in our environment that then trigger uncontrollable impacts on human habitat and agriculture, with subsequent complex impacts on social, economic, and political systems. I will return to the implications of these trends after listing some more of the impacts that are already being reported as occurring today.

Already we see impacts on storm, drought, and flood frequency and strength due to increased volatility from more energy in the atmosphere (Herring *et al.* 2018). We are witnessing negative impacts on agriculture. Climate change has reduced growth in crop yields by 1-2% per decade over the past century (Wiebe *et al.* 2015).

The UN Food and Agriculture Organisation (FAO) reports that weather abnormalities related to climate change are costing billions of dollars a year and growing exponentially.

Now, the impact is calculated in money, but the nutritional implications are key (FAO, 2018). We are also seeing impacts on marine ecosystems. About half of the world's coral reefs have died in the last 30 years, due to a mixture of reasons though higher water temperatures and acidification due to higher CO_2 concentrations in ocean water being key (Phys.org, 2018). In ten years prior to 2016, the Atlantic Ocean soaked up 50% more CO_2 than it did the previous decade, measurably speeding up the acidification of the ocean (Woosley *et al.* 2016). This study is indicative of oceans worldwide, and the consequent acidification degrades the base of the marine food web, thereby reducing the ability of fish populations to reproduce themselves across the globe (Britten *et al.* 2015). Meanwhile, warming oceans are already reducing the population size of some fish species (Aaron-Morrison *et al.* 2017). Compounding these threats to human nutrition, in some regions we are witnessing an exponential rise in the spread of mosquito and tick-borne viruses as temperatures become more conducive to them (*ECJCR*, 2018).

Looking ahead to the impacts

The impacts I just summarized are already upon us, and even without increasing their severity, they will nevertheless increase their impacts on our ecosystems, soils, seas, and our societies over time. It is difficult to predict future impacts. But it is more difficult not to predict them. Because the reported impacts today are at the very worst end of predictions being made in the early 90s—back when I first studied climate change and model-based climate predictions as an undergraduate at Cambridge University.

The models today suggest an increase in storm number and strength (Herring *et al.* 2018). They predict a decline of normal agriculture, including the compromising of mass production of grains in the northern hemisphere and intermittent disruption to rice production in the tropics. That includes predicted declines in the yields of rice, wheat, and corn in China by 36.25%, 18.26%, and 45.10%, respectively, by the end of this century (Zhang *et al.* 2016). Naresh Kumar *et al.* (2014) project a 6-23% and 15-25% reduction in the wheat yield in India during the 2050s and 2080s, respectively, under the mainstream projected climate change scenarios.

The loss of coral and the acidification of the seas is predicted to reduce fisheries productivity by over half (Rogers *et al.* 2017). The rates of sea level rise suggest they may soon become exponential (Malmquist, 2018), which will pose significant problems for billions of people living in coastal zones (Neumann *et al.* 2015). Environmental scientists are now describing our current era as the sixth mass extinction event in the history of planet Earth, with this one caused by us. About half of all plants and animal species in the world's most biodiverse places are at risk of extinction due to climate change (WWF, 2018). The World Bank reported in 2018 that countries needed to prepare for over 100 million internally

displaced people due to the effects of climate change (Rigaud *et al.* 2018), in addition to millions of international refugees.

Despite you, me, and most people we know in this field already hearing data on this global situation, it is useful to recap simply to invite a sober acceptance of our current predicament. It has led some commentators to describe our time as a new geological era shaped by humans—the Anthropocene (Hamilton *et al.* 2015). It has led others to conclude that we should be exploring how to live in an unstable post-sustainability situation (Benson & Craig, 2014; Foster, 2015). This context is worth being reminded of, as it provides the basis upon which to assess the significance, or otherwise, of all the praiseworthy efforts that have been underway and reported in some detail in this and other journals over the past decade. I will now offer an attempt at a summary of that broader context insofar as it might frame our future work on sustainability.

The politically permissible scientific consensus is that we need to stay beneath 2°C warming of global ambient temperatures, to avoid dangerous and uncontrollable levels of climate change, with impacts such as mass starvation, disease, flooding, storm destruction, forced migration, and war. That figure was agreed by governments that were dealing with many domestic and international pressures from vested interests, particularly corporations. It is therefore not a figure that many scientists would advise, given that many ecosystems will be lost and many risks created if we approach 2°C global ambient warming (Wadhams, 2018). The IPCC agreed in 2013 that if the world does not keep further anthropogenic emissions below a total of 800 billion tons of carbon, we are not likely to keep average temperatures below 2°C of global averaged warming. That left about 270 billion tons of carbon to burn (Pidcock, 2013). Total global emissions remain at around 11 billion tons of carbon per year (which is 37 billion tons of CO_2). Those calculations appear worrying but give the impression we have at least a decade to change. It takes significant time to change economic systems, so if we are not already on the path to dramatic reductions, it is unlikely we will keep within the carbon limit. With an increase of carbon emissions of 2% in 2017, the decoupling of economic activity from emissions is not yet making a net dent in global emissions (Canadell *et al.* 2017). So, we are not on the path to prevent going over 2°C warming through emissions reductions. In any case, the IPCC estimate of a carbon budget was controversial with many scientists who estimated that existing CO_2 in the atmosphere should already produce global ambient temperature rises over 5°C and so there is no carbon budget—it has already been overspent (Wasdell, 2015).

That situation is why some experts have argued for more work on removing carbon from the atmosphere with machines. Unfortunately, the current technology needs to be scaled by a factor of 2 million within two years, all powered by renewables, alongside massive emission cuts, to reduce the amount of heating already locked into the system (Wadhams, 2018).

Biological approaches to carbon capture appear far more promising (Hawken & Wilkinson, 2017). These include planting trees, restoring soils used in agriculture, and growing seagrass and kelp, amongst other approaches. They also offer wider beneficial environmental and social side effects. Studies on seagrass (Greiner et al, 2013) and seaweed (Flannery, 2015) indicate we could be taking millions of tons of carbon from the atmosphere immediately and continually if we had a massive effort to restore seagrass meadows and to farm seaweed. The net sequestration effect is still being assessed but in certain environments will be significant (Howard *et al.* 2017). Research into "management-intensive rotational grazing" practices (MIRG), also known as holistic grazing, shows how a healthy grassland can store carbon. A 2014 study measured annual per hectare increases in soil carbon at 8 tons per year on farms converted to these practices (Machmuller *et al.* 2015). The world uses about 3.5 billion hectares of land for pasture and fodder crops. Using the 8 tons figure above, converting a tenth of that land to MIRG practices would sequester a quarter of present emissions. In addition, no-till methods of horticulture can sequester as much as two tons of carbon per hectare per year, so could also make significant contributions. It is clear, therefore, that our assessment of carbon budgets must focus as much on these agricultural systems as we do on emissions reductions.

Clearly a massive campaign and policy agenda to transform agriculture and restore ecosystems globally is needed right now. It will be a huge undertaking, undoing 60 years of developments in world agriculture. In addition, it means the conservation of our existing wetlands and forests must suddenly become successful, after decades of failure across lands outside of geographically limited nature reserves. Even if such will emerges immediately, the heating and instability already locked into the climate will cause damage to ecosystems, so it will be difficult for such approaches to curb the global atmospheric carbon level. The reality that we have progressed too far already to avert disruptions to ecosystems is highlighted by the finding that if CO_2 removal from the atmosphere could work at scale, it would not prevent massive damage to marine life, which is locked in for many years due to acidification from the dissolving of CO_2 in the oceans (Mathesius *et al.* 2015).

Despite the limitations of what humans can do to work with nature to encourage its carbon sequestration processes, the planet has been helping us out anyway. A global "greening" of the planet has significantly slowed the rise of carbon dioxide in the atmosphere since the start of the century.

Plants have been growing faster and larger due to higher CO_2 levels in the air and warming temperatures that reduce the CO_2 emitted by plants via respiration. The effects led the proportion of annual carbon emissions remaining in the air to fall from about 50% to 40% in the last decade.

However, this process offers only a limited effect, as the absolute level of CO_2 in the atmosphere is continuing to rise, breaking the milestone of 400 parts per million (ppm) in 2015. Given that changes in seasons, temperature extremes, flood, and drought are beginning to negatively affect ecosystems, the risk exists that this global greening effect may be reduced in time (Keenan *et al.* 2016). These potential reductions in atmospheric carbon from natural and assisted biological processes is a flickering ray of hope in our dark situation.

However, the uncertainty about their impact needs to

be contrasted with the uncertain yet significant impact of increasing methane release in the atmosphere. It is a gas that enables far more trapping of heat from the sun's rays than CO_2 but was ignored in most of the climate models over the past decades. The authors of the 2016 Global Methane Budget report found that in the early years of this century, concentrations of methane rose by only about 0.5 part per billion (ppb) each year, compared with 10 ppb in 2014 and 2015.

Various sources were identified, from fossil fuels—to agriculture to melting permafrost (Saunois *et al.* 2016).

Given the contentiousness of this topic in the scientific community, it may even be contentious for me to say that there is no scientific consensus on the sources of current methane emissions or the potential risk and timing of significant methane releases from either surface or subsea permafrost. A recent attempt at consensus on methane risk from melting surface permafrost concluded methane release would happen over centuries or millennia, not this decade (Schuur *et al.* 2015). Yet within three years, that consensus was broken by one of the most detailed experiments which found that if the melting permafrost remains waterlogged, which is likely, then it produces significant amounts of methane within just a few years (Knoblauch *et al.* 2018). The debate is now likely to be about whether other microorganisms might thrive in that environment to eat up the methane—and whether or not in time to reduce the climate impact.

The debate about methane release from clathrate forms, or frozen methane hydrates, on the Arctic sea floor is even more contentious. In 2010, a group of scientists published a study that warned how the warming of the Arctic could lead to a speed and scale of methane release that would be catastrophic to life on earth through atmospheric heating of over 5°C within just a few years of such a release (Shakhova *et al.* 2010). The study triggered a fierce debate, much of which was ill considered, perhaps understandable given the shocking implications of this information (Ahmed, 2013). Since then, key questions at the heart of this scientific debate (about what would amount to the probable extinction of the human race) include the amount of time it will take for ocean warming to destabilize hydrates on the sea floor, and how much methane will be consumed by aerobic and anaerobic microbes before it reaches the surface and escapes to the atmosphere. In a global review of this contentious topic, scientists concluded that there is not the evidence to predict a sudden release of catastrophic levels of methane in the near-term (Ruppel & Kessler, 2017).

However, a key reason for their conclusion was the lack of data showing actual increases in atmospheric methane at the surface of the Arctic, which is partly the result of a lack of sensors collecting such information. Most ground-level methane measuring systems are on land. Could that be why the unusual increases in atmospheric methane concentrations cannot be fully explained by existing data sets from around the world (Saunois *et al.* 2016)? One way of calculating how much methane is probably coming from our oceans is to compare data from ground-level measurements, which are mostly but not entirely on land, with upper atmosphere measurements, which indicate an averaging out of total sources. Data published by scientists from the Arctic News (2018) website indicates that in March 2018 at mid-altitudes, methane was around 1865 ppb, which represents a 1.8% increase of 35 ppb from the same time in 2017, while surface measurements of methane increased by about 15 ppb in that time. Both figures are consistent with a nonlinear increase—potentially exponential—in atmospheric levels since 2007. That is worrying data in itself, but the more significant matter is the difference between the increase measured at ground and mid-altitudes. That is consistent with this added methane coming from our oceans, which could in turn be from methane hydrates.

This closer look at the latest data on methane is worthwhile given the critical risks to which it relates. It suggests that the recent attempt at a consensus that it is highly unlikely we will see near-term massive release of methane from the Arctic Ocean is sadly inconclusive. In 2017, scientists working on the Eastern Siberian sea shelf, reported that the permafrost layer has thinned enough to risk destabilizing hydrates *(The Arctic,* 2017).

