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Permaculture Activist welcomes your articles, news items, photos, and other materials of interest. Please contact the Editor in advance of your submissions (editor@permacultureactivist.net) to request writers guidelines and present your ideas.

Upcoming Issues, Themes & Deadlines

#73	Bioregionalism	June 5
#74	Energy Descent	September 2
#75	Local Food	December 1

Permaculture is a holistic system of DESIGN, based on direct observation of nature, learning from traditional knowledge, and the findings of modern science. Embodying a philosophy of positive action and grassroots education, Permaculture aims to restructure society by returning control of resources for living: food, water, shelter, and the means of livelihood, to ordinary people in their communities, as the only antidote to centralized power. For 30 years Pc has combined top-down thinking with bottom-up action to make a world of difference in over 100 countries. We are everywhere.

Editor's Edge

One World, Ready or Not

Peter Bane

THE VIEW FROM ABROAD CARRIES MORE than one message. In opening our pages to the world's words, we recognize that permaculture gains strength by bridging between South and North. The next Intl. Pc Conference, is set for southern Africa in November. In the pages that follow, activists from Africa and the Caribbean give us a taste of what may be in store. These messages, with a different cultural frame, remind us that North Americans, despite outsized ambitions and colossal footprints, represent a small minority of the world's people, languages, and ways of living.

We also honor the stories from North Americans and other rich-country nationals working as permaculture teachers and researchers in the global South. These are people on the bridge who look both ways and can help us translate the messages from our neighbors. Some of them, like aManda Greene, were born on the bridge, and have a passion for the traffic that passes over it. Others, like Rowe Morrow, have been across the bridge so many times, they can be said to have honorary citizenship on both sides. She brings back treasure in documenting the traditional water wisdom of Ethiopia's Konso highlanders, and does so with an eye to returning wisdom in kind. Warren Brush, another traveler between cultures, tells a tale we need to absorb: the toxic impacts of western culture have spread far and wide, but the corrective insights, which exist within our own culture, have been slower to move.

There's another message here too: The rest of the world is watching us, if perhaps no longer waiting. America has been in the global spotlight the past decade. Its criminal wars in Iraq and blundering in Afghanistan have heightened justifiable resentments again a nation that already claims too much of the global commons. As the US begins to tackle its massive addiction to fossil fuels there is hope we may reenter the circle of the world's peoples as a peer and a companion, not merely a bully and a vandal. In the weeks this issue has been in layout, the U.S. EPA began rulemaking to regulate greenhouse gases as "a threat to human health and well-being." This historic turning point is reflected in Jonathan Dorn's report of the beginning of the end for coal in the country that has used more of it than any other. Coal's legacy will be with us for centuries, perhaps millenia, even if we never burn another ounce of it. The question behind the eyes watching North America (and China too) is can we stop? And is there still time to make a difference?

The edge of the cliff is very close. To listen, through windows just opened to the arrival of warm weather in southern Indiana, and hear the automotive din of a Saturday night is deeply disheartening. Where are they racing at 2am? What could justify these petty but potentially catastrophic crimes against humanity? Youthful hormones? Medical emergency? Rush delivery of widgets? Entertainment? As Keith Morris reminds us, the illegal flaring of gas from oil wells in the Niger Delta makes even the

carelessness of a youth-obsessed culture pale. But we have to see that the two excesses, gross and petty, are inextricably linked.

For better and for worse, in sickness or in health, our fates are joined. The engines of destiny are making the lives of all humans, and most forms of higher life on planet Earth, into one story.

If this issue reaches you later than usual, please forgive us. Editor Scott Horton was called away in early April by a death in the family. Please keep him in your thoughts over the coming months. He will return to the Editor's Edge soon to prepare the August issue, the theme of which is Bioregionalism. We'll look at all things local, from lore to lucre to lunacy.

Dusting off my editor's eyeshade after five years, I find myself enjoying again the work's creative aspects, but also daunted by the increased complexity of what we do and the physical challenge of holding attention on fine motor movements for long, long hours. Readers with a keen eye may notice subtle signs of a change. With the help of friends and despite the hurdles thrown at us by software corporations, faulty computer chips, and cosmic rays, we have left behind our familiar Pagemaker for its vastly more complicated successor InDesign. We fought and kicked and haven't yet found all the reasons why the new is better than the old, but there is some consolation amidst the struggle. Our printer is closer now that email has replaced paper and disks that once rode in trucks and planes.

Email brings its own burdens and traps though. We have many fine stories from Africa, Asia, and Latin America, and we never intended to exclude Europe or Australia. But stories on offer from France and elsewhere got caught in an email glitch that went undetected for weeks. We apologize to our correspondents who tried to file and got no answer. The editor's inbox was shut down prior to deadline, preventing us from developing those stories. We hope to bring you some of them soon, and ask that if you have tried to reach us since January without success that you forgive our failings, which are not of the heart, but due to gremlins.

We are speeding delivery of this issue through the mails to offset the delays we faced in producing it, but at a cost. We are also struggling with rising postal rates, cable tariffs, and printing costs. We have more readers than ever and interest in permaculture is growing fast, but this has not yet translated into more revenue. The sad story of small-scale publishing is that it never pays its way. And in a hard times, we are under great pressure to provide to more people for less money. Only our advertisers—to whom we are grateful, and book sales balance the ledger. If you find the Activist useful, please consider going beyond a subscription, and send us a few discretionary dollars or euros to promote your project or lengthen your library shelf. We'll do our best to make it worth your while. Permaculture, and our publishing work, as modest as it is, helps hold up that bridge of cultural exchange. Let's keep it strong—there are gifts to be given and received, and messages to be delivered. △

Viva Biafra!

Machine Guns, Naked Women, and Heliciculture in Nigeria

Keith Morris

In 2006, I was recruited by FarmServe Africa to work for the United States Agency for International Development (USAID) “Farmer to Farmer” program as an added-value apiculture products specialist in Nigeria and Ghana. While I was excited to share my passion, knowledge, and expertise about honeybees and the many healthful products of the hive, I knew I had much more to learn than I did to teach.

My limited knowledge of the ecology of West Africa’s rainforests and semi-arid Sahel came more from books than real experience, and I’d never observed the habits of bees—either wild or kept—in their indigenous environments. To prepare for my assignment, I researched nectar sources, pollination roles, seasonal behaviors, traditional beekeeping techniques, honey hunting practices, medicinal herbs, and oils suitable for

Delta. Before leaving home, I had read the U.S. Department of State’s explicit “Travel Warnings,” for this area. They advised “avoiding all but essential travel to the Niger Delta” due to the prevalence of “violent crime committed by individuals and gangs, as well as... persons wearing police and military uniforms,” the frequency of “armed muggings, assaults, burglary, kidnappings, and extortion, often involving violence, as well as carjackings, roadblock robberies, and armed break-ins,” and “communal violence that could erupt quickly and without warning.”(1) On the plane, I read a photocopied chapter from a travel guidebook I was given: this area was “not a destination for first-timers to Africa.”(2) While these quotes may make for a dramatic beginning to my story, I’m troubled even to repeat them—they portray anything but the character of Africa and the Nigerian

I was continually confronted by my preconceptions and assumptions about Africa, myself, and my place there.



A view of the aquaculture moat (covered with screens), rows of papaya, and banana that encircle the ‘Free Range Paddock.’

apitherapy products, and as I read, I made many new discoveries. I had everything to learn about the cultures and communities of the region, the people who would be my hosts.

During the trip I was continually confronted by my preconceptions and assumptions about Africa, myself, and my place there. I was forced to reevaluate the continent’s tangled history and the complex legacies of colonialism, racism, missionaries, oil extraction, mining, corrupt government, social hierarchies, and more. I’d like to share a few brief views I gleaned there that present humanity’s most beautiful aspects and a few that show some of our worst.

Anticipating violence

I first touched African soil (or at least concrete on top of it) at Port Harcourt, and there breathed the dank air of the Niger River

people. The phenomena to which these reports refer, and the reputation of the Niger Delta in general, when placed in proper context, show a picture of resistance to systemic exploitation and a struggle for autonomy. Instead of perpetuating the fear reflected in the Dept. of State’s warnings, we can find opportunity for solidarity and mutual aid with some of the most gentle, hospitable, and inspiring people on the planet.

Roots of conflict

From 1967 to 1970, this area seceded from Nigeria as the Republic of Biafra, which resulted in the tremendously violent Nigerian Civil War (or Nigerian-Biafran war). The causes of the secession and ensuing war were many and complex, but

stem broadly from significant cultural and political differences between Southeast and the northern sections of the country. An artifact of the late-19th Century European land grab in Africa, Nigeria had been formed from the territories of over 300 diverse and distinct tribal cultures arbitrarily “unified” into a domain defined by British rule. Unlike other areas of the country that had been ruled by traditional monarchs or sultans, the Southeast, a region dominated by the Igbo people, was more democratic and decentralized. The territory consisted of about 600 autonomous villages, where in decisions were taken by a general assembly in which everyone could participate. Dividing Biafra from the rest of Nigeria would probably have been possible by mutual agreement had not the tremendous value of the Delta region’s



Traditional press for red palm oil.

oil reserves already been grasped by the ruling elite of northern Nigeria.(3)

Today, this oil—known as “bonny light”—is highly sought after for its low sulfur content and ease of refinement into gasoline and diesel. Over 2.5 million barrels a day are shipped to the United States and Europe. However, the oil has been nothing but a curse to the people who live on top of it. Since the government nationalized the oil industry in 1971, the delta, with its wetlands, coastal mangroves, and maze of bayou-like creeks, has been dominated by oil drilling, refining, and transport, the night sky lit by gas flares that burn around the clock. Along the 4500-plus miles of pipelines, there have been over 6817 oil spills reported by the government (and analysts estimate that to be about 1/10 of the actual number of spills—about 70,000 oil spills since 1976!).(4)

In the communities where the oil is drilled there are no schools, no clean water, and no longer any fish to catch. As engineers lay roads through marshes and pipelines through mangrove swamps, spawning grounds and stream courses are disturbed, threatening the livelihood of entire villages.

While it’s easy to point the finger at the multinational corporations drilling in this region (Royal Dutch Shell, Total, Agip, ExxonMobil, and Chevron in case you’d like

to know) and Americans’ blood-thirst for oil (as I once thought I could do for almost all of our problems), there is rampant corruption within the Nigerian national government. Distribution of the country’s energy wealth is far from equitable. It’s estimated that in 2003, for instance, about 70% of oil revenues were stolen or wasted—almost none of the money makes it to the communities most impacted.(5) This is in part because Igbo and other Biafran Nigerians are underrepresented in the national government, a legacy of their defeat in the civil war over 30 years ago.

Perhaps we can now come to a better understanding of Nigeria’s supposedly violent reputation. Is it random violence? Rampant criminality? Now, I’m not trying to excuse this violence—but I’ll ask you to put yourself in their shoes: how would you react if someone were sucking out the blood of the earth beneath your feet, poisoning your waters, destroying the fisheries that supplied your traditional diet, removing the forest, darkening the skies with smoke, lighting the night with gas flares, fouling the smell of the air, and taking it all by force? While the corporations make record profits, and Nigerian politicians buy mansions in the US and send their children to private schools in London, your community is relocated to make way for an oil field and offered nothing but toxicity and squalor in exchange.

Motorboat guerrillas and naked women

I don’t know what you would do, but increasingly the Delta’s young men are turning to arms. The Movement for the Emancipation of the Niger Delta (“MEND”) is a militant indigenous movement dedicated to armed struggle against what they regard as the exploitation and oppression of the people of the Niger Delta and the degradation of the natural environment by foreign multinational oil corporations and the Federal



Oil-rich fruit of the red palm gave the name “Oil Rivers” to the Niger Delta. The Igbo people cut the fruit and spare the palm to be harvested again.

Government of Nigeria.(6)

Of course, the motorboat militants hiding throughout the

delta, striking oil fields, kidnapping expatriates, and prompting the travel warnings aren't the only actions in response to such intolerable exploitation. Women and girls, arguably more directly affected by the region's pollution, are at the forefront of nonviolent protest. Occupying corporate facilities, and employing one of the most powerful protest tactics used throughout Africa—the “curse of nakedness”—the women are having some of the

ecological livelihoods, most people in the city of Owerri (where I was housed) were looking for something else. I'm not sure why this would be surprising (perhaps idealized notions from growing up listening to Afro-centric hip-hop and roots reggae, or my immersion in permaculture and progressive agrarian communities in Vermont), but nonetheless I was disappointed to find most people embracing the dominant paradigms of capitalism, Euro-centric culture, evangelical Christianity, and even



(Dr. Frank Wilson and the author pictured with a rural women's beekeeping collective.)

most notable results. Exposing themselves “to inspire a deep sense of shame in their enemies,” mothers and grandmothers are closing oil terminals, airstrips, and docks, demanding local employment, improvements in infrastructure, and assistance in developing poultry production, fish farms, and other sustainable agricultural endeavors.(7)

Here enter agricultural aid workers like myself. Although my presence was not the direct result of such dramatic actions, I did work with incredibly inspiring groups of women. Wanting to move beyond farming just for their families, these women banded together in collectives to learn beekeeping techniques and develop and market added-value products like candles, cosmetics, cough medicines, salves, and more.

Perhaps the most challenging aspect of this work was my struggle to shun the “authority of the expert,” counter the legacies of missionaries before me, and debunk the “foreigners have the answers” mentality: we don't. The skills I brought were valued, but the sharing of information was mutual—I was equally a student. I can only hope my genuine curiosity and esteem helped build respect and reverence for traditional culture. In particular, I stressed that direct observation of nature and ecological relationships would be a far better teacher than me, other “experts,” or even books could ever be. I have much more hope for the solutions that arise from these sources—nature and traditional culture—than any western models or industrial ideals.

The curse of modernism

While these women, like so many people I met in my travels, were growing good food, building community, and making

I stressed that direct observation of nature and ecological relationships would be a far better teacher than me...

racism. Like almost anywhere else in the world, people seemed to want office jobs, big houses, televisions,



Boy with tame duiker.

cars, their own cell phones and computers, and material wealth more than they wanted healthy, intact ecosystems, real food, or to retain traditional knowledge and culture. Billboards depicted those without cellphones as primitive savages, and “roots culture” was seen by surprisingly many as backward or even “sinful darkness” from which Africa had been “saved.” At least in the city, farming was anything but “cool”—it was a status symbol not to grow your own food. Even many of the extension agents and farm trainers I worked with would wear impressive suits and dresses, lest they be mistaken for actual farmers themselves.

In the countryside, where I'd see the flag of Biafra waving, traditional culture seemed vibrant, and lush cultivated rainforest surrounded many villages. While culture was equally rich in the city, and many important traditions were maintained—it was often hard to see through all the diesel smoke, power outages,



The author pictured with Enyihoa Co-operative Farms staff, Imo State ADP staff, and our top-bar beehive.

and frighteningly common fatal car accidents. The rapid expansion of roads, vehicles, plastic garbage, and unplanned development was a visceral assault, with biological diversity, health, and beauty moving just as fast in the other direction. Electronic garbage was beginning to accumulate everywhere, with no waste management of any sort, beyond piling trash in the center of roads—which served as de facto medians for the disordered traffic patterns. For the few hours during the day when the grid was on—or the generators running—there was MTV, American movies with Arabic subtitles, and American televangelism.

In the midst of this mad scramble for an “American” way of life, however, I found some of the most inspiring examples of permaculture I’ve seen anywhere in the world—even though their creators never heard the word. One place I was able to spend some time was the Enyihoa farming co-operative, where I first experienced some of the amazing agricultural innovations of sub-Saharan Africa. Besides their novelty and their beauty, what struck me about these systems was their cultural relevance and the way they appeared to be distinct manifestations of the ecosystem from which they emerged.

A new kind of livestock

At Enyihoa, the farm fields—largely bananas and papaya

over pineapple—were laid out between snaileries—technically the growing of snails is called heliciculture. These polycultures also produced the giant African snail (I was most likely seeing *Achatina achatina*, the largest terrestrial snail)—an example of additive yield at its finest. The snails, a threatened indigenous species, have always been considered a delicacy, their price kept high by the difficulty of harvesting them in the wild. Recently, they have become over-hunted due to the high market price and their culinary value, which has contributed to a burgeoning

The ponds worked as “moats” to protect the snails from voracious tropical ants...

demand in Asia and in Asian markets all over the world. In the snaileries, the “livestock” were kept fenced in an environment much like their habitat in the wild—the debris of the tropical rainforest floor. However, in this system, the canopy was bananas interplanted with cassava, a staple root crop. At Enyihoa, the snaileries were surrounded by catfish ponds, providing further yields of fish. The ponds, by way of relative location, worked



Achatina achatina out of the snailery, these were a little bigger than my fist.

as “moats” to protect the snails from voracious tropical ants and other predators. Whether called “permaculture” or not, this was good ecological design that shows our favorite principles.

In the larger “free range paddock” snailery, I found yet another function stacked into the system, and encountered another new character in the playbook of sustainable tropical

agriculture. The duiker, a miniature antelope endemic to the tropical rainforests of Sub-Saharan Africa, is prized game, though difficult to hunt. In the wild, they are notoriously shy and elusive. "Duker" comes from "diver"—as the few times they are seen they are darting away into tangled undergrowth. The duiker at Enyihoa, also browsing under the banana-cassava polyculture, was a lone male for whom the farmers were hoping to find a mate. Having grown up with humans as protectors and providers, this duiker was as friendly as a pet dog—he wanted to kiss and jump into my lap.

Elsewhere in the region, folks maintain the tradition of tapping palm trees for palm wine. In many areas, palms are cut down to be tapped, but the Igbo are careful to leave the tree alive and healthy. Another critical staple from palms, red palm oil, is used for cooking and as a fuel. This crop was so important the Niger River Delta came to be known as "Oil Rivers." In fact, it was named "The British Oil Rivers Protectorate" from 1885 until 1893. While the name ironically still holds true, it's a shame that it's for an entirely different kind of oil.

There is much more to tell about my work and learning in Biafra. For continuing updates, visit my blog at <http://apisafrika.wikispaces.com>. △

Keith Morris began turning his love of nature, culture, and activism towards permaculture and ecological design in 1996 and has worked as a farmer, builder, and designer since 2000. Among other endeavors, he's helped make beehive-derived medicinal products with Honey Gardens Apiaries (www.honeygardens.com). He is a Permaculture Instructor on the faculties of Sterling College, the Yestermorrow Design Build School, and the University of Vermont.

Notes

1. http://travel.state.gov/travel/cis_pa_tw/tw/tw_928.html
2. http://www.lonelyplanet.com/shop_pickandmix/previews/west-africa-nigeria-preview.pdf
3. http://en.wikipedia.org/wiki/Nigerian_Civil_War
4. <http://www.hrw.org/legacy/reports/1999/nigeria/nigeria0199.pdf>
5. http://en.wikipedia.org/wiki/Petroleum_in_Nigeria#cite_note-19
6. http://en.wikipedia.org/wiki/Movement_for_the_Emancipation_of_the_Niger_Delta/

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Green Tech: An Optimistic View of the Future

© David Holmgren 2009



THE GREEN-TECH SCENARIO is the most benign, in that adverse climate changes are at the low end of projections. Oil and gas production decline slowly as in the brown-tech future, so the sense of chaos and crisis is more muted without major economic collapse or conflict. This allows resources to flow to a greater diversity of responses at the global, national, city, community, and individual level. In some already densely populated poor countries, conditions worsen.

Higher commodity prices, however, allow some poorer producer economies to escape their debt cycle, while programs to empower women result in rapid reduction in the birthrate. The gradual reduction in the capacity of countries to project power globally, owing to rising energy costs, increases national security and redirection of resources away from defense and resource capture to resource conservation and technological innovation. The consolidation of global communication systems maintains global outlooks and understandings if not global economics.

As in the brown-tech scenario, electrification is a key element in the energy transition, but the renewable energy sources of wind, biomass, solar, hydro, tidal, and wave grow rapidly, developing a more diverse and distributed mix. The relatively benign climate allows a resurgence of rural and regional economies on the back of sustained and growing prices for all natural commodities including feedstock for biofuels.

The principles behind organic agriculture and ecological management and resource allocation become the norm in many farming systems, helping to stabilize agriculture challenged by increasing cost of energy inputs and (albeit mild) climate change.



The accelerating conflict between biofuels and food is stabilized if not resolved by government subsidies to support food supply from agriculture, with biofuels coming mainly from forestry waste. In many regions with prime agricultural land and small populations, wealthy farmers and agribusiness corporations are the main beneficiaries, employing both high technology and cheap labor from migrant workers. In some regions, with poorer and steeper land and more diversified land ownership, smallerscale polyculture systems designed using permaculture principles spread wealth more evenly through local communities.

Continuous contraction affects large sections of the economy, but the energy, resource, and agriculture sectors along with recycling and retrofit industries experience rapid growth based on high commodity prices that are sustained despite economic recession in the main consuming economies. In some affluent countries, reform of monetary systems lowers the scale of

financial collapses and refocuses capital on productive and socially useful innovation and investment.

Information technology continues to yield gains in energy and resource management, from real-time pricing and self-healing electrical grids, to Internet-based ride-sharing systems and telecommuting. Conservation yields the greatest gains with major public policies to change personal and organizational behavior. In



other countries, especially the United States, the apparent opportunities for continued economic growth, combined with government policies to support a low-carbon economy, lead to a renewable-energy investment bubble

followed by a severe recession.

Continuous contraction affects large sections of the economy...

State and city governments responsible for providing services are able to lead much of the restructuring to more compact cities and towns with increasing public-transportation infrastructure. Growth in large cities (especially in coastal lowlands) is reversed by public policies ahead of the worst effects of increased energy cost and global warming, while regional cities, towns, and villages see modest growth on a compact urban model that preserves prime agricultural land and develops mixed-use neighborhoods with more local work and radically less commuting.



The placing together of many of the more optimistic aspects of energy descent may seem artificial, but there are reasons to believe that the green-tech scenario will tend toward a more egalitarian structure with the relative shift of power from control

of oil wells and mines to control of the productivity of nature via traditional land uses such as agriculture and forestry and more novel renewable technologies.



The inherently distributed nature of these resources will lead to more distributed economic and political power at the level of cities, with their hinterlands and organizations focused at this scale. For example, successful large-scale

farmers who have reduced their dependence on energy-intensive inputs through permaculture strategies and organic methods may find new profits in more localized markets with prices sustained by policies that encourage regional self-reliance. Any profits beyond farming are likely to be invested into local energy systems that generate more employment and further reduce economic dependence on central governments and large corporations. It is possible that these same processes could lead to highly inequitable, even feudal systems. However, the universal focus on more sustainable production and reduced consumption that is not forced by remote and arbitrary central power has the tendency to foster more egalitarian responses than in the brown-tech scenario.

The substantial reductions in greenhouse gas emissions that result from this scenario keep climate-change impacts to a minimum, thus stabilizing and reinforcing the scenario's basic characteristics for at least several decades.

The success in radically reducing consumption of resources while sustaining modest growth in some local economies, combined with stabilization of the climate, encourages a new "sustainability" elite to consider further changes to consolidate these achievements in the face of ongoing net energy decline. The worst excesses of consumer capitalism are controlled by restriction and reform of advertising and other dysfunctional forces.

Civic culture strengthens where further transition toward a non-materialistic society combines with the maturation of feminism and environmentalism, and a resurgence in indigenous and traditional cultural values. These



trends stabilize the accelerating loss of faith in secular humanism allowing the evolution of more spiritual "cultures of place." Over time, an evolution toward the Earth-Steward scenario seems an obvious and natural response to the inexorable decline of nonrenewable resources. "Distributed powerdown" summarizes this scenario by emphasizing both the distributed nature of resources and power, and the planned contraction involved.

At their extremes the Green-Tech and Brown-Tech scenarios also describe many of the elements that could be expected in the techno-stability long-term scenario where new energy sources manage to replace fossil fuels without the stresses that lead

to systemwide contraction. The current levels of ecological, economic, and sociopolitical stress are the indirect indicators that we are entering the energy-descent scenarios rather than simply a transition from energetic growth to stability. Relative insulation from those stresses and the persistence of faith in the monetary accounting "house of cards" by the upper middle class (if not the global elites) continues the confusion. The lack of understanding

Civic culture strengthens where further transition toward a non-materialistic society combines with the maturation of feminism and environmentalism, and a resurgence in indigenous and traditional cultural values.

of net energy concepts and disagreement among the experts on appropriate methods of net energy accounting, combined with political pressures from the unfolding crisis, lead to energetic descent being mistaken for "business as usual." Δ



David Holmgren is the co-author of the Permaculture concept. The above excerpt is taken from his 2009 book, Future Scenarios: How Communities Can Adapt to Peak Oil and Climate Change. (See review pg. 42.) Green Tech describes aspects of a possible world future based on a slow onset of resource depletion (peak oil, etc.) and also a slow development of climate change. The excerpt has been adapted for print and web and is used by permission.

Future Scenarios: \$12 + postage
How Communities Can Adapt to Peak Oil and Climate Change
available from—
Permaculture Activist • PO Box 5516 • Bloomington IN 47407 USA
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Integrated Water Management in Ethiopia

Traditional and New Konso Dams, Springs, and Rivers

Rosemary Morrow, October 2008

IN THE HIGH MOUNTAINS OF SOUTHWEST ETHIOPIA live the Konso people whose farming is marked by a complete integration of water, stone, and plants with the contours of the land.



Architecture without architects

In early June 2008, during a break between teaching two Permaculture Design Courses (PDCs) in Konso region, a team of us visited eight dams of the more than 185 owned by several regional villages and administered and maintained by village councils. We wanted to record their oral history and conserve the knowledge by which these systems had been built and

managed. (The Konso language has not yet been written down.) We also wanted to assess present conditions and problems in the region, list the measures needed to restore new and old water sources as a back-up to cope with future uncertainty of supply, and provide information for a potential European Union agricultural project.

We looked at the strengths and the recent problems with traditional water supplies, and compared them with newer ponds.

The value of recording the history of the siting and building of dams, and of maintaining dams, springs, and rivers for drinking water is that the practices are universally valuable, can be reinstated locally, and are easily transferrable to most countries and cultures. For example, the traditional Konso dam design would be particularly valuable for Australian farmers.

Our team consisted of Enrico Castello, the manager of CISS, a local NGO in Karat, Konso, Kambro Kussia, a consultant from Konso Development Association (KDA) who knows the 185 ponds in the Wareda district,

Rosemary Morrow, permaculture teacher and writer, and Dan Palmer, permaculture teacher.

The highly aware and knowledgeable Kambro Kussia told me of the Konso and their care of dams for drinking water. I have only written down and arranged what he said. Evidently he knows much more, so this is only a small part of his knowledge. However, as most Konso are illiterate and their own language is not written, I wanted to put his words down in order later to give them back to conserve this knowledge. Kambro spoke of springs, rivers, and forests in order to provide an integrated view of long-standing cultural practices.

The Konso region and people

Southwest Ethiopia is a rugged highland region divided by an extension of Africa's Great Rift Valley. For more than 600 years the Konso have built and maintained subtle water systems thousands of kilometres long which snake across the landscape and deliver water to fields considerable distances away, all without flooding or eroding the land. They built large dams, terraces, walls, and small channels to support agriculture in a region where the rains are adequate but irregular, and where the fields are small and scattered by uneven terrain. In doing so, they have protected the soil, rivers, and springs. The Konso built extensively in stone: Many villages are fortified by stone walls, and creeks can be lined in stone up to two metres high. Their stone terraces wind across the mountains following the contours at altitudes from 1800 to 4000m (6000'-13,000'). All the land



Stone dam walls built over centuries

works are essentially designed through an intuitive understanding of contours. Every student in both of my courses was fully “contour literate.”

This culture developed from needs for protection from marauders, for sustainable supplies of water, and under the productive limits of small fields sited on steep slopes in a difficult environment high above the Rift Valley. The Konso ‘architecture’—because that is what it is—supported crops, animals, and fields through elaborate and sophisticated agricultural designs in stone. These took hundreds of years to build and required the participation of whole villages and strict social and environmental controls to maintain.

Some of the works look like simple roadside canals, and others like medieval terraces. However they all represent longstanding agreements about who gets the water, helping to resolve the

constant competition among the shepherds for their animals, the people, and the field crops. Over hundreds of years the Konso have also constructed village dams to provide drinking water. These are known as *harta* in the Konso language of Afa-konso. These traditional works, which are unique to the Konso, kept the people healthy for centuries and built a distinctive culture and agriculture in a harsh, steep environment with unpredictable weather patterns. Because of these works, the area has now been proposed as a UNESCO World Heritage site.