That report of subsea permafrost destabilization in the East Siberian Arctic sea shelf, the latest unprecedented temperatures in the Arctic, and the data in nonlinear rises in high-atmosphere methane levels, combine to make it feel like we are about to play Russian roulette with the entire human race, with already two bullets loaded. Nothing is certain. But it is sobering that humanity has arrived at a situation of our own making where we now debate the strength of analyses of our near-term extinction.

Apocalypse uncertain

The truly shocking information on the trends in climate change and its impacts on ecology and society are leading some to call for us to experiment with geoengineering the climate, from fertilizing the oceans so they photosynthesize more CO_2, to releasing chemicals in the upper atmosphere to reflect the sun's rays. The unpredictability of geoengineering the climate through the latter method, in particular the dangers of disturbances to seasonal rains that billions of people rely on, make it unlikely to be used (Keller *et al.* 2014). The potential natural geoengineering from increased sulphur releases from volcanoes due to isostatic rebound as weight on the Earth's crust is redistributed is not likely to make a significant contribution to earth temperatures for decades or centuries.

It is a truism that we do not know what the future will be. But we can see trends. We do not know if the power of human ingenuity will help sufficiently to change the environmental trajectory we are on.

Unfortunately, the recent years of innovation, investment, and patenting indicate how human ingenuity has increasingly been channeled into consumerism and financial engineering. We might pray for time. But the evidence before us suggests that we are set for disruptive and uncontrollable levels of climate change, bringing starvation, destruction, migration, disease, and war.

We do not know for certain how disruptive the impacts of climate change will be or where will be most affected, especially as economic and social systems will respond in

complex ways. But the evidence is mounting that the impacts will be catastrophic to our livelihoods and the societies that we live within. Our norms of behavior, that we call our "civilization," may also degrade. When we contemplate this possibility, it can seem abstract. The words I ended the previous paragraph with may seem, subconsciously at least, to be describing a situation to feel sorry about as we witness scenes on TV or online. But when I say starvation, destruction, migration, disease, and war, I mean in your own life. With the power down, soon you wouldn't have water coming out of your tap. You will depend on your neighbors for food and some warmth. You will become malnourished. You won't know whether to stay or go. You will fear being violently killed before starving to death.

These descriptions may seem overly dramatic. Some readers might consider them an unacademic form of writing. Which would be an interesting comment on why we even write at all. I chose the words above as an attempt to cut through the sense that this topic is purely theoretical.

As we are considering here a situation where the publishers of this journal would no longer exist, the electricity to read its outputs won't exist, and a profession to educate won't exist, I think it time we break some of the conventions of this format. However, some of us may take pride in upholding the norms of the current society, even amidst collapse. Even though some of us might believe in the importance of maintaining norms of behavior, as indicators of shared values, others will consider that the probability of collapse means that effort at reforming our current system is no longer the pragmatic choice. **My conclusion to this situation has been that we need to expand our work on "sustainability" to consider how communities, countries, and humanity can adapt to the coming troubles. I have dubbed this the "Deep Adaptation Agenda," to contrast it with the limited scope of current climate adaptation activities. My experience is that a lot of people are resistant to the conclusions I have just shared.** So before explaining the implications, let us consider some of the emotional and psychological responses to the information I have just summarized.

Systems of denial

It would not be unusual to feel a bit affronted, disturbed, or saddened by the information and arguments I have just shared. In the past few years, many people have said to me that "**it can't be too late to stop climate change, because if it was, how would we find the energy to keep on striving for change?"**

With such views, a possible reality is denied because people want to continue their striving. What does that tell us? The "striving" is based in a rationale of maintaining self-identities related to espoused values. It is understandable why that happens. If one has always thought of oneself as having self-worth through promoting the public good, then information that initially appears to take away that self-image is difficult to assimilate.

That process of strategic denial to maintain striving and identity is easily seen in online debates about the latest climate science. One particular case is illustrative. In 2017, the *New York Magazine* published an article that drew together the latest data and analysis of what the implications of rapid climatic warming would be on ecosystems and humanity. Unlike the many dry academic articles on these subjects, this popular article sought to describe these processes in visceral ways (Wallace-Wells, 2017). The reaction of some environmentalists to this article did not focus on the accuracy of the descriptions or what might be done to reduce some of the worst effects that were identified in the article. Instead, they focused on whether such ideas should be communicated to the general public. Climate scientist Michael Mann warned against presenting "the problem as unsolvable, and feed[ing] a sense of doom, inevitability and hopelessness" (in Becker, 2017). Environmental journalist Alex Steffen (2017) tweeted that "Dropping the dire truth... on unsupported readers does not produce action, but fear." In a blog post, Daniel Aldana Cohen (2017) an assistant sociology professor working on climate politics, called the piece "climate disaster porn." Their reactions reflect what some people have said to me in professional environmental circles. The argument made is that to discuss the likelihood and nature of social collapse due to climate change is irresponsible because it might trigger hopelessness amongst the general public. I always thought it odd to restrict our own exploration of reality and censor our own sense-making due to our ideas about how our conclusions might come across to others. Given that this attempt at censoring was so widely shared in the environmental field in 2017, it deserves some closer attention.

I see four particular insights about what is happening when people argue we should not communicate to the public the likelihood and nature of the catastrophe we face.

First, it is not untypical for people to respond to data in terms of what perspectives we wish for ourselves and others to have, rather than what the data may suggest is happening. That reflects an approach to reality and society that may be tolerable in times of plenty but counterproductive when facing major risks.

Second, bad news and extreme scenarios impact on human psychology. We sometimes overlook that the question of how they impact is a matter for informed discussion that can draw upon psychology and communications theories. Indeed, there are journals dedicated to environmental psychology. There is some evidence from social psychology to suggest that by focusing on impacts now, it makes climate change more proximate, which increases support for mitigation (McDonald *et al.* 2015). That is not conclusive, and this field is one for further exploration. That serious scholars or activists would make a claim about impacts of communication without specific theory or evidence suggests that they are not actually motivated to know the effect on the public but are attracted to a certain argument that explains their view.

A third insight from the debates about whether to publish information on the probable collapse of our societies is that sometimes people can express a paternalistic relationship between themselves as environmental experts and other people whom they categorize as "the public." That is related to the non-populist anti-politics technocratic attitude that has pervaded contemporary environmentalism. It is a perspective that frames the challenges as one of encouraging people to

try harder to be nicer and better, rather than coming together in solidarity to either undermine or overthrow a system that demands we participate in environmental degradation.

A fourth insight is that "hopelessness" and its related emotions of dismay and despair are understandably feared, but wrongly assumed to be entirely negative and to be avoided whatever the situation. Alex Steffen warned that "Despair is never helpful" (2017). However, the range of ancient wisdom traditions see a significant place for hopelessness and despair.

Contemporary reflections on people's emotional and even spiritual growth as a result of their hopelessness and despair align with these ancient ideas.

The loss of a capability, a loved one, or a way of life, or the receipt of a terminal diagnosis have all been reported, or personally experienced, as a trigger for a new way of perceiving self and world, with hopelessness and despair being a necessary step in the process (Matousek, 2008). In such contexts, "hope" is not a good thing to maintain, as it depends on what one is hoping for. When the debate raged about the value of the *New York Magazine* article, some commentators picked up on this theme. "In abandoning hope that one way of life will continue, we open up a space for alternative hopes," wrote Tommy Lynch (2017).

This question of valid and useful hope is something that we must explore much further. Leadership theorist Jonathan Gosling has raised the question of whether we need a more "radical hope" in the context of climate change and a growing sense of "things falling apart" (Gosling, 2016). He invites us to explore what we could learn from other cultures that have faced catastrophe. Examining the way Native Americans coped with being moved onto reservations, Lear (2008) looked at what he calls the "blind spot" of any culture: the inability to conceive of its own destruction and possible extinction. He explored the role of forms of hope that involved neither denial nor blind optimism. "What makes this hope radical, is that it is directed toward a future goodness that transcends the current ability to understand what it is" *(ibid).* He explains how some of the Native American chiefs had a form of "imaginative excellence" by trying to imagine what ethical values would be needed in their new lifestyle on the reservation. He suggests that besides the standard alternatives of freedom or death (in service of one's culture) there is another way, less grand yet demanding just as much courage: the way of "creative adaptation." This form of creatively constructed hope may be relevant to our Western civilization as we confront disruptive climate change (Gosling & Case, 2013).

Such deliberations are few and far between in either the fields of environmental studies or management studies. It is to help break this semicensorship of our own community of inquiry on sustainability that motivated me to write this article. Some scholarship has looked at the process of denial more closely. Drawing on sociologist Stanley Cohen, Foster (2015) identifies two subtle forms of denial—interpretative and implicative. If we accept certain facts but interpret them in a way that makes them "safer" to our personal psychology, it is a form of "interpretative denial." If we recognize the troubling implications of these facts but respond by busying ourselves on activities that do not arise from a full assessment of the situation, then that is "implicative denial." **Foster argues that implicative denial is rife within the environmental movement, from dipping into a local Transition Towns initiative, signing online petitions, or renouncing flying, there are endless ways for people to be "doing something" without seriously confronting the reality of climate change.** Δ

This article along with a list of references and resources will continue in the August 2019 issue (#113).

Acknowledgments from the author. To write this paper, I had to block out time to review climate science for the first time since I was at Cambridge University in 1994 and to analyse implications in a rigorous way. I would probably not have done that without the encouragement of the following people for me to prioritise the issue: Chris Erskine, Dougald Hine, Jonathan Gosling, Camm Webb, and Katie Carr.

I thank Dorian Cave for research assistance and Zori Tomova for helping me to prioritise my truth. I also thank Professor Carol Adams for finding reviewers for this paper, and the two anonymous reviewers who provided some useable feedback despite requiring such major revisions that conflicted with the aim of the paper. I also thank Carol for involving me in the *SAMPJ* as a Guest Editor in the past. Some funding for my focus on deep adaptation during my sabbatical was provided by Seedbed. If you edit an open access peer-reviewed academic journal and would like this paper to be submitted, please contact the author.

Reader Support A list of readings, podcasts, videos and networks to support us in our emotional responses to the information contained in this paper is available at www.jembendell.com

Endnotes

1. A full text search of the journal database shows that the following terms have never been included in articles in this journal: environmental collapse, economic collapse, social collapse, societal collapse, environmental catastrophe, human extinction. Catastrophe is mentioned in 3 papers, with two about Bangladesh factory fires and the other being Bendell et al (2017).

2. A full text search of the journal database shows that the terms environmental collapse, social collapse and societal collapse have been mention in one different article each. Economic collapse has been mentioned in three articles. Human extinction is mentioned two articles. Environmental catastrophe is mentioned in twelve articles. A reading of these articles showed that they were not exploring collapse.

This paper was rejected for publication for reasons given at the author's website above. It was released as an Occasional Paper from the Institute of Leadership and Sustainability (IFLAS) at the University of Cumbria, UK, and has attracted considerable attention worldwide. We have reprinted it here by permission of Prof. Bendell.

Designing with Goats!

Vasko, the Digital Goatherd

De Chantal Hillis

LAST SUNDAY, I packed my daughter in the car, and we drove off to visit my friend Vasko. When we arrived at his house, no one answered the door—so we walked around the side of the house and into the backyard. At the rear of the property, there was a windy path, and we followed it down into a beautiful meadow. There were goats everywhere, and a lovely young girl child was sitting on the grass. She was weaving daisy chains and then using them to decorate her hair. When my little daughter Rafaela spotted her, she ran straight over to her. After a minute or two, the older child began to teach the younger one how to make daisy chains. In the long grass under a tree, a man lay dozing. It was my friend Vasko; the beautiful girl that my daughter befriended is his six-year-old daughter, Leah. They brought their goats to the meadow to graze. Indeed, Leah had what appeared to be a homemade shepherd's crook next to her. Vasko saw us—got up and walked over to a nearby tree. He cut down a long, green branch and began shaping it with his knife. In five minutes or so, he made a tiny shepherds crook, which he handed to Rafaela. Her delight was evident—she was now an official shepherd.

Her delight was evident: she was now an official shepherd.

I have experienced these kinds of idyllic rural scenes before—just never in real life. I have seen oil paintings of sleepy shepherds in meadows. I read *Heidi* as a child, and I recently watched the *Sound of Music* with my kids. Can this be real life? I mean, beautiful meadows? Lovely young girls making daisy chains? Cavorting goats? I am slightly relieved that Vasko doesn't play the pan pipes—that would be weird. But, of course, this is real life—or at least, a really, really beautiful version of it. Vasko often brings his goats to the meadow that adjoins his own land. He likes to watch them free range and to observe the ways that they graze. He is watching for what the herd can achieve when pastured on different kinds of landscapes and ecologies.

Vasko first became interested in goats, and the power of these goat herds in action, when he bought his house from an old Croatian man seven years ago. The old man had planted fruit trees on the land and was keeping goats himself. That was when he first discovered that a herd of goats can crop grass more effectively than a row of lawnmowers. Goats are able to smash through a remarkable amount of greenery. They can tear down small shrubs and rip through patches of blackberries. Despite their small size, they are able to eat their way through an almost ridiculous amount of vegetation. A goat is a highly effective land-clearing machine. This is their mutant power—they love to eat, rip apart, and/or destroy just about everything in their path.

It was this mutant power—the power of goat—that first attracted the attention of permaculture enthusiasts in the area. Vasko lives only five minutes down the road from Melliodora, the passive house and permaculture demonstration

Children are a wonderful match for curious and playful goats in the field.

site where David Holmgren and his wife Sue Dennett live. Vasko, David, and Sue are friends; they are part of a dynamic social ecology of permaculture enthusiasts that live in the local area. While David Holmgren has an international reputation, his commitment to localization means that he typically throws a lot of weight behind projects run in his own backyard. Vasko, David, and Sue (along with Vasko's friends Patrick Jones and Nikki Marshall) all attend the "Local Lives/Global Matters" conference which is held in the area. It was at this forum that ideas around the possible uses of "goat power" first emerged.

Discussions centered around the obvious; all agreed that goats are experts at clearing landscape. A herd of goats have the capacity to consume an almost ridiculous amount of vegetation in a day. Goats are high-speed feeding machines. In addition to this, goats can get themselves into the kinds of tight, tricky, steep, and slippery places that humans struggle to access. It's become a popular fact that goats can climb trees. A friend of mine even came out one morning to find her two goats jumping from the roof to the hood of her car and back again. Because of this unique ability to navigate steep, unstable, and uneven ground, you can move them onto hillsides and into gullies and waterways. These are the kind of landscapes that are hard to access with land-clearing machinery.

In order to make use of this superpower, however, "goat power" must be directed. A big herd of goats wandering everywhere is no use to anyone. Throughout most of human history, traditional peoples have shaped and directed their herds using open cell grazing. This form of "peasant grazing" or herding involves nothing more than a shepherd waving a crook, with perhaps a little harsh language thrown in. In a dramatic break from timeless, old shepherding traditions, we have also seen the development of new technologies that make it easier than ever before to capture and direct the natural behaviors of animals, including goats. Farmers like Joel Salatin have been popularizing the use of lightweight and portable forms of electric fencing. These solar-powered, moveable electric fencing systems have made it relatively easy for herders to shift their animals to new pasture as frequently as once per day. The fences, which are quick to move and set up, deliver a small electric shock to anything that touches them, making it relatively easy for farmers to create instant boundary fences and shape access to the landscape.

This could be your idyllic life. Vasko watching over the goats and the children playing in the sun.

In addition to the use of portable electric fencing, Vasko's goats may well be going digital. As strange as it may sound, GPS-centered approaches to animal control are already being successfully trialed.

This is how the goats of tomorrow may be herded. A (digital) shepherd draws the boundaries of an animal pasture using an online map. The goats all wear collars that have been programmed to respond to this virtual fence. When an animal starts to wander out of the prescribed area, the collar creates an aversive experience which forces the animal back into its pasture. The collar may begin to buzz or emit an unpleasant sound, and the further the animal moves away from where it is meant to be, the worse the sound or buzzing will become.

The goats will clear public land within the shire.

This is geofencing, or the use of virtual fencing. Such collars would effectively force herds to graze in set locations, ensuring that the right areas are targeted. Collars of this kind would be particularly useful for certain kinds of grazing sites. For example, goats could be used to manage steep, rocky escarpments and watercourses where it is particularly difficult to erect fencing.

Vasko's efforts have attracted the attention of local and state government bodies. He lives in the Shire of Hepburn, a place where local government leaders have been seeking solutions for two key issues that are common to rural areas throughout Australia. The first issue is that of bushfire: rural Australians live in a constant state of alert during summer months because of the danger posed by devastating and even deadly bush fires. The second challenge is that of invasive, non-native weeds (like blackberry and gorse) and the impact these have on native ecosystems.

Let's start with the issue of bushfire. During summertime, rural Australians live with the constant threat of bushfire. Bush fires have always been a part of life in these areas, but global warming has increased the frequency, severity, and impact of these summer fires. On Saturday, February 7, 2009, a series of fires and extreme firestorms killed over 180 people. These fires became known as the "Black Saturday" fires. This event followed several months of unusually high temperatures, with the highest temperature ever recorded in

Melbourne (46°C; 115°F) occurring on the same day as the fires. It is almost impossible to overstate the impact that the Black Saturday fires had on the popular imagination. The day marked a turning point in the way Australians view the threat of bushfire.

Since Black Saturday, rural government bodies in Australia have been seeking new strategies to mitigate fire risk. As strange as it may seem, trees in a forest don't really burn that well. Trees are living, green wood. It is dead wood and dry vegetation that feed bushfire; old underbrush and grass are highly flammable. In summer conditions, these typically dry out, creating a large mass of combustible material (or fuel load). This dry vegetation can function as a "fire bridge," forming the pathways which allow a fire to spread from one area to the next. The worse possible fire bridges are those found in slopes and gullies. These are areas where fire quite literally races uphill, achieving far greater power, intensity, and velocity than it does on flat land. Using goats, it is possible to clear this kind of vegetation throughout slopes and gullies before it dries out and to reduce the kinds of grasses and underbrush that can accelerate devastating bush fires. Thus, a fire bridge can be transformed into a fire break.

Herds of goats can also be used to address another issue that local government grapples with; that of pervasive, non-native plant species. These European imports are quick to take over Australian landscapes, displacing indigenous vegetation and threatening local flora and fauna. Because Australian wildlife has co-evolved with indigenous Australian plants, they rely on natives for both food and habitat. When blackberry bushes or gorse displace native fauna, it can upend whole ecosystems.

Both community members and business owners want to phase out pesticide use.

Landowners and local government have typically fought invasive species using the "slash, burn, and poison" approach. They spray pesticides, use heavy machinery to remove vegetation, and/or burn weeds to ground level. This has led to a poison—slash—regrowth cycle that even the experts admit doesn't work very well. Ground laid bare and burnt is, quite literally, scorched earth. Poisonous chemicals also pose a risk to both the health of humans and the health of entire ecosystems. Glyphosate (which is sold in Australia and the US under the brand name Roundup) is one of the most commonly used herbicides in the world. Though the jury is still out, it is likely that glyphosate causes cancer in humans (in particular, non-Hodgkins lymphoma). Neonicotinoids, another class of biocides, have been linked to colony collapse disorder in bees.

Vasko and his digital goatherding demonstrate an effective land managment technique for earth restoration. Photo by Lloyd Williams.

Both Hepburn and Daylesford (the twin towns where Vasko lives) are popular tourist destinations. Hepburn is known for its mineral springs; there are spa complexes dotted around the town, and visitors pay big money to bathe in these. The area is also considered an epicenter of organic food growing and gourmet and/or artisanal food cottage industries. The use of poisons (particularly ones that can leach into groundwater) directly undermine the image that these towns seek to present to the world—very few people want to bathe in glyphosate. Both community members and business owners in the area want to phase out pesticide use, and this goal is supported by the local Shire council.

In order to explore new, and hopefully safer and more

Goats are voracious eaters, and excellent at controlling rampant cane fruits like this blackberry.

effective solutions to these challenges, the Hepburn Shire committed to funding a four-year trial of goat-based land management. This pilot project began in April 2019. Vasko and his friends, Patrick Jones and Brad Radovic, are the individuals behind the cooperative that has been formed to implement this new land management strategy. The goats will clear public land within the shire. Any excessive remaining weed vegetation (like blackberry canes) that are left behind will be cut at ground level using simple hand tools, leaving a layer of mulch on the soil. This layer of mulch will provide ground cover and help to retain moisture in the soil. Because both mulch and moisture activate microbial life within the soil, and microbial activity increases the water carrying capacity of the soil, it is anticipated that this increased microbial activity will, in turn, further hydrate the landscape. Such mulch and woody matter ultimately become soil over several years.

There has been an increase in the idea of "stacked farming" in recent years.

Goats cannot eat trees like oaks and willows so these will provide shade within the landscape (living trees do not pose a fire risk because they are considered green wood; they don't ignite without a dry fuel load around them). Goats also have a tendency to shift landscapes into grasslands, so with carefully planned planting and revegetation activities, it is possible to transform the land back into the kind of landscape that was common prior to the white settlement of Australia.

In order to achieve this, Vasko has chosen a breed of goat that is particularly well-suited for this job. He is using Boer goats; a breed that was developed in South Africa in the early 1900s. Boer goats owe their lineage to a combination of native African and European goat strains. They are one of the most popular commercial breeds of 'meat goat' in the world. They are also extremely hardy and resilient. This is a particular advantage in some parts of Australia, where the tough conditions can overstress more delicate animals.

Boer goats are happy to feed on herbaceous weeds, woody weeds, and European grasses. This gives them an advantage over the majority of other goat varieties; these can only survive on herbaceous (or leafy) weeds. Despite their adaptability, however, they cannot feed on the much tougher Australian grasses. This means that they will consistently weed out the European imports, giving the native species a chance to gain dominance. Vasko has already noted that on the landscapes where he has consistently grazed his goats, he has been able to observe the return of a range of native species such as kangaroo apple *(Solanum aviculare)* and blackwood *(Acacia melanoxylon).*

Vasko and his friends Brad Radovic and Patrick Jones want to ultimately create a service-based business where their goats provide land-care services, weed management, and bushfire mitigation. They also want to consider extending their offerings to revegetation and possibly a range of educational activities. The three of them are in the process of developing a community cooperative so that locals can engage with the project on a number of levels. Boer goats are primarily considered meat goats, but there is no reason why dairy goats could not be included in land-clearing herds. There has been an increase in interest in the idea of "stacked farming" in recent years. These are farms (or enterprises) which produce multiple income streams through diversified output. Thus, Vasko might make his income by providing land-care services, while another member of the herding co-op runs a dairy and make artisanal cheeses. Yet another individual could draw an income from goat meat, or goat fibers, or any other goat-related product.

Right now, Vasko's herd is even providing educational services. Most Sundays, Leah attends "shepherding school" with her dad. She and her friend Woody head out into the pastures and work with the animals and forage for food. According to Vasko, shepherding and time in nature are having a subtle yet powerful effect on his daughter. She is calmer, he tells me, and happier. She is more observant of the relationships between things and more confident in all areas of her life. Most importantly, she seems to understand that if she looks after the land, the land will look after her. Δ

De Chantal Hillis has a Masters degree in education. Her work is centred around permaculture and ecosystem education. She lives in Malmsbury, Australia with her husband, the activist academic Jose Ramos, and their two children.

They'll be experts in no time. What a great educational opportunity!