Building traditional dams (*harta*)

The traditional drinking water structures are very large and deep. The bottom is curved and the sloping sides are lined with huge pieces of stone, forming walls. The sites are chosen for their capacities to capture, hold, and distribute surplus water. The dam wall is an enormous earthen structure built from fill excavated at the site. The people dug the ponds by hand and lined the walls with stone. Every villager was required to be present; those too old or too young to dig would at least exhort the workers. Absent residents had to return to their own village to help with this work even if they were occupied in another town.

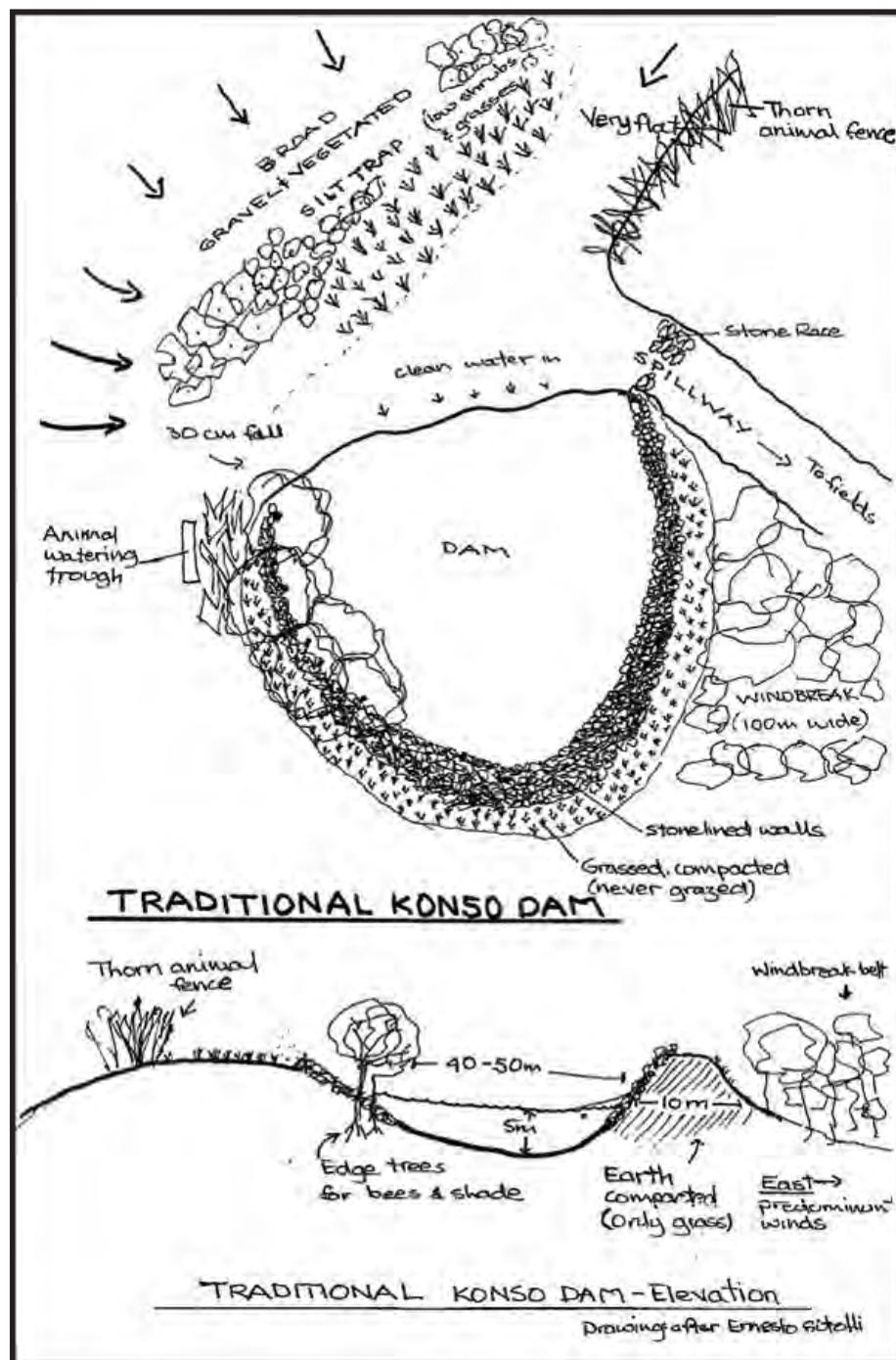
Water culture passed on

As the dam was dug and the retaining wall constructed, women and young ones danced on the wall, sometimes all night, to compact the newly dug earth. When maintenance or cleaning of the walls was required, the dancing recommenced, and again the older people sang the story of building the dam and of how to clean and maintain it, while the young ones sang their commitment to do the same as their elders. Each dam had its story in song and dance. Some ponds took a hundred years to build and were well maintained until recently: Custom forbade growing large trees on the *harta* wall, nor were animals allowed to drink or graze around it. In this way the structural integrity and water quality were maintained.

The subtle siting of the dams

The dams were normally placed at the end of a ridge or high on the land to give each control of water distribution to all the fields below it through a series of channels when the pond overflowed. (P.A. Yeomans, you were preceded.)

The drawing shows the architectural structure of a typical traditional dam and its effectiveness in maintaining clean water especially when supported by the traditional



social controls. Water was diverted from a permanent or ephemeral spring or stream and carried along a side canal to a fairly flat basin, up to twice as large as the surface area of the pond. This is the silt trap. The silt trap would be well vegetated and often had a gravel bed. Here water was spread, slowed, and cleaned before it entered the dam. (Why don't western dam builders do this?) Then the water bounced through a stepped stone race, aerating it, and further improving water quality.

In addition to the structural design for water quality, the social control of water and vegetation was rigidly enforced for similar purposes.

- Animals were watered from stone troughs away from the clean pond water.



Top of embankment where women danced and sang all night to compact it.

In addition to the structural design for water quality, the social control of water and vegetation was rigidly enforced for similar purposes.

- Vegetated buffer zones surrounded the area where animals were watered but not allowed to graze.
- No animal was allowed to graze the dyke on which grasses and shrubs were maintained.
- A thick spiky living fence surrounded the whole area.
- Windbreaks reduced evaporation from the pond surface.
- Water from the spillway was delivered equitably to field crops and pastures.
- A silt trap for inflowing water was bedded with gravel and planted with grasses and shrubs to reduce the silt load entering the dam

Special plant species were grown around each part of the dam for different purposes. For example, the tree *Balenites egyptica*, was traditionally planted for shade, because its roots go deep into the ground vertically and do not seek the water or reduce it. It is valued also because the leaves and fruits are eaten in times of famine (although they have to be carefully prepared for eating or they cause illness.) Because of its deep roots, the tree survives even extreme erosion, as shown by the living roots transformed progressively into wood. Its leaves are prickly, and so beehives are placed in its branches, affording the bees access to water yet inhibiting their predators. This is just one example, among hundreds, of the profound knowledge of the uses and functions of vegetation common to the Konso culture.

Collective care of the hartas

There were traditional environmental sanctions over water dams. From childhood, the Konso were taught and warned about the special nature of water and how to care for it. No structures around the dam were allowed to be moved and if this happened, the community punished the person involved: If anyone removed a single resource from the dam (even a single stone) then the materials had to be returned. This was considered a criminal activity and if a person continued, they were banished from the community. This was the worst punishment.

There was seasonal maintenance work to be completed, and everyone had to stop other work to assist at these times. All the community members, even children and the very elderly, had to be present. There is punishment for not coming to work to repair the dam. Others from the village who live outside must leave

Background to the Problem: Deforestation and Drought in Ethiopia

<http://www.virtualfoundation.org/proposals/tuethiop01.cgi>

“In former days, Ethiopia had a very high density of forests, but now due to irresponsible interaction with the environment and the consequences of severe poverty, the forest cover has been significantly reduced. In Ethiopia, the regimes of Haile Selassie and Durg were catastrophic for the forest cover. During the former, immense clearing of the forest lands owned by the feudal lords occurred. Similarly, with the collapse of the Durg regime, (*Ed.—Ethiopia's Marxist government in the late 20th century*) considerable forests grown on communal land by coercive participation, were cut down, due to the lack of felt ownership by the community. This forest destruction greatly contributed to the failure of Ethiopia's food security programs. The original forest cover, for instance, had been reduced to 16% by 1954 and there was a dramatic reduction to 3% by 1991 (UNCED report 1992). To worsen the situation, the number of people depending on forest resources for survival is geometrically increasing, due to poverty, crop failure, population growth, and lack of alternative means of income generation.”

their work and return to their mother village and participate. “Only the dead or those gone to unknown areas were excluded.”

When the dry season was nearing an end and the dam was almost dry (but importantly before the rains), the villagers would remove all the exposed silt and use it to build up the dam walls again. As the silt was collected, people in generation-by-generation cohorts danced and sang on the wall to compact it. The older generation sing of what they have done to preserve the water, and the younger sing for what they will do to care for it. Both women’s and men’s groups participate equally. Carrying stones to repair the walls is very heavy work and: “women carry on their backs and men carry on their shoulders.” Those men who carried the biggest and heaviest stones were cheered on by women and sisters who clapped, sang, and counted how many stones each carried. “No one knows how many good things you have done in your grain field but carrying gives your name public dignity in the community. It is like an exam.”

Protecting the springs and the water

Most springs are down deep chasms (walls) and the water is drawn up by skin buckets and ropes. The Konso’s spiritual beliefs teach them they must not cut any shrub or bush around any spring because plants provide shade and protect the water. The Konso believe that the water will disappear if the vegetation is cut.

Visiting times to the springs were regulated: people could take water in the morning from 4 am to 8 am when “the world was quiet—all birds and animals are still sleeping.” Also quantities of water to be removed were limited so that those with big families did not take all the water. In times of famine or drought, a guard was put on the spring to ensure equality for each person or family. Then if some water was left, there could be a second round of visits. Destitute or disabled people got priority at springs because they couldn’t go far away to get water from other sources.

When the spring needed maintenance, the whole community was again required to help. Sometimes flood works were implemented to divert flood water and ensure it didn’t enter and contaminate the spring. Similarly the nearby washing of clothes or one’s body was forbidden because it could contaminate the water. There were restrictions preventing visits by menstruating women or new mothers (up to 40 days). The same controls were observed as for the *harta*: Access to grazing animals and the cutting of nearby vegetation were banned.

Protecting and caring for the rivers

Terracing protected the rivers from erosion and silting and ensured that runoff was clean. In addition trees were regarded as inalienable and always left along the rivers to provide structural support for the banks. In dry times how much water each family could take was regulated fairly.

Some of the ‘sacred’ river trees are especially thorny and it was into them that the Konso placed their beehives. Honey was the main sugar source and it was highly valued. Today, the Konso still love honey but they can now get large quantities of refined cane sugar which they eat in huge amounts.

Away from the river, on the hillsides, trees for special construction purposes were planted and maintained. These mature trees could only be used for very special purposes. “Unfortunately today, the Konso don’t care and will even burn trees more than 100 years old,” said Kambro.

Protecting and caring for the forests

Parts of the natural forest known as the *moora* were endowed with special spiritual properties, and in this way protected wildlife and biodiversity. No one was allowed to cut or remove any part of the *moora*. People were often buried near the *moora*, and these cemeteries acted as buffer zones. While no animals could graze around the sacred *moora* it was possible to plant trees and crops. Other “closed areas” also existed which were spiritual, and so they also maintained biodiversity.

However this was to change; a rumour was introduced that there were ‘evil spirits’ living in the *moora*, and so people cut down the trees. This may have come in with Christian missionaries or with other interested parties. During the time of the Marxist government known as Durg, these forests were felled because they were considered to be the sacred personal inheritance of village chiefs and the Durg wanted to introduce a socialist system of equal ownership of land.

Decline of traditional dams

Over the last 25 years, the water systems, the stone terraces, and the dams have started to break down, and with them the social environmental controls. We encountered several problems, and the main ones were:

- The neglect and breakdown of drinking water dams which now function primarily as goat drinking troughs, with a subsequent huge increase in goat populations, land degradation, and eutrophic water from the abundance of nitrogen and phosphorous from animal faeces.
- Conflict for water among people for domestic use, agricultural crops, animals, and a burgeoning population.
- Interventions from NGOs and government departments who



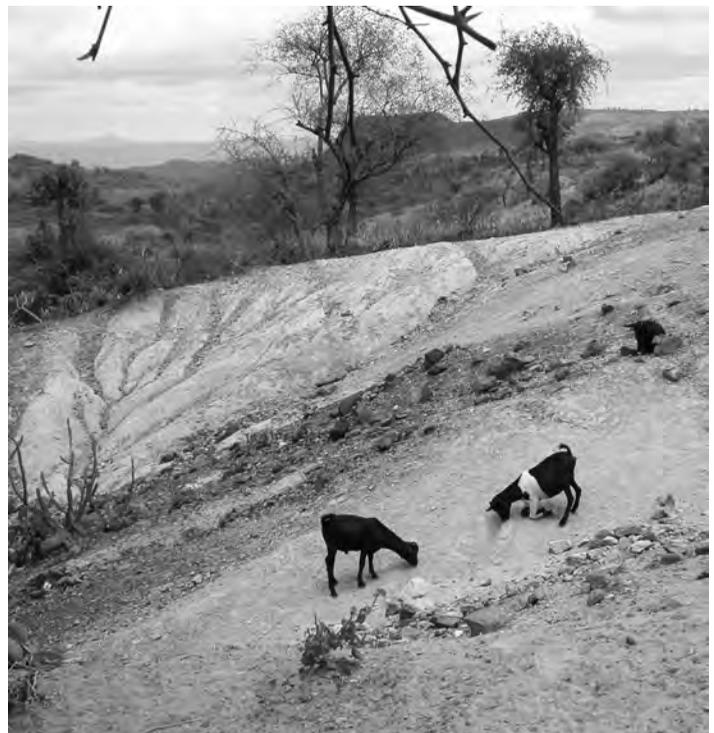
*Goats at a traditional dam at noon.
Hundreds more followed them.*

do not understand the traditional systems.

- Neglect or disregard for traditional environmental controls normally exerted by the village councils.
- New major and minor construction works ignore the traditional dams and sacred forests either because their detail is not visible, their significance is denied, or the workers are not educated as to their importance.

The present condition of the harta

Community environmental controls are not being enforced with the result that only remnant shrubs remain of the original trees and living fences. This is primarily due to animal grazing and tree removal by local people. Animals are grazing and damaging the dyke walls. The silt traps have suffered vegetation removal and erosion. Stone embankments have broken and in some cases the stones have been carried away. Because of tree removal there is a lack of shade resulting in high water temperatures. The lack of windbreaks hastens surface evaporation. Water in the hartas has become muddy for all of these reasons and worse, because cows and goats have been allowed direct access.



Goats licking seed out of soil on eroded bare land they caused.

New ponds built by government and NGOs

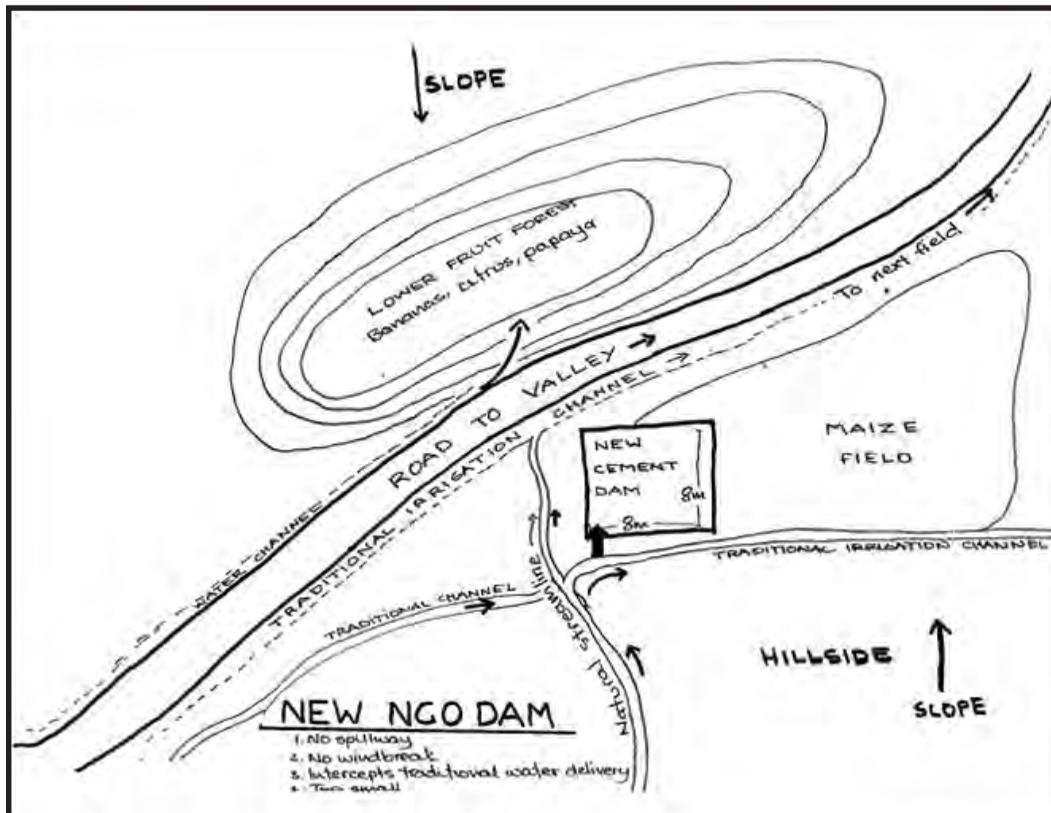
Below are four case studies of recent works which affect traditional water supplies.

Case Study 1 – Interference with social traditions

Farm Pond in Jarso village was built in 2002 by Farm Africa in

the style of a traditional pond. It was well constructed but fell into disrepair. The local people told us that there was a new project from Safetinet NGO to restore nearby stone terraces by paying for village labor. This new practice destroyed the traditional practice of local volunteer maintenance. While some social controls remained and did not allow the removal of stones or the taking of wood, we saw where the trough used to water animals

outside the pond has been completely obliterated by the hooves. We can see how modern practices have contributed to the corruption of what was traditionally a successful holistic system for maintenance of fields and water.



Case Study 2 – Town water connected resulting in pond now used by goats only

At Kumbalaya and also in Jarso, another dam was built, by Farm Africa in 2002. We were shocked when we visited at noon to see huge numbers of goats were present drinking from it. Local people told us of another well-meaning NGO which provided and connected town water to the village. The unforeseen result is that this village is now dependent on a

water source, the town supply, which is much less secure and less under their control. (The local town had completely run out of water to the high school and the church, and we were only able to access town water twice a day for two hours.)

The presence of goats at this pond showed that the community has lost its commitment to preserving its dam as common useful property. The people rely on the town water and the dam is only watering goats. If this is not remedied, the goats will overgraze the surroundings with appalling degradation of the land and desertification.

Already the surrounding area shows signs of severe degradation of soil, which already has no grass cover at all. This dam had an extra wall for silt control but again lacks maintenance. The silt trap area was grazed (photo 1448) and now the soil, stones, and filtering gravel are loose. Details of the previous fence and of the scattered stones which were once a protection wall shows the water gate at the edge of the silt area marked by *Euphorbia candelabrus* of astonishing dimensions showing natural spikey regrowth.

There is some awareness by local people we spoke with of the necessity for immediate intervention through repairs and a return to the prohibition of animal access. Rebuilding of surrounding terraces will be required to control erosion.

Case Study 3 – Intervening to “improve” a pond

The village of Karmote has a traditional dam just off the road. When we visited, to our surprise, we saw people washing clothes on its banks. This very large dam shows signs of care with trees throwing their shade and giving clear, cool water. However just as at the other sites, an elderly local man appeared and gave us the history of why it had lost its effectiveness. He told us that Mekane Jesus, an NGO with an evangelical mission, tried to clean the pond of bottom silt but the result was destructive because the bottom was flattened and not made convex as is necessary. Also the bulldozer driver threw the silt down the river destroying the wall that conveyed water to the pond. So the villagers had to divert a river upstream to direct the water to a larger area for silt cleaning.



Kambro near tree roots and goats

To improve this dam, its walls will need to be rebuilt including a sluice channel to provide the dam with extra water. It now comes from the side catchments and is useless. The dam also requires protection from contamination by human activities.

Case Study 4 - A new pond design

In the village of Gawadda Kebele a completely new pond was built to a new design by Mekane Jesus. This dam is for a group of 37 families of potters who live just beyond the village. Down from the houses is a site where the potters extract their clay of such good quality it can be use without degreasing. The pots are made by hand without requiring a wheel or coil. The dam is only a few metres from the clay pit. It is above a road and only a short walk from it downhill.



New NGO square dam with plastic cover to inhibit evaporation, already torn.

The structure is unusual in being square shaped, 8x8m and 2.5m deep like an upside down pyramid. In addition it was lined not with silt and stones but a thin layer of cement. Unfortunately this pond was empty when we visited because the cement had cracked. Now the dam will not collect water because there is no water capture system. The downhill water is directed either to fields below or erodes beside the dam and is wasted.

In addition the large surface area of this new dam is inadvisable because in dry areas such as this the smallest possible surface area along with shading and windbreaks are required to minimize evaporation.

Another issue is that the dam lies completely across the traditional water harvesting channels which look like drains beside the road but have been in use for centuries. Evidently these were not seen by the builders. To compensate, the farmers cut across the inflow channel and redirected water to their fields. Dams and goats

The new dams now serve primarily as “animal drinking dams” (mainly for the increasing populations of goats). The destructive behaviors of these goats have caused appalling erosion to the perimeters of the dams. As a result, conflicts now occur regularly between the goat and cattle herders and the community.

The NGOs who assisted villages with water from town or wells have unwittingly contributed to land degradation and a decline in emergency water availability and the authority of the

local village council controls. The best solution would be to start again with advice from the Konso farmers.

Recommendations

These case studies illustrate the problems of competition for water between people, agriculture and animals, and what happens when there is intervention by outsiders. To resolve these problems, each dam requires remedial structural work and social sanctions. Social intervention would come as the reinstatement of traditional drinking dam environmental controls and sanctions by village councils, the building of community awareness for the protection of water as an environmental cultural heritage, and the knowledge of its necessity as an emergency or disaster source.

Remediation would consist of:

- extending buffer areas around the ponds to an area larger than the ponds themselves
 - revegetating protective buffer zones
 - prohibiting animals from the whole area, including the walls and the silt traps
 - re-establishing the traditional and very savage, living fences of cacti and aloe to exclude grazing animals
- (Fences in Konso consist traditionally of plants of extremely thorny, long-lasting species.)
 - restoring windbreaks on the SE side to reduce surface evaporation from prevailing dry winds
 - replanting selected trees such as *Balanites egyptica* for shade and water quality
 - planting reeds on the edges to assist with water cleaning
 - cleaning out silt from the ponds
 - animals to be watered, as formerly, from troughs outside the ponds
 - some ponds require walls to be rebuilt and spillways reconstructed.

In the future, climate change, peak oil, uncertain rainfall, and growing animal and human populations will only further adversely affect the Konso. Their efficient traditional methods of water and slope management will need to be relearned, reinstated, and managed again by traditional village councils.

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Shrinking Forests: The Many Costs

Lester R. Brown

IN EARLY DECEMBER 2004, Philippine President Gloria Macapagal Arroyo "ordered the military and police to crack down on illegal logging, after flash floods and landslides, triggered by rampant deforestation, killed nearly 340 people," according to news reports. Fifteen years earlier, in 1989, the government of Thailand announced a nationwide ban on tree cutting following severe flooding and the heavy loss of life in landslides. And in August 1998, following several weeks of record flooding in the Yangtze River basin and a staggering \$30 billion worth of damage, the Chinese government banned all tree cutting in the upper reaches of the basin. Each of these governments had belatedly learned a costly lesson, namely that services provided by forests, such as flood control, may be far more valuable to society than the lumber in those forests.

At the beginning of the twentieth century, the earth's forested area was estimated at 5 billion hectares. It has since shrunk to just under 4 billion hectares, with the remaining forests rather evenly divided between tropical and subtropical forests in developing countries and temperate/boreal forests in industrial countries. Since 1990, the developing world has lost some 13 million hectares of forest a year. This loss of about 3 percent each decade is an area roughly the size of Greece. Meanwhile, the industrial world is actually gaining an estimated 5.6 million hectares of forestland each year, principally from abandoned cropland returning to forests on its own and from the spread of commercial forestry plantations. Thus, net forest loss worldwide exceeds 7 million hectares per year.

Unfortunately, even these official data from the U.N. Food and Agriculture Organization (FAO) do not reflect the gravity of the situation. For example, tropical forests that are clearcut or burned off rarely recover. They simply become wasteland or at best scrub forest, yet they still may be counted as "forest" in official forestry numbers. Plantations, too, count as forest area, yet they also are a far cry from the old-growth forest they sometimes replace

The World Resources Institute (WRI) reports that of the forests that still stand, "the vast majority are no more than small or highly disturbed pieces of the fully functioning ecosystems they once were." Only 40 percent of the world's remaining forests can be classified as frontier forest, which WRI defines as "large, intact, natural forest systems relatively undisturbed and big enough to maintain all of their biodiversity, including viable populations of the wide-ranging species associated with each type."

Pressures on forests continue to mount. Use of firewood, paper, and lumber is expanding. Of the 3.5 billion cubic meters of wood harvested worldwide in 2005, just over half was used for fuel. In developing countries, fuelwood accounts for nearly three fourths of the total.

Deforestation to supply fuelwood is extensive in the Sahelian zone of Africa and the Indian subcontinent. As urban firewood demand surpasses the sustainable yield of nearby forests, the woods slowly retreat from the city in an ever larger circle, a process clearly visible from satellite photos taken over time. As the circles enlarge, the transport costs of firewood increase, triggering the

development of an industry for charcoal, a more concentrated form of energy. March Turnbull writes in Africa Geographic Online: "Every large Sahelian town is surrounded by a sterile moonscape. Dakar and Khartoum now reach out further than 500 kilometers for charcoal, sometimes into neighboring countries."

Logging for lumber also takes a heavy toll, as is most evident in Southeast Asia and Africa. In almost all cases, logging is done by foreign corporations more interested in maximizing a one-time harvest than in managing for a sustainable yield in perpetuity. Once a country's forests are gone, companies move on, leaving only devastation behind. Nigeria and the Philippines have both lost their once-thriving tropical hardwood export industries and are now net importers of forest products.

Perhaps the most devastating development affecting the earth's remaining natural forests in this new century is the explosive growth of the wood products industry in China, now supplying the world with furniture, flooring, particle board, and other building materials. In supplying domestic and foreign markets, China has gone on a logging orgy outside its borders, often illegally, to procure logs from Indonesia, Myanmar, Papua New Guinea, and Siberia. And now Chinese logging firms are moving into the Amazon and the Congo Basin.

Forest Trends, a nongovernmental organization consisting of industry and conservation groups, estimates that at the current rate of logging, the natural forests in Indonesia and Myanmar will be gone within a decade or so. Those in Papua New Guinea will last 16 years. Those in the Russian Far East, vast though they are, may not last much more than 20 years.

Forest losses from clearing land for farming and ranching, usually by burning, are concentrated in the Brazilian Amazon, the Congo Basin, and Borneo. After having lost 93 percent of its Atlantic rainforest, Brazil is now destroying the Amazon rainforest. This huge forest, roughly the size of Europe, was largely intact until 1970. Since then, close to 20 percent has been lost.

Africa's Congo Basin, the world's second largest rainforest, spans 10 countries. Like the Amazon rainforest, it is also under assault, primarily from loggers,

miners, and farmers. This 190-million-hectare rainforest—home to 400 species of mammals, including the world's largest populations of gorillas, bonobos, chimpanzees, and forest elephants—is shrinking by 1.6 million hectares a year. The fast-rising demand for palm oil led to an 8-percent annual expansion in the palm plantation area in Malaysian Borneo (Sarawak and Sabah) between 1998 and 2003. In Kalimantan, the Indonesian part of Borneo, growth in oil palm plantings is higher, at over 11 percent. Now that palm oil is emerging as a leading biodiesel fuel, growth in oil palm cultivation will likely climb even faster. The near-limitless demand for biodiesel now threatens the remaining tropical forests in Borneo and elsewhere.

Haiti, a country of 9.6 million people, was once largely covered with forests, but growing firewood demand and land clearing for farming have left forests standing on scarcely 4 percent of its land. First the trees go, then the soil. Once a tropical paradise, Haiti is a case study of a country caught in an ecological/economic downward spiral from which it has not been able to escape. It is a failed state, a country sustained by international life-support systems of food aid and economic assistance.

The biologically rich rainforest of Madagascar, an island country with 18 million people, is following in Haiti's footsteps. As the trees are cut, either to produce charcoal or to clear land to grow food, the sequence of events is all too familiar. Environmentalists warn that Madagascar could soon become a landscape of scrub growth and sand. When land is cleared for grazing or farming in the Amazon, the amount of rainfall that runs off and returns to the sea

increases, while that which is recycled inland to provide more rainfall is reduced dramatically. The forest begins to dry out, and at some point, the weakened rainforest becomes vulnerable to fire. As the Amazon rainforest weakens, it is approaching a tipping point beyond which it cannot be saved.

A similar situation may be developing in Africa, where deforestation and land clearing are proceeding rapidly as firewood use mounts and as logging firms clear large tracts of virgin forests. As the trees disappear, rainfall runoff increases, depriving the land of the water pumped through trees and into the atmosphere. When the forests disappear, this rainfall declines and crop yields follow.

More and more countries are beginning to recognize the risks associated with deforestation. Among the countries that now have total or partial bans on logging in primary forests are China, New Zealand, the Philippines, Sri Lanka, Thailand, and Viet Nam. Unfortunately, all too often a ban in one country simply shifts the deforestation to others or drives illegal logging. △

http://www.earthpolicy.org/Books/Seg/PB3ch05_ss2.htm.

Adapted from Chapter 5, "Natural Systems Under Stress," in Lester R. Brown, *Plan B 3.0: Mobilizing to Save Civilization* (New York: W.W. Norton & Company, 2008), available for free downloading and purchase at www.earthpolicy.org/Books/PB3/index.htm.

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Food Exploration in the Caucasus

An Encounter with Wild *Hablitzia*

Justin West

DURING A FIVE-WEEK PLANT EXPLORATION and seed collecting expedition last summer I had the good fortune to meet the wild ancestors of many of our common (and some less common) fruits and perennial vegetables. One lucky encounter in particular was with *Hablitzia tammoides* in the wilds of an Armenian canyon. This meeting encapsulated well the journey, the land, and the possibilities that arise when one stays attentive and open to dynamic unfolding of one's local environment.

For years I have been exploring the world of edible plants, and the Caucasus has for me become synonymous with wild edible plant origins. As I came to find out this past summer, species of almonds, chestnuts, walnuts, hazel, pomegranate, grape, hawthorns, plum, apples, and pears, to name a few of the more common crops, can all be found growing wild in this rugged land bridge between Europe and Asia. Three of the four wild ancestors of wheat originate there. Along with these, a wide range of herbaceous species is found there, one in particular with which readers of *Permaculture Activist* will be familiar. It was this little known but much talked about *Hablitzia tammoides*, or Caucasian Spinach, which had piqued my curiosity. In August 2008 and early September I had the good fortune to travel through Russia, Armenia, and Georgia exploring the homes of some of these wild edible ancestors, and with luck finally to meet *Hablitzia* in the wild. To my pleasant surprise, the journey of discovery revealed much to me about the plant, and the plant, equally, drew forth from me clarity of perception about the land.

Geography of the Caucasus

The Caucasus region is roughly the same size as the state of Washington (200,000 sq kilometers), and at about the same latitude. But with 6350 vascular plant species, the area has close to twice the botanical diversity of Washington. As well, an abundance of wildlife inhabit the area (130 species of mammals) including brown bear, lynx, wild cat (ancestor to the modern house cat), European bison, boar, striped hyena, antelope, wild goat, wild sheep (ancestor to domestic sheep), deer, jackal, tiny populations of Caucasian panther, and of course, humans. (The Caucasus are, it is supposed, the land bridge through which our ancestors walked out of Africa.)

The diversity so inherent to this place is an authentic embodiment of the wide range of ecosystems found in the Caucasus, and a prime example of the permaculture principle of diversity at the edges. The Caucasus are bordered on the west by the Black Sea, and to the east by the Caspian Sea. In the north is the Greater Caucasus mountain range, and to the south lie the semi-arid and arid deserts of Turkey and Iran. Here at the confluence of these divergent geographical features subtropical and temperate climates meet. The Black Sea provides warm humid air, which is buffered from the cold northern winds by the

Greater Caucasus range. Many species took refuge here during the last ice age, and some from the Tertiary and early Quaternary periods survive to this day.

All of this biodiversity is astounding to contemplate when one considers how long people have lived in this part of the world, and to consider that these people, and this land, have been conquered by virtually every passing empire known through the history books. It is a land which has known armed conflict as a way of life for millennia, and yet somehow, an abundance



*Entering the rugged Armenian canyon where we found *Hablitzia* growing wild.*

of biological diversity remains. (1) Equally miraculous is that despite the coming and passing of these many empires (or perhaps because of it) there is a wellspring of cultural, religious, and linguistic diversity which rivals any other part of the world of comparable size. It should be noted, however, that the past twenty years have seen remarkable changes in the Caucasus and consequential pressures on the other-than-human biodiversity not previously felt. Many species are rapidly showing up in the "Red Book" of endangered species.

On the path of wonderment

I wondered, amongst this almost overwhelming diversity of landscapes and plants, if I might stumble upon *Hablitzia*, but I knew very little about where to look. I kept my eyes open at every opportunity; in every market, and along the many kilometers of trails my partner, Li An, and I walked. However, I was not so much hunting the *Hablitzia* as I was allowing the landscape to unfold around me and reveal herself in the way that she so chose. Through this mode of open and exploratory traveling we experienced Russian mountainsides covered in ancient old-growth chestnut. Kilometers from the Iranian border in southern Armenia we cracked nuts at the base of a walnut five feet wide, and walked into a hollow ancient Sycamore (*Platanus orientalis*) over 12 feet wide. In the steppe of Armenia we shared bread, cheese, and smiles with semi-nomadic Kurdish herders. In Georgia, near the border with Chechnya, we drank homemade vodka out of sheep horns with animist herders, and later followed fresh bear tracks along a glacier-fed stream to the headwaters valley. Later, in a small village market we marveled at jars packed full of pickled *Smilax* shoots and *Staphylea* flowers.

Through it all we were continually inspired by the sheer diversity of landscapes, and the equal diversity of fresh, organic (2) fruit and nuts in the markets of the cities and in the villages. In peoples' private gardens, the pears, apples, plums, persimmons, apricots, peaches, and Cornelian cherries were seemingly woven



The author with Hablitzia in hand.

together with streamers of grape vines, and under-planted with patches with corn, beans, and other vegetables. The streets were lined with rows of walnuts and chestnuts. It often felt as though we had stepped not into the past, but rather into a future realm, a post-oil era, where the lack of cheap consumer goods was all but forgotten amidst daily rituals of food production and celebration.

Wine, as one park botanist in Georgia told me, is the petrol of the Georgian. Every glass of homebrew had a distinct flavor, a murmur, and at times a flagrant yeasty bellowing of the small garden in which the grapes were grown.

When we did end up coming across *Hablitzia*, the whole experience of discovery—the land, the topography, and the climate—seemed such a concrete reflection of the actual qualities of the plant itself. There were no giant, jaw-dropping, primeval trees around. The landscape was beautiful but modest in scale. The weather was hot, and provoked in us an overarching desire to seek shade. Finally, like *Hablitzia*'s creeping, shade-loving tendrils, the trail, the river, and the canyon itself wound its way through the highland steppe, a meandering crevice of dark green growth in an otherwise brown and rocky land.

We had only been in Armenia a couple of days and were still getting our bearings on the extensive landscape. Our views were filled with dusty browns and red ochres after two weeks in the lush green of subtropical and montane Russia. Soviet-era Russian topo maps in hand, we set out on a four-day trek to follow this particular river to its source. From a first century Roman sun goddess temple and a ninth century Orthodox Christian cave monastery carved out of the volcanic tufa rock, we entered into the narrow river valley in spectacularly poor fashion. We soon learned from the intensity of sunshine that any climbing, up or down, would have to be done in the cool morning hours. Though the terrain, covered in thick brush, was steep, rocky, and at times nearly impossible to pass through, we enjoyed happening upon wild almonds, pears, the ever-present cherry plum (*P. divaricata*), and at least two species of hawthorn (*Crataegus spp*).

That same morning we arrived in a tiny village perched on a slope which would eventually take us into the canyon. Through the persistent care of some simple irrigation ditches the people of that village have, over countless generations, created an oasis of green, visible from miles away. Meter diameter walnut trees (*Juglans regia*) surrounded the turf-roofed stone huts built into the side of the hill. They had gardens of corn and beans planted in the north side shade of these giant trees, a testament to the solar intensity of the place.

Hospitality and abundance

A woman and her daughter picking apples in their orchard reached over the fence and handed me some. Before I could say thank you she was already walking back to her trees to get us some more. A brief, choppy conversation of mostly smiles and hand gestures led to us being ushered into their home and sat down at their table for "coffee." Coffee, in the Armenian and Georgian way, roughly translates into "everything in the cupboard being laid out onto the table and made available to share." From this one small corner cupboard emerged a banquet of apples, pears, peaches, grapes, watermelon, butter, cheese, jam, bread, honey, dried apples and apricots, walnuts, tomatoes, cucumbers, sweets, and, bizarrely, even the eldest son's university diploma in

computer engineering.

Any chance of beating the noon-day heat was happily thwarted by our gracious hosts. We set out eventually in the baking sun, our packs fully laden with juicy apples and walnuts one can crack with two fingers. We stopped a couple of times to cool off in the river, and when we eventually set camp that evening we were well within the shady overgrowth of the riparian oak and ash of the canyon bottom. The next morning I discovered in the light of day that we had luckily set up camp at literally the very confluence of the two forks of the river. With that good omen and knowing therefore exactly where we were on the map, we headed up the northern of the two, following, when available, a rough game trail along the river.

The moment of discovery

We had just taken a long break, and began walking again when I noticed the *Hablitzia* growing very inconspicuously among some currant bushes, and up a rocky north-facing cliff wall. It looks a bit like bind weed, but instead of binding steadily up it followed more of a lazy crawl up or down, or along whatever seems to be available. It was, however, the flowers which clued me in to the fact that I had actually stumbled upon *Hablitzia*. I recognized them from having seen the same tiny green flowers on Stephen Barstow's *Hablitzia* in Norway. Upon closer inspection I found small green tissue-paper thin caps, almost like moss operculum's, falling away from the center of the flower and revealing shiny black seeds, just like the ones Barstow had given me last summer. What luck! There were several plants along this dank canyon wall, each with only a couple of gangly 6-10 foot long shoots on them.

While harvesting some of the abundant seed, I wondered if this would be the first of many more encounters with *Hablitzia* over the course of the next few weeks. As it turned out it was not. We saw it twice more that day and never again afterwards in the wild, nor in the markets.

Later that same day, after a run-in with a litter of young boars and a disinterested sow, we arrived at a wider part of the canyon. The river had already narrowed substantially, and the landscape was beginning to soften into less profound cliff faces. Here we found a series of caves, each with a large welcoming entrance, providing ample headroom and plenty of flat space to lay out our bedrolls. The first cave had a ceiling with too many loose rocks, so we moved on to the second wherein we found a lush *Hablitzia* inhabiting the better part of half the cave floor. The shoots on this giant were about 15-17 feet long and the leaves were in some cases as much as a foot long and wider than my hand; again with abundant seed available. We harvested some while lamenting that the cave floor was a bit too slanted for a comfortable night's sleep.

We moved on and discovered a third cave, practically hidden by the thick foliage of an apple tree whose trunk was actually growing from within the cave and arching its way out into the light, thereby partially concealing the entrance. A fine dusty ground and a solid ceiling made it our choice for the night.

That evening we built a fire, and in the orange glow of the flames our shadows danced on the cave wall as we steamed *Hablitzia* leaves. I pondered the odds. While preparing for this trip, the prospect of discovering wild *Hablitzia* had grown into

a pursuit of mythic proportions. I had read about it, and seen it in Stephen Barstow's garden in Norway, Martin Crawford's forest garden, as well as in Eric Toensmeier and Jon Bates' forest



*Flowers (top) and seeds of *Hablitzia tamnoides*.*

garden in Massachusetts. The fact that my partner and I had, without really knowing where in a region of several countries we might look, left me feeling a bit stunned; that the *Hablitzia* happened to be just at the point of setting seed really felt a bit miraculous.

I sat by the fire that night and in the wake of an incredibly satisfying day, wondered about the signs constantly surrounding us. The growth forms of plants are forever providing snapshots of their environments and the events that have led up to the present moment. I considered the apple tree, branches swaying above me. Likely a feral sprout from a core tossed aside decades ago, the form the tree had taken spoke volumes about the shape of the cave, the wind in the valley, the available moisture, and the daily path of sunshine overhead. The seedling germinated and took root, perhaps nourished by a tiny bit of apple core composted with the aid of a few mouse droppings, a fair trade for the food which the other apple seeds in the core likely provided the little scavenger. Why didn't the mouse eat all of the seeds? Had a raptor passed overhead at just the right moment, startling the mouse into hiding? Emerging on the inside lip of the

cave, that apple seedling must have had a tough first few years, seeking light, and more, searching deep in the rocky ground for moisture. Each bend in a branch unfolds a whole history lesson to the patient and attentive observer. Plants embody perfectly their environments through a unique and creative process of interpretation. And so, I believe, do we.

Justin West is the resident applied ecologist at Schumacher College in Devon, UK where he teaches on the MSc in Holistic Science, as well as short courses. He is currently regenerating

the lawns around the 14th century buildings into productive forest garden polycultures.

Notes

1. It should be noted that although this has been a land of near perpetual conflict, it is also a place in which I have never felt a stronger sense of community and cooperation.
2. Chemical horticulture is largely uneconomical, and besides, Armenians in particular revel in their fresh fruit.

Trees, Fire, and Farmers

Making Woods and Soil in the Maya Forest

Ronald Nigh

UNDERSTANDING AGRICULTURE in tropical landscapes is an interdisciplinary task, focusing the interest of the ecological, physical, and social sciences. The research reported here is part of an ongoing, long-term study of Lakandon Maya agricultural and forestry practices of an interdisciplinary community of researchers.

The Lakandon *milpa* system was first described in detail in a coauthored paper. (33) Nearly 20 years later, Levy produced a study of successional dynamics in Lakandon fields which revealed unsuspected ecological sophistication. (25, 26) In recent years, ethnobotanists, biologists and social scientists have collaborated on further work as reported in joint papers (11) and in graduate theses. (10, 12) This paper reports the results of further ethnographic fieldwork carried out by the author during several visits to the study area in 2005 to 2007.

Our interdisciplinary theme is the relationship between traditional Maya agriculture and the tropical woodlands matrix within which it is practiced. We focus on the specific functional components of the *milpa* multicropping agroecosystem as it moves through the phases of managed secondary succession after the cultivation phase.

Ecosystem function has been defined as “the minimum aggregated set of processes (including biochemical, biophysical, and biological ones) that ensure the biological productivity, organizational integrity, and perpetuation of the ecosystem.” (41) Though there is no formally defined minimal set of such functions, we know that they are primarily supplied in forest ecosystems by two classes of organism: trees and microorganisms. These species necessarily relate to other secondary key

organisms, including birds, bats and other mammals, as well as lianas, ferns and epiphytes, among others.

In this paper, I present preliminary analysis of two Lakandon agroforestry practices intended to increase soil fertility: enrichment planting in early successional stages of selected tree species and the controlled use of fire. Technical assessment of these practices has been presented elsewhere. (11, 26) An underlying purpose here is to compare Lakandon practice and knowledge concerning secondary forest regeneration with the knowledge of Western-trained forest ecologists. The considerable

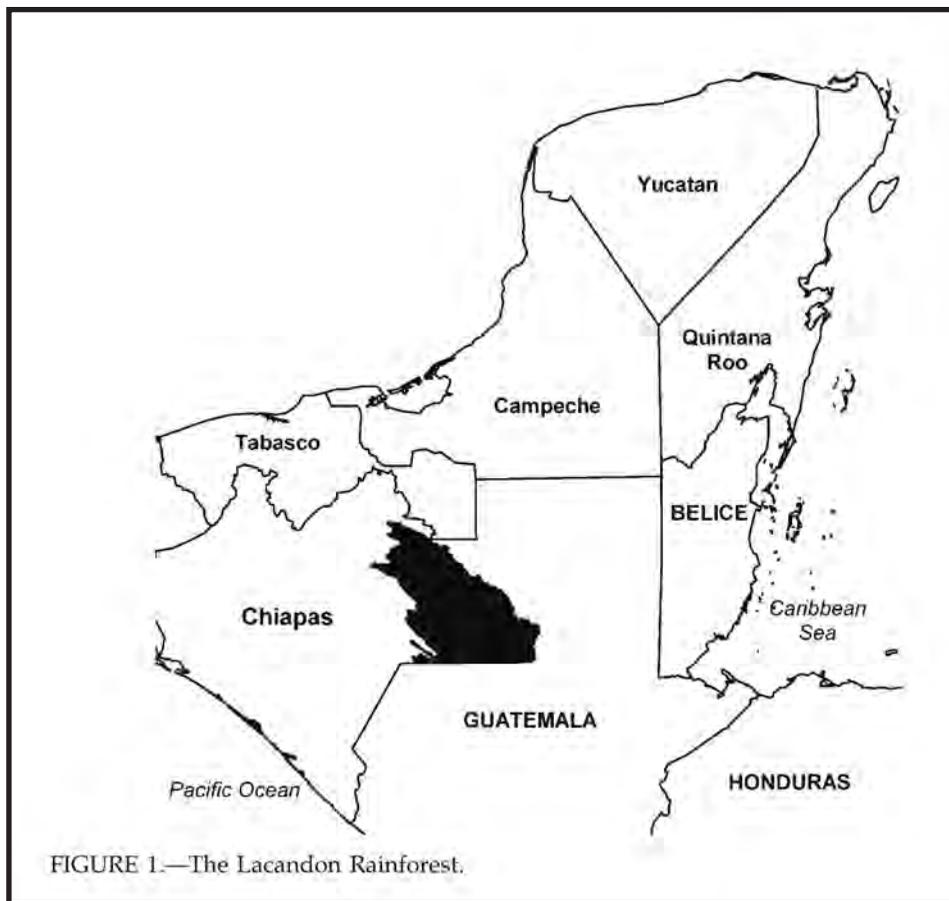


FIGURE 1.—The Lacandon Rainforest.

convergence of native and biological plant taxonomies has been extensively documented in the Maya area and elsewhere. (5) The possible correspondence of categories for and understanding of ecological processes among native farmers and forest ecologists is, however, less studied. I analyze ecological succession in traditional Lakandon Maya agroforestry as perceived by farmers and researchers to explore the degree to which they share an understanding of the successional process. Not surprisingly, Maya agroforesters and field ecologists have arrived at similar representations of succession. The process of documenting this conclusion reveals many interesting aspects of secondary succession management in forest garden systems. (4)

Study Area

The communal lands of the Comunidad Lacandona are located in the Lacandon rainforest of northeast, lowland Chiapas, Mexico. The Lakandon settlement of Lacanjá Chansayab lies on the intersection of latitude 16°45'38.0"N and longitude 91°07'49.0"W. The region is characterized by long, low, ridges (600 to 1000 m/2000-3300') running in parallel from northwest to southeast to the Lacantún River. Fanning out between the ridges, in the relatively level, though undulating land among abundant small streams we find the sites where the Lakandon Maya disperse their dwellings and their agriculture.

Corn field in a mosaic of secondary forest in southern Belize.



The climate is humid tropical, with an annual rainfall of 2300 to 2800 mm (90-110") and average temperature of 25°C with minimal seasonal variation. (33)

Soil is predominantly Redzina associated with limestone and derived sand and extensive alluvial deposits. Of agricultural interest is a highly fertile mollic A horizon formed on all soil types by leaf litter on the limestone base. (3,14) Some of the deeper alluvial deposits are also fertile but of high clay content with a tendency to waterlogging and thus are agronomically challenging.

Vegetation is characterized by types of tropical woodlands called tropical rainforest, lower montane rainforest, and evergreen seasonal forest. (7) These woods typically show three or more strata and present a fairly uniform canopy between 35 and 45 meters with occasional emergents up to 60 meters tall. (31) The most common canopy species in the Lacanjá area are *Brosimum alicastrum* Sw., *Aspidosperma megalocarpon* Muell. Arg, *Dialium guianense* (Aubl.) Sandwith, *Guatteria anomala* R.E.Fr., *Terminalia amazonia* (J.F. Gell.) Excell., *Swietenia macrophylla* King, among others (see below).

The Lakandon Maya are Yukatek speakers, closely related to the Itzaj Maya of the Petén, Guatemala. (2) The population of around 800 currently resides in three villages in eastern Chiapas, Mexico. They are the smallest Maya group, sharing their original territory with some 500,000 Tzeltal, Ch'ol, and Tojolabal Maya. The Lakandon are the oldest residents of the Lacandon lowlands,

with a complex ethnogenesis in the region reaching back to the 18th and 19th centuries. (34) The other Maya groups are more recent colonists from nearby highland areas. (1)

Milpa agroforestry as successional management

The term milpa refers to an agricultural system with a deep history of practice throughout Mesoamerica. It is centered on the production of maize (*Zea mays* L.) but is always a polyculture with companion plants selected from a basket of dozens of

annual and perennial crops, according to taste and the particular local ecology. Milpa is often practiced as a swidden, a clearing for agriculture surrounded by woodlands, established as a rotation with secondary vegetation. The Maya milpa systems discussed here are of this type. (6, 18, 22, 33, 42) We distinguish 'traditional' from 'conventional' milpa, commonly practiced today in the Maya area. Traditional milpa is a highly diverse, intensively managed swidden system, probably far more common among all Maya groups in the past, also called the 'high-performance milpa' by Wilken (1971).

Early ecological studies of forest succession demonstrated

TABLE 1—Phases of Neotropical secondary forest succession, and vegetations dynamics, as defined by forest ecologists. (Chazdon 2008)

- Phase 1—Stand initiation phase (0–10 yr)
- Germination of seed-bank and newly dispersed seeds.
 - Resprouting of remnant trees.
 - Colonization of shade-intolerant and shade-tolerant pioneer trees.
 - Rapid height and diameter growth of woody species.
 - High mortality of herbaceous old-field colonizing species.
 - High rates of seed predation.
 - Seedling establishment of bird- and bat-dispersed, shade-tolerant tree species.
- Phase 2—Stem exclusion phase (10–25 yr)
- Canopy closure.
 - High mortality of lianas and shrubs.

- Recruitment of shade-tolerant seedlings, saplings, and trees.
- Growth suppression of shade-intolerant trees in understory and subcanopy.
- High mortality of short-lived, shade-intolerant pioneer trees.
- Development of canopy and understory tree strata.
- Seedling establishment of bird- and bat-dispersed, shade-tolerant tree species.
- Recruitment of early-colonizing, shade-tolerant tree and palm species into the subcanopy.

- Phase 3—Understory reinitiation stage (25–200 yr)
- Mortality of long-lived, shade-intolerant pioneer trees.
 - Formation of canopy gaps.
 - Canopy recruitment and reproductive maturity of shade-tolerant canopy and subcanopy tree and palm species.
 - Increased heterogeneity in understory light availability.
 - Development of spatial aggregations of tree seedlings.

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that the initial floristic composition of a disturbed area is a strong determinant of later vegetation composition (13) and suggested the long-term legacy of chance

TABLE 2—Lakandon Terminology for Successional Stages, approx. chronology and characteristic spp according to Lakandon farmers.

Initial colonization, 1 a 4 yrs – robir	
Botanical name	Lakandon name
<i>Bidens ordarata</i>	kuxnok'
<i>Baccharis trinervis</i>	SisicusAU (grass?) suk
<i>Iresine difusa</i>	ch'kubakeyok
<i>Schistocarpa eupatorioides</i>	mumubakex
<i>Smilax domingensis</i>	shukur ? kuriki
<i>Erechtites hieracifolia</i>	SiscusHU ?
	apaac ? concom ? chaok
<i>Acalypha diversifolia</i>	chiriptux
<i>Mimosa ervendbergii</i>	jarochkiix
Secondary forest 4-10 yrs – jurupche	
<i>Heliocarpus appediculatus</i>	s'akjaror
<i>Spondias mombin</i>	jujup
<i>Piper aduncum</i>	m'k'uram
<i>Piper auritum</i>	jover
<i>Cecropia obtusifolia</i>	k'o'och
<i>Bursera simaruba</i>	ch'acaj
<i>Podachaenium eminens</i>	kibok
<i>Lochocarpus guatemalensis</i>	yaxbache
<i>Inga pavoninana</i>	bitz
<i>Ochroma pyramidale</i>	chujum
Second'y forest 10-20 yrs – nukuxhche	
<i>Pouteria sapota</i>	jaas
<i>Brosimum alicastrum</i>	ox
<i>Blepharidium mexicanum</i>	sak yuste
<i>Sweetenia macrophylla</i>	puna
<i>Calophyllum brasilense</i>	babaj
<i>Schizolobium parahybum</i>	petskin
<i>Ceiba petandra</i>	yaajche
<i>Cordia stellinifera</i>	popojche
<i>Platymiscium dimorphandrum</i>	sakchuru
<i>Nectandra globosa</i>	econte
<i>Cedrela odorata</i>	kuche
Mature forest 20+ yrs – tamanche	
<i>Chamaedorea alternans</i>	chiip
<i>Chamaedorea oblongata</i>	sacboy
<i>Geonoma oxycarpa</i>	kunchepajok
<i>Chamaedorea elegans</i>	chirixboy
<i>Chamaedorea ernest-</i>	augusti k'ewen
<i>Heliconia librata</i>	s'kre
<i>Clarisa biflora</i>	chak' opche
<i>Dipholis minutiflora</i>	subur
<i>Rinorea hummelli</i>	makanche
<i>Ampelocera hottlei</i>	rubin
<i>Sabal mexicana</i>	xa'an
<i>Poulsenia armata</i>	ak ju'un
<i>Piper hispidum</i>	m'k'uramik ak
<i>Trichilia breviflora</i>	majas'aku

colonization events in determining the composition of secondary vegetation. Rather than allowing 'chance colonization events' during the early phases to determine the course of succession, humans intervene in the early stages of regeneration. The purpose is to influence the eventual structure and function of secondary vegetation in ways that favor human subsistence. The initial goal of secondary vegetation management, according to Lakandon farmers, is canopy closure, though this may require soil fertility restoration as a prerequisite. There are two principal factors to control in early secondary succession on agricultural fields: 1) the germination substrate, including resprouts and the soil seed bank and 2) species composition during the early stages of woody stem regrowth. Resprouting is the most important form of recolonization after swidden, but in unmanaged contexts may lead to uneven cover and clumping. (38) Enrichment planting directly influences the species composition and the nature and rate of successional processes. (36) Our and others' research has shown that management during the cultivation period greatly affects recruitment rates, total biodiversity, growth rates during subsequent succession. (15)

Management of the transitional phase between annual cultivation and the reestablishment of woody vegetation is especially critical for the farmer, as that is when the field is most vulnerable to invasion by exotic species that can delay or deflect succession from desirable vegetation associations. (39) In contemporary Mesoamerica, the principal threats in this regard are Old World pasture grasses and the universal bracken, *Pteridium aquilinum*, L. Kuhn. (17, 30, 37) Lakandon farmers take conscious measures to ensure that species composition of regenerating vegetation rapidly approaches that of the original mature forest. This concern is evidenced during the maize cultivation cycle by careful weeding of the cropping area, involving several techniques. In the traditional Lakandon milpa, weeding is a daily activity, as emerging plants are cut or pulled and usually left on the ground, or are removed to avoid resprouting. Repeated year after year, such thorough weeding maintains a reduced presence of annuals (weeds) in the soil seed bank. These practices, along with the forest landscape surrounding

the field, affect the process of secondary succession resulting in rapid establishment of desirable secondary vegetation. (9, 20)

Under Maya management in the evergreen and seasonal rainforests of eastern Chiapas, canopy closure of the 'stem exclusion stage' is achieved in two to three years, rather than up to ten as described by ecologists (Table 1), through the propagation of fast-growing pioneer trees. Bats and birds are attracted to these pioneer species and bring the seeds of more shade-tolerant trees that eventually make up the canopy of the mature forest. Thus, the transition into the ecologists' 'Understory reinitiation stage,' normally occurring at least 25 years after the disturbance event (Table 1), is reached in half that time under Lakandon management, that is, in around 12 to 15 years. Though most Lakandon farmers would probably prefer to prolong the forest-growth stage for many more years, the field is theoretically ready to be reconverted to milpa at that time. (25, 33)

An example of steps taken to build soil fertility in the earliest stages of succession is provided by the Lakandon Maya's management of *Ochroma pyramidale* Cav. ex Lam (Bombacaceae), the balsa tree, chujum in Yukatek. (The ethnobotany was first described in Levy Tacher et al. 2002.) This tree has a natural distribution in just four fragments of very humid forest in Mexico. (35) The presence of balsa in Lacanjá (and other sites in the Maya forest) is restricted and probably depends entirely on human intervention. This species is encouraged and deliberately seeded in Maya agroforestry practice, and is believed by Maya farmers to increase organic matter in the soil. Studies have confirmed the accuracy of farmers beliefs. (28) Both the experience of Lakandon farmers and the results of research reveal balsa to be a useful tool for soil enrichment.