Starting Out in Permaculture

On the Yellow Brick Road…

Rhonda Baird

This is the initial offering an a new regular column meant to support people new to permaculture design in understanding how to approach it and have more success in their projects. We welcome submissions from you about your own experiences or advice to people just starting out.

- the Permaculture Design team

WHEN YOU ARE WORKING with permaculture design, where do you start out? How do you sort through the myriad videos, books, online articles, magazines, courses, and opportunities? Are there designers in your area? What would having a design even mean? Is permaculture really the road to some sort of Shangri-La? A new Eden? The Emerald City? Understanding the design process and considering your goals carefully are the first two steps—and they are always worth a review.

Can the abundance and resilience of the ecosystems we tend foster new forms of culture which give back more than they take?

The yellow-brick road

When people ask me what permaculture is, I tell them: Permaculture is an ethical design process which reintegrates humans with the natural world. I worked pretty hard on that definition, and each word is packed with intention.

Ethical: Permaculture is based on the core ethics of care of the earth, care of people, care of the future (which is implied in the original formulation—Limits to Population and Consumption and Redistribution of Surplus). As an ethical process, or system, it is held to a different standard than other ecological design systems.

Design Process: or sometimes I use "System of Design." That means there is a process. Step one, two, three, and so on… a yellow brick road of investment of vision, time, energy, and skill which will lead to the best possible design within the given limits and available resources. Just like Dorothy, we can trust that staying on the path will help us reach our goals.

Reintegrates humans with the natural world: this implies we were integrated with the natural world in a way we are not now. It might be the biggest "elephant in the room" of which our modern culture never speaks. Of course our species was deeply adapted to the various environments of the globe. That is one of the most wonderful things about humans: our ability to adapt and survive and thrive in a wide range of habitats. This part of the definition suggests we can regain that right relationship with the other species of our planet and with each other.

This right relationship is what we are after. Can we live in

a way that meets our needs while also relying on regenerative materials and forms of energy sourced from people and practices which are regenerating the Earth? Can the abundance and resilience of the ecosystems we tend foster new forms of culture which give back more than they take?

At this point, I like to bring up the concept of the Fourth Ethic proposed by Jessi Bloom and Dave Boehnlein in *Practical Permaculture* and embraced by others: Transition Aware. I like to interpret that so we are aware of our own pace of adaptation and transition into the unknown future while cultivating compassion for others on their own journeys.

So, what is this step by step process? The design process starts and ends with our goals—insomuch as they are what we bring to the design. The client of the design is the one who has to live in and tend the space designed. They are responsible for the implementation and reap the rewards of the commitment to the land. **Goals articulation**, is followed by and included in the time period for observation of the landscape or project to be designed. Careful **observation** might take the longest period of time in combination with the next step: **analysis**. Permaculture design has some specific criteria and models for good research and an analysis: Yeoman's Scale of Permanence, sectors, and zones, for example. **Patterns** in nature and healthy cultural patterning can support the design process by showing us what is missing or giving us an element that can drive the health of the whole system. Layering these analyses on the previous elements helps us to move into the design phases: **concepts and detailed design**. The research into specifics, timelines, implementation techniques, and budgets brings the design process to a point of implementation. During **implementation**, feedback helps us learn and adapt the design to the very specific needs unfolding in the moment. After the initial design is complete, we can **evaluate** the success and learning to that point and then **tweak** and modify elements of the design as they emerge. We understand that *design is iterative, emergent, and unending*. If we've done well as designers, the core elements of the design might stand for a very long time or be renewed by future generations as worthy investments of their time, energy, and materials. I want to be the designer of that which will last hundreds of years in my mind—not five or fifteen.

We can be inspired by beautiful, but completely impractical, landscapes.

It is well worth investing in your project by hiring a designer. Their experience and insight will save you time, energy, and costly mistakes—well more than the cost of the design or the time it takes to complete the design.

Are we really heading to Oz?

Somewhere along the path, you will probably realize that with all that you are learning, your goals have changed! Hopefully, they deepen, and insights or intuitions you had about the project are borne out in the final design and implementation. In my experience, many people have an understandably naive impression of what their project might look like when it is installed. We can be inspired by beautiful, but completely impractical, landscape designs. Why are they impractical? Most often because they require inputs which do not fit with our ethics: herbicides and pesticides. The other limit is the time it takes to maintain many landscapes without using these chemical controls. I have seen some permaculture centers—though I don't know the models for every site—use interns and volunteers to create the landscapes that visitors admire. This is great as a learning tool, but I believe it misleads people about what they can accomplish if they have other obligations such as a full-time job.

Dorothy on her way to Oz. Starting out in permaculture can feel like starting out on the yellow brick road. Image: CBS Television Network. [Public domain]

From my own experience, I know that I not only tolerate,

but prefer, a wilder looking forest garden with many perennials as a strategy for production. This garden doesn't have high yields that I would see in intensively managed production beds, but it matches my aims for integration with nature while allowing me to get away with four to seven hours of maintenance per week from spring to fall. Last year, due to circumstance, I missed the spring planting season almost completely and still had something to harvest throughout the summer and into fall with almost no maintenance whatsoever. I will have more to do this year, but I appreciate nature's abundance and consider this proof of concept.

People often think that within a season or two, they will be providing 100% of their own food needs while also having an abundance of flawless produce for market. The flip side of this is holding on to high energy-use housing, vehicles, and fast, disposable tech without duly considering the cost—or Emergy accounting that David Holmgren describes (1).

We want to be working from sound design principles towards goals that are practical and exciting.

That's what permaculture seems to promise—that we can have it all. The Emerald City is full of flawless wonders. If we draw back the curtain on the wizard, we will find a slow and challenging start in our own learning curve. Our yields will vary. Pesky insects and birds and mammals will find their way to your system and take advantage of YOUR fruits. (Remember, the human footprint is limiting their habitat and you just created one—so learn to share at least some of your yield with them. Integrated pest management suggests 10-30% is pretty normal before responding with interventions.)

Despite the challenges to our vision, it is still important to take responsibility for how our food, energy, water, and infrastructure are supplied to us. You will probably find that doing so is empowering and even fun!

Determine your own adventure

Getting savvy about what it takes to provide for your household and your community within the environmental constraints of your landscape (which are changing quickly with climate change) are where the adventure is. If you are still holding onto designs that require hundreds of thousands of dollars to support your household, you might want to reconsider how your life choices could provide you with opportunities to invest less cash and increase your capacity to invest in time or relationships that provide your needs while also leading to greater satisfaction. Your life is your adventure!

I loved the choose-your-own-adventure books that were sold at my school's book fair every year. Looking through and considering the different choices that led to unexpected outcomes deepened my understanding of the consequences of our choices. Permaculture design can feel a lot like that. There isn't really a wrong set of goals—as long as they are moving within the realms of permaculture ethics—but taking time to really get in touch with your goals is important.

All this is to say that we want to be working from sound design principles in a community of people with experience and skill towards goals that are practical and exciting at the same time.

Working SMART-er, not harder

At this point, we've established how critical it is to set realistic and exciting goals that will keep you invested in your permaculture design while also making sure you stay flexible enough to adjust as new information becomes available. When we find we have to invest a great deal more time, money, materials, or energy into a situation—that's feedback that our goals have been off from the start. In working with new clients, I listen very carefully about what their goals are and match them to the limits I see in the landscape around me. With the conceptual and detailed design, I'm helping to shape their goals into the now-famous SMART goals: Specific, Measurable, Achievable, Realistic, and on a Timeline. Mirroring these goals back to the client in the conceptual design and detailed design reports helps us all understand how to proceed and what can likely be achieved during the implementation process. Hopefully, this leads us to easier maintenance, quicker yields, and more enjoyment of the system.

If you need some starts on setting your goals, check out the free introduction to permaculture course through the Great Lakes Permaculture Design Course (glpdc.info). Using the permaculture flower devised by David Holmgren (available at permacultureprinciples.org) can also give your some specific ideas about where your permaculture design goals could take you. Δ

Rhonda Baird is editor of this magazine, designs and facilitates permaculture design education through Sheltering Hills Design, LLC (shelteringhills.net) and Great Lakes Permaculture Design Collaborative (glpdc.info). She volunteers with various organizations including the Great Rivers and Lakes Permaculture Institute (greatriversandlakes.org) and the Permaculture Circle for Sociocracy for All (sofa.org/permaculture). You can reach her directly at rhonda@shelteringhills.net.

Resources

1. David Holmgren, *Permaculture: Principles and Pathways Beyond Sustainability,* 2002. Revised, 2017. Melliodora Publishing: Hepburn, Victoria, Australia. www.PermaculturePrinciples.com/

Plant Profiles: Let us introduce you to…

Hardy Kiwi: *Actinidia arguta*

Gloria Flora

Just The Facts

SAY: *Ak-tih-NID-ee-uh ar-GOO-tuh*

AKA: Chinese Gooseberry, Tara Vine, Bower Actinidia

DESCRIPTION: Woody, twining deciduous vine to 25'-30'. Vigorous perennial, bearing 1"+ ovoid, smooth-skinned kiwi fruit.

Dioecious (need at least 1 male plant for 1-8 female plants).

HARDINESS: Zone 4-9

FAMILY: *Actinidiaceae (ak-tin-id-ee-AY-see-ee)*

ORIGIN: Northern China

HEALTH BENEFITS: Protects against cancer, stroke, heart attack/disease, and helps control blood pressure.

WaldenEffect.org

Why we love this plant…

If you love the flavor of those well-known fuzzy brown kiwifruits *(Acitinidia deliciosa)*, you'll love the fruit of this hardy kiwi. Somewhat sweeter, juicy with no skin to peel—what's not to like? Eat fresh, add to fruit salad, make jam, juice, flavor kombucha, or freeze or dry for a taste treat through the winter. And they're high in vitamin C!

The vines grow vigorously, produce an abundance of pretty white flowers and have attractive bright green foliage on red petioles that turns a lovely, rich, warm yellow in the fall.

Annual pruning helps to shape and control the vines which require sturdy support while providing dappled shade.

Related Species

Arctic Beauty Kiwi *(A. kolomitka).* Zones 3-7, a striking smaller plant, produces smaller fruit but less needy of support, arching quite daintily in a shady garden. Leaves tend to be variegated with pink and white.

Hardy Kiwi "Ken's Red" *(A.mellanandra x A. purpurea)* produces small reddish fruits on hardy vines, can also be pollinated by male *A. arguta* but may affect fruit color. Zones 5-9.

Silver Vine Kiwi *(A. polygama)* Just as hardy, this 8-10' vine tolerates partial shade. Young leaves are silvery, and its orange fruit is 2+". Zones 3-8.

All require a male of the same species to produce fruit!

Cultivation & Care

SITING: People's experience with growing kiwis seem to vary depending greatly on site conditions. Early emergence can lead to spring frost bite, so full south exposure isn't recommended. Wild swings in winter temperatures can stunt growth. Most species enjoy a lot of light, but Artic Beauty prefers partial shade. All young kiwis are sensitive, so protect them!
SOILS: Well-drained soils are a must while water needs are moderate. Acid-leaning soils are preferred, and don't overdo the fertilizer.
POLLINATION: Keep your male within 35' of the girls. Wind, honeybees, and insects aid in pollination. The flowers are small but showy on both sexes. Flowers are born on the bottom portion of shoots from last year's canes.
CULTIVATION: All but Arctic Beauty require sturdy supplemental support. Tradition calls for pruning to a horizontal trellis, but imagination can be used to suit your site. Pruning in late winter before buds swell is best but further control can be had with summer pruning. First fruits appear in 3-8 years. Plants are readily propagated by cuttings.
PESTS: Pest problems are few but leaf eaters (snails, slugs, Japanese beetles) can be problematic for young plants.
HARVEST: Production can range from 20 to 200+ pounds per plant. Harvest, then allow to soften and sweeten for a week. Cool fruit will keep two months. Freezing works if you eat the fruit semi-frozen. Δ

This is an initial offering in plant profiles by Gloria Flora. Let us know which plants you'd like to learn more about. We'll be happy to share and improve the profiles. You can send us feedback at:
publisher@permaculturedesignmagazine.com.