Balsa is a fast growing tree that is capable of creating a closed canopy of 5 to 10 m/16-32' within one to two years under favorable conditions. It is a prolific producer of leaf litter, and the resulting soil is highly enriched with organic matter. Competing annuals and sun-loving plants are soon shaded out, and the conditions are created for the growth of the shade-tolerant, long-lived tree species characteristic of the later stages of succession. Where soil has been exhausted by extractive land use, such as prolonged



Mature forest garden at the farm of Saul Garcia in southern Belize.

extensive cattle grazing, early stages of secondary succession are vulnerable to invasion by bracken. Balsa is effective in the control of such invasive species that can dominate space rapidly and detour succession from desired afforested states. Furthermore, balsa is crucial to succession as a kind of keystone species around which occur interactions that further determine the direction of the successional process. The species involved have not yet been identified, but the star-shaped, aromatic blossoms attract bats, who are also responsible for pollinating the balsa tree. Bats and birds are the crucial vectors of the seeds of intermediate and long-lived trees that sprout on the newly shaded conditions provided by fast growing pioneers such as ramón (*Brosimum alicastrum*), hog plum (*Spondias mombin* L.), and Santa Maria (*Calophyllum brasiliense* Camb.), among others.

MAYA farmers and forest ecologists

The Lakandon name the distinct successional stages, indicating a concern with the type of vegetation that ideally develops after several years of maize polyculture. (Table 3) On comparing Lakandon stages with those defined by forest ecologists, we find similarities and some important differences that reflect Maya management concerns. For example, Chazdon

(2008), following previous authors, defines the three basic stages in the process of re-establishment of mature woody vegetation after disturbance. (Table 1) Lakandon classification divides Chazdon's second stage, 'stem-exclusion' into three separate stages and then distinguishes a fourth stage of mature vegetation, corresponding to ecologists' 'old-growth' or 'mature forest'. The principle event defining Lakandon stage 2 (jurupche) is canopy closure, which agrees with the forest ecologists' view. In the Lakandon system, enrichment planting in the early years of succession helps shape the later composition of flora. If we examine the species Lakandon farmers consider typical of the second stage (jurupche in Table 2), we find all of these trees are also recognized as dominants of the stem-exclusion stage in empirical studies by ecologists. (10, 26)

The move from Lakandon stage 2 (jurupche) to stage 3 (mehenche) is marked by a change in the dominant canopy trees as the short-lived pioneers such as *Cecropia obtusifolia* Bertol. and *Ochroma pyramidale* are replaced by intermediate to long-lived secondary species such as *Spondias mombin* and *Heliocarpus appendiculatus* Turcz., among others. In the final stage of mature vegetation these latter species disappear as well, and the long-lived, old-growth trees such as *Ronorea hummeli*, the enduring *Brosimum alicastrum*, and others dominate the

canopy. Thus, it is clear that the Lakandon facilitate the establishment of a particular functional group of secondary forest trees in an early stage of succession, with the intention of influencing ecosystem processes.

It is important to note that the secondary associations that develop from traditional Lakandon agroforestry practices differ from those deriving from land use practices by more recent colonists to the region, or by Lakandon Maya who have adopted the conventional milpa system. Traditional Lakandon mature successional stages are more similar to old-growth forest in species composition and other characteristics (26, 33) than regrowth on conventional fields. Lakandon farmers encourage certain tree species for their ecological functions and their consequent desirable impact on succession. (11, 28) Practices, such as the weeding techniques described above, along with the treecovered landscape surrounding fields, prepare the process of succession resulting in rapid progress to desirable secondary woody vegetation. (9,

20)

Soil and succession

Fire is a defining feature of swidden agriculture. For a number of reasons this complex form of land management and its key technology have been cast as villains in the drama of tropical development, a process that may well have obscured a more careful and perhaps more fruitful analysis of the roles that fire and succession might have had in the creation of soil fertility over longer stretches of time. (21)

Under high-performance management, such as practiced by the Maya and other tropical farming people, repeated intensive cycles of cultivation and regeneration can actually lead to enhanced soil fertility, a fact about swidden agriculture that contradicts widely held views. Hecht (2003) has reported a similar observation for Kayapo' vegetation management in the Xingu region of the Brazilian Amazon. The standard stereotype of slash-and-burn or shifting cultivation as a destructive or wasteful practice fails to recognize the potential range of labor and knowledge intensity of tropical agriculture, varying from high-performance milpa and forest gardens to something that might be legitimately be called slash-and-burn. The amount of skilled forestry management carried out by Maya smallholders is also variable. The long-term stability and development of these agroforestry systems depends on specific enabling ecological and socio-economic conditions. The outcome for soil varies widely with the intensity of application of traditional skills. Under favorable conditions, intensive management such as described here can lead to greater soil fertility after each cycle of swidden cultivation.

One of the keys to the increases in fertility during the anthropogenic soil building process is the formation of black carbon (BC) as a significant fraction of the soil profile. (16, 40) In contrast to the conventional milpa system, in traditional Lakandon practice, small piles of residues of weeds or crops are incorporated directly into the soil or are burned occasionally in small, cool fires, throughout the year. These low-temperature burns produce charred plant material, and cause charcoal to be spread about the field; a hot burn over the entire field occurs only once in

the 8 to 30 year swidden cycle, when the initial vegetation is felled to initiate cropping. Even then, a controlled fire can lead to greater charcoal formation. During the maize cultivation phase, most of the weeds pulled or cut are not burned at all but left in the field to decompose, providing a continuous supply of labile organic matter to the soil. Low-intensity burning results in incomplete combustion of vegetable material from crop residues and weeds and a significant addition of pyrogenic charcoal to the soil.

Black carbon has a dramatic positive effect on soil fertility, providing surface area for microbial activity and the fixing of nutrients. High BC in soil is associated with higher P levels (reaching 200–400 mg P/kg), and causes higher cation exchange capacity (CEC), pH, and base saturation of soil. (16, 29) These soil characteristics not only help succession to move towards desired vegetation associations, but assure agricultural productivity in future cycles as well. Increased BC provides increased surface area for the formation of electronically negative sites that capture positively charged nutrients.

Temperature must be controlled in the fire to avoid all the biomass being converted to ash, leaving no fixed carbon behind. This is mainly achieved by frequent small fires that prevent the accumulation of flammable biomass. CEC is believed to be increased through the oxidation of aromatic C on the charcoal surface resulting the formation of carboxyl groups with negative charge, or through the adsorption of highly oxidized OM onto the BC surfaces. (16, 24) Carbon stored in soil is also highly persistent, remaining for centuries (24) and constituting a significant part of the soil carbon store.

The propagation of balsa, weeding, and the use of fire are critical tools, part of a range of such tools forest farmers may use to mold and maintain the tropical woodland environment. Traditional Maya milpa involves a high demand for labor and skill in horticultural practices that result in the formation of an anthropogenic soil of increasing fertility. Under proper conditions, one outcome of this process, intensified over generations, could be the formation of anthropogenic dark earths found throughout the Neotropics. This example supports the suggestion of Graham (2006:58) of “encouraging the expansion of dark earth research in

TABLE 3—Trees most commonly found by ecologists in the *jurupche* phase of Lakandon succession.

Species Name	Lakandon Name
<i>Heliocarpus appediculatus</i> Turcz.**	jarum
<i>Spondias mombin</i> L.**	jujup
<i>Piper aduncum</i> L.*	makurum
<i>Piper auritum</i> H.B.K.	jover
<i>Cecropia obtusifolia</i> Bertol.*	k'och
<i>Bursera simaruba</i> (L.) Sarg.**	chakra
<i>Podachaenium eminens</i> (Lag.) Baill.**	kibok
<i>Lonchocarpus guatemalensis</i> Benth.	yaxbache
<i>Inga pavonina</i> L.	bitz
<i>Ochroma pyramidale</i> Urban**	chujum
<i>Tetrochidium rotundatum</i>	mumuche

*Dominant species (Levy 2000)

**Species planted by the Lakandon

the Neotropics beyond the Amazonian region.”

Conclusions

Traditional Lakandon milpa is an intensive agroforestry system that enhances soil fertility and encourages the rapid development of secondary forest after maize cultivation. Guiding and accelerating the successional process is a form of intensification of swidden agriculture. (23) Shortening of the fallow period is usually thought to lead to soil degradation and forest loss. But under Maya management repeated cycles of intensive milpa could result in the formation of highly productive anthropogenic soil similar to those known as dark earth in Amazonia. It is likely that intensive milpa was more widely practice in the past when it formed the axis of the rural subsistence system in the Maya area. Far from being a destructive force in the forest, traditional Maya milpa is an efficient tool for maintaining and restoring biodiversity and creating fertile anthropogenic soil. Policies oriented towards discouraging investment in milpa agriculture are mistaken, and in fact worsen conservation rather than promoting it. As the Maya farmer's labor is 'transferred to other more productive activities,' energy is diverted from the management tasks necessary for the maintenance of the woodland matrix in which the Maya have lived for some 5,000 years. In the Maya forest we need conservation policies supportive of local management alternatives and oriented towards programs of participatory restoration based on the synergy of traditional knowledge and contemporary scientific ecology. △

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Magic Heals the Land

Bringing Permaculture to Trinidad

Erle Rahaman-Noronha

EMBRACE THE ETHICS OF PERMACULTURE, implement its principles wholeheartedly, and sit back to watch. Positive things that you could never have planned for start occurring as the land begins to heal itself. Peter Bane called it the magic of permaculture, the stage at which things take off and the unexpected happens as a reward for all the hard work you have put in. Although the information from my first permaculture design course (PDC) overwhelmed me and it took almost six months before I picked up another permaculture book and started reading again, that little phrase always stayed with me and has constantly kept showing up as our permaculture projects have unfolded.

I have not always lived in Trinidad. I have been blessed with an exposure to many cultures. My grandparents are from Goa, a Portuguese colony that was eventually taken over by India. My parents moved to Kenya where I was born and lived for the first 19 years of my life. I then moved to Canada where I went to university. My first exposure to permaculture came when I met perhaps the only two people in Trinidad who were practicing it: Bunty O'Connor, a potter, and Dr. Hugh Skinner, a professor who had been exiled to Australia and had returned when the government that had been in power since independence finally changed. Bunty had given me an old copy of *Permaculture One* and told me to give it a try.

My wife and I had just graduated from university, were still living in Canada (she was Trinidadian) but wanted to get into tilapia aquaculture. We decided moving back to Trinidad was our best option. We looked at a few places that could have worked but by luck we found something that we instantly fell in love with: a 30-acre citrus estate with a few ponds and streams and huge potential. I remember not being able to put down *Permaculture One* for weeks as I drew plans for the farm, sketched out my zones 1 and 2 and waited to move to Trinidad to launch our new business. We had a name for the farm, Wa Samaki Ecosystems, Wa Samaki being a Swahili term from Kenya meaning "from the fish."

Permaculture backwards! (Start from Zone 5 and move in)

In permaculture you start small and work outwards. When you buy a functioning citrus estate with very flammable fire climax teak planted all along your boundary you suddenly have the full 30 acres to take care of all at the same time. We had our plans in place. We had our zones set out. I came down to Trinidad first (with our dogs) to set up the fish farm, my friends shipped in all our breeder fish from Canada and then my wife came down with our three-month-old daughter. We moved onto the farm at the height of the dry season in 1998 and within the first week had our first fire (from one of our neighbors) that took out about 150 of our mature citrus trees. The fires have happened every year since and come from all directions; some years we have held

them back, other years have been devastating! The areas farthest away from our house (our boundaries and what we had planned to be zone 5) became a high priority.

We quickly learned that any forest with wildlife close to your boundaries also tended to attract illegal hunters who don't respect boundaries. We also ran into a labor problem. We couldn't get many reliable workers, and the two we had could only accomplish so much. The citrus monocrop on our farm, which was initially part of our zone 3, turned out to be uneconomical



All photos this article by Peter Bane

The author and permaculture colleagues inspect aquaculture operations at the Sugar Cane Feeds Centre, Longdenville.

to maintain and required huge amounts of time and money to keep functioning without a lot of herbicides and fertilizers. Sheep under the citrus turned out not to be an option either because they attracted thieves! Adapt and change; plans had to be redrawn.

Hard decisions

The first three years were the steepest on the learning curve (although I still feel overwhelmed most of the time). Hard

choices had to be made and continue to be made. The first big decision we made was to abandon the citrus and begin planting a variety of timber trees through most of the estate to shade out the grass that was proving to be expensive to keep down and was a huge fire hazard. That decision would eventually convert most of the farm to zone 4 and 5, but for the first four or five years we had to give as much attention to it as we would have to zones 2 and 3. This was primarily to keep the grass from over-running



Fish culture was the author's first enterprise in Trinidad.

the tree seedlings and becoming a fire hazard. We've still had problems where fires have come across our firebreaks and caused all kinds of havoc. It's hard going into an area one week and seeing 20-foot trees everywhere and thinking the work is done for that section and then come back the following week and seeing a charred field. After 11 years of fires and observations, I am finally getting a grasp of where we have to plant fire climax monocrop species and where we can have our wildlife mixed forests. Some sections are now maintenance free while others have to be planted back from scratch!

The second decision we made was to get into the cut flower business. An acquaintance had approached us to purchase his entire heliconia operation and move it to the farm. He gave us all his income figures (which were not too exciting) and offered us the option of paying him off over a period of ten years. We knew nothing about cut flowers and against the advice of a lot of people we took up the offer. We had a few permaculture reasons for making the leap. The business was to supply local flower shops versus the export business we had with the tropical fish. The heliconias would be our zone 3 intensive income earner; heliconias yield much more revenue per acre than citrus. Most flower shops in Trinidad still sell a lot of imported flowers, and with peak

oil approaching, we knew that imports would not get any cheaper. We saw the market potential for local flowers.

Heliconia are tropical South American plants, well adapted to our climate conditions and therefore don't require a lot of pesticides (we've never had to use pesticides on them). The seller had a collection of over 20 different varieties and species of heliconias. We would not have a monocrop, but a diversity of plants ranging from three feet tall to over 20 feet for some of the varieties. Heliconias are also very prolific and we figured we might as well use them throughout the farm to compete with the grass and still give us a yield (of both flowers and biomass).

The transition was very stressful. Land preparation for the initial planting proved impossible because of a wetter than normal rainy season. Then the dry season that followed overstretched our water supply, and we killed all the fish in our biggest pond one night when it went anoxic. The political party in power happened to have a great distaste for heliconias because it was the symbol of the opposition which meant large orders for some events that our flowers could have gone to didn't materialize! We eventually overcame all our obstacles and have been extremely successful. When we finally got out of the tropical fish export business because of a number of issues, including cheap-oil competition from the Far East, we already had another business to fall back onto. I will finish paying off the heliconias in 2010 but I can honestly say the investment was sound and it supported the farm through an extremely tough time.

The third major decision affecting our evolution was probably the hardest. As they say in permaculture, the problem is the solution. Three years ago I got divorced. Many permaculture projects disappear once partners split up. Luckily, Wa Samaki Ecosystems has not been one of them. Although the break up was a stressful event with all its attached emotions, it put me back on the rather rundown farm full-time with very few distractions.

The magic returns

The magic has been happening ever since we started doing positive things on the farm. The most memorable event was when I saw a wave moving up a tiny stream I was walking next to, and out popped an otter onto the bank! Otters are extremely rare in Trinidad, mostly surviving in the north of the island, which is mountainous and rugged. Almost everyone I told informed me that I



Lush growth makes it difficult to imagine the danger of fire in Trinidad, yet it happens every year, mainly from human causes.

must be mistaken. Otters don't exist in the hill country of central Trinidad! Eventually, I did find out there was a tiny population left in central Trinidad and I had been extremely lucky to see one. That one event gave me the push to put in more ponds throughout the farm. We've seen the otters a few times since, the latest sighting being of two young ones! Birds that we hadn't seen before are always showing up and each event gives me more confidence to keep going.

Turning to Permaculture

In 2005, my friend John Stollmeyer declared that "now is the best time to try to bring permaculture to the wider Trinidad audience. We should hold the first PDC for the Caribbean." He had made a few attempts before but a PDC had never got off the ground. While I had been quietly working away on my farm over the last eight years, Johnny had been immersing himself in bioregionalism, attending gatherings and taking courses. He knew who he could approach for our PDC. Peter Bane! He set off to North Carolina for the bioregional gathering in 2005 with a mission to convince him to come teach us.

We planned to host the first ever PDC in the Caribbean on my farm in January of 2007. Plans were made; the course was advertised on our website www.wasamakipermaculture.org and elsewhere for almost a year. November 2006 rolled around and the course was six weeks away. We had by then only one sign-up! It was a Friday. Johnny and I had a meeting and decided we had to postpone the course. We emailed Peter. That weekend we got two more sign-ups. Monday, we had another meeting. We had enough money to pay for Peter's flight; we decided to take the risk, emailed him again, and reversed direction: the course was on! The magic started happening. Johnny went on television before the course and was joined by Peter for another televised interview after he arrived. When the PDC started, we had 23 people in attendance; we graduated 17 designers, and the oldest graduate was 86!

The group included people from the Ministry of Agriculture, Youth Development Initiative, and the Division of Forestry, also private landowners, faculty at the University of the West Indies, and even one of my neighbors. One woman came from New York, and a young man from St. Vincent, but the rest were from Trinidad.

Two things amazed Peter: the qualifications of the people who attended and their capacity to effect change, and the fact that they all drove in every morning, left in the evening and actually came back for the whole 14-day course.

Permaculture, in a nutshell, deals with self-reliance in energy, water, and food for local communities, based on planning for the long-term. The sign-up fiasco taught us quickly that Trinidadians live their lives very much in the present, which is to say, at the last minute! Life in Trinidad to a great extent is good; most people don't think of the long-term. Trinidad and Tobago has been blessed with a tropical climate, substantial oil deposits, large gas reserves, ample rainfall, and the resources (from oil and gas) to import food. It is just south of the hurricane zone and although it has its fair share of tremors, there are no huge earthquakes.

It doesn't face disasters on a yearly basis like most of the other Caribbean islands. Permaculture in 2007 was a fairly hard sell to the general public. The people who came to the PDC were the few who realized what was going on globally and wanted to find out more.



PDC students prepare designs in the open-air classroom at WaSamaki estate.

l to r, Rory O'Connor, John Stollmeyer, Charles de Matas

Before we held the PDC, there were about five people in the country who knew about and were practicing permaculture. After it was over we had 17 more. The word spread: Johnny and Peter did another television appearance after the course and before Peter left. One of the daily newspapers did a story about the PDC. And Peter was invited to speak to the staff of the Sugar Cane Feeds Centre on his last day in country; the audience included a member of the parliament with a brief for agriculture.

The concepts of permaculture are not new to many of the older people here; they grew up in agricultural settings. Cacao estates were at one time self-sufficient—producing their own fuel, food, and lumber, but they are quickly disappearing as labor moves to higher paying industrial jobs. The average age of a farmer in Trinidad is 65! It had been hard to get people to take the design course, but it is not hard to explain permaculture here as the culture still retains some knowledge of the land.

Reaching out

The second PDC in 2008, which John and I taught, was not as well attended by locals but we had a greater attendance from throughout the Caribbean. It seems the other islands and countries were beginning to feel the effects of climate change, high oil and food prices before we in Trinidad were.

We wondered how we could reach the other 1.5 million people in Trinidad and the wider Caribbean community? The magic started happening again.

I was invited to give a presentation on permaculture in

Barbados. The ticket was expensive for a two-day trip but I made the commitment, went, and received an excellent reception. A few months later I got invited, then disinvited (they found out I was a man), and then re-invited (they found out that permaculture might be something good to offer their participants) to an all women's Train-the-Trainer workshop in organic agriculture in Jamaica. There I was able to make connections and permaculture presentations to another group of very dynamic participants from throughout the Caribbean.

Deep in the country

The magic kept getting better. John and I were approached by one of the biggest companies in Trinidad to design and install a 15-acre buffer zone around their natural gas plant. The forest we have designed and are installing will be a functional food forest (so when the gas runs out the town may not have jobs but at least they will have food). As part of the project, two permaculture booklets (5000 copies each) were published and distributed to over 30 mostly rural schools in the southwest peninsula of Trinidad. A seed collecting competition was also initiated to gather indigenous seeds to plant in the buffer zone. John and I



Tropical flowers have proved a successful business producing more dollars per acre than citrus.

then went into each school and did interactive sessions with the agricultural clubs to begin to sensitize them about the benefits of trees, animals, and their connections to the environment. The sessions ended with the children coming up with hypothetical permaculture designs for their front and back yards. The results and feedback have been amazing.

The teachers involved have said that the students enjoyed researching the uses of the seeds within their communities and felt empowered that their knowledge has been found useful. A few schools collected over 100 different varieties of seeds and documented all their local medicinal and cultural uses. This year the schools will germinate as many seeds as they can for a greening drive that involves them selling seedlings to the sponsor company to plant in the buffer zone as well as having trees to plant around their school yards, community centers, and playing fields. We have a third booklet on waterways and watersheds

coming out in March and one on wildlife and permaculture due out in June.

Our sponsor company also agreed to fund a PDC this July in the area for any of the teachers involved in the project to learn about permaculture and become designers for free. We believe training the teachers as designers will ultimately allow them to influence all the students they teach. This week we sent out a sign-up list. A year and a half ago when we started the project, no one knew about permaculture; it was a new word. We hoped that

I saw a wave moving up a tiny stream I was walking next to, and out popped an otter onto the bank! They are extremely rare here...

10 teachers would sign up and the other spots we would then have to fill by advertising the course. We had 30 teachers sign up! We are actually quite overwhelmed at the response, and we may have to run two courses.

As I am writing I have just finalized my tickets to go to a PDC in Belize at the Maya Mountain Research Farm. Interest has been shown for us to teach a PDC in the interior of Suriname in September, and it appears I will go there soon on a reconnaissance to prepare for the course. Johnny is committing to go to the PDC in Zimbabwe in October and we will both be teaching a PDC in Puerto Rico in November (www.PermaculturaPuertoRico.org).

Wa Samaki Ecosystems is beginning to flourish again. Many of the ideas generated at the two PDCs we have held here are slowly being implemented. My streams are all forested and provide wildlife corridors into and out of the farm. My zone 5 is safe from fires in the middle of the farm which is surrounded by zone 4 belt of timber trees. I can now view wildlife outside my windows because I have tree cover linking my house with my zone 5 sections. My zone 3 is flourishing with heliconias, orchids, and ginger lilies. My zones 1 and 2 have finally been put in over the last two years although their placement is a little unconventional just because we have to deal with the ten stray dogs and six stray cats that my children and I keep picking up. Last weekend I hosted my first set of WWOOFers (Willing Workers On Organic Farms), and they are actually coming back this weekend. I am also constantly receiving emails for internships. By the middle of 2009 we should have accommodation for at least six interns.

The magic is still working and I truly believe permaculture will spread throughout the Caribbean. △

Erle Rahaman-Noronha is Owner/Manager of Wa Samaki Ecosystems and holds degrees in biochemistry and zoology. He is an expert in recirculating aquaculture with experience in tilapia production, dendrology, tropical landscaping and agroforestry.

Solidarity Through Soil

aManda Greene

THE IRONY OF THE INDUSTRIAL REVOLUTION is that it has been so successful in its rampage of destruction that it is now waving the flag of surrender. That flag isn't white, it's green. But it's a false flag, and the people of the leading industrial nations, who have every reason to put an end to the business-as-usual that is killing the planet, are being seduced into more of the same. We have been offered supposed solutions to big problems that don't involve compromising or changing much about our daily lives. Most of these ersatz solutions to social and environmental problems boil down to, "Just buy Green!"

While I believe we must be conscious in the use of our purchasing power, I know that change within the market system is not enough. I hear Einstein's words echo in my head, "You can't solve a problem with the same kind of thinking that got you into it." So how can we solve the predicament of the Industrial Revolution? Of humanity out of balance with the needs and capacities of the planet?

The answers required by the questions of our time are many and varied, but they all depend on our learning to use less stuff and less energy to meet our needs. The wisdom of living well



Three generations of family at Paravanasu where we arranged a home stay for our tour.



Building a cob wall in south India.

The myth of material progress, driven by technological advancement, is one of western culture's sacred cows.

with less is not common in our culture, but in the "developing" nations—really, the majority nations—that wisdom is easier to find. I have found that wisdom through traveling and working in other cultures.

Cultivating the lessons of culture

The maintenance of ecological balance isn't new to humans. Traditional practices in many cultures support it. In India, for instance, it is customary to drink with the cup away from your mouth. Heads are turned back and liquids are poured without contact to lips. Children learn this at a young age and it becomes as natural as pulling your pants down before you pee. Because of this, water dispensers at universities, post offices, and even public bus stations have one metal cup, often attached with a

chain, to be shared communally by strangers and familiars alike. In developed and developing countries alike there is a recognition that disease can be transmitted through body contact with food or water. But in India, the solution takes a lower-energy pathway. Social capital—everyone learns from childhood how to drink harmlessly from a shared cup—substitutes for ecological capital (paper or plastic cups used once and thrown away). I'm reminded of the story told about the American space program. NASA spent \$2 million to develop a pen that would write in the zero-gravity conditions of orbiting satellites. The Russians used pencils.



Exploring cacao forests in the Atlantic rainforest of Brazil.

In the face of the climate and resource crisis now upon us, our future well-being, even our very survival depends on how quickly, thoroughly, and intelligently we can substitute ingenuity, restraint, and sharing for the intensive use of energy and materials. Looking to other cultures for guidance makes a lot of sense.

The myth of progress

An artifact of the industrial project that is essential to its cultural propagation is the impressive image of progress that has made many in the majority world feel inferior. Like the advertising constructs used to make people feel that their bodies and their ways of life are inadequate (to be amended by the purchase of toothpaste, deodorant, fancy clothes, cell phones, or cars), the image of progress—alluring but unattainable—propels a juggernaut of cultural and environmental destruction. We have been led to believe that a surfeit of consumer goods signifies the “natural” superiority of the industrialized nations. Indeed, the myth of material progress, driven by technological advancement, is one of western culture’s sacred cows. The shadow of progress, reflected in the rates of murder, rape, youth aggression, and dis-ease, is less well understood as a true measure of cultural weakness.

I grew up between minority (North America) and majority

(Brazil) countries, so these contradictions have continued to be entwined with my understanding of personal identity.

Seeking a road home

The hunger for understanding this cultural divide led me further abroad, to India, where I worked with Rico Zook, a New Mexico-based permaculturist, for two years, assisting him with courses and projects. (Rico has written of his work in India in PcA #60 and #70.—ed.) The centerpiece of our work together evolved into the South India Permaculture Tour, which offered participants practical permaculture experience in an Indian cultural context.

We focused the tour in Karnataka, one of India’s southern states, but included a variety of locations and projects. These included a farm-stay at Paranavasu—a small family-run organic coconut and pepper plantation, a two-week wetland restoration and water harvesting project near the mystical rock empire of Hampi, an urban Permaculture course at India Song House—an Organic vegetarian restaurant, and a visit to Beeja—a transitioning rose farm, both of these latter two in Mysore. We also made day visits to universities and other organic and biodynamic farms and organizations.

The tour used Permaculture as a vocabulary and a method of connecting both with the local habitat and the people. Although participants and hosts came from different countries, spoke different native tongues, and had customs that were unfamiliar to each other, cohesion arose from sharing and

exploring the passion of permaculture.

(In India) everyone learns to drink harmlessly from a shared cup—social capital substitutes for ecological capital (paper or plastic cups used once and thrown away).

The beginnings of exchange

A beautiful thing about the work, and the reason Rico’s first short visit to India turned into a lasting relationship, is that one opportunity led to another. We found that when you walk through

one door and have a conversation, the invitations just don't stop coming. From farm to project to organization and back to farm, endless invitations to chat were offered with warm greetings accompanied by genuine smiles and cups of chai.

We started with a basic outline for the tour and some contacts from Rico's first visit, but he and I then traveled the route we expected to take, checking the arrangements and timing. We wanted both an authentic and a comfortable tour, so it became necessary to change our plans as we went along. This openness to circumstance was reflected in the tour itself, which ran over the planned schedule by a week when the wetland restoration project took more time than we had foreseen. While the tour had many aims and objectives—cultural integration and ecological experience among them—what I found to be its most profound impact was also the most silent, our simple presence.

India, a favored travel destination, is accustomed to receiving visitors from around the world throughout her four seasons. In Rico's words, "tourism is extractive, like mining." What is potentially an exchange is often reduced to a lopsided relationship in which the traveler spends each day seeking and buying food to eat, sights to see, and souvenir goods in the market for the cheapest price. The natives are constantly in the position of giving while the visitor is always receiving. The medium of exchange is money, and the subtle message, which



Excavating for future wetlands in south India.

impacts most upon the youth, is that progress and superiority consist of having money, and that money is worth bargaining away legacies, cultural wealth, and in many cases dignity.