Actinidia arguta *'Tatyana'—three years old. Zone 6a. Photo by G. Flora.*

Hardy kiwi is featured in

Agroforestry News Vol. 1, No. 4

available from our web store ($8 postage paid to US)

The Whole Animal

Laura Killingbeck

LAST FALL, I WAS SITTING at the table chopping pumpkins, when Shaun mentioned we had two sheep to slaughter. He had found a company online that would teach us how to do it. He opened his laptop and read the website's description out loud:

No matter what your experience level, we will show you and those you invite (all ages welcome!) all aspects of this oldest human profession... If you value your animal's companionship, and the gift of their body, consider being involved! We recognize that it is challenging to be present for the death of the animals you care for. We will confidently guide you through this process in a respectful context of connection and gratitude....

It was a business called Ape and Ape, run by a person who traveled around New England, teaching people how to slaughter their farm animals, butcher them, and use all the parts. I was intrigued by how it united the emotional aspect of caring for animals with the practical skills of processing those same animals into meat.

"Well, the price is reasonable," continued Shaun.

"They sound perfect," I said.

Farm life

Shaun and I work at Round the Bend Farm Center for Restorative Community, a nonprofit working farm that collaborates with an array of "agriprenuers"—entrepreneurs with businesses that utilize regenerative practices. The farm and its agriprenuers produce organic vegetables, pastured meats, honey, and herbs; provide an animal-powered weed removal service ("goat-scaping"); educational services; and more.

Farm agripreneur Paradox Acres produces meat that goes to a USDA-approved slaughterhouse. But meat for our own consumption doesn't have to be USDA-certified, so we also slaughter chickens and ducks for home use. Because it was our first time slaughtering sheep, we decided to hire Ape and Ape to take us through the process step by step.

Ape and Ape

A few days later, Ape and Ape director Felix Lufkin knocked on the farmhouse door. He arrived with his friend Violet, who came along "for the meat." They were both friendly and relaxed, and seemed genuinely excited to share the experience of farm life with us. Myself, Shaun, and our teammate Hannah walked outside with them to the car. Felix opened up the trunk to show us a bowl of congealed blood and two pizza boxes full of organs.

"We did two pigs today, and they didn't want the hearts and stuff," Violet explained. For her, this was a fabulous windfall.

We drove down to the barn, and Felix went over our schedule. We would start with a "meet and greet" with the sheep, then circle up to center ourselves. Afterwards we'd take the sheep to the slaughter spot, slit their throats, hang the bodies in the barn to gut, and then bring the carcasses to the kitchen for butchering. His voice was friendly and calm, and I liked the way he went over everything ahead of time.

We all walked into the barn. The two sheep stood in their pen, munching hay. Felix crouched down, put his face against the wooden slats, and breathed loudly in and out. Then we went outside and stood in a circle. Felix had us spread our legs and bend our knees and think about the sheep. I watched Violet close her eyes, her face fully concentrated, engaged.

"We give gratitude to the stars and the sun, which created the Earth and make life possible. Floating on a living, lava planet, a living layer of rock and soil supports us, as thin as the skin compared to an apple. Let's give thanks to the sheep, their lives here on the farm, the grass that fed them, and the sky and water we both share.""

We spent a few minutes remembering the parts of all the things in the world and how they related to the sheep and ourselves. Then he asked us which parts of the bodies we wanted to keep, and which ones we didn't, so we could put those in a pile for Violet.

"The fat?" he asked. "The organs? The blood? The blood is sooooo good in brownies."

We decided on all the meat and bones, and some of the fat and organs. We'd render the fat into tallow, cook the bones into stock, and tan the hides. In the past, we've also used liver for pate, and other organ meats in soups and stir-fries, but being quite busy that week and Violet being so eager, we gave those parts to her. Almost every piece of the animals was spoken for.

Sheep graze at Round the Bend Farm. Credit Laura Killingbeck.

From animal to body

Shaun led the first sheep to the grass, and Felix showed Hannah how to pull it gently onto its side. The sheep kicked a little, so Felix laid on top of it, embracing it with his arms and chest until the animal calmed. He talked gently to it and rubbed its coat with his hands. Then he put a bowl under the neck for blood, and gripped the head gently, exposing the throat. Violet held a long knife and kneeled by the sheep. She thanked the sheep and sliced the throat with the knife. The neck opened wide, and the blood gushed into the bowl. It happened very quickly.

Experiencing our role in the cycle of life helps us to care more, not less, about the animals we eat.

Hannah and Shaun took the truck up to get the second sheep, while Felix, Violet, and I cleared a place in the barn to hang the animals. Violet offered me some homemade lemon balm tincture she happened to have in her pocket.

Killing an animal, especially a large mammal that you know, is always a meaningful experience. I've killed quite a few animals over the last few years—lots of old laying hens, rabbits, a goose, woodchucks, opossum, goats. I teach interns and volunteers how to humanely slaughter chickens by dislocating the vertebrae and severing the carotid artery quickly in their hands.

The first time I killed an animal for food was terrifying, as was the second time, and third, and fourth. My hands would shake as I picked up the animal or the knife, and I would question myself, "Can I do this? Should I do this?" In all of those early cases, I had volunteered to do the slaughter because I felt it necessary—personally necessary to take responsibility for the full circle of life when I ate meat; necessary to give the animal a quick and humane death; and necessary from a practical level. If you live on a farm and have laying hens or dairy goats, you will need to do something with the hens when they stop laying, and the male kid goats that will never give milk. It's just a part of the process. I believe that if we care for animals in life, we must also care for them in death, and that humane slaughter is a part of how we care for the animals we raise for meat.

Even though I have more practice with this now, in moments before slaughtering an animal, I am still very aware of the process—my heart rate increases, and my skin becomes more sensitive. I still question myself about what I will do and why. But I do this calmly, and in advance.

To slaughter an animal humanely, you need to have the right tools and know how to use them. And especially for animals you know and care about, you also need to engage emotionally in the process before you start. You need to make the cognitive and emotional decision to do it, before you ever pick up the knife or the animal. Once you pick up the knife, you cannot have any doubt, or you risk cutting too lightly. You need to know what you are doing and why, and this gives both the animal and the person the most humane experience.

For the second sheep, we repeated the process as Felix had showed us. Hannah braced the body, Felix pulled back the head, and this time I kneeled and slit the throat wide with the knife.

We hauled the bodies to the barn. Felix and Violet skinned the legs with sharp knives, and we hung the half-skinned animal from a hanger to gut. Felix and Violet moved quickly and talked about their connection with the animals, and the skill of gutting. Felix started removing body parts and explaining their uses—the tail for soup, the feet baked for the dog to crunch, the fat to render, the tongue—did we want the tongue? As he removed organs and flesh, I was struck, as always, by the vivid colors and shapes—the organs were simply beautiful.

Laura Killingbeck shows students how to humanely slaughter a chicken. Credit Desa Vanlaarhoven.

Geoff Kinder feeds Paradox Acres cattle at Round the Bend Farm. Credit Laura Killingbeck.

It was cold in the barn, and the sun had gone down, so Hannah moved a big cylindrical lamp closer to where we worked. At one point Felix was so engrossed in the animal that he told us to tilt the body "a little closer to the sun," meaning toward the lamp. I was only a couple feet away from him, but still when he tossed a piece of entrails toward a bucket, he missed entirely and it landed on my arm.

"Oh," he said, and I brushed it off.

Felix had lots of tools, including knives, a mallet, and a saw. He handed us different things to hold, or told us to cut a slit here or there, or help roll down the pelt. The lungs were large, like how I would imagine human lungs to be, and coral pink. Felix paused and gave us a look, then lifted the lungs away from the carcass, raised them to his mouth, and blew into the sawed-off trachea. They inflated like a balloon. He lowered them, spitting on the ground, and they immediately deflated.

"But," he said, excited, holding up the pink blobs, "But they are not hollow!"

We peered over and examined the tissue, full and delicate and entirely whole. It was a mass of intricate passages to catch and release gas. All of the parts of the animal were beautiful, but the lungs especially were both art and magic trick.

Meat

Eventually, the sheep disappeared and were replaced by piles of body parts. Plastic bags with organs and fat; a wheelbarrow of compostable intestines; and two bodies split lengthwise with a hand saw. By then the bowls of blood had fully congealed to jiggly crimson jello.

We put the four sheep halves in the back of the truck, and Hannah drove the tractor with the intestines out to the compost pile to bury, while Shaun put away the sheep halters. Violet and Felix and I cleaned up the barn and waited by the truck with the sheep parts. Standing in the dark, the truck bed full of flesh, we talked about books. I asked Violet how she had gotten into all this.

"For me," said Violet, "it was a book called Stalking the Wild Asparagus. That book was so great. I read it, and it seared this place inside my heart forever."

She smiled, and it struck me that here she was, a young woman on a Friday night, collecting organs and talking about the heart. How many social boundaries did she have to cross, to spend the evening connecting with the most ancient of life cycles, instead of staring glassy-eyed at a smartphone? On a personal level, this presence and participation had to be a good thing.

When I was in high school, books also drew me into the world of wilderness and the existential. I loved reading about explorers, farmers, and people who lived off the land. I remember a book about a boy who ran away to live in a hollow tree, and a story about a guy who hunted and gathered along the Appalachian Trail. Those stories broke apart my ideas about what life had to be like and about, and drew me to explore nature and food.

Now I'm in my early 30s, and I often hear people say, "Oh, I couldn't do that!" when it comes to animal slaughter. Usually these same people are happy to pay someone else to do the slaughter, so they can eat the flesh afterwards. I find this intriguing, because either it means that they don't think they can physically acquire the skills to do the slaughter, or it means they believe there will be some insurmountable emotional consequence. I think in most cases it's a question of how they feel as a human more than a question of the fate of the animal.

I don't think that everyone has to personally kill animals

Tallow rendered from Paradox Acres beef at Round the Bend Farm. Credit Laura Killingbeck.

to eat, or should. But I do think that farming, growing food, and participating in the care, life, and death of the animals we eat, satisfies not just a primal physical urge, but also an important emotional engagement with the life cycle we are tangled up in. I believe that experiencing our role in this cycle helps us to care more, not less, about the animals we eat. Is it really that out of place, to think about food in the biggest of big pictures, to consider it fully, and participate in the cycle? Is it "inhumane" to draw the knife, swiftly and calmly, instead of hiring someone at a crowded slaughterhouse to do a similar act in a less personal way?

When Hannah and Shaun returned, we drove over to the kitchen, where we cut and sawed the sheep halves into usable parts—legs, ribs, bones—and put the pieces in plastic bags. Once it was all divided up, it looked like meat instead of a body, and fit neatly into a few five-gallon buckets.

Felix and Violet packed up their knives and said some parting words about the value of organs. Before driving away, Violet sadly dropped the bowl of congealed blood, which broke apart on the ground like thin jello. She scooped the best pieces back into the bowl to take home.

Hannah and Shaun and I were left in the kitchen. My sweater sleeves were covered in dried blood. We looked at each other.

"I can't stop thinking about lava!" I said, remembering our pre-slaughter gratitude circle that included giving thanks to the Earth's core.

Shaun nodded and stored the meat in the freezer. Δ

References

Gibbons, Euell. *Stalking the Wild Asparagus.* New York: David McKay (1964).

Laura has nine years experience developing farm-to-table food systems in both tropical and temperate climates. When she isn't immersed in food education and seasonal planning, you may (or may not!) be able to find her deep in the forest, hiking, biking, and foraging for berries. Follow her reflections on body, place, food, and motion on Instagram @ laurakillingbeck. For on-site butchering services in New England, contact Ape and Ape at www.apeandape.com. Special thanks to Round The Bend Farm Center for Restorative Community (www.roundthebendfarm.org) and Choza Del Mundo for supporting this and other articles.

Reviews

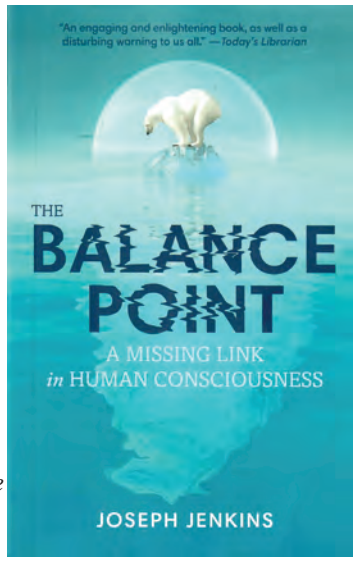
Long Strange Trip

Review by John Wages

Joseph Jenkins

The Balance Point: A Missing Link in Human Consciousness

Joseph Jenkins Inc., Distributed by Chelsea Green Publishing. White River Jct., VT. 2018.
341 pp. Softcover. $14.95



Most of us recognize Joseph Jenkins as the author of *The Humanure Handbook.* Jenkins also gave us *The Slate Roof Bible* and is an authority on slate roofing technology. Now, he gifts us with a work of fiction, in the tradition of *Ecotopia* and *Ishmael,* with a pinch of Carlos Castaneda, in *The Balance Point.*

The narrator, whom we might presume to be Jenkins, goes on a journey in search of an inheritance left by a mysterious aunt he barely knew. But his mission and the legacy of his aunt turn out to be far more significant than her estate—no less than saving the planet and humanity as well. This reviewer might add that there's nothing new here for those of us who have already taken this particular voyage, but Jenkins presents compelling truths in a new and entertaining way. Old truths told in a new way—this is important.

Ego is real. Our physical needs are real. But eco is also real—there are limits to consumption. Not only are there limits to how much we can consume, but also there are limits to how much real benefit and satisfaction can come from amassing physical goods, whether food, clothing, and shelter, or sports cars, MacMansions, and 100-ft. yachts. Each one of us travels the same journey, and it's a pilgrimage toward self-awareness. We begin as extremely selfish and temperamental infants, before learning to temper the tantrums of the id with the more modest ego. Jenkins posits that we must move beyond this journey of self-awareness to a state of "selfless awareness." We must learn to balance our needs and our wants. In that balance lies "spiritual" fulfillment. Redefining "spirituality" is extremely important for those of us who look for reason, evidence, and rationale.

What makes Earth unique? Life—well maybe, but probably not. It's "this particular kind of life," where we can have possums without tails. Nowhere else in the universe are there possums without tails. You did know that, didn't you? And honeybees—what peculiar congruence of environments and genetics could render a planet replete with honeybees?

Reading this small book, I was struck by its spiritual message, which resonated with my own concerns about the real vs. the imaginary and the virtual. What is spirit? Read on for a new and very practical definition. What is real? The Earth Mother and The Great Mystery are real. Plant helpers, sacred plants that open our consciousness, are real. Rituals and incantations are suspect. Tradition and technology have led to our current impasse, and both are suspect.

In my reading, I found no mention of permaculture by name, although the essence of Jenkins' book is the achievement of Mollison and Holmgren: a permanent and enduring culture that could make Earth happy to host a species like *sapiens.* Far from where we are at this moment, the vision is compelling. A mark of good writing is that even this skeptical reader suspended disbelief for a few pages. In this case, it was rather amazing. With witches and Wicca in these pages, there seemed to be just the right amount of hocus pocus for a sort of narrative hormesis. Photos (yes, photographs) contributed to this effect. Δ

Life in Design with Max Lindegger

Annaliese Hordern & Delvin Solkinson

OUR PLANETARY permaculture pilgrimage led us across a blue sky day in the dry subtropics of Queensland, Australia to Crystal Waters Eco Village and Community Cooperative. We traveled to the village green where the monthly markets occur, bordered by natural buildings that house a baker, two cafes, community mailboxes, and a multi-purpose community meeting space. More than 30 years old and designed with permaculture principles, this 260-acre site demonstrates the practical possibilities of permaculture and intentional community.

Max Lindegger arrived from picking nuts in the orchard. He turned 70 this year but still has energy to travel and teach. A mechanical engineer and designer with experience in civil engineering, Max has been farming since he was very young, growing up milking cows, making honey, and spreading manure. His early mentor, Reinhard Schneider in Switzerland was working with the future in mind by leaving the land better than he found it. As an adult, Max was involved in the global Ecovillage movement from the beginning, including many projects and some crisis situations. We were joyed to receive some stories and reflections of his life in design…

When I was traveling eight months a year and teaching around the world, I was always still spending time in the garden. This gave me a spiritual connection. I met Bill Mollison in 1976. He was absolutely amazing, somebody who could capture students' attention and encourage them to find out more. He taught us that part of education is learning how to act.

Decent design is based on good observation. I initially spent nine months with Robert Tap wandering around the site that would become Crystal Waters Eco Village. We walked in rain and shine, during day and night. I think you could still drop me off pretty much anywhere around here, and I'll find my way home. We spent nine months taking notes as we observed the site, this included consultation with people who lived in the area including Aboriginal Affairs. Practicing permaculture, like being a mother, father, or beekeeper, turns you into a better observer. When the owner of the land, Bob Sample, came in March 1985, he said we need two things; a legal organization so we can have as many people living on the land as possible, and a land use plan. The initial restrictions included lack of finance. When we gave our first presentation to the local government, they responded by saying "What you want to do is illegal. What you want to do is impossible."

We had no model to work from, so we had a clean canvas, but we also had nobody to follow. The design process began with a number of guiding principles and themes. Caring for the land is the most important. The land becomes the boss. Clean water and clean air is needed. This is something we already had at Crystal Waters, so we have a responsibility to keep it clean. It's important to test and treat water. Access to sunlight, forest, and running water helps. The ability to participate in community means people may choose to be hermits, but they don't have to be lonely. There are a lot of opportunities for being social. Freedom of Religion means more than just a tolerance, it's sharing in different traditions.

Working in more than 60 countries, I learned about the importance of Security of Tenure in Bangladesh. I went to a slum area which was orderly and clean. It was very basic, but the people were organized. Next, I went to a slum that was a mess. There was a big difference. For the first slum, the government did not put in water or houses but said the people could stay there as long as they wanted. For the second slum, the government put in services but said they were going to take the land back and put a highway through the property in the future at some point.

I am naturally a shy person and never wanted to become a teacher. I was thrown in the deep end by Bill Mollison, so I learned how to survive in that environment. I started teaching permaculture in 1981, and the need is no less now than it was 20 years ago. Teachers need to have an example of something to show. Bill Mollison was a brilliant teacher. He once said to me, "Don't try and teach something if you can't mention an example, or an anecdote, or a joke, or tell a story".

Education is a key in design. The permaculture ethics of care for the land and care for people are always in the back of my mind. Everyone should learn to become a better listener, to be able to read a report and respond to it, and have basic public speaking skills. In design education, I would like to see more focus on design, environment, and soft engineering like how to design a dam or road.

I taught an Ecovillage Design course which was four months long and one that was six weeks long. The cost to feed and house participants made it financially difficult. In the morning, we had theory but it often took place in the field. The afternoon was hands-on, including planting seeds, repotting seedings, collecting plant cuttings, and learning to graft. It's important for teachers to live by example and share skills. Good teachers can encourage people to immerse themselves in learning. Everyone has a responsibility to try to pass on as much as possible what they have learned.

We have shared profoundly meaningful times taking planetary permaculture pilgrimages to learn from, and interview, pioneers of the movement. Our journeys have been driven by the design of our questions. For the reader, we ask

What have you learned that you could share more of?

What article or blog would you write about a class you took?

What would you like to learn more about?

Who can teach and mentor you more?

How can you contribute to the permaculture movement in your local human and ecological community?

Max Lindegger is a designer of ecological communities and sustainable systems of international repute. He is a respected and sought-after teacher in the disciplines of sustainable systems. His reputation is born of 20 years of hands on experience and leadership in the design and implementation of practical, workable solutions to the challenges of sustainability. As the creator and Director of the Oceania/Asia secretariat of the Global Ecovillage Network, Max participates in and contributes to the international flow of current thinking and best practice in the fields of sustainable systems design and education. He lives with his wife Trudi at Crystal Waters. www.crystalwaters.org.au

Max Lindegger and Annaliese Hordern teach a PDC at Crystal Waters Eco Village with a strong focus at the Eco Community level. www.symbioticnature.com.au

Delvin Solkinson teaches at CoSM Chapel of Sacred Mirrors in New York (www.cosm.org) while creating free open source learning and teaching tools. www.dewpermaculture.com

Casting seeds into the future
Mini-reviews by John Wages

AKIVA SILVER
Trees of Power: Ten Essential Arboreal Allies

Chelsea Green, White River Jct., VT (2019)
260 pp. Paperback. $24.95

I like this small book for the way it introduces some basic tree-related skills, then focuses in close on ten highly useful tree species. If you live in temperate regions, you can likely grow all or almost all of these trees, from our temperate-zone breadfruits, the chestnut and hazelnut, to the ultra-productive mulberry. Just perusing these chapters distracted me from this review, as I decided to coppice some ash before they leafed out, and order some everbearing mulberries. Granted, it's a short book and a short list (where are figs? and the oaks? There may be a sequel... or two or three.), but you'll find enough inspiration to keep busy for a while.

Covered in short, concise form are planting and propagation techniques, including cuttings, seed, grafting, and layering. The chapters on individual trees include tips on the best propagation methods.

Particularly good are the chapters on ash *(Fraxinus spp)* and black locust. Ash coppices well and can provide ample firewood in mild climates. Coppiced regularly, the trees live longer, and the small-to-medium diameter wood does not have to be split. While the writer spends a bit of time discussing the emerald ash borer, and this may be a serious concern in the North, the borer has not yet made it into the South except in isolated pockets, and as far as I can tell, is not in my area at all. Along with Eastern red cedar *(Juniperus virginiana),* the ash is the most resilient tree on my farm. These vanguards of restoration are the first to sprout in an unmowed field. Maybe the borer will change all that. I hope not. Aside from firewood, ash is ideal for higher-value uses like tool handles. In this chapter, the writer shares with us his childhood memory of a giant ash on a creek bank, whose roots were undercut by the creek to create a kid-size cave. Memories like that anchor us to the natural world, and people who grow up without them can never understand what they've missed.

Black locust *(Robinia pseudoacacia)* is another especially useful ally, mainly because of its legendary rot-resistant wood. As a nitrogen-fixer and fast-grower, black locust is good to plant where worn-out ground needs to be restored. Beware, however, of root suckering and rampant naturalization (aka invasiveness), although I haven't seen anything like that around here. Perhaps the locust borer keeps them just weak enough that they don't spread as vigorously here. I see the swellings on some of the branches that indicate borers, but the trees seem healthy enough. Black locust grows readily from seed, yielding posts and pieces of high-quality firewood in just a few years. They're also beautiful trees when in bloom and when not in bloom, due to their pleasing form—much like their namesakes, the acacias.

While there is much indeed to bemoan in the destruction of our world and ever-encroaching urbanization, Silver exhorts us to see the barren ground as waiting for seeds. Cast some black locust seeds through your nearest portal into the future. Who knows what yields may be waiting in a few years, when you get there. Δ

GLENNIE KINDRED
Walking with Trees

Permanent Pub.. East Meon, UK (2019)
269 pp. Paperback. $19.95

Amazingly, the only overlap between Akiva Silver's book and Walking with Trees is beech, crabapple, elder, and hazel. Clearly written for Britain, this is still quite useful to the North American reader. In contrast with the former, this book emphasizes traditional uses and spiritual viewpoints of the covered species.

Willow gets its 15 minutes of fame here, and astounds us with its myriad uses. Soft, bendable willow is perfect for basketmaking.