What is development?

In our Permaculture courses there, Rico (coming from a "developed" nation) always asked, "What is India (a developing country) developing into?" This often opened a dialog, wherein it could be seen that in fact minority nations, like those of North America, have more to learn from majority nations like India, than the reverse, which is held in the western myth of progress. We can agree that to progress (to move forward, to grow) is a capacity and trait of being human; it is a natural need that all should have the liberty to fulfill. What our dialogs revealed was that the progress needed in this turbulent time often has roots in traditional lifestyles, customs, ethics and values. However, not

all traditions and customs should be perpetuated. In some cases the lessons they offer us are negative. The caste system in India, a hoary legacy of tradition, continues to enforce racism and class differences that are discordant with our democratic sense of justice. The legacies of our modern struggle are not all bad. The Industrial Revolution has brought forth much destruction, but has also contributed to the noble wisdom of humanity.

An example of the need to develop by a return to healthy

With minimal dependence on external inputs and a recycling of resources, they live a lifestyle that many in the West are now trying to learn from.

tradition can be found in all of India's city streets and along train tracks throughout the country. Less than a decade ago all chai wallas (tea stands) sold tea in small ceramic cups, snacks were wrapped in banana leaves or served in pressed leaf bowls. Once your tea was savored, the unfired ceramic cup was tossed and broken to be composted back into the earth from which it came. So it was with the banana leaves. While it is still common to receive your dosa (India's vegetarian equivalent to a hot-dog or hamburger) in a banana leaf tied with a string, the chai—often drunk four or five times in a day, is now served in white plastic "disposable" cups. Today these white cups litter the landscape, an unnecessary burden and a sacrifice on the altar of progress.

Exodus out of Eden

As in India, Brazil, and around the world, youth are leaving the rural areas and the ways of their ancestors to inhabit urban



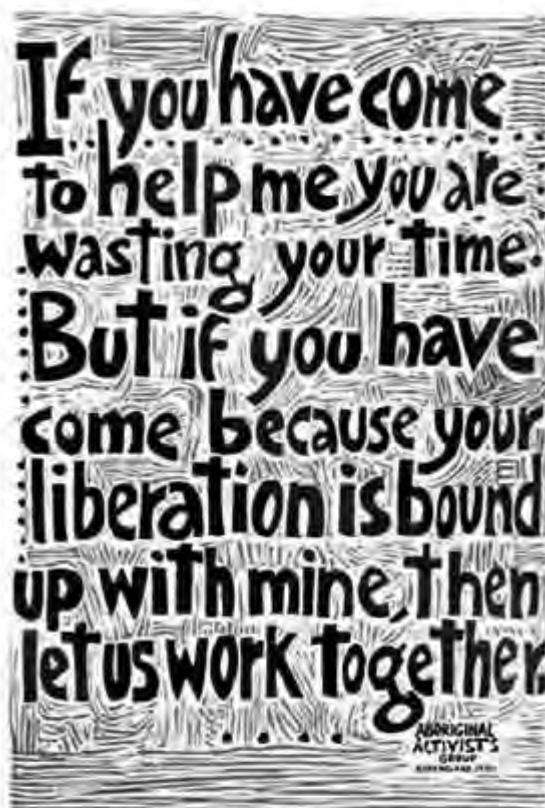
Diggers unite!

centers. With the increase of population in cities, the demand on agricultural land increases while the number of people farming dwindles. Modern media has penetrated the minds of the young to devalue the importance of rural and traditional living. The images of wealth, power, and easy sexuality are deployed to sow discontent, create cravings, and sell products. Combined with a deliberate political campaign to destroy rural economies by eliminating trade barriers in agriculture, these media seductions have triggered mass migrations from the countryside.

I had the opportunity to accompany a doctoral student in botany to a Quilombo community in the south of Bahia, Brazil. The Quilombo are descendants of self-liberated African slaves. In the region of Serra das Águas (mountains of water), the main crop is cacao. It is traditionally grown in an agroforestry system called *cabruca*, in which the cacao is planted and tended in the understory of native old-growth trees. Cabruca has supported a highly diverse community of flora, fauna, and fungus in the Atlantic Rainforest, of which the Serra das Águas are a part.

My botanist friend was conducting fieldwork relevant to her thesis and we were graciously shown around these beautiful chocolate forests. Soon after arriving and meeting some of the community leaders we set off on our forest walk, with two young girls glued to our side as we visited the farms of their relatives, exploring the many textures and sights of the serra. I noticed the girls exchanging puzzled looks as we expressed our enthusiasm over what to them were routine events, such as drinking fresh water from a spring, or the creative way they harvested roofwater, or tasting cacao honey. Although they didn't call it by that name, these families lived together in an ecovillage. With minimal dependence on external inputs and a recycling of resources, they live a lifestyle that many in the West are now trying to learn from. Though poor in the material ways of the modern world, these girls and the culture to which they belong have a wealth upon which humanity is dependent. By showing interest in their daily lives, we who

and leisure. It is then a shock for villagers where we traveled to see privileged Indians as well as westerners getting down and dirty. Often met with a strong silent stare,



these uncommon sights left the most profound impact. Why would we, who had no obligation or need to work the earth, willingly and with excitement be sweating under the sun when we could be sipping chai? Why would we with access to the wealth of the cities, voluntarily spend our time learning to use and integrate humble resources? Why, when we could buy vegetables, would we want to grow them? I believe our presence and our enthusiasm communicated, "We are here because we value this; we are here because it is important."

By working together we show that people from developed nations too are concerned about the fate of the earth, and are committed to the conservation of resources.

We show that despite our heavy footprints today, we can learn how to diminish our impact, that we are committed to a fair exchange. We show that the majority nations have cultures of value. By listening to the elders and assisting in the harvest, we show the younger generations, who are rejecting the ways of their grandparents, that the legacies and lessons of the past are not only of interest but are critical to the future.

△

aManda Green writes from Bahia, Brazil. She can be reached at solidaritythroughsoil@gmail.com.



Making chappatis.

come from economic privilege add a new vigor and reflect to them the true value of their world.

Solidarity through soil

My favorite part of the South Indian permaculture courses came when the chapas (sandals) flew off, and hands and feet grasped the earth. In India as in America permaculture courses are often filled by those who have privilege and access to things like literature

Permaculture in Schools

in Southern and Eastern Africa

Mugove Walter Nyika

PERMACULTURE IN AFRICA ALL STARTED with the establishment of Fambidzanai Permaculture Centre (FPC) near Harare, Zimbabwe in 1988 following a training workshop facilitated by Bill Mollison in Botswana a year earlier. In 1994, FPC teamed up with other not-for-profit organizations and with the Ministry of Education in Zimbabwe to set up the Schools and Colleges Permaculture (SCOPE) Programme. The goal was to assist schools to benefit from the multiple outcomes that arose from a redesign of school environments using the Permaculture approach.

Permaculture has been defined as a design system for creating sustainable human environments (Mollison, 1991). It is a design-based framework for sustainable living that can be used to transform lives and landscapes in a manner that is ecologically sound, economically viable, and socially just.

The Schools and Colleges Permaculture (SCOPE) Programme developed a tool that schools can use for planning and implementing a very productive, healthy, and ecologically sustainable environmental management system on school land. The system is developed with the active involvement of the whole school community and will then be a good model for replication in the community. The tool is called Integrated Land Use Design (ILUD) and it has been applied in over 200 schools in Zimbabwe since 1994 with exciting results. In addition to permaculture, the development of the ILUD process was informed by thinking from a number of contemporary theories and techniques such as holistic management, participatory methodology, and practical rural appraisal.

The main features of the ILUD Process are:

- A tool for planning , implementing and monitoring sustainable land-use in schools.
- A step-by-step process undertaken by representatives of all key stakeholders in any given school community.
- Stakeholder participation and ecological integration are the key principles.
- Implementation begins with sensitization of leadership, followed with the training of implementers, participatory and holistic design of the school environment, and finally monitoring.
- The whole school is involved and all the resources at the school are incorporated in the new design.

Integrated Land Use Design is a step-by-step process that involves:

- Situational analysis – The stakeholders observe the existing situation to develop a common understanding of the current problems and potential resources that they have to start off with.
- Holistic goal formation – The stakeholders define their vision for the school environment.
- Integrated design – The stakeholders redesign their land by creating connections between the various elements in their environment.

The integrated land-use design process is a tool for a holistic approach to the management of the school environment. Schools can benefit from a wide range of physical and socio-economic outputs of the ILUD process if they implement it successfully. Below is a list of some of the benefits that accrue to schools that implement permaculture well.



IPC9
9th International Permaculture Conference
& Convergence
OCT. 2009 • South Africa, Malawi, Zimbabwe
with the theme "Plan Africa ~ Food and Empowerment"

For more information and dates please visit www.ipc9.org
Convened by The Regional Schools and Colleges Permaculture (ReSCOPE) Programme

IPC9 AFRICA October 2009

The banner features a central globe, a stylized plant on the left, and the flags of South Africa, Malawi, and Zimbabwe on the right.

Social Outputs

- The participation of children, parents, staff and other stakeholders in the planning, implementation and monitoring of their new landscape design for their grounds.
- Positive attitudes towards indigenous knowledge and endogenous development.
- Increased sense of ownership of the project, and of the school.
- Relationship-building skills.
- Stronger school and community linkages.
- ILUD tool for social analysis.
- Increased access to fruits, vegetables, herbs, and other foods.
- Culinary, aromatic, and medicinal use of herbs.

Economic Outputs

- Organic fruits, vegetables and herbs.
- Increased income from school land.
- Increased value of school land.
- Agro-ecological production skills.
- Affordable source of seeds and seedlings for the home economy.

Educational Outputs

- Enhanced teaching and learning using locally available resources.
- Opportunities for comparative studies of conventional and organic agriculture.

- A real mixed forest at school—a source for real life examples across the curriculum.
- ILUD tool for problem solving.
- ILUD tool for environmental analysis, planning, and monitoring.
- Increased motivation.

Physical Outputs

- Soil and water conservation.
- Organically improved soil.
- Greener landscapes.
- Improved ground cover.
- Integrated cropping systems.
- Increased biodiversity.
- Predator-/prey systems develop.
- Improved air quality.
- Windbreak.
- Cool microclimate in classrooms.
- Shady school grounds and outside classrooms.

The Regional Schools and Colleges Permaculture (ReSCOPE) Programme provides technical support for organizations who may be interested in the promotion of more productive and healthy schools so that they can become resource centres for their communities. For more information please contact P.O. Box 32280, Chichiri, Blantyre 3, Malawi or by email zipscope@yahoo.co.uk. Or visit our website: www.rescopeprogramme.org.

Mugove Walter Nyika is Regional Coordinator, ReSCOPE Programme.



What is Permaculture...?

Permaculture is a design system based on ecological principles for creating sustainable human environments, and is one of the most holistic, integrated systems analysis and design methodologies found in the world. Originally coined from the words PERMANent agriCULTURE, it has evolved to one of permanent or sustainable culture with consciously designed landscapes that mimic the patterns of nature.

Permaculture Ethics:
Earth Care
People Care
Fair Share

Permaculture Goes to Africa...

Permaculture has a long history in Africa with well known centers in Kenya, Zimbabwe, Malawi, South Africa and others. For the first time the International Permaculture Conference (IPC9) will be held on the African continent in 2009. Plan Africa – Food & Empowerment, is the theme for the Conference. A major goal of IPC9 is to establish the structure to bring permaculture training and knowledge to all

countries of Africa. IPC9 will bring government and world press attention to grassroots permaculture work by showcasing the sites and projects already underway. African organizers are committed to bringing participants from every economic sector and region to attend.

Permaculture Locally and Globally...

Santa Barbara Permaculture Network (www.sbpermaculture.org) is a part of the official Support Group for the International Permaculture Conferences (IPC's), along with other communities and individuals around the world. Traditionally IPC's take place every two years and switch between continents. Past host sites have been in Australia, USA, New Zealand, Scandinavia, Nepal, Croatia, Brazil, and will be held on the African continent for the first time in 2009. IPC9 is organized by a collaboration of African Permaculture organizations, coordinated by ReSCOPE Programme in Malawi.

We Need Your Help...

Donations are needed to sponsor participants, many who are coming from cash poor, but experience and skill rich regions of Africa and the world. Please visit www.ipc9.org to learn more ways to support participants and the conference. Cause Related Marketing and Sponsorships opportunities are available to companies and other organizations.

Chasing the Bugger-Bug in Liberia

Warren Brush

FOR TENS OF THOUSANDS OF YEARS intact cultures from around the world have been intricately woven into the fabric of the landscapes that nourish them. Culture itself has sprung from the land through the people's relationship with all that sustains them. This is not as esoteric as it sounds: Imagine a group of people living in a particular watershed with a distinct mix and availability of plants and animals, weather patterns, sun angles, sound resonance, distance to other bioregions, etc. The land would provide unique implements for survival, foods, hunting practices, shelters, musical instruments, honoring practices, ceremonies, and stories. These peoples have known the origins stories of all that give them life. This in turn became the foundation of true, intact culture where the land would express itself very tangibly through the people.



In Liberia, many of the people, young and old, will adopt nearly anything “western” as a personal sign of status and progressiveness.

A trail of tears

Then came what one of my elders has called, “the Western Syndrome.” (We call it a syndrome because the definition of the word describes it perfectly; syn-drome n, a group of things or events that form a recognizable pattern, especially of something undesirable.) Some have called it the story of empire. This has moved around the earth consuming intact cultures by replacing rooted stories with distant tales, carried on the backs of a commerce that bears no responsibility for the land that sustains it. And out of this cultural erosion as grown the story of broken-hearted people who have no memories of their origins and no place, who move continually west to flee their oppressors only to

find they have become the oppressors of the intact cultures and peoples they encounter in their flight. This story has repeated itself in untold ways for millennia. It runs deep in our blood and bone, and it plays itself out in our daily lives and worldviews around the world. This syndrome is not just carried or transmitted by one particular group of people defined by race, creed, or color but has affected and been purported by us all.

In my permaculture education and design work in the West African country of Liberia, I have often found myself in a face-off with the Western Syndrome in its quest to cull life from communities to gain a profit, mostly for large western corporations. I soon found that one of my roles as a permaculture educator coming from the so-called “developed” world was to dispel the myth that the “western way” leads to a glorious future. In Liberia, many of the people, young and old, will adopt nearly anything “western” as a personal sign of status and progressiveness.

Confronting the devil

I was first confronted with this when I visited a midwifery clinic near where I was facilitating a permaculture design course.

At the clinic, which was well made of mud bricks and palm thatching, there were women, some pregnant, others with babies and children all about on benches, playing, sitting next to a cooking fire, and others were weaving baskets as they they shared stories, laughed, and tended to the little ones. One woman was walking about with a spray can pumping away to keep the spray mist constant on all the leaves of the plants that were all about. I hoped she was spraying a compost tea, yet my intuition knew

differently, so I went to see what the magic concoction was that was so necessary to spray around this clinic for women and children. It was DDT. I was shocked. As I read the label on the



Even in a traditional societies there can be profound ignorance of nature.

can she was reloading her sprayer from, it only had the warning, “fatal if swallowed” and the name of an American chemical company. My heart sank in the dark reality of standing face to face with the Western Syndrome.

I asked the woman what were her reasons for spraying and if she knew the repercussions of using this biocide. She replied, “We have to use it to kill the bugger-bug which destroys our crops. They have got so bad since the war that we have no choice but to use most of the few dollars we make to buy this chemical or we lose our food.” She also shared that she knew it would make her sick if she drank the chemical, but nothing else.

The myth of the bugger-bug

Later that day in our permaculture design class, consisting of 25 students from all backgrounds in education, traditions, tribes, languages, and beliefs, some of them respected elders in their community, others barely adults, I asked them, “who is this bugger-bug.” It was as if I had the devil itself as the translator shared my question in the common tribal language. Everyone stirred; some even grew fiery red in the face as they explained how the losses of their crops from this little beast could mean the difference between life and death for whole families and communities. They also shared how they had been told that they should spray to kill mosquitoes that

bring malaria. When I asked them about the DDT, they spoke of it as a kind of savior, yet costly for people who make \$2 a day for 8-10 hours of hard labor. None of them knew anything of the long-term ill effects of this chemical nor why it is illegal to use in most “western” countries in the world including the country of origin of the spray found at the midwifery clinic, the USA.

I spent some time gathering more information about DDT to better inform them and myself of its chronic effects. I shared the gamut of research that detailed how DDT is an endocrine disruptor and has other long-term effects on the nervous system, kidneys, liver, and the reproductive and immune systems. It is a carcinogen that contributes to cancer and is one of the nine persistent organic pollutants, which more importantly for the midwifery clinic, accumulates most intensively in mammals through the mother’s milk. Needless to say, they were horrified.

The problem is the solution

When everyone began to settle down a bit, one elder asked the very important and relevant question, “So what else can we do about the Bugger-Bug if we don’t use DDT?” I certainly did not have the answers, as often I don’t when it comes to local knowledge of place. So in full permaculture style, I replied, “Let’s go ask the Bugger-Bug!” So right then and



Learning to make compost.

there, with very quizzical looks abounding, we all got up from our makeshift classroom and went outside to ask the bugger-bug what we could do to survive together?

We all walked into a newly cleared area of rainforest where the debris had been burned off and the land was laid bare and exposed except for patches of monocropped maize and cassava. The bugger-bug abounded, busily gathering leaf material from the crops and bringing it back to a growing mound in the middle of the clear-cut. We found that the mounds were rich in detritus and



Showing the permaculture design process.

bird manures, and seedlings of the native forest were sprouting all around it. The growing mound looked like a miniature forest mountain rich in diversity and nutrient.

We then left the middle of the clearcut and went to the edge of this monocropped farm where the forest and the maize intermingled and to everyone's surprise, the bugger-bug was significantly less prevalent and the damage to the crop was minimal. In fact, anywhere we went that had diversity of plant species with a mulch layer on the ground there was minimal damage by the bugger-bug.

We finally ventured deeper into the forest to observe how the bugger-bug lived there in a natural setting and found that they were so diminished in numbers within the forest that we had a difficult time finding any damage at all from them on the understory plants. They seemed only to be feasting on the leaf drop from the canopy trees and had significantly fewer numbers than in the clearcut areas.

Keystones and cops

In true detective fashion, we then assembled the observations and clues we gathered, and lo and behold, a story of true forest stewardship emerged. Our little bugger-bug was a "keystone" pioneer in the forest regeneration process. It seemed that this termite would live peacefully in the forest until the time when a complete devastation of the forest occurred. Then it would spring into action to assist the forest in rebuilding its structure. The insect numbers would increase, and then they would search out plants, especially unhealthy stands of plants, to gather organic matter from which they would build their mounds. As the mounds grew, they would soon become the highest point in the treeless

landscape, so that birds of all sorts would perch on them. Thanks to the birds, the mounds were seeded with many types of plant life, and also bird manures rich in nitrates and phosphates. From the little mountains of richness gathered by the bugger-bug, the forest would regenerate outward in concentric ring-like patterns.

The spell of the bugger-bug had been broken. We excitedly went back into class where we applied our new learning to the design of a food growing system that incorporated diversity in both annuals and perennials, layered in both space and time, using deep mulch—a structure that analogous to the natural forest. We then began building our demonstration farm using these practices learned from our bugger-bug teacher. One elder said, while pointing to their 150-foot high ancestral tree, "I will give thanks to these little bugs for I know that without them we would not have our forests."

We found that the mounds (of the bugger-bug) were rich in detritus and bird manures, and seedlings of the native forest were sprouting all around them.

At the very root of permaculture is the knowing that we must live in harmony with the world which sustains us. The Western Syndrome cunningly distorts our ability to take responsibility. In our time it takes on the many faces of globalization, and often leaves us barren of integrity whether we know it or not. The bugger-bug story illustrates that in our work as permaculture teachers and designers, we have a duty to read the pattern languages around us and to incorporate them into the conscious design of how we live. Our ethics tell us that to endure, we must do this in support of that which gives life. △

Warren Brush is a Permaculture designer and educator as well as a mentor and storyteller. For over 20 years he has inspired people of all ages to discover, nurture, and express their inherent gifts while living in a sustainable manner. He is co-founder of Quail Springs Learning Oasis & Permaculture Farm, www.quailsprings.org. He works in North America and in Africa through his design firm, True Nature Design, and can be reached through email at w@quailsprings.org.

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The End of an Era

Closing the Door on New Coal-fired Power Plants in America

Jonathan G. Dorn

COMMUNITY OPPOSITION, legal challenges, and financial uncertainty over future carbon costs are prompting companies to rethink their plans for coal. Since the beginning of 2007, 95 proposed coal-fired power plants have been cancelled or postponed in the United States—59 in 2007, 24 in 2008, and at least 12 in the first three months of 2009. This covers nearly half of the 200 or so U.S. coal-fired power plants that have been proposed for construction since 2000. The vast majority of the remaining proposals are essentially on hold, awaiting word on whether the Environmental Protection Agency (EPA) is going to impose limits on carbon dioxide (CO₂) emissions. With further legal challenges ahead and the regulation of CO₂ imminent, 2009 may very well witness the end of new coal-fired power plants in the United States.

An April 2007 Supreme Court ruling is proving to be a seminal decision. In *Massachusetts v. EPA*, the Court ruled that the Clean Air Act gives the agency authority to regulate CO₂ emissions and that the EPA must review whether such emissions pose a threat to public health or welfare. Complying with the Court order, new EPA Administrator Lisa Jackson submitted an endangerment finding to the White House in late March 2009 indicating that human health and welfare are indeed threatened by CO₂ emissions. This finding opens the door to regulating CO₂ emissions under the Clean Air Act. Such regulation would provide a backup option for curbing emissions if Congress fails to set limits on them through legislation.

Congress, however, is under increasing pressure from grassroots activists to take on Big Coal. Encouraged by calls from former Vice President Al Gore and leading climate scientist James Hansen for civil disobedience to stop the construction of

coal-fired power plants, thousands of individuals from across the United States converged on Washington, DC, on March 2, 2009, to protest the coal-burning Capitol Power Plant and to urge Congress to pass legislation to reduce carbon emissions. The rally was the largest act yet of civil disobedience against coal in the United States. (See timeline and data at www.earthpolicy.org/Updates/2009/Update81_data.htm.)

Both Senate Majority Leader Harry Reid and Speaker of the House Nancy Pelosi are strong advocates of regulating carbon emissions and were pressing to get a climate bill through Congress before the United Nations Climate Change Conference in Copenhagen in December. If limits on CO₂ emissions are imposed via a carbon tax or a cap-and-trade system, the operating cost of fossil-fuel based power plants would increase. And since the burning of coal releases more CO₂ per unit of energy than any other energy source, coal-fired power plants would be hit the hardest. With President Barack Obama calling for a cap-and-trade program to curb carbon emissions, the future for new coal-fired power plants looks tenuous at best.

Even if legislation to regulate carbon emissions does not materialize this year, approval of pending permits for coal-fired power plants is potentially on hold. In November 2008, prior to the endangerment finding, the EPA Environmental Appeals Board determined that the agency's regional office must consider whether to regulate CO₂ emissions before approving an air quality permit for a proposed coal-fired plant in Utah. This not only put the brakes on building the Utah plant, it set a precedent to halt the permitting process for any proposed plant until the EPA determines whether and how to regulate emissions under the Clean Air Act. States turn away from

At the state level, actions within various branches of government demonstrate the growing distaste for coal. Since May 2007, the governors of Florida, Illinois, Kansas, Michigan, South Carolina, Washington, and Wisconsin have all taken action or voiced opposition to new coal-fired power plants. In her State of the State address in February 2009, Michigan Governor Jennifer Granholm called for an evaluation of "all feasible and prudent alternatives before approving new coal-fired power plants" in Michigan—placing at least five proposed coal plants on hold. Instead of investing in coal plants that would require Michigan to buy coal from Montana and Wyoming, Governor Granholm stated that money spent on improving energy efficiency and tapping renewable energy sources in Michigan would create thousands of new jobs in the state.

This viewpoint does not seem to have occurred to the Kansas legislature, which is attempting for the fourth time in a year to pass a bill that would let Sunflower Electric Power Corporation build a 1,400-megawatt coal-burning power plant in Holcomb. With vast wind resources, it makes little sense for Kansas to rely on coal, a more expensive out-of-state fuel that creates fewer jobs than wind development for a given investment. Kansas Governor

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Kathleen Sebelius has vetoed all attempts by the legislature to approve the coal plant.

In June 2008, Georgia Superior Court Judge Thelma Moore, in accordance with the Massachusetts v. EPA ruling, rescinded an air pollution permit issued by the Georgia Department of Natural Resources for the proposed 1,200-megawatt Longleaf coal-fired power plant. Judge Moore's action halted construction on the plant and marked the first time that CO₂ had been cited as a factor in denying an air pollution permit. And in February 2009, Georgia legislators introduced House Bill 276 calling for an immediate moratorium on the construction of new coal-fired power plants in the state and the phase-out by mid-2016 of the burning of any coal extracted by mountaintop removal.

Power companies and utilities are responding to the increasing regulatory uncertainty and mounting public opposition by backing away from coal and turning to clean, renewable sources of energy, such as wind, solar, and geothermal. Dynegy Inc., a wholesale power provider serving 13 states, announced in January 2009 that it will no longer continue its joint venture with LS Power Associates, L.P., to build up to seven new coal-fired power plants. On the day that Dynegy made the announcement, its stock price rose 19 percent. Several weeks later, Arizona's largest electric utility, Arizona Public Service Co., submitted a Resource Plan to the Arizona Corporation Commission indicating that it will not build any new coal-fired power plants because the carbon risk is too high. In late February, Oklahoma Gas & Electric released a plan to turn to renewable energy and defer building any fossil-fired power plants until at least 2020.

The notion that the United States needs additional coal-fired electricity generation to meet electrical demand is misguided. Simply using electricity more efficiently could reap large energy gains. A recent study by the Rocky Mountain Institute found that if the 40 least energy-efficient states raised their electric productivity—the dollars of gross domestic product generated per kilowatt hour of electricity consumed—to the average level of the 10 most efficient states, 62 percent of coal-fired power generation in the United States could be shut down—roughly 370 coal plants.

The events of the past two years illustrate that the door is closing on the prospect of building new coal-fired power plants in the United States. While only five new coal plants, totaling 1,400 megawatts, began operation in 2008, more than 100 wind farms capable of generating 8,400 megawatts came online. Yet this is only the beginning. To have a decent chance of mitigating the potentially catastrophic effects of climate change, our attention should now turn to phasing out all coal-fired electricity generation over the next decade. Δ

For more information, see Chapters 11 and 12 in Plan B 3.0: Mobilizing to Save Civilization, available online for free downloading at www.earthpolicy.org/Books/PB3/index.htm. A summary presentation of Plan B 3.0 is available at www.earthpolicy.org/Books/PB3/presentation.htm. Data and additional resources at <http://www.earthpolicy.org/Updates/2009/Updates81.htm>. Research Contact: Jonathan G. Dorn Tel: (202) 496-9290 x15, E-mail: jdorn@earthpolicy.org. Earth Policy Institute, 1350 Connecticut Ave. NW, Suite 403, Washington, DC 20036. Web: www.earthpolicy.org.

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Reviews

Making Preparations Review by Peter Bane

DAVID HOLMGREN

Future Scenarios

How communities can adapt to peak oil and climate change

Chelsea Green. White River Jct. VT. 2009.

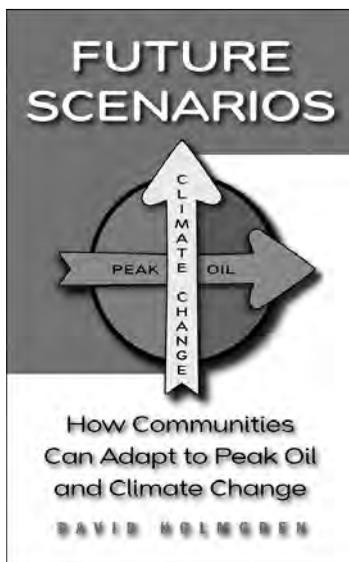
126 pp. paper. color illus. \$12.

This small back-pocket broadside stands to become the flying wedge of the permaculture movement in the 21st century. Inexpensive, attractively illustrated, and making no large intellectual demands on the reader, it should be easily digested by almost anyone who can follow the daily news. That said, the message is still sobering: Change is coming, it will be sweeping. We need to sharpen our design skills and flex our mental muscles to be ready for conditions none of us have seen.

Using carefully chosen photos from his recent travels, especially in the Americas, and a clear, sober, and matter-of-fact voice, Holmgren sketches the prospects for the developed world in the face of peaking supplies of fossil energy and certain movements toward rising global temperatures. We cannot yet be sure whether climate change will come on “with speed and violence,” as science journalist Fred Pearce has written, or will look like a benign edging toward the warmer, or wetter, or drier end of conditions we already recognize. Less well understood publicly, but likely to make bigger impacts sooner, the incipient decline of world petroleum output, and of other fossil fuels shortly thereafter may be a slow slide into intermittent shortages or a fast collapse from an inability to continue exploration and extraction. These two variables, each with either a rapid or desultory onset in the next decade, yield four possible scenarios which the author attempts to make imaginable by drawing on spot examples from current culture, recent history, and familiar traditions.

Holmgren has been developing these ideas for a number of years, and has

benefitted from a close collaboration with Richard Heinberg, enriched by a joint 2006 speaking tour of Australian capital cities. The scenarios, which here are labelled Brown Tech, Green Tech (both paths unfolding from a slow depletion of energy), Earth Stewards, and Lifeboats, have gone by different names in Holmgren’s recent writing and in the literature of the Peak Oil movement. They are broadly equivalent to Plans A through D respectively (expanding on Lester Brown’s well-known book, *Plan B*), but have been developed with greater nuance here.



Community Solution director Pat Murphy’s recent book, *Plan C* (reviewed in *PcA 70*) advocates strategies for economic relocalization (thus a reinvigoration of community) combined with curtailment of consumption as a preferred response to the twin challenges of energy and climate. Similarly, Holmgren—while giving careful attention to all the scenarios in this book—points out that the Earth Stewards scenario offers the best chance for preserving core cultural values of the democratic West (including intellectual advances of the modern era), and presents the conditions for which permaculture is most relevant.

The website www.futurescenarios.org launched a wider conversation about the present form of these four scenarios in May 2008, and the publication of this fine small volume should be cause for celebration in the community of permaculture and environmental activism. It makes a fitting bridge between the stir of current events related to economic contraction and the 30-plus-year-old

permaculture analysis described in much greater depth in David Holmgren’s 2002 work, *Permaculture Principles and Pathways Beyond Sustainability*. This book is a potent attention grabber that should help ease readers into the chewy conceptual material of the *Principles* volume.

Each of the four scenarios David details here are believable, and each will appeal to some sections of the population. Brown Tech—alternately Techno-Explosion, a possible response to slow decline of energy and fast onset of climate change, is in many ways the path advocated by the recently deposed Bush junta. Many in the corporate and government worlds, as well as large numbers of those privileged by the present economic system would find the continued availability of energy from dirty sources such as tar sands, coal-to-liquids transport fuels, and expanded nuclear power worth the likely tradeoffs in environmental degradation, increasing ghettoization of society—including the internment of migrants and the homeless, and a loss of familiar liberties with the growth of a much more intrusive government.

Despite permaculture being a household word and widespread phenomenon down under, Holmgren suggests that Australia especially among the developed countries may be susceptible to the appeal of a fascist movement. Harshly drier climate and relatively abundant material and energy resources might push a thinly scattered population towards a top-down pathway of mega-projects to ensure resource flows—such as nuclear-powered desalination plants and pipelines—and greater social control.

Green Tech aligns in many ways with the optimism of Brown’s *Plan B* to present a politically coordinated response to slow climate change and slow energy depletion. Novel energy technologies such as wind, solar, and tidal, plus a strong economic shift toward conservation by design hold out the prospect of a continuation of many of the present forms of consumer society, if in a more steady state eschewing actual economic growth. Medium-scale businesses, smaller states, and regional governments may find these ideas appealing as the focus would shift away from imperial military adventures and overarching central government programs.

William McDonough's cradle-to-grave industrial ecology, Amory Lovins' negawatt conservation strategies, and the hopes of Paul Hawken's green business schemes all nest here. Whether capitalist economics and usury money can survive without actual expansion of material throughput is in itself highly questionable, and Holmgren suggests that Green Tech is likely in any case to devolve within 30 years to a lower level of complexity that is already envisioned by the next scenario.

Earth Stewards foresees a world

Despite permaculture being a household word and widespread phenomenon down under, Holmgren suggests that Australia especially among the developed countries may be susceptible to the appeal of a fascist movement.

of significant economic contraction brought on by slow climate change combined with sharp declines in energy production, beginning now and continuing incrementally downward. The global and even national economies would collapse with fiat currencies becoming worthless—think 1932-33 and the Great Depression without federal intervention. Smaller municipal and local governments in some areas would help stabilize and reorganize economic life at community and household levels, issuing local currencies, stimulating the growth of local food and materials production from forests and town wastes. Biological resources would move to the forefront of technology with a return to more animal traction, sophisticated small-scale horticulture and urban agriculture, a general re-ruralization of society, and minimal mobility.

Lifeboats envisions a world made hostile to all but oasis agriculture by rapid climate shift, and in which sharp drops in energy production have triggered collapse in economic relations and political

authority to the household and band level of social organization. Hunting might well be the only reliable means of food supply with a concomittant halving of human population in a few decades. Salvage from decaying urban and industrial infrastructure, the ready availability of high-quality small arms, and dangers from pandemic diseases would give rise to patriarchal social relations in gated communities and nomadic warrior cults.

While each of these scenarios has been described in broad strokes by one or another body of literature: the left political critique of right-wing government, the buoyant green business sector, permaculture and allied movements for rural renewal, or the dystopian fantasies of science fiction and film, Holmgren's greatest contribution to the field of futurism is to anchor each of these scenarios in a permaculture analysis of energy as the primary driver of human cultural evolution. Derived from studies by and of Howard T. Odum, energy analysis, Holmgren asserts, provides a more accurate description of the trajectory of technological advance and decline than the more common narrative approach

to history as an interplay of dynamic actors with chance events. Ironically and contrary to the general trends of history, he points out, the volatile period of energy peak and early decline provides unusual opportunities for individual efforts to yield surprisingly large results. This too is consistent with the permaculture thesis—that positive attitudes and responsible action by individuals can matter a great deal.

As the author concludes, "...we live in a world of collapsing culture where we have to choose what is worthwhile at this great turning point in history. We are faced with the mixed pieces of myriad broken traditional cultures...and the novel and shining bits of unraveling industrial modernity. All of this will end in the dustbin of history. Our task is to choose which pieces of these jigsaw puzzles will be useful in creating an energy-descent culture, the boundaries, features, and colors of which we can scarcely imagine. What is worth saving? What are the limits of our capacity? We have little time to decide and act. We must commit to concrete actions and projects. We must stake our claim, not for ourselves but for



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the future.”

Looking at plausible alternative futures, Holmgren compares patterns of energy use, politics, agriculture, economics, and spiritual forms and attitudes to suggest the best ways to prepare for and adapt to the possibilities of the turbulent decades ahead. Highly recommended for wide distribution. Δ

Tinkering at the End of Time Review by Peter Bane

JOHN MICHAEL GREER

The Long Descent

A user's guide

to the end of the Industrial Age

New Society Publishers.

Gabriola Isl. BC. 2008.

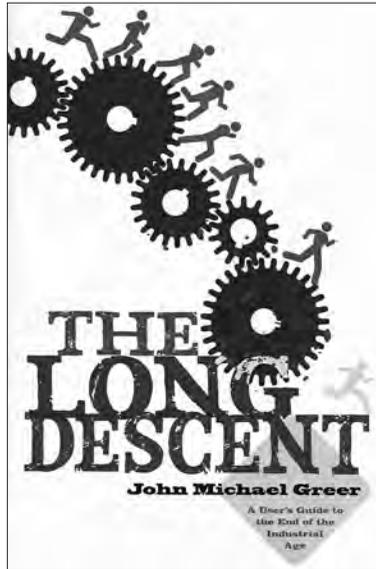
257 pp. paper. \$18.95.

Known to many surfers of the Web as the Archdruid, Greer is an erudite writer with a keen sense of historical tempo. Though not apparently informed by permaculture, this book takes some of its cues from permaculture's intellectual roots in the energy analysis of Howard Odum. Greer is one of very few writers—Holmgren another who is conspicuously among those Greer does not cite—to address the issue of Energy Descent as a complex phenomenon. The book expounds a theory of catabolic (self-consuming) collapse of industrial civilization, and attempts to sketch a bit of what it might look like. Greer takes his lead as a student of history from Toynbee and Tainter it would appear. The author also offers some suggestions for responding to the import of his message.

Greer is a stylish writer with a puckish sense of humor which peeks out from time to time from behind the sonorous phrases of his discourse. This book, however, is not easily digested, despite its intelligence. By that I mean that it requires thoughtful chewing, as its argument is not trivial but nuanced. The catholic and extensive bibliography gives a sense of the author's diverse intellectual interests (late Roman coin hoards?). Steering a middle course between the myths of apocalypse and progress (the latter now obviously insupportable), the author takes time to tease out lessons from history both recent and ancient as he suggests that the future

will be neither more of the same, nor the end of the world, but instead a series of crises following by stabilizations. Energy Descent will not come in one fell swoop but more as a bumpy roll down the hill, interrupted by pauses of more or less time as we consolidate gains from shedding the complexities of our energy-intensive civilization. In the face of energy famine, this conjecture is plausible. Whether it remains true in our real future may depend to a considerable extent on the pace of climate change, a factor Greer does not much consider.

On the block to be let go of are such energy extravagances as the



American empire, airline and highway transportation, 24/7/365 grid electricity, much of modern medicine, and the concept of leisure time. The past 35 years have already seen a reduction in quality of life and financial security for the middle classes in the developed world, as vacations and other benefits shrank while real wages stagnated or declined. Now steady employment itself is contracting significantly and is unlikely to recover. Home ownership, college education, farming out elders and children to the care of others, and other recent trappings of late imperial excess are also headed down. Large-scale unemployment is probably with us to stay.

Does this mean hordes of barbarians in the streets? Well, not everywhere and maybe not many. Though already poverty-driven crime is proliferating, and some rural economies have degenerated to drug production. What about food shortages and homelessness? We already have both

and they'll increase, but people will adapt by growing more of their own food and eating more frugally, by migrating or by banding together in camps (tent cities are springing up in Sacramento and other U.S. cities as I write).

Though he anticipates that the unwinding of empire will be painful and dangerous, Greer's reading of history suggests to him that governments are very keen to preserve stability (and their own survival). Some regimes won't make it, but most will slough off functions and satrapies in order to preserve the center as long as possible. Debt and voodoo economics will give way to hyperinflation or new currency issues, or food and fuel rationing, or a dozen other strategies by which governments in the past have righted their affairs and dealt with crisis for a time.

That he regards apocalyptic visions of the future as mythic and ungrounded, is not to say that Greer imagines a cheery time ahead. The next two or three decades are likely to be a period of severe change with widespread suffering. Thus, he says, we should focus now on surviving that period with as much social and cultural capital intact as possible. And we should also try to conserve some energy and material resources from this relatively abundant time to give ourselves and our children a little advantage when things do smooth out a bit. (But don't put your trust in gold and silver—it didn't serve the Romans very well.)

He is less optimistic about the prospects for liberal democracy in the United States, even if it should be able to maintain itself as a political unit, acknowledging that Americans took the bait of unearned imperial tribute 100 years ago and really haven't looked back. There may, however, be some profit to local communities reinvigorating the institutions of civil society, among which he puts unexpected attention on the fraternal orders that flourished through the upslope of industrial growth. These mostly anachronistic groups such as the Oddfellows, Optimists, and the Grange provided early and useful forms of social security to their members by taking dues and paying benefits to the sick and families of deceased members. Their halls were places where the rituals of democratic governance were honed and citizens learned to make their voices heard.

Greer's historical analysis is thoughtful and wide-ranging. From the decline of the Roman Empire in the West to the decline of civil society in the United States in

That he regards apocalyptic visions of the future as mythic and ungrounded, is not to say that Greer imagines a cheery time ahead. The next two or three decades are likely to be a period of severe change with widespread suffering.

the early 20th century, his insights are uncommon, holistic, and reflect deep study. In this way, his "Briefing for the Descent" merits careful reading and

even re-reading. Energy Descent is a predicament to be endured, adapted to, and accommodated, not a problem to be solved. If there was a moment for humanity to "solve" the problem of energy decline, that moment is at least 30 years behind us and cannot now be retrieved.

The Long Descent's spotlight moves over unusual arenas, often ignored or overlooked by other books in the literature of Peak Oil and civilizational collapse. Like the focus on relict civil institutions, Greer pauses to call our attention to obsolete technologies, which he believes will merit our conservation and renewal—be that horse-drawn farming implements, tube radios, or old car alternators for hooking up to windmills for a little electricity. The arts of salvage will be keys to success in the economy of descent.

The author's musings on historical palimpsests are creative and intriguing. His systematic approach to adaptation, however, leaves some levels of response begging for attention. He offers us ten steps. I can't say that it's bad advice to tell people to change the lightbulbs (step one)—I've done it myself, but as important as it is, it doesn't measure up to

the scale of the crisis Greer is describing. In that and in other glimpses, I get a sense of the author's naiveté and isolation. Switching over to wood fuel is a good idea—also one I've done—that won't go very far in most areas of the country. The Deep South and the Northwest (where Greer lives) are two exceptions. Cutting gasoline use is also important, but I was surprised to see little mention of the bicycle as a working tool. Gardening, composting, handicrafts, home health care, and community volunteering are all needed and important, but their treatment here is notional, not instructive.

More useful is Greer's approach to technological triage. He has well internalized Illich's critique of modernity and particularly the importance of assessing technologies for their energy intensity. He goes on to give us a useful scheme for assessing which technologies merit our limited efforts and resources to conserve them. Can we fuel it? Can we make or salvage spare parts or repair them? (There are hundreds of millions of car alternators in junkyards.) Will it do something we'll continue to need? (Not airplane maintenance...) When will it

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emerge as economically viable? (horse tack, sailing ships) Is it flexible? (organic agriculture yes, lens grinding less so).

These kinds of meta-thinking make *The Long Descent* a worthwhile contribution to the literature of social change. By considering the rates and nature of energy descent and social adaptation, the author has peered deeply into a realm most of us have thus far feared to enter. Where most

have seen only darkness; he is saying “here and there are patches of light; watch your step.” In a world of the blind, the one-eyed man is king. The book is a clear statement that it is time to overcome the denial surrounding energy descent, and to face squarely the magnitude of what lies before us. Greer is a leader in his own religious tradition (he is indeed the Archdruid), and as such his thoughts are

rightly turned to the highest levels of our collective life: what makes a society successful, what values are of enduring importance; how can the long-term viability of a community best be ensured? By focusing the reader’s attention on these questions, he stands with Donella Meadows in reminding us that setting the aims of a system is one of the most powerful leverage points available to us. Δ

Reclaiming Runoff Review by Peter Bane

NIGEL DUNNETT & ANDY CLAYDEN

Rain Gardens:

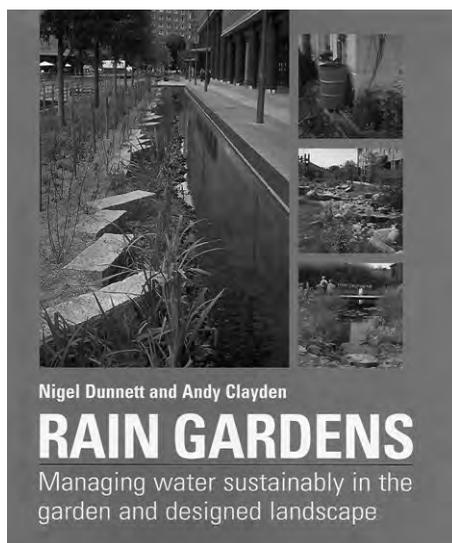
Managing water sustainably in the garden and designed landscape
Timber Press. Portland, OR. 2007.
188 pp. cloth. color plates.

Nigel Dunnett co-authored the book *Planting Green Roofs and Living Walls* several years ago (with Noel Kingsbury), also from Timber Press. As an international leader in the green roof and urban stormwater communities, Dunnett is well positioned to expand awareness of ecological treatments for water in the built environment. I have come to admire his high quality technical writing. Andy Clayden is his colleague at the University of Sheffield. In this work they examine a wider range of runoff solutions.

Rain gardens are ephemeral wetlands, places in the urban landscape where water can collect during and after rain events, that provide habitat for wildlife, amenity for humans, and recharge to groundwater. Because of their proximity to high traffic areas in human settlements and their amphibious habit (water comes and goes), they have a distinct set of design needs and criteria. Porous surfaces, protection for aquatic plants during dry cycles, gentle gradients, and accessible edges are all important to their success. How these features can be incorporated into the landscapes around buildings, along roads, and within the city is covered in some depth by this attractive book.

The range of subjects presented here is broader than in Dunnett’s earlier work, including roofwater catchment tanks, permeable paving, natural swimming

ponds, water gardens, filter strips and swales, detention ponds, green roofs, and even briefly, greywater systems. This book touches on green roofs, explaining their role in the urban water cascade, but of course gives much less detail than does *Planting Green Roofs*. Still, what is here is good. We see photo images of traditional



Scandinavian green roofs, as well as contemporary owner-builder experiments with gardens sheds, and public buildings to boot. The emphasis is on small-scale projects that can be easily added to a backlot or side yard. The main subject, of course, is shallow basins into which runoff can be directed for infiltration and amenity. Green roofs form the first part of the urban watershed, where they serve to slow and retain runoff, lessening the burden on downstream infrastructure. Detention basins and planted swales constitute the next layer of water harvesting in the broader landscape.

The book deals with these small earthworks and ephemeral wetlands in great detail, always employing attractive color photographs. Timber Press does good work with botanical and nature

subjects, and this book is no exception. The layout is handsome, with illustrations on every page spread, many luscious color photos throughout, and good diagrams, sketches, and case studies to highlight different techniques.

**This book...
has focused on
accessible projects
that would enhance
the health of the
urban ecosystem.**

The appendices offer tables of wetland plants for various applications. These cover perhaps 100 species but are not as extensive as the listings in *PGR*.

This book seems to have been written to reach a wider audience than the *Green Roofs* work, and —The many photographs document a wide range of water-related sculpture, public parks, and play areas, while the text introduces basic concepts of water cycling through the atmosphere, the soil, and in the built environment. We are all touched by water and seek it wherever it comes to the surface or collects in pools.

While offering adequate practical detail (including schematic drawings) to create the various structures it highlights, the book’s chief purpose would seem to be to present a wide range of options for water management in the built environment. I found it inspiring and attractive in the way that one can sometimes benefit from a coffee-table book of garden ideas. Here the gardens are tiny and form an obvious adjunct to buildings and other large impervious structures in the city. Rain gardens are nonetheless charming, vital, and extremely important elements by which we can make our urban landscapes

healthier and more appealing. The authors' eyes for the whimsical and creative have greatly helped bring this message home.

The focus on natural swimming ponds and porous paving, as well as its many and varied ideas for infiltration zones, should make the book useful to permaculture designers for whom these ideas have current and enduring importance.

All metrics in the book include translation into English measures (ironically, of course, the British no longer use them). There were one or two references to currency as sterling, and some words like "overspill" for "overflow" give bits of the text a colloquial flavor, but these minor quirks take nothing away from the excellent assembly of high quality

information and imagery—indeed, fine writing is one of the better features of this solid work. The examples and subjects themselves, while strongly representing northern Europe, are drawn from far and wide, and the selection of color images is superb. I recommend *Rain Gardens* to the urban landscape designer or anyone specializing in water systems. △

Eat Your Meat Review by Peter Bane

LIERRE KEITH
The Vegetarian Myth:
Food, justice, and sustainability
Flashpoint Press.
Crescent City, CA. 2009
309 pp. paper. \$20.

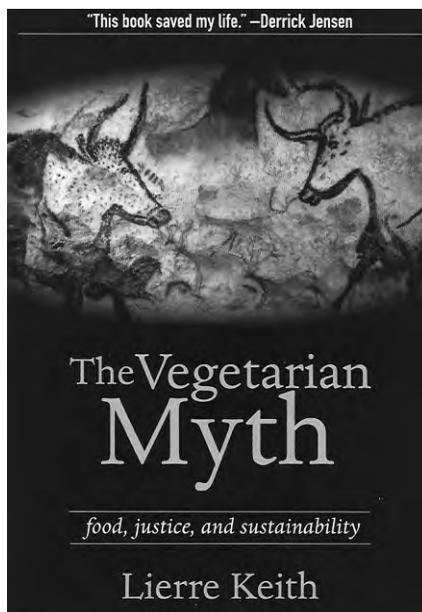
This book almost literally blew in the door one March day recently and I found myself still engrossed in its captivating story an hour after tearing open the brown padded wrapper. That doesn't very often happen.

Lierre Keith has written a compelling tale of her own near self-destruction from a vegan diet and a broadside against its being perpetrated upon or adopted by any other victims. She has converted 20 years of pain and suffering, and permanent damage to her health into a galvanizing passion to demolish the myth that she believe underpins the worldview of most who adopt vegan diet: "I want to eat without killing." You can't, she says, and if you try you'll die.

The arguments are compelling, and bluntly presented in three large chapters addressing moral, nutritional, and political vegetarians. Every field of grain or soybeans kills ecosystems and a myriad of creatures mostly too small to be seen and thus wept over. But they are just as dead as steers stunned and gutted in a meatpacking plant. At this point the enterprise of agriculture threatens all life on planet Earth.

Humans, unlike ruminants, cannot eat grass and survive. Our digestive systems are tuned for a variety of foods, always including meat. Many vegans, she reports from personal experience, do not know this, and fantasize worlds in which the lamb and the lion shall lie down, if not together, then at least on either side of a big fence from each other—eating the

same uncomplaining plants. Can modern people actually be this ignorant? It seems so. Traditional diets have universally recognized the importance of flesh foods, especially animal fats, as the researches



of Weston Price and many others have confirmed for over a hundred years. But modern people devoid of dietary or any other cultural traditions have picked up deadly memes, and many, especially younger people, have killed themselves trying to atone for civilizational violence.

Keith is no less an activist for interspecies justice and care of the earth now than she was when eschewing flesh in her diet. Are plants insentient? Do they care naught for their offspring? Of course not, and the moral impulses that inform veganism are still sound: we should care for all life—animal, plant, and microbe alike—and especially its higher expressions in the organization of ecosystems and species genomes. She has simply recognized the appalling state of willful ignorance that drew her down a deadly road, and is determined to do all she can through personal testimony and powerful persuasion to prevent any others

falling victim to the same form of self-destructive madness.

The author demolishes political vegetarianism by exposing its ignorance. On the pretense (and this is the one that caught me 36 years ago) that surplus grain and oil crops from the western developed countries were needed to feed the hungry of India, Africa, and Asia, many political vegetarians have persuaded themselves to turn away from healthy food and embrace arrangements of power that, were they seen clearly, would be understood as imperialist, racist, even genocidal—certainly unjust. No, people in the majority world don't need U.S. food aid. They don't need GMO corn or inedible soybeans. These countries need us to stop overpowering their own native farm sectors with our subsidized exports and our high-powered trade negotiators. She goes on to peel the covers back from the orgy of interlocked corporate boards that makes up the American food system. Scratch beneath the skin of Dean Foods or Odwalla Juice, Hain Food Group, Cascadian Farms or Muir Glen, and you find the likes of Chevron, General Electric, Monsanto, Nike, Starbucks, Texas Instruments, and WalMart as the majority stockholders. "So you're an environmentalist. Why don't you know any of this?" she asks.

Feedlot finishing, chickens in battery houses, and CAFO pork operations are lousy, and we shouldn't be eating that food, but animals living their lives under the sun on agricultural savannas like those nurtured by intensive graziers such as Joel Salatin and thousands of others are tremendously healthy. These carefully managed pastures are sequestering carbon, increasing plant diversity, and growing healthy food for people. Wake up! The author's words virtually scream out from the page. You who disdain eating flesh are fooling no one but yourselves.

Apart from the gripping passion of Keith's personal narrative, why should

anyone already eating meat bother reading this book, with its indictments of fast food addiction, its tight analysis of the downward spiral of anorexia and bulimia, and its chilling litany of the deterioration of the body deprived of saturated fats and animal proteins? Because control of food is central to the control of our bodies, our minds, and the political system itself. The author has done a tremendous amount of focused research on the issues of diet and nutrition, ecosystem destruction, agriculture, and the manipulation of the food system, and the chain of money and control that weave an insidious trap for us all. You will learn many things you need to know here. Things on which your very life depends.

This book is a political exposé, a diet book, a treatise on anthropology, and a roaring condemnation of grain agriculture. Keith looks at agriculture's destruction of the land, amped up by fossil fuels to a massive holocaust in the past five decades, and finds no redemption anywhere. She admits that the Land Institute's project to breed seed-heavy perennial grasses could prevent much of the destruction of plow agriculture, but asks "why would we want to?" When Kansas and the rest of the Great Plains virtually overflowed with bison, antelope, and a host of other ruminants, flesh of which is superb food for humans, why would we try to replace it with something that may not ever work, and certainly stands little chance of feeding anyone for decades?

Grain isn't good for us. We love it because its seeds contain small amounts of opioids that give our brains a rush, but it causes all our tissues to swell when we eat it: our joints, our liver, our nerves, our blood vessels. Most of the degenerative diseases of modern life are linked to the inflammatory influence of a diet rich in refined carbohydrates and vegetable oils. We eat them also because they are the cheapest and most profitable calories that industrial farming and food processing can put on the shelf, and Money wants us to eat them.

Meat, Keith reminds us, especially organ meats with their superb assembly of minerals and saturated fats, literally made humans into our modern form. These readily absorbed, nutrient-dense foods allowed our brains to grow and our digestive tracts to shrink. We are still dependent on this complex of foods for

wholesome nutrition, but most of us don't know it. Or should I say that the cultures that reminded us of its importance are eroding and disappearing from the modern world. And that the manipulation of memes by corporate advertising is killing us, one cheese puff at a time.

In the nature of a book that attempts to integrate personal passion and scholarship to a high degree, it might be too much to expect a program of reform to be well

The arguments are compelling, and bluntly presented... Every field of grain or soybeans kills ecosystems and a myriad of creatures mostly too small to be seen...

articulated. In her fourth chapter, Keith expounds on a simple formula for saving the world: Refrain from having children; stop driving your car; and grow your own food. Many will take issue with at least the first, though by any account we need to reduce the human population humanely and as fast as possible, but there can be little quarrel with the science of the latter two points. You won't find a lot here about how to make the changes happen—and let me tell you they are tough in the aggregate—though the author gives a good account of the logic of permaculture and the importance of perennial polycultures, rotational grazing, and no-till gardening. In recommending how "To Save the World," Keith takes a good lick at patriarchy and monotheism along with industrial farming and soy pseudofoods. By this point in the argument, you don't have to care if her polemic is over-the-top. The point has been driven home. Our food system is killing us—resist!

Published with the blessing and under the imprint of Derrick Jensen's Flashpoint Press, *The Vegetarian Myth* is an attractive and information-rich book that lives up to its subtitle. Aside from a few graphs used to illustrate the manipulation of cholesterol studies, the book consists of

text only. The cover theme of Lascaux cave art is carried through on most pages with tiny glyphs of bison marking transition points in the text. No matter the lack of illustration, the writing is powerful and persuasive. Keith has every reason to be bitter and angry, but she has transmuted her anger and seasoned it well with a self-reflective humor that sweeps us along this road to recovery from a scorched earth. As I read her description of her first meat meal in 20 years (a can of tuna eaten reluctantly with a plastic fork), I found myself in tears. Ten years recovering from a quarter century of vegetarian folly myself, I never went through the agony that Keith lives with yet, but I knew the shattering epiphany she experienced with that first bite—coming home to the truth of her body, and of life itself.

Whether you are a vegan (run, if you can, to the bookstore), vegetarian, recovering from either diet, or never gave up meat at all, you will benefit from this author's painful mistakes and her laser-like focus on the path to a sane diet and all that it entails. Mark this one for the top shelf on cultural recovery. △

Flows and Feedback Review by Peter Bane

**DONELLA H. MEADOWS
Diana Wright, ed.**

***Thinking in Systems:
A Primer***

Chelsea Green. White River Jct. VT.
2008.

218 pp. paper. illus. \$19.95

Donella Meadows may be the most famous systems thinker of the 20th Century. She belongs to the community of Permaculture as one of our patron saints. Her most important work, co-authored with her husband Dennis Meadows and Jorgen Randers, and known to the world as *The Limits to Growth*, was notable in having applied system analysis—just possible for large problems in 1972 because of the advent of computers—to global economic flows. We weren't using the term "global economy" then, either politically or conceptually, but we had one, and they imagined and described it. What Donella and her co-authors showed us was that systematic thinking

could reveal the fundamental flaws in the economic system then and still dominating the world. It could show us things that our poets and social critics might write about with feeling, but that few of our scientists or politicians had yet conceived, let alone measured.