Kindred introduces us to the Celtic/druidic Tree Ogham system. Each tree has a name and a symbol, with associated signature qualities and uses. For example, willow is associated with wisdom. Why? I'm not sure there is a "why," but that's fine. Not everything has to have a logical explanation. The writer shares with us how to make a set of Ogham staves, which are a collection of wood from each tree. This could be an instructive exercise for children (and others) to open their hearts and minds to the species of trees in their community.

Walking with Trees covers 13 trees (species and genera), uses and folklore. Lots to learn and think about in these pages. Δ

EVENTS

Permaculture Design Course
Online

Dates: Ongoing

Description: Our course is the classic, official 72-hour Permaculture Design Certificate Course (PDC) as taught by the founders of permaculture.

The full Permaculture Design Course (PDC) is a 72- hour intensive program. This course involves study modules supported by practical exercises, fieldwork and videos.

Instructors: Dr. Alan Enzo, Jessica Enzo, Art Freeman, Ben Bishop

Cost: $550

Contact: info@PermacultureEducation.com, PermacultureEducation.com

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Permaculture Design Course
Orcas Island, WA

Dates: July 13–27

Location: Bullock's Permaculture Homestead

Description: A two-week design course on the Bullock's 35 year-old permaculture homestead. Well over 100 hours of classroom and hands-on education including design methodologies, observation skill-building, whole systems design, annual and perennial foods, water/energy/waste management, appropriate construction, plant propagation and culture, fertility, aquaculture, and more. Includes a copy of Practical Permaculture by Bloom and Boehnlein.

Instructors: Douglas & Samuel Bullock, John Valenzuela, Dave Boehnlein, & more.

Cost: $1,535, camping and meals provided.

Contact: Dave Boehnlein
360-840-8483
info@permacultureportal.com
permacultureportal.com

Syntropic Farming Course
Costa Rica

Dates: June 23-28

Location: Mastatal, Costa Rica

Description: Syntropic Farming is a farming revolution grown out of Brazil and made famous by Ernst Gotsch and the Life in Syntropy short documentary. Syntropic Farming seeks to cultivate resilient ecosystems that are abundant, financially viable and heal abused land. This results in abundant systems which grow healthy soils, sequester carbon, produce a diverse array of yields, regenerate the ecosystem and that don't require long term external inputs. Syntropic Farming is a holistic approach, working with nature's processes.

This class will leave students with examples of how syn-tropical agriculture is applied to vegetable, fruit, grain, and livestock farming and how these are incorporated into agroforestry systems. The class includes a hands-on component.

Instructors: Fernando Rebello and Thiago Barbosa

Cost: Central Americans: $500, Other $800

Contact: info@ranchomastatal.com
ranchomastatal.com

Introduction Workshop
Orcas Island, WA

Dates: May 24–26

Location: Bullock's Homestead

Description: Tour, lecture, hand-on projects, presentations, group discussion, and networking. We will cover Permaculture design theory & practice, forest gardening, perennial food systems, plant propagation, efficient water & energy systems, fertility management - beneficial plants/healthy soils, and ecological systems as a model for human communities.

Instructors: Douglas & Samuel Bullock, Dave Boehnlein

Cost: $200, camping and meals

Contact: Dave Boehnlein
360-840-8483
info@permacultureportal.com
permacultureportal.com

Permaculture Design Course
Ireland

Dates: July 13–22 (also Aug. 2-11)

Location: Cloughjordan Ecovillage, Tipperary, Ireland

Description: Practical skills for horticulture, farming, enterprise, green building, perma-facture, collaboration, social innovation and community resilience. This 10-day Permaculture Design Certificate Course is organised by Cultivate and hosted in association with Cloughjordan Community Farm and is accredited by the UK Permaculture Association. The setting for this immersive course is Cloughjordan Ecovillage, one of Ireland's leading examples of an ecosystem of innovation - it includes over 50 eco-homes, community woodlands, renewable energy production, a wood-fired bakery, research gardens and a community farm.

Instructors: Scott Gallant, Rachel Jackson, Laura Killingbeck, Alejandro Arango, Durga

Cost: C€495 (approximately $610) before April 15th 2019 | €550 (approx. $680) after

Contact: cultivate.ie
pdc@cultivate.ie
+353 505 56060

Permaculture Design Course
Washington

Dates: July 2-16

Location: Skalitude Retreat Center

Description: In this course, hosted by the not-for-profit Skalitude Pollinator Sanctuary Project, we will learn how to design productive life-support systems that both mimic and work in collaboration with Natural ecological systems.

We will explore what a collaboration with communities of plants, animals and humans (with some emphasis on the role of pollinators) that live together in a respectful, sustainable and abundant manner.

This Course will teach how to create settings and construct ecosystems that have the diversity, stability, and the resilience of natural ecosystems.

This 14-day comprehensive also presents the unique opportunity to learn to tune into the Intelligence of Nature, in a beautiful and wild surrounding in its many manifestations.

Instructors: Michael Pilarski and guests

Contact: 360-643-9178
friendsofthetrees@yahoo.com
www.friendsofthetrees.net

Send Event and Calendar Listings for Issue #113

(August 2019)

Stocking Up

by the June 1st deadline

events@permaculturedesignmagazine.com

Permaculture Design Course

California

Dates: July 20-August 2
Location: Occidental Arts & Eco. Ctr., Occidental, CA
Description: Spend two weeks living with us in one of the nation's best examples of a working permaculture site that is set up as a holistic, well-functioning organism at every level. Immerse yourself in regenerative thinking at one of the oldest and most beautiful permaculture centers in the west.

- Interact with a wide array of permaculture systems in action: grey water, roof water catchment, composting toilets, erosion control, seed bank, food forests and biointensive gardents, natural building, wildlands restoration, and much more
- Participants create a real design project for a local community group
- Experience a functioning intentional community at OAEC and learn skills to facilitate group process & democratic decision-making
- 100 hours of course time including hands-on activities & visits to local permaculture sites. Upon completion, students receive a Certificate of Permaculture Design, authorized by PINA.

Instructors: Brock Dolman, Kendall Dunnigan
Cost: $1,600 ($1,700 within 30 days of course date)
Contact: OAEC.org/permaculture

Social Permaculture & Community Building

California

Dates: November 22-24
Location: Sivananda Yoga Farm, Grass Valley, CA
Description: This workshop will look beyond the ways we grow our food, access water, build shelter, and tend to ecology to see how permaculture can also guide us in relating with one another and building community as we reclaim our lives and translate personal healing into collective healing.
Instructors: Ryan Rising, Colin Eldridge
Cost: $160 plus accommodations
Contact: yogafarmregistration@sivananda.org, 530-272-9322
yogafarm.org

Colorado

Central Rocky Mountain Pc Inst.

Contact: Jerome Osentowski
jerome@crmpi.org
crmpi.org

Weekend Forest Gardening and Greenhouse Workshop

Dates: May 25-26, June 15-16
Description: This workshop offers hands-on instruction in forest gardening and high-altitude, low energy use, and low-cost greenhouse design, installation and maintenance. Taught by Jerome Osentowski, we will cover topics such as: soil building, vermiculture, compost tea, sheet mulching, cultivating your soil food web, companion planting, Integrated Pest Management, medicinal and culinary understories, near net-zero energy use greenhouse design and materials, greenhouse maintenance and management, climate battery technology, passive heating and cooling techniques, and more!
Instructors: Jerome Osentowski, Michael Thompson, Vanessa Harmony, Stephanie Syson

Permaculture Academy

Dates: August 17-25
Description: The Permaculture Academy is a hands-on, immersive, in-depth permaculture education, designed to go further into the concepts of forest gardening (4 days) and greenhouse design and management (4 days). The forest gardening section is taught in CRMPI's 32-year-old forest garden, with established examples of each course topic.

The greenhouse section covers considerations for designing, building, planting, and much more Students may sign up for one or both sections.

Instructors: Jerome Osentowski, Vanessa Harmony, Stephanie Syson, Avery Ellis
Cost: $1,400

32nd Annual

Permaculture Design Course

Dates: July 15-27
Description: Come join experienced permaculture teacher, author, and designer, Jerome Osentowski, at his 32-year-old permaculture forest garden homestead in the mountains of Colorado for an immersive and life-changing two-week-long permaculture course.

Students will have the opportunity to experience first hand the long term outcomes of design concepts they will learn in the course, gain experience with new innovative greenhouse technologies, and become intimately familiar with the near-closed system of CRMPI.

Instructors: Jerome Osentowski, Vanessa Harmony, Stephanie Syson, Adam Brock, Avery Ellis, Creighton Hofeditz
Cost: $1,875

Permaculture Teacher Training

Oregon

Dates: July 27-August 2
Location: Aprevecho Sustain. Ctr., Cottage Grove, OR
Description: The course is a great fit for Permaculture Design Course graduates of all skill levels, as well as professional teachers who want to expand and fine-tune their Permaculture knowledge. We welcome community activists, designers, homesteaders and anyone who wishes to share about integrated systems.
Prerequisite: PDC certificate or instructor approval.
Instructors: Jude Hobbs
Contact: infocascadiapc@gmail.com
541-342-1160

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Permaculture Design Course
North Carolina

Dates: September 11 - 22 with optional Oct. 5th presentation day
Location: Weaverville, NC
Description: Wild Abundance's Permaculture Design Course empowers students to become effective ecological designers, using the tools and knowledge needed to integrate permaculture into every landscape. We follow the PINA curriculum, adding more time to aspects that we find especially compelling and putting some extra emphasis on design for the South. We'll cover principles of ecology; forest guilds; reading the land and observing patterns; plant identification; climates, biogeography and microclimates; understanding zone and sectors; mapping; plant succession; holistic forestry and orcharding; conservation, waste and recycling strategies; human nutrition; social ecology; urban farm tour; economics; and client relations and interviews.
This class is appropriate for those interested in pursuing a career in permaculture design, as well as those who want to learn how to apply Earth-inspired philosophies in their own lives. All students will cultivate a deep engagement with the natural and human systems of which they are an integral part. Students who complete the course (and submit thoughtful designs and presentations) will receive their Permaculture Design Certification. Located near Asheville, NC.

Instructors: Natalie Bogwalker, Laura Ruby, Becky Beyer, Ben Falk, Cailen Campbell, Eric Toensmeier
Cost: Early Bird Price (until June 19, 2019): $1,079 without/$1,379 with catered meal
Regular Price: $1,149 without/$1,449 with catered meals
Contact: www.wildabundance.net, (828) 775-7052 admin@wildabundance.net

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Permaculture Design Course
Pennsylvania

Dates: Alternating weekends beginning August 24, 2019
Location: Hundred Fruit Farm, New Hope, PA
Description: This course will be offered as a weekend course designed for local residents who don't have time to take an intensive two-week PDC. This course will be mostly classroom-based but will also include hands-on components. It will go through the basics of permaculture design relating to different climates, energy, natural building, the global climate, social systems, and more.

This course is aimed at anyone who wants to live a more sustainable lifestyle, bring more meaning into their lives, build a stronger community, and/or work towards an ecologically responsible future. This course is also ideal for backyard gardeners, homeowners, landscapers and landscape designers, teachers/educators, farmers, community organizers, nonprofit workers, orchardists, horticulturalists, students, etc.

Adam Dusen is the main teacher and facilitator for the course, and divides his time between running Hundred Fruit Farm and doing professional permaculture designs for clients throughout the mid-Atlantic and internationally. Adam also helps manage the Panya Project, a permaculture educator center in Thailand, and previously served as the Permaculture Farm Manager and Teacher at The Island School in The Bahamas.