When someone offers a model of thinking that can accurately reveal earth-shaking trends 30 years in advance of their becoming popular knowledge, you have to give them some credit.

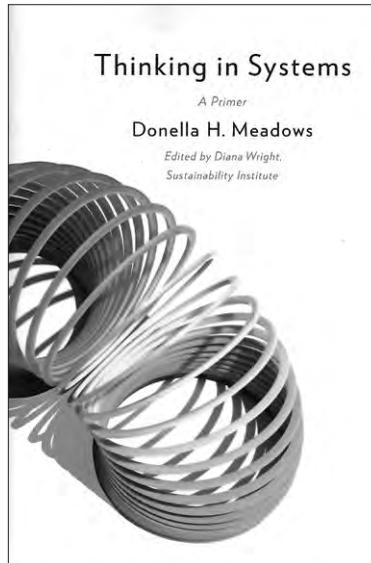
Limits to Growth predicted in 1972 what we are now experiencing in our daily lives—that humanity and its economic institutions would begin to hit a wall early in the 21st century from energy and resources constraints. Though it was derided by the establishment upon its publication, L2G is no longer a subject for serious doubt. *The Economist* magazine and other prominent detractors have been eating a sizable helping of crow for several years now. All sober eyes are now on the indicators of climate change, as Industrial Man's most dangerous waste product climbs toward levels that threaten to toast us off the surface of the planet.

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By all accounts, Donella Meadows was a wise, funny, and humane person, and one of the best problem solvers anyone ever met. She was also a good teacher. This book, incomplete at her death in 2001, has been brought into shape and into the public's hands and eyes by Diana Wright of the Sustainability Institute. We should be grateful.

Thinking in Systems offers a highly accessible primer in the principles of systems analysis. Mathematically inclined readers will recognize that these principles

reflect algebraic concepts: flows and rates of change in flows. But you needn't be a math wiz to grasp what the book offers. All the examples are basic stories about the familiar world of daily life, including some looks at popular issues in civic culture, like crime and pollution. Meadows asks, and offers some answers, "Why do we consistently get what no one wants in many arenas of public policy?" For example, no one wants drug use and drug sales to remain high and resistant to social sanctions, but no matter how many



billions of dollars of law enforcement and paramilitary operations we buy, the levels of use, sales, smuggling, and violence associated with the drug trade and the Drug War remain stubbornly high. Neither Republican nor Democratic administrations seem able to make any headway. The Coast Guard and the Columbian Army scarcely make a dent. As Meadows points out, systems analysis would reveal the stubborn link between enforcement, high prices, and increased incentives to break the law. The competing structures of law and addiction create a great device for job security for border patrol agents, politicians, drug dealers, and leftist guerrillas. Do we like this? Is it necessary?

If you read the papers and consistently wonder why no one understands anything, and why some problems of public life seem insoluble, consider that ideology or ignorance is often pushing us toward one or another kind of system trap. There's the Policy Resistance trap, wherein various actors are trying to pull a system

toward incompatible goals. If any one of the actors succeeds in pulling the system toward its goals, the other players simply resist harder and a bidding war ensues. The Drug War is this kind of problem. All the players work harder and harder: more cash, blood, drugs, and words flow, but the results are little different from year to year. How to change? Let go, bring the actors together, and solve problems at a higher level, says the author.

Some other system traps include *The Drift to Low Performance* ('ho hum, we can't do any better'—so we do worse...) and *The Tragedy of the Commons*, familiar from the writings of Garrett Hardin, and which has its corollary, *The Futility of Individual Virtue*. In an unbounded situation, it's easy for common property resources to be eroded. Witness pollution of the seas and the atmosphere as two immense problems facing humanity today. Fifteen years ago the collapse of the cod fishery off Maritime Canada gave us a smaller scale demonstration of the Tragedy of the Commons. The way out? Educate and exhort the users, and strengthen the feedback to users, either by privatizing the resource, or by restricting access to it for all. So we are headed toward carbon taxes, thankfully, and not a minute too soon.

By examining common dilemmas in political and social affairs, Meadows helps us see through the polemic of opposing views. She is first and foremost, a problem solver, and this is what commends her book to permaculture readers who will have similar dispositions.

The book's concluding chapter on Leverage Points—ways to influence systems—has been circulated in various forms for a number of years, and will be familiar to many of our readers, but it remains an invaluable guide to strategic action. Fiddling with the numbers, which politicians love to do, is about the weakest impact you can make on any system. Appropriate another 10 billion dollars? Sounds good, but you might as well be pissing in the wind. Affect the information flow: who does and who doesn't have what information? Now you're starting to gain traction. The Freedom of Information Act had a profound influence on public life in the United States. So much so that George W. Bush did everything in his power to undermine it, gut it, and ignore it. By making government

more transparent, Barack Obama hopes to have wide and enduring influence. But information flows are not the most powerful leverage point by far. Setting the goals of the system, shaping the paradigm of the system, and transcending paradigms altogether are respectively numbers 3, 2, and 1 on Meadows' list of leverage points. Read the book and learn the rest of the list, and how to use them.

Systems thinking underlies all biology and ecology, permaculture design, and urban planning. It is essential to policy formation and social activism. Indeed, systems thinking is a fundamental intellectual tool for living today, and no one can consider themselves properly educated who is not able to grasp its basics. All talk of resilience, feedback, and tipping points has its origins here. This book provides an excellent introduction by one of the last century's greatest minds.

As the author herself has said, "Pay attention to what is important, not just what is quantifiable." Δ

Living with Trees

Review by Peter Bane

BEN LAW

The Woodland Year

Permanent Publications.

East Meon, Hampshire. 2008.

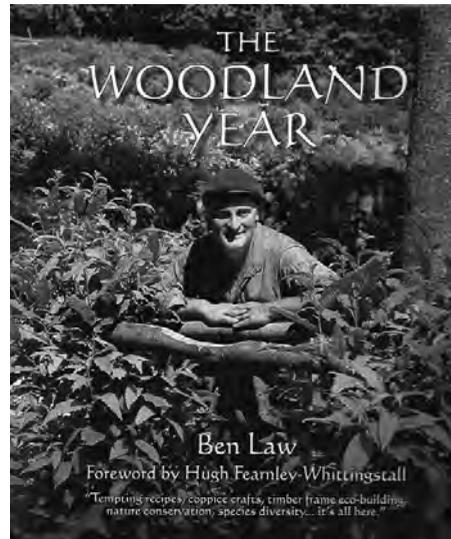
173 pp. hardbound. color plates.

\$49.95.

Ben Law is Britain's greatest living woodsman. His earlier books, *The Woodland Way*, and *The Woodland House* described his life as a coppice woodworker and his building a timber-frame house on his small coppice holding from materials he harvested himself in the woods. *The Woodland Year* takes a larger look at the reemerging craft of coppice, or managing tree regrowth for a variety of economic products.

Coppice is ancient, and was practiced throughout Europe (it goes by other names in other countries and regions, but is a common practice), but it may have reached its greatest and most enduring expression in the tradition-honoring culture of the British Isles. Stumps (or "stools" as they are known) of ash have been managed there continuously for over 1000 years. These tree organisms, most

of whose biomass remains underground, continue to sprout vigorously and to maintain dynamic organic growth and ecosystem health around them. Coppice is unusual in being a well-documented and accessible cultural tradition with roots in the medieval world that endures and has relevance to our time and place. This book reveals much about this admirable phenomenon.



Nearly extinct between the world wars, coppice has enjoyed a modest and growing revival in the past 20 years as new, younger woodsmen and women take up the traditional arts and expand upon them. Besides running commentary from Ben's work at Prickly Nut Wood in Sussex, we are treated to a dozen vignettes (one for each month of the calendar, starting in November) of individual coppice workers from up and down the country. Each of these tales is told in the voice of its own author, so we get quite a range of flavors. The coppice woodworkers Law has chosen to spotlight are men and women, families and collectives, young and middle-aged, attempting and succeeding at making a living and a life for themselves in Britain's slowly recovering coppice stands. Against the political strictures that have largely emptied the countryside, many of the writers have succeeded in obtaining permission to dwell and build on their holdings, which are often leased.

Besides offering a full-featured look at a different but familiar way of life, at once ancient and future-oriented, this lovely book displays a wealth of cultural treasure. Ben tells us about his lurcher Oily. A friendly bitch of a traditional breed with

keen senses, she helps him point squirrels in the woods, which he then dispatches with a rifle. Grey squirrels, imported accidentally from North America, wreak havoc with young trees in the woods. Since coppice is all about young regrowth, the wise coppice woodworker learns quickly how to control their populations. A dog and a gun are more reliable and less dangerous than squirrel birth control, and one gets to eat the stew. We get a recipe, of which the book is full of examples, not just for squirrel, but also rabbit in cider and wild mushroom omelets, all made with fresh woodland herbs.

Offered as a visually attractive glimpse of artisanal forestry, this book actually sets out a reasonable cultural study of a way of life that will become essential in forested regions in the coming century.

The coppice workers (at least Law) are fond of wine, so many recipes for wild fruit wine are included in the text, along with details of finding and caring for the trees that grow the fruit. And just for good measure, recipes for bilberry pancakes and beach leaf noyveau (brandied beech leaves in gin!).

We learn about fire, making it, keeping it burning all the time, making charcoal with it, and which woods supply the stove best. Britain has a different set of trees than North America, but many are of familiar genres: ash, oak, beech, hazel, apple, elderberry, and brambles are all known on this side of the pond as well. *The Woodland Year* offers up careful assessment of all their qualities and virtues.

My favorite chapter was the December tale by Frankie Woodgate of logging with her team of horses in Chiltern Beech Wood. If you thought that coppice was all about hand tools and scruffy bearded gnomish drudges covered with moss, think again. Frankie is bright-faced and

beautiful, even in an orange hardhat. and her rapport with her sturdy equine companions is visible in the photos. The juxtaposition of high-tech but tiny hydraulic machines for lifting logs with leather tack and draft horses steaming at the nostrils as they snake logs out of the woods with barely a scratch is worth the price of admission!

The book covers yurt making, and house craft, the design and use of bill hooks, and how the coppice worker markets his or her hurdles (movable

fencing), chairs, garden stakes, and firewood, among hundreds of subjects. Offered as a visually attractive glimpse of artisanal forestry, this book actually sets out a reasonable cultural study of a way of life that will become essential in forested regions in the coming century. Snedding limbs from poles and other reminders of bygone British lore may seem quaint, but they are in fact highly adapted to sustainable living in woodland regions and we had best pay attention. The beauty of this book lies in its ability to harness

the reader's deep feelings of affection for the countryside, which the coppice workers down the centuries have done so much to shape, with the modern public's appreciation for genuine craft, authentic flavor, and individual integrity, which are all handsomely displayed herein.

With color photos on every page and an elegant layout by Tim Harland, *The Woodland Year* would make a fine gift for anyone with a feeling for trees, forests, or wild food. △

Old Ways Made New Review by Peter Bane

GENE LOGSDON

***Small-Scale Grain Raising,*
2nd ed.**

***An organic guide to growing,
processing, and using nutritious
whole grains for home
gardeners and local farmers***

Chelsea Green. White River Jct. VT.
2009.

307 pp. paper. illus. \$29.95.

Gene Logsdon is one of my heroes for his intrepid writing on agriculture. The author of dozens of books, he's been helping to shape the organic and small-scale farming restoration for more than 30 years. This classic, now revised and fully updated, was first published in 1977, when it's message was strange to all but a tiny segment of back-to-the-land homesteaders. Now Logsdon's plain-spoken advice seems ever so timely as sales of garden seed and implements shoot off the charts. I'm glad he's lived long enough to be enjoying a well-deserved revival.

On the permaculture advice that the opposite is also true, we are reviewing a book on grain raising in the same issue as one that condemns grain eating. Nothing is black and white, and if eating grain-derived processed food is generally unhealthy, it's likely that growing, harvesting, and consuming your own grain is a far healthier practice than eating what General Mills has to sell you. Corn is a vegetable as well as a source of industrial sugar. The overarching principle is "Back to the source."

Grain is the holy grail of agriculture. In the present food system, grain feeds

the world. Challenges to agriculture falter on the question of how to replace it as a source of nutrition. Grain growing has been hard to justify on a small scale for at least 80 years, since fossil fuels and mechanization drove artisanal farming off the land, but for centuries farmers raised grain to feed their families, and sometimes had extra to sell. It can be done. Grass (which most grain is) is, with legumes, the largest plant family on earth, and too economically important to leave to the multinationals. This book is FULL of information, a lifetime of it and more, that you, dear reader, do not have. If you don't need this information directly, a lot of good people in your community do, so make sure your library gets a copy of this.

While the author covers all the main grains: corn, wheat, oats, barley, rice, sorghum, and many minor ones, plus dried beans and legumes as companions and crops in their own right, this book is actually about a much larger subject, which Logsdon has been writing about for three decades: the family farm. Organized but anecdotal, he give us counsel on how to stay on the land, something the culture needs to remember. Buy land and farm for the long-term (50-100 years). Use organic methods and biological resources (permaculture principle #5). Let natural reproduction of animals make you wealthy. Be frugal and save money. Don't sell land in an economic downturn. From someone who's living by his principles, those are gems of wisdom.

Logsdon does what few others have been willing to do over the period he's been writing: he challenges the orthodoxy of scale, making his case again and again, unapologetically that other values than money more than tip the scales in favor of garden farming and hand work in many cases. Recreation, intellectual stimulation,

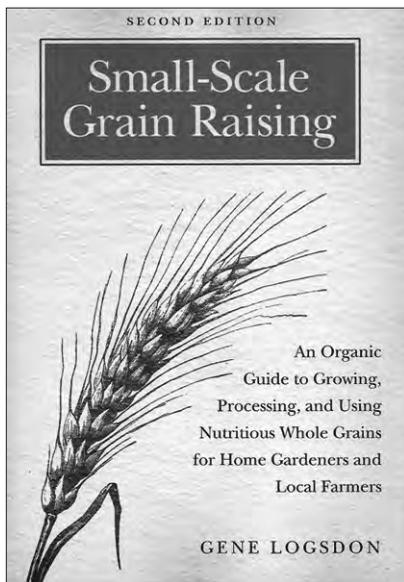
involving the family, quiet, settled work, contact with the land. Nothing wrong with 90 bushels an acre from your corn crop if you are not paying the \$600 per acre for inputs that the chemical farmer is shouldering to get 160 bushels from the same area. He is not dogmatic. He

While the author covers all the main grains..., plus dried beans and legumes..., this book is actually about a much larger subject, which Logsdon has been writing about for three decades: the family farm.

says when he thinks you can profit from planting or harvesting by hand (and tells you about corn hooks for stripping the ears off the stalk quickly—you can still buy 'em—and when you would do better to use some machinery. Then he tells you how to buy the machinery as frugally as possible and when to use a one-row planter and when to use a two-row planter (don't mix them). His experience enables him to say with authority that you should plant your corn in rows of 40 inches about 8 or 9 inches apart in the row. More dense plantings take too much fertility from the soil, and you can't replace it with organic methods. So to avoid chemicals, follow his advice. Popcorn is a little different; and here's how to shuck it and dry it, and pop

it for that matter.

The book, in an unromantic way, helps preserve knowledge of traditional farming techniques. He describes making strawstacks, a skill he learned almost by accident from some stubborn (and cheap) farmers in Minnesota who wouldn't give up their old threshing machine. The stacks were a hub of biological wealth on the farm. Animals ate the hay and sheltered under the stacks as they were carved out during the cold months. Manure accumulated and composted; nutrients piled up in the soils around them. And the smart farmer planted his melons there in years to follow.



Logsdon offers us recipes (he's no gourmet, but likes to eat), and stories, and pictures of his children and grandchildren helping on the farm. Isn't this what we want to see? Of course. He's nurturing our collective story of being at home with the land, and that's a story that really needs more press.

On the technical side, the book offers good information on varieties, seeds and seeding, planting and harvesting, processing, storing, and uses of grain for food, feed and seed. Everything is accompanied by recommendations told from the inside of the rural economy (how to buy at the local elevator or hardware store, for example). But Logsdon is no Luddite. He cites the Amish, and insists that "absolutely everything is available on the Internet." The value to the reader lies in just this juxtaposition of the contemporary and the traditional.

Always a personal writer with a

distinctive voice and humor, Logsdon is thorough in his coverage of grains, spilling over into other areas of farming. He has written elsewhere about raising animals on pasture, so the sections in this book detailing how to feed grain to beef, turkeys, rabbits, or dogs and cats for that matter, are complementary not contradictory. There is plenty of room in his sensible sentences and pithy paragraphs for philosophy of farming. Wildlife? Only city people who don't know where food comes from can remain romantic about deer and raccoons and crows. Without natural predators to control their populations, they will starve themselves and us too while damaging woodlands and gardens alike. You need to know about—and he tells you—fencing, and scarecrows (they work some)—and putting old socks over your ears of sweet corn. And you need to develop some respect for hunters, even if not all of them

are perfect gentlemen.

This book would be a good introduction to farming, even if you didn't want to raise grain. There's so much unfussy reverence and deep levels of knowledge displayed here unostentatiously that it's a culture lesson first and a farming manual second. All praise due, and though he mentions Wes Jackson and the Land Institute's breeding program for perennial grains, Logsdon does not address no-till, permanent agriculture methods of growing grain. An integration of Masanobu Fukuoka's insights from the One-Straw Revolution is still needed. But the parents are here for the breeding of a new line. This would be integrative work for permaculture designers—to bring perennial insights to the cultivation of staple crops, which cannot be dismissed or dispensed with anytime soon.

Highly recommended for anyone with agricultural leanings or a love of the land. Δ

From the Regions

Hawai'i Permaculture Convergence 2009

Thomas Baldwin

On the weekend of January 24th and 25th 2009 nearly 50 people gathered from the Hawaiian Islands to present and share some important themes and examples of permaculture. It was an important time for meeting new people as well as reestablishing connections with distant friends. Most of us feel isolated in nooks around the various distinct parts of our island chain nearly oblivious to the efforts and work others are making on multiple fronts of land stewardship, youth education, whole ecosystem restoration projects, and various things linked as innovations in the field of permaculture.

History

Permaculture has been well established in the islands since 1981, and some of the participants from that first course have been working in an original and inventive manner, since more than 25 years ago. Some names might include Michael Howden, Dano and Robin Gorsich, and John Pollock. It might be added that the first permaculture course in the United

States was in Hawai'i. We are also part of a very large region known as Polynesia that shares plants and knowledge and more generally culture even though many of us in Hawai'i are transplants from other places. Trainings and gatherings also occurred on the Big Island in 1990 and 1991, with Bill Mollison returning that year to exhort a group of his earlier students as well as some newer graduates, and Max Lindegger and Lea Harrison giving two courses and advanced trainings at Wood Valley.

Trainings have continued in the intervening 18 years both on the Big Island at La'akea and in Kauai, often drawing on the talents of West Coast U.S. teachers. A small convergence was held during a 1999 permaculture course on Kauai taught by Michael Pilarski, Doug Bullock, John Valenzuela, and Bruce Hill that was attended by several people from the Big Island and Molokai. I attended that course, and it was an inspiration to host the event at our farm, Uluwehi Farm and Nursery. That convergence followed a

course mostly devoted to medicinal plants and their role and use in agroforestry.

Speakers and discussions

At the 2009 gathering, Robert Silber dazzled us with his discussion of the social and cultural aspects of sustainability for ecovillages and communities. He emphasized communication skills and emotional awareness techniques that are necessary for carrying out successful endeavors allowing people to participate in a fulfilling way.

Tim Rieth gave a presentation with slides of natural building projects he has helped realize in Thailand, Hawai'i, North America, and England. The range of his projects includes an orphanage, natural ovens, and small bungalows, all in materials that range from cob, strawbale, slip straw, and earthen bricks.

The main presentations were interspersed with introductions and discussions on food, energy, water, fiber, and medicine facilitated by myself and Nelson Denman. Breakout sessions from these larger topics included one about rat lung disease, which is currently affecting some people in Puna on the Big Island. Two people have not recovered and are on the verge of dying. The disease is carried by snails and slugs which harbor small parasites which hatch and can move through the entire body affecting the central nervous system and brain tissue, not to mention the excruciatingly painful effects. To move towards a solutions-oriented discussion, a range of positive design approaches were suggested to minimize further exposure to this parasite originating in Asia.

All-Islands issues

On the second day we had a group discussion that included permaculture design and its role with ongoing climate destabilization, and what is permaculture in Hawai'i? Can it engender new solutions in the ongoing debate over energy descent and our distant place in the world? John Schinerer and others posed questions about what role different technologies will have in time, and the need to foster deep-rooted connections to the past. The term "backcasting" has emerged from the Transition Towns movement as a tool for looking forward to what we want to see in the future and preparing what is needed today to nurture those positive outcomes.

This comes as a contrast to preparing for catastrophe. Overall themes included restoration and protection of our forest systems and improvement of degraded watersheds from mountains to coastlines as put forth neatly in the traditional land management of the *ahu'pua'a*, or watersheds of the islands. The subjects of biological erosion, food security, and seeds were discussed in a session led by Meliana Judd of Oahu. She presently represents the groups Hawai'i Seed, and HIGEAN which are working with many indigenous groups to stop genetic modification of Taro, and the ongoing growing of transgenic crops in Hawai'i. Further thoughts on alternatives to the official stance on food security were discussed, including the ginger farmer and fermented foods crafter Andy Sarhanus on local barter and farmers markets.

Trans-Polynesian initiatives

Some people already know of the substantial role Craig Elevitch has played to bring awareness on the international level to tree crops and food systems with publications he has coauthored and edited including more recently *Traditional Trees of The Pacific Islands: Their Culture, Environment, and Use*. He gave an updated version of a talk he has been giving to the public called "Island Food Security, Pacific Style" and his upcoming project to pioneer and live off of a bare quarter acre within a year abundantly. He reminds us that there is much to learn from our neighbors in Tonga, Samoa, and elsewhere where people carry on traditional livelihoods.

Local projects

Dano and Robin Gorsich have probably the longest running Community Supported Agriculture program in Hawai'i, or FSA as Dano calls it (food system delivery) which seemed to them to be a more accessible name for Molokai people. They combine a very intensive garden with many seasonal crops to put together custom boxes in a unique system that has evolved since they started in 1992. Their farm, however, is much older than that. Their gardens are a retrofit of an overgrown terrace system for taro called lo'i. Since then they have included fruit trees that border the gardens in a rotation with Khaki Campbell Ducks. The combined poultry and garden fertilizes and enriches the soil while eliminating

pathogens in their garden beds. High yielding birds provide a plethora of eggs to include in the FSA program. Many of their innovations have sprung from ongoing feedback from the systems they have, as well as many late night talks with Bill Mollison who has often visited his favorite farm on Molokai. Building upon a subculture of people making use of human waste in urban systems, Nik Bertulis talked about unique systems for growing food using sawdust and urine to make raised-bed gardens. He also introduced the group to "poopooponics" in a system that uses a drum to compost human feces and sawdust capped with a layer of soil. This substrate grows excellent tomatoes and other crops. He also demonstrated a number of other more elaborate solutions to human waste transformation.

Taking into consideration all the energy required to preserve endemic plants, heirloom vegetables, unique nut trees, rare varieties of fruit, Paul Massey has been quietly working to connect people with an annual seed exchange and other educational events. He is also assembling a unique collection of plants in a distributed botanical garden based on the careful stewardship of many gardeners.

Jim Channon in this area near Hawai'i on the Big Island has recently helped to initiate the Sustainable Kohala group focused on energy and food issues. He focused his talk on a broad range of design issues related to town planning, rural homestead design, and housing. He brought the group into discussions about the audible qualities of our home and how to make paradise real in a visual and audible sense. He asks us to shift our paradigm out of traditional farming into creating a generation of land crafters. The conclusion of the event was a presentation of Stephan Reeve's unique landcrafting work. He has been achieving some impressive land restoration in degraded pastures at Kipahulu on east Maui. Steph has created a food forest and bamboo house that supports his raw vegan lifestyle. He is also replanting and protecting the rare upland forest species working together as a family with the community called Kipahulu Ohana. Δ

Thomas Baldwin can be contacted at tombaldwin@turquoise.net.

Permaculture Design for Kauai Island

Michael Pilarski

Permaculture design can be applied at all scales from small to large. Most permaculture design is applied to yards or single properties. I was recently involved in applying permaculture design to the island of Kauai. Kauai is one of the Hawaiian Islands with a land mass of 353,000 acres (550 sq. miles/141,000 ha) and a population of 65,000. This highly-dissected, mountainous, volcanic island has spectacular scenery. Being 2,500 miles from the nearest continental land mass, it is particularly vulnerable to disruptions in the supply of outside inputs. Currently it imports over 90% of its food needs as well as most of its fuel, building materials, etc. In the old days the economy revolved around sugar cane, but the industry is now almost gone. In recent decades tourism has been the dominant income source peaking out several years back at 1,250,000 annual visitors. Tourist numbers are dropping fast and the worsening global economic crisis may lead to an island-wide unemployment crisis. On April 4, 2009, 250 people came together in Lihue on Kauai to update Kauai's master agricultural plan. The Kauai Agricultural Forum brought together a wide range of farmers and agriculture stakeholders (including agencies and local government). The unique thing about this public, agriculture planning process was that permaculturists had a major role in planning and directing the event. I gave the keynote address to set the tone for the day and was one of the main facilitators. About one-fourth of the participants were permaculture design course graduates. Our mission for the day was to plan the future of agriculture on Kauai. The plan developed at the Forum and in a follow-up meeting the next day. It strongly reflected a permaculture outlook with sustainability as the stated goal. Local food self-reliance based on local inputs was a major focus. To my knowledge this is the first county-wide agricultural planning event directed by the permaculture community. The event was very successful and already has a broad range of public support. It will take years of effort to implement the plans and build even broader public support. We didn't use the term "permaculture" a lot during

the process but rather focused on the term "sustainability." The success of this forum makes me encourage permaculturists everywhere to become more involved in public planning processes. We have lots to offer and the public is increasingly open to permaculture ideas in this time

of deepening crisis. In the future I hope to hear of many other examples of permaculture design being applied at the county level. For further information on the forum, the planning documents developed, and follow-up activities please go to www.kauaiagriculturalforum.org. Michael Pilarski is a permaculture educator, practitioner, and community organizer based in Washington State. Michael@friendsofthetrees.net, www.friendsofthetrees.net

Northeast Network News

Jono Neiger

Permaculture is active and spreading in the Northeast as witnessed by numerous courses, workshops, local organizations, and events. A nine-day teacher training at Epworth Center in High Falls, NY led by Dave Jacke and a team of five others taught creative, interactive permaculture education to 27 students from within the region and beyond. As part of the training, these new teachers hosted over 60 participants in a da-long

permaculture workshop. Other advanced courses are springing up in earthworks, forest garden design and installation, nature awareness, and sustainable agriculture. Regional colleges such as SUNY Ulster, Cornell, UMASS, Sterling College, and UNH are hosting design courses and various non-profits such as PINE, APIOS, New Forest Institute, Local Energy Solutions, and Green Phoenix are guiding growth in the Northeast region.



The Oarcea family, winners of the 2008 Northeast Permaculture Olympics.

Last summer the fourth annual regional convergence was hosted by the Western Massachusetts Permaculture Guild at Nuestras Raices Farm in Holyoke, MA. Over 100 people came to the lively event with local tours, speakers, music, dancing, learning, and the first annual permaculture Olympics. The Oarcea family won the day with impressive swale digging and wild salad gathering. This year's convergence will be hosted by the Winooski Valley Permaculture Collective with help from

members of Burlington Permaculture and promises to be another great event bringing together folks from around the region and sending a wave of hope and enthusiasm into the region. For more information see the regional wiki at www.northeasternpermaculture.wikispaces.com.

PINE, Permaculture Institute of the NorthEast (thepine.org), a regional Permaculture organization, will support the growing regional network. PINE hopes to get non-profit status over the next

year. In the meantime, some projects in progress include developing a database of Permaculture organizations, businesses, and sites; helping track and promote courses in the region; and supporting events such as the yearly convergence.

It's exciting to have this level of interest and to see the widening ripples of connection and change. We look forward to fielding our Olympics winners at a future national permaculture Olympics. Δ

Movement Musings

An Eye on the Western Mountains: Watching climate change

Suvia Judd

I like to watch change. I relish the turning seasons, and look for the small details in nature that differ from week to week. One March day, when the round yellow buds of our cornelian cherry (*Cornus mas*) had just appeared, I went up on the mountain. On the old snow I saw a cluster of tiny bright sulphur-colored insects hopping. Later, at home, I found clumps of mercury-silver insects skittering on the puddles atop the hay tarp. I enjoyed these signs of the earth tilting towards the sun. And last week on my mountain walk I was rewarded with swaths of glacier lilies, two kinds of yellow violets, and the first unfurling trilliums, with their delicate Easter lily scent. I even saw a wood anemone, just opening its lavender-backed white petals.