Contact: HundredFruitFarm.com/pdc
Cost: $575 before 6/1/19; $650 after 6/1/19

Earthskills and Permaculture Immersion
North Carolina

Dates: April - November (one 3-day weekend per month)
Instructors: Natalie Bogwalker, Laura Ruby, Ben Falk, Eric Toensmeier, and others.
Location: Wild Abundance, near Asheville, NC
Description: This immersive program goes way beyond the traditional 72-hour PDC. In it, we include over 100 hours of additional classes and instruction on important Earth-based living skills. These subjects support and complement the traditional permaculture curriculum. They include: foraging for food and medicine, friction fire, natural building, community dynamics and communication, preparing for catastrophe, human nutrition, homestead economics, and much more. Students and teachers build lasting bonds in this immersive class, which meets for one long-weekend every month for the entire growing season, from April - November. Get your permaculture design certificate and so much more.
Contact: Admin@wildabundance.net, Asheville Earthskills PDC

Permaculture Apprenticeship
North Carolina

Dates: April - November (3, 4, and 9 month options)
Instructors: Natalie Bogwalker, Frank Salzano, Laura Ruby, Ben Falk, Eric Toensmeier, and more.
Location: Wild Abundance, near Asheville, NC
Description: Live and learn at the heart of Asheville's permaculture and homesteading revolution. The program includes small group instruction, one-on-one mentorship time, facilitated independent study, and participation in Wild Abundance classes that take place during the apprenticeship. All permaculture apprentices live in their own 3-season tiny cabin, with access to a shared outdoor kitchen, apprentice garden, and breathtaking views of Mt. Craggy. Spring focus is gardening and wild foods; fall focus is natural building and tiny houses. Full-season apprentices will also earn their PDC.
Contact: Admin@wildabundance.net

Permaculture Service Day
California

Dates: First Sunday of every month
Location: Sivananda Yoga Farm, Grass Valley, CA
Description: Learn through hands-on volunteer work on the land and participate in a free workshop, open house and tour of the Sivananda Yoga Farm in the beautiful foothills of the Sierra Nevada. Enjoy free Yoga Class, meditation, chanting, and two organic vegetarian meals.
Instructors: Colin Eldridge
Cost: FREE!
Contact: yogafarmregistration@sivananda.org; 530-272-9322; yogafarm.org

Permaculture Series

Design and Implementation

Chicago Area and Online

After teaching together for five years, this trio of educators, designers, and organizers with a wealth of background are offering a series of workshops which will ground your practice of permaculture. Whether you come for one or take them all (at a discount), we aim to facilitate your best learning experience in permaculture design and practice.

Permaculture Design Course

Dates: June 24 & following

Description: This online PDC combines the collaborative, engaging style the GLPDC team developed in the classroom and adapts it to the online format so that you are practicing as you learn the design process and approach to permaculture. An online circle of graduates of this course are excited to continue building understanding together.

Plants & Permaculture (May 26-27) Plants--we just can't get enough time with them. This is an opportunity to delve into propagation, choosing plants, care, and problem-solving with our favorite photosynthesizers.

Learning from Nature (Jun. 22, Sept. 28, Dec. 7, Mar. 21) With a guest instructor or two, we will be working on practices which deepen our connection to nature and help us learn from it as a source of inspiration and guidance for permaculture practices.

Rocket Stoves (September 21-22) Learn the fundamentals of rocket stove design while building a simple one. Take your experience home and scale up as desired.

Women's Gathering (September 28-29) Women's space is critical in all different kinds of settings. This workshop will hold space for women's pathways of learning, connecting and visioning permaculture. Facilitated by Rhonda Baird.

Advanced Course: Organizing & Community Development (November 8-10; 23-24) This course will equip you to design and implement social permaculture from conceiving of the right project for you to the nitty gritty details of decision-making, collaborating, organizing and re-designing your projects.

Instructors: Rhonda Baird, William Faith, Milton Dixon

Contact: www.glpdc.info

Permaculture Design Course

Michigan

Dates: July 14-27

Location: Blue Sky Farm, Montague, MI

Description: Permaculture problem-solving leads to sustainable lifeways that nurture people and planet. During this magical fortnight, our team of world-renowned and locally grounded teachers will create a stimulating atmosphere for group learning, giving you the tools to practice regenerative land design. Join us for this exceptional opportunity in the friendly White Lake community. West Michigan's wonderland of natural beauty, between lakeshore dunes and wooded ridges, and the emerging garden farm and homestead systems of Blue Sky Farm will provide us a laboratory for exploring carbon farming, the mycelial internet, polyculture gardens, home food preservation and storage, regenerative forestry, energy-efficient building science, and the circular economy.

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

Contact: Peter Bane
pcactivist@mindspring.com
permaculturereactivist.net

2nd Annual

Permaculture Design Course

Ohio

Dates: May 12-18 and June 16-22

Location: Agraria Farm, Arthur Morgan Institute, Yellow Springs, OH

Description: Permaculture problem-solving leads to sustainable lifeways that nurture people and planet. The Agraria farm and education center pairs regenerative practice with land repair that give you the context and tools to practice regenerative land design. A full series of courses, including a course on keyline are available through the institute, though not a part of this PDC. Arthur Morgan Institute, with its well-known documentaries on Cuba, and focus on community provides a wonderful supportive environment in which to engage in learning the design process and using permaculture to engage in work that is meaningful to you. Agraria Farm provides us a laboratory for exploring stream restoration, agroforestry design, community-building, nature connection, and much, much more.

Instructors: Peter Bane, Rhonda Baird

Contact: Peter Bane
pcactivist@earthlink.com
community-solution.org/cs-farm/

Our readers love seeing your courses in these pages. Send in information for your multiple-day permaculture events by June 1 for the August/Fall issue.

Permaculture Design Course

Pennsylvania

Dates: June 16-29

Location: Garfield Community Farm, Pittsburgh, PA

Description: Earn your permaculture design certification in this two week intensive hands-on course at Garfield Community Farm, Pittsburgh's largest urban permaculture farm. Garfield Farm is a three acre urban farm existing on three city blocks where around twenty five homes once existed. Today this large tract of abandoned urban land, is rich in biodiversity, producing thousands of pounds of food every year from our bioshelter and gardens, and attracting native birds and wildlife. Through grassroots community activism the farm has been shaped into a hub of permaculture education for children and adults, a place where neighbors can get seasonal organic produce and people can come together.
For people interested in leading urban permaculture projects with faith communities an optional "missional permaculture" track will be available during some evenings of the PDC. In this track we will understand the potential behind equipping communities of faith with permaculture. We will also go deeply into the "how" and "why" of making the ethics of permaculture central to the practice of modern communal spiritual practice.

Instructors: Darrell Frey. John Creasy, Elizabeth Lynch

Cost: $1,650.00 includes food and housing.
Commuter Registration: $1,200.00 includes some meals.

Contact: threesisterspermaculture@gmail.com, threesisterspermaculture.com

Networking

Ecosystem Restoration Camps: A Timely Idea

Ecosystem Restoration Camps is an idea whose time has come. Thousands of people around the world are watching the news of ecological collapse in horror, feeling a deep need to take action. And there are hundreds of farmers and landowners stuck in a cycle of land degradation that they want to escape.

Ecosystem Restoration Camps, the brainchild of documentary film maker and ecologist John D. Liu, marries the two. It gives everyday people the opportunity to restore degraded ecosystems and learn the skills needed that they can take home.

Campers learn these techniques and then implement them on land managed by farmers and landowners with the desire to transition to regenerative practices.

The journey began in September 2016, when John Liu created a facebook group called the 'Ecosystem Restoration Cooperative,' to test his idea with the public. The group quickly become popular, and gathered together a group of individuals from all over the world who were keen to make the idea a reality.

The strategy was, if 1,000 people pledged to give 10 euros a month, the organisation would be formed. Hitting the 1,000 mark gave the organising committee the confidence to register the Ecosystem Restoration Camps Foundation as a non profit foundation in the Netherlands in February 2017.

The first camp is blossoming in the Murcian region of south eastern Spain, a region heavily affected by drought, desertification and climate change due to unsustainable industrial land management.

Accommodation, washing and eating facilities now exist at the first camp, with hundreds of people passing through to restore the region and a waiting list 5 months long.

A second camp is opened in Mexico in March that gives people the opportunity to learn how to restore degraded ecosystems through practical action at Regeneration International's regenerative ranch, Via Organica.

Another element of Ecosystem Restoration Camp's work is the Re-Generation Festival concept, a music, dance and arts festival that restores degraded ecosystems. Festival goers plant trees, bushes, and shrubs as well as digging, composting and watering whilst dancing to music from live bands and djs from around the world.

There is interest in opening camps all over the world. This truly is an idea whose time has come. This is a global movement of everyday people. Join by becoming a member, a camper, and start your own camp in your community.

For more information check out their website: www.ecosystemrestorationcamps.org and follow them on Facebook and Instagram. Δ

Calendar

May

May 12-18, June 16-22. Yellow Springs, OH. Permaculture Design Course. community-solution.org/cs-farm/
May 24-26. Orcas Island, WA. Introduction to Pc. info@permacultureportal.com, permacultureportal.com.
May 25-26. Basalt, CO. Forest Gardening and Greenhouse Workshop. CRMPI.org.
May 26-27. Chicago, IL. Permaculture and Plants. glpdc.info.

June

June 15-16. Basalt, CO. Forest Gardening and Greenhouse Workshop. CRMPI.org.
June 16-29. Pittsburgh, PA. Permaculture Design Course. threesisterspermaculture@gmail.com, threesisterspermaculture.com.
June 22, September 28, December 7, March 21. Chicago, IL. Learning from Nature. glpdc.info.
June 23-28. Mastatal, COSTA RICA. Syntropic Farming Course. info@ranchomastatal.com, ranchomastatal.com.
June 24-November. ONLINE. Permaculture Design Course. glpdc.info.

July

July 2-16. Skalitude Retreat Center, WA. Permaculture Design Course. 360-643-9178, friendsofthetrees@yahoo.com, www.friendsofthetrees.net
July 13–22. Cloughjordan Ecovillage, Tipperary, IRELAND. Permaculture Design Course. www.cultivate.ie, pdc@cultivate.ie, +353 505 56060
July 13-27. Orcas Island, WA. Permaculture Design Course. 360-840-8483, info@permacultureportal.com, permacultureportal.com
July 14-27. Montague, MI. Permaculture Design Course. pcactivist@mindspring.com, permacultureactivist.net.
July 15-27. Basalt, CO. Permaculture Design Course. jerome@crmpi.org. crmpi.org.
July 20-August 2. Occidental, CA. Permaculture Design Course. OAEC.org/permaculture.
July 27-August 2. Cottage Grove, OR. Permaculture Teacher Training. infocascadiapc@gmail.com, 541-342-1160.

August

August 2-11. Cloughjordan, Tipperary, IRELAND. Permaculture Design Course. pdc@cultivate.ie.
August 17-25. Basalt, CO. Permaculture Academy-Forest Gardening & Greenhouse Design. Jerome@CRMPI.org. CRMPI.org.

September

September 7-9. UNITED KINGDOM. National Permaculture Convergence. www.permaculture.org.uk/noticeboard/
September 28-29. Chicago, IL. Women in Permaculture Gathering. glpdc.info.

November

November 8-10, 23-24. Chicago, IL. Advanced Course in Organizing and Community Development. glpdc.info.
November 22-24. Sivananda Yoga Farm, Grass Valley, CA. Social Permaculture & Community Building. yogafarmregistration@sivananda.org, 530-272-9322, yogafarm.org.

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Online. Permaculture Design Course. info@PermacultureEducation.com, PermacultureEducation.com.

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FREE DAYS: Permaculture Design 1057 Roberts Creek Road, Roberts Creek, BC, Canada Delvin Solkinson and Kym Chi We offer regular free intro to permaculture days, free advanced gatherings as well as PDC's, volunteer farm days, APDC's and specialty courses. Based in the Sunshine Coast and Vancouver area of Southern British Columbia we teach at exceptional farms, gardens and forest locations for additional diversity. Our specialty is free, open-source permaculture learning and teaching tools that we offer as free downloads at printable resolution on our website. http://www.permaculturedesign.ca

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