April 12th, at a meeting of the Idaho Native Plant Society, I heard Jerry Rehfeldt, recently retired from the local Forest Service Experiment Station, talk about the changes global warming will bring to the Western landscape. Dr. Rehfeldt combined several dozen variables describing climate, (of which the balance between rainfall and temperature appears to be the most important,) and developed a model which predicts with less than ten percent error the present day 25 vegetation communities of the western United States. He then took the most widely accepted predictions of the change

in climate over all the regions of the West, if global warming continues unchecked, and projected the changes in plant communities for the decades of 2030, 2060, and 2090. One of the striking things he found was that in 80 years, almost 50 percent of the land area of the West will be occupied by associations of plants not seen in the West today.

When used to predict current distributions of individual tree species, Dr. Rehfeldt's model had an error rate of less than five percent. This indicates the confidence we may have in what he found when he used the model to look into the future at where the climate zones for individual tree species would move. He found that, for example, by 2090, the northernmost climatic limits for saguaro cactus shift to north of Las Vegas. The lower Columbia Basin would have the climate zone of the current Mojave Desert: if Joshua trees had any way to get there, their habitat could be waiting. Chihuahua pine, a Mexican native, would be suited to the conditions on the Camas Prairie, along with the now rare wildflower McFarlane's four o'clock, which could migrate up from the canyon floor and become invasive.

Western larch, lodgepole pine, subalpine fir, aspen, and white pine would disappear to Canada, except for some tiny refuges, the model predicts. Around Moscow, ponderosa pine habitat would

shrink drastically, and the area suitable for Western red cedar would expand, but it would be suitable for coastal red cedar.

The amount of change that we are facing is old news in biologic history, but the speed of change is totally new. Drastic change first brings a reduction in biota; this is confirmed in the fossil record. In other words, there will be plants and animals and other living things, but a whole lot fewer kinds of them. Pioneer species, including noxious weeds, will thrive. Dr. Rehfeldt told me that an eye opener for him is how a change in temperature a little as two degrees F can have a big effect on the balance between temperature and precipitation, and thus have a profound effect on the vegetation. We in the audience were pretty shaken. I like change, but change within familiar boundaries. I don't care for wholesale revision.

Dr. Rehfeldt hopes humans will make changes to lessen global warming, but he also thinks we should consider preparing for inevitable climate change by establishing populations of trees where their future climate zones will likely occur. A conifer species that takes ten to twenty years to produce its first cone, and two or three years for each crop of cones to mature, may find tracking its receding habitat difficult, especially if it has to jump over mountain ranges.

This is all food for thought and inspiration to act now.

Suvia Judd lives in Moscow, Idaho.

IPC-9 to Emphasize African Development

The 9th Intl. Permaculture Conference will be held in southern Africa this October and November. The biannual event, last held in Brazil in May 2007 and in Croatia in 2005 will be spread over three countries. The conference is planned for Pretoria, South Africa, the Convergence of permaculture graduates for Kumbali Lodge, located just outside Lilongwe, the capital city of Malawi, and a pre-conference design course for Harare, Zimbabwe. Dates and contact information are available on page 61 and in the Calendar on pg. 62.

Travel

Malawi is in south central Africa on the southern end of the Great East African Rift Valley. The main gateway is Kamuzu International Airport outside Lilongwe some 30 km from the venue for IPC9. There are just a few direct flights between Lilongwe and London. The main routes from the rest of the world are through Johannesburg, South Africa or Nairobi, Kenya. There are also flights connecting Lilongwe to Dar es Salaam in Tanzania, Lusaka in Zambia, Harare in Zimbabwe, and Addis Ababa in Ethiopia. The airlines that serve Lilongwe are South African Airways, Kenya Airways, Air Malawi, Ethiopian Airways, and Air Zimbabwe. The sponsors are exploring the possibility of organising a road caravan (bus) to take people from Johannesburg to Lilongwe and back. This bus would travel through Zimbabwe and Mozambique on its way to and from Lilongwe. An official travel agent will be appointed soon to assist with travel arrangements.

The setting

November in Malawi marks the end of the hot dry season and the beginning of the hot wet season and temperatures will be in the 30s/80s during the day and around 20°C/68°F at night. The convergence will coincide with the full moon. The venue is outside town but is only about 20 minutes drive from the city center, enjoying the advantages of both rural and urban settings. It has lots of space and is surrounded by savanna woodlands.

Health and safety

The main environmental threats to health in Malawi are malaria, bilharzias, and cholera which are all spread by parasites and tend to peak during the rainy season,

and so the timing for IPC9 is quite good in terms of minimizing these threats. Much local and scientific knowledge is available about these maladies. Cholera outbreaks tend to be localised in overcrowded areas with poor sanitation and bilharzias tends to be limited to riverine areas along the lake shore.

The theme for IPC9 is Plan Africa ~ Food & Empowerment, and is based on inspiring, informing, and enabling a development strategy for Africa that seeks to understand her natural heritage and the inherent wealth that it contains and to find ways of unlocking value so as to create strong sustainable regional economies that are in harmony with nature.

Work of the Convergence

The convergence will highlight ways of empowering marginalized communities out of poverty through concerted, well-designed social and economic development. The starting point is learning to manage water resources so as to use rain water as the basis for runoff agriculture. Africa simply doesn't have enough water to rely on irrigated agriculture to feed, clothe and power its people. Once the water management is sorted out, the focus shifts to soil conservation and improvement, preparing the way for establishment of an agroforestry system. Then the design must anticipate what plants, shrubs, and trees can be used that are indigenous to an area and that will extract maximum economic value for the surrounding communities. The aim is to create jobs through harvesting, processing, packaging, transporting and adding value to the natural capital thus developed.

The conference and convergence will link the sustainable production of food, fuel, fiber, and medicine with the development of added value for local economy. There will also be attention put on education, gender, green economics, disaster preparedness, health and HIV & AIDS.

Aims and outcomes

The conference organizers emphasize the following outcomes as their hope for the event:

- Strategies for strengthening Permaculture education and training in Africa.
- Increased awareness of the strategic



importance of the alternative development paradigm among the young generation and the policy makers.

- Increased confidence and motivation among the Permaculture teachers and farmers in Africa.
- Improved networking and organizational development for the Permaculture movement in Africa.
- A raised profile of Indigenous Knowledge Systems (IKS) and the Natural Resource Management (NRM) model for endogenous development.
- Increased awareness among African farmers of the alternatives to the 'green revolution' approach.
- Increased understanding in the international community (Permaculturists and others) of the issues around development in Africa.
- Higher recognition among government officials, the funding community, and other key stakeholders of the huge potential of Permaculture to transform lives, landscapes, and the development outlook of Africa
- Practical solutions for global challenges described.

Registration

Some international speakers will present keynote speeches directed towards designing, planning, and responding to the immediate challenges that Africa faces. The Convergence will attempt to give voice to as many participants as possible, and the organizers are requesting that registrants advise them at the time of registration of proposals.

Pre-registrations are now being accepted, and forms, available by mail or on the web, should be sent to
P.O. Box 32280,
Chichiri, Blantyre 3, Malawi.
Telephone: +2651831373.
Fax: +2651831363.
Mobile: +2659788373.
Email: ipc9malawi@ymail.com;
rescope@sdnp.org.mw; zipscope@yahoo.co.uk; esjopempamoyo@malawi.net.

EVENTS

9th Annual

Advanced Permaculture Course in Teaching

Northwest USA

Dates: August 9-15, 2009

Location: Cottage Grove, OR

Description: Empower yourself to advocate for Change through Whole Systems Design and Teaching. In this dynamic, interactive, and engaging course, you will learn significant teaching techniques to communicate Permaculture Principles and Strategies in a wide variety of settings. Jude and Guests have a combined experience of over 30 years of teaching and in the design field. Their commitment to encouraging diverse learning styles inspires you to build upon your unique strengths and talents. They model various visual aids, storytelling and facilitating. Each participant will be offering several presentations, which provides essential hands-on experience. This course provided by the Cascadia Permaculture Institute in collaboration with Permaculture Institute USA.

Instructors: Jude Hobbs and guests.

Cost: Tuition \$700-\$775. Includes course materials, 3 mostly organic meals/day (non-vegetarian, vegetarian & vegan options) and camping.

Contact: Cascadia Pc Institute

541-342-1160

cascadiapc@gmail.com

www.cascadiapermaculture.com

Permaculture Design Course

Northern California

Dates: July 11-24, 2009

Location: Occidental, CA

Description: Whether you currently own property or dream of it, this two-week intensive course will immerse you in information, ideas and inspiration for how to design sustainable, regenerative systems in balance with your home ecosystem. Using a combination of lecture, discussion, hands-on activities at OAEC's 80-acre site, visits to local permaculture examples, and a group design project, you will have the chance to integrate and apply the concepts of permaculture.

Instructors: Brock Dolman, Kendall Dunnigan, and guests.

Cost: \$1,500/\$1,400 if registered two-week before start date.

Contact: Occidental Arts & Ecology Ctr.
15290 Coleman Valley Rd.
Occidental, CA 95465
707-874-1557
oaec@oaec.org

Permaculture Design Course Northern California

Dates: September 19-October 2

Location: Occidental, CA

Description: Using a combination of lecture, discussion, hands-on activities at OAEC's 80-acre site, visits to local permaculture examples, and a group design project, you will have the chance to integrate and apply the concepts of permaculture during almost 100 hours of course time.

Instructors: Brock Dolman, Kendall Dunnigan, and guests.

Cost: \$1,500/\$1,400 if registered two-week before start date.

Contact: Occidental Arts & Ecology Ctr.
15290 Coleman Valley Rd.
Occidental, CA 95465
707-874-1557
oaec@oaec.org

Advanced Permaculture Training with Robyn Francis

Northern California

Dates: July 5-9, 2009

Location: Bolinas, CA

Description: Award-winning permaculture designer, educator, presenter, pioneer, and writer Robyn Francis will be teaching an advanced training at Commonweal Garden this summer: Getting Started as a Permaculture Design Consultant.

Instructors: Robyn Francis

Contact: Regenerative Design Institute
PO Box 923
Bolinas, CA 94924
415-868-9681
www.regenerativedesign.org

Permaculture Design Course Southwest USA

Dates: July 11-25, 2009

Location: Cleveland, NM

Description: Participate in a dynamic, transformative design course at Hummingbird Community located between Taos and Sante Fe, NM, amidst a riparian corridor and natural wetlands; an ideal setting for exploring and practicing the spectrum of Permaculture Principles and Design practices. We will focus on land systems with as much hands on work and examples as possible.

Instructor: Rico Zook

Cost: \$1,325 by June 11, \$1,450.
Camping, meals and materials included.

Contact: Robert Griffin
Hummingbird Community
575-387-5877
robert@globalfamily.net

Permaculture Design Course: Creating an Ecovillage from the Earth Up

Northern California

Dates: June 15-29, 2009

Location: Laytonville, CA

Description: This is a two-week intensive Permaculture Design Certification Course that will be hosted on the beautiful site of the newly forming Laytonville Eco-village in Mendocino County, California. This course will immerse participants in the design system of permaculture to create and maximize the beneficial relationships between our natural resources, our daily needs, and the regeneration of the Earth.

Instructors: John Valenzuela, Emily Wacker, Erik Ohlsen, Max Meyers, Nan Kohler, Jay Ma, Dave Shaw, and others.

Cost: \$1,250

Contact: Living Mandala

707-634-1461

laytonville@livingmandala.com

Permaculture Design Course

Northern California

Dates: May 30-June 15, 2009

Location: Bolinas, CA

Description: This two-week certification is taught by an amazing line-up of permaculture all stars! If you have been wanting to take an intensive, this is the one to take--and if you've already taken a certification course you will be tempted to take it again.

Contact: Regenerative Design Institute

PO Box 923

Bolinas, CA 94924

415-868-9681

www.regenerativedesign.org

Sustainable Aid & Community Development Advanced Course

Southern California

Dates: July 27-30, Part I

August 1-6, Part 2

Location: New Cuyama, CA

Description: A course specifically for people working in community development with culturally diverse communities. Part I covers Working with Cultural Diversity, Part II Overseas Development Work.

Instructors: Robyn Francis

Cost: Part I, \$550, Part II, \$820

Both together \$1250, pmt. due by July 13, \$300 deposit to hold a space. Early registration discount til June 1, see website.

Contact: Quail Springs

info@quailspring.org

805-886-7239

www.quailsprings.org

23rd Annual

Permaculture Design Courses

Central Rocky Mountains

Dates: June 8-20

September 19-October 1

Location: Basalt, CO

Description: The CRMPI Permaculture Design Course provides participants with an understanding of the essential principles and elements of permaculture, enabling them to better design and engineer sustainable systems including forest gardens, appropriate buildings, greenhouses, and more. During the first week, we'll cover the essential elements of permaculture, followed in the second week by a full-spectrum design project. The curriculum includes a variety of classes and workshops essential to every permaculturist's development: from soil structure to the invisible structures of our economy and society.

Instructors: Andrew Goodheart Brown, Peter Bane, Becky Elder, Jerome Osentowski, Sandy Cruz & guests.

Cost: \$1,250 (includes meals, camping, and materials)

Contact: Jerome Osentowski
CRMPI
PO Box 631
Basalt, CO 81621
970-927-4158
jerome@crmpi.org
www.crmpi.org

Permaculture Teacher Training

Central Rocky Mountains

Dates: September 12-16, 2009

Location: Basalt, CO

Description: Teacher training at CRMPI gives aspiring students a grounding in techniques and the practices that lead to becoming an effective permaculture teacher in the classroom or the field.

Instructors: Peter Bane, Sandy Cruz.

Cost: \$550 (incl. meals, camping, and materials)

Contact: Jerome Osentowski
CRMPI
PO Box 631
Basalt, CO 81621
970-927-4158
jerome@crmpi.org
http://crmpi.org

New Contact

Information for Events!

Please write Rhonda Baird at
pcaeditor@comcast.net

Fundamentals of Permaculture

Central Canada

Dates: July 18-25

Location: Orangeville, Ontario

Description: This intensive course combines theory with practical hands-on learning. Topics include: permaculture design techniques and principles, site analysis, soil fertility, organic gardening techniques, herbs and medicinal plants, fruit and nut trees, water uses, and ecological buildings.

Instructors: Gregoire Lamoureux, Richard Griffith & guests

Contact: Russell Scott
True Source Seminars
Orangeville, Ontario, Canada
519-942-8339
info@truesourceseminars.com
www.truesourceseminars.com

Permaculture Practicum

Central Canada

Dates: July 26-August 2

Location: Orangeville, ON

Description: A 7-day course of design exercises that integrates hands-on activities, this will complete the Permaculture Certificate for those who have taken the Fundamentals. The topics include: observation, client interview, site analysis, principles, zone & sector planning, design process, concept plan, pattern language, ecological design principles. Also included in the course: the role of a permaculture consultant and designer.

Instructors: Gregoire Lamoureux, Richard Griffith and guests.

Contact: Russell Scott
True Source Seminars
Orangeville, ON, Canada
519-942-8339
info@truesourceseminars.com

Permaculture Design Course

Western Canada

Dates: May 31-June 13, 2009

Location: Winlaw, BC

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

Instructors: Gregoire Lamoureux & guests.

Cost: Cdn\$975
Contact: Gregoire Lamoureux
Kootenay Permaculture Inst.
PO Box 43
Winlaw, BC, Canada V0G 2J0

7th Annual

Permaculture Design Course

Ohio Valley

Dates: May 31-June 14

Location: Paoli, IN

Description: The wooded hills of Southern Indiana are the backdrop for this intensive course at the Lazy Black Bear Lodge, in the heart of the Hoosier National Forest. Its over 200 acres serve as a practical lab for permaculture design work. The instructors bring decades of experience to the course from a range of expertise offering a well-balanced curriculum for those beginning their work in permaculture as well as those wanting to deepen their practice. This course may also be taken for credit through Indiana University.

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

Cost: \$1,290

Contact: Andy Mahler/ Shagbark
812-723-2430, andy@blueriver.net

For credit through Indiana Univ.: David Haberman. 812-855-8895. dhaberma@indiana.edu.

Permaculture Design Course

Ohio Valley

Dates: August 1-14, 2009

Location: Cincinnati, OH

Description: Come study Permaculture with Globally Trained and Locally Activated Practitioners in the Heart of the Nation. The course will be taught at many urban and rural sites including an urban ecovillage. You will also witness and learn how the young, fast growing Cincinnati scene is waking people up and motivating them to shift Middle America.

Instructors: Braden Trauth, Sam Dunlap, Andy Schewe and guests

Cost: \$777 before 7/1; \$825 after 7/1; includes housing and some meals.

Contact: Braden Trauth
513-541-4550
513-569-2579
bradentrauth@yahoo.com
cincypcguild.blogspot.com

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Prenax, Inc.
603-717-0383

Permaculture Design Course

Northern New England

Dates: June 9-21, 2009

Location: Brooks, ME

Description: This course is taught by Julia and Charles Yelton who have over 15 years of international experience teaching and living in various pc settings including Crystal Waters Pc Village in Queensland, Australia.

Instructors: Julia and Charles Yelton

Cost: \$1,250

Contact: New Forest Institute

207-722-3625

info@newforestinstitute.org

<http://newforestinstitute.org/>

Earth Activist Training Offered for First Time in New England

Dates: June 25-July 5, 2009

Location: Unity, ME

Description: Students learn how to heal soil, cleanse water, and design human systems that mimic natural systems using a minimum of energy and resources. This is the cornerstone approach of permaculture. Unity College sits on 225 acres of fields and woodlands overlooking Lake Winnecook--also known as Unity Pond, near the friendly town of 1,800 residents.

Cost: base price is \$1400-\$1800 sliding scale.

Contact: Earth Activist Training

PO Box 170177

San Francisco, CA 94117

earthactivisttraining@gmail.com

com

<http://earthactivisttraining.org>

9th International Permaculture Conference (IPC9)

Southern Africa

Dates: October-November, 2009

Location: Southern Africa

Description: Permaculture Design Course, Harare, Zimbabwe; Conference in Pretoria, So. Africa; Convergence in Mulanje, Malawi. Dates in Calendar.

Contact: IPC-9 Secretariat

c/o The Regional Schools

and Colleges Permaculture

(RESCOPE) Programme

PO Box 32280

Chichiri, Blantyre 3

Malawi, Africa

+2651 831373

+2651 831363

secretariat@ipcon.org

www.ipcon.org

sbpcnet@silcom.com

Yestermorrow Permaculture Design Certification

Northern New England

Dates: September 20-October 2, 2009

Location: Warren, VT

Description: Held at the Yestermorrow Design Build School, this is a residential intensive Permaculture Certification course offered at the nation's leading Design Build School in the heart of the Green Mountains. Learn alongside students, architects, community planners, homesteaders, farmers, and others while engaging in real world design problems.

Instructors: Andrew Faust, Keith Morris, and guests.

Cost: \$1,410 not including meals and lodging.

Contact: Yestermorrow

Design Build School

189 State Rte. 100

Warren, VT 05674

888-496-5541

<http://yestermorrow.org/>

Permaculture Design Fundamentals & Practicum

Upstate New York

Dates: August 16-29, 2009

Location: Paul Smiths, NY

Description: At Paul Smiths College near Lake Placid, NY in the beautiful Adirondack Mountains. College Credits available.

Instructors: Peter Bane, Keith Morris and guests.

Contact: Tom Huber

Paul Smiths College

PO Box 265

Paul Smiths, NY

518-327-6330

thuber@paulsmiths.edu

Urban Permaculture Design Course

New York City

Dates: July 18-19, Aug. 15-16, Sept. 12 & 26, Oct. 3, 10-11, 17-18 & 24.

Location: Manhattan & Brooklyn, NY

Description: Urban Permaculture covers all of the points of the traditional permaculture design course with a heavier emphasis on community building and urban gardening in its many forms. This 12-session course will work with model design sites at a park and middle school as well as two community gardens.

Contact: Claudia Joseph

New York Open Center

permie@earthlink.net

Permaculture Design Course

Northern New England

Dates: June 14-26, 2009

Location: Burlington, VT

Description: Set on the shores of Lake Champlain, and touring some of the area's most innovative farms, homesteads, nurseries, and more, this course combines wild ecology, radical urban sustainability, and natural building with hands-on design and co-creation of vibrant, wholly nourishing human landscapes. The course will be led by an experienced team of designers, farmers, and educators from Vermont and the Northeast. We'll design and implement permaculture solutions for a multi-use community center, farm, and nature preserve, and each student will also generate a whole systems design for space of their own choosing. Lodging at the Bishop Booth Conference Center, overnight trips, and Local Organic Meals are all included in the affordable tuition. College Credit available through the University of Vermont, scholarships and financial aid available through VSAC.

Instructors: Keith Morris, Mark Krawczyk, Michael Blazewicz, Chris Jackson, Alyssa White, and many guests.

Cost: \$1,200 incl. lodging and local meals. College credit may incur an extra fee.

Contact: Burlington Permaculture

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5th Annual

Northeastern Pc Convergence "Permaculture in Practice"

Central Vermont

Dates: July 3-5 (Optional farm tours on July 1-2)

Location: East Montpelier, VT

Description: This year, Vermont permaculturists have offered to host the annual gathering at the 'All Together Now!' Living Arts Center in Central VT. Designers, Educators, Farmers, Builders, Authors, Transition Towners, Homesteaders, Community Activists, Families, and other enthusiasts from Quebec to New Jersey and Pennsylvania to Maine gather to practice, learn, celebrate, inspire, and embody our ecological culture. Other regions are welcome- of course!

Contacts: <http://northeasternpermaculture.wikispaces.com/> To volunteer to help organize, please contact Janice Walrafen: jwalrafen@verizon.net. To submit a workshop proposal please contact Nicko Rubin: narubin@gmail.com. For information about farm tours preceding the conference, contact Keith Morris: earthsurfing@gmail.com.

Back Issues of *The Permaculture Activist*

- I,1 July '85 **Permaculture in Oz** I,2 Nov. '85 **Fruit & Nut Trees**
 II,1 Feb. '86 **Garden Design** II,2 May '86 **IPC-2 & Pc Courses**
 II,3 Aug. '86 **2nd Int'l Pc Conference**
 II,4 Nov. '86 Fukuoka, Keyline, Genetic Conservation, City Farms, Oceanic Pc
 III,1 Feb. '87 Networking, Natural Farming, D-Q Univ., Children's Permaculture
 III,2 May '87 **Wild Land Restoration** III,3 Aug. '87 **Annual Planting Cycle**
 III,4 Nov. '87 **Trees for Life** IV,1 Feb. '88 **Marketing Pc Products**
 IV,2 May '88 **Urban-Rural Links**, Economics & Community Development
 IV,3 Aug. '88 **Social Forestry**, Gabions, Jap. Org. Ag., Producer/Consum. Coops
 IV,4 Nov. '88 **Multi-Story Tree Crops**, Greening Dominican Repb., Runoff Gdns
 V,1 Feb. '89 *Permaculture: A Designers Manual*, Tree Bank, Water in Pc
 V,2 May '89 **Plant Guilds**, Roof Gardens, Small Livestock
 V,3 Aug. '89 **Rainforest Conservation** in Ecuador, Gaia, Weed Gardens
 V,4 Nov. '89 **Earthworks & Water Conservation**: Small Dams, Ponds, Keyline
 VI,1 Feb. '90 **Household Greywater Systems**, Soil Imprinting (\$5 each to here)
 VI,2 May '90 **Insectary Plants**, more Greywater, Land Use for people " "
 VI,3 Aug. '90 **Water**: Forests & Atmosphere, Catchment, Pond Design
 VI,4 Nov. '90 **Urban Permaculture**: EcoCity Conf., Soil Detox, Suburbs & Pc
 #23 May '91 **Politics of Diversity**, Greenhouse Market Gdn, Pc in Nepal
 #24 Oct. '91 **Creativity in Design**: Case Studies; **Index to Issues #1-23**
 #25 Dec. '91 **Design for Community**: CSAs Restoring Forests; Garden Ecology
 #26*May '92 **Soil**: Our Past, Our Future; Fertility, Worms, Cover Crops
 #27*Aug '92 **Integrating Pc**: Deconstructing Utopia, Grassroots Organizing,
 Garden Polyculture, Pattern Learning, Living Fences
 #28*Feb. '93 **Structures**: Comm'ty Dsgn, LETS, Industry, Strawbale/Timber-frame Bldgs.
 #29/30* Jul. '93 **Networks**: Media Revw, Rural Reconstruction, Leaf Concentrate, Comm'ty
 Food Inits, Palestine Pc, Do-Nothing Educ, Feng Shui, Pc Academy
 #31*May '94 **Forest Gdng**: Energy & Pc, Mushrm Cultvn, Robt.Hart's F.G., Spp for
 No. Cal., Alders, Agroforestry in Belize & China, Honeylocust, N-fixers
 #32*Apr. '95 **Animals & Aquaculture**: Animal Polyculture, Small-scale Cattle,
 Goat Dairy, Keyline, Feral chickens, Bee Plants, Constructed Wetlands
 #33 Dec. '95 **Cities & Their Regions**: Green Cities, L.A. Ecovillage, MAGIC Gdns,
 CoHousing, Micro-Enterprise Lending, Suburban Conversion
 #34 June '96 **Useful Plants**: Bamboo Polyculture, Medicinals, Pest Control, Root
 Crops, Oaks, R. Hart's F.G., Russian Plants, Regl. Plants, Sources
 #35 Nov. '96 **Village Design**: Pattern Language, Consensus Democracy, Conflict,
 Historic & New Villages, Planning for Tribe, Village Economics
 #36*Mar. '97 **Climate & Microclimate**: Climate Change, Windbreaks, Low-Tech Sun
 Locator, Drylands, Cool Slopes, Straw-Clay Bldg. Round Beehive, Water Catch.
 #37 Sept. '97 **Tools & Appropriate Technology**: Dowsing, Workbikes, Scythes,
 Japanese Saws, Nursery, Ferrocement, Greywater, A-frame &
 Bunyip Levels, Ram Pump, Solar Toilet, Log Yoke, Cookstoves
 #38*Feb. '98 **Economic Transformation**: Speculation, No Middle Class, Coops
 WWOOF, Global Warm'g, Hol. Fin. Plan'g. Land Use, Adopt-a-Hive
 #39 Jul. '98 **Knowledge, Pattern & Design**: Pc Way of Seeing; Native Consvn
 Sand Dunes, Language-Worldview-Gender, Patterning Process,
 Land-Use Planning, Teaching Pc, Vietnam, Holmgren on Pc
 #40*Dec. '98 **New Forestry**: Regl. Devl., Horselogging, Menominee Reservation,
 Forest Investing, Restoration, Old Growth, Homestead Tenure, Forest
 Soils, Forest Farming, Woody Agric., Rainforests, Windbreaks, Coppice
 #41*May '99 **Natural Building**: Oregon Cob, Cordwood, Bamboo, Thatch, Ethics,
 High Winds, Origins of Conflict, Greenhouses, Ponds, Adobe, Road
 Bldg, MicroHydro, Bldgs. That Live, Under \$20K Houses, Dreams
 #42 Dec. '99 **Self-Reliance & Community Cooperation**: Co-Intelligence & Self-
 Orgn., Archetype Design, Sovereignty, Samoa, Mondragon, Natural
 Hous'g, Comm. Gdns., Zone Zero, Solar Electric Tractor, Beekeeping
 #43*June '00 **Food & Fiber**: Hunger, Ferments, Seasonal Salad, Heirlooms, Fencing
 Self-Fertile Gdns, Rice Revolt'n, Cold-Climate Food, Edible Insects,
 Chilies, Food Origins, Garlic, Ethnobotany, Wild Food, Bamboo, Hemp
 #44 Nov. '00 **Earthworks & Energy**: Spreader Drain, Horse Swales, Earth Dams,
 Machinery, Carpet-lined Ponds, Constr. Wetlands, Biogas, Windmills
 #45 Mar. '01 **Medicine & Health**: World & Self, Healthy Home, Designing Care,
 Ayurveda, Agents of Decay, Comm. Health Centres, Women Trad. Med.
 4th World Apothecary, Healing Weeds, Medicinal Crops, Hawaiian Bot'ls
 #46 July '01 **Good Work & Right Livelihood**: Pc Golf Course, Downsize Cost of
 Living, New Forest Economy, Energy Currency, Buddhist Mktg, End
 Wage Slavery, What's Surplus?, Urban Community, Enterprise Facil'n
 #47 June '02 **Watersheds**: Water4Sale, Basins o' Relations, Watershed Devl, Gabions,
 Urban Runoff, Beavers, Skywater Ctr, Consvn. Investmt, Peat Bogs, Rabbits
 #48*Sept '02 **Making Changes**: Co-Intelligent Activism, Webs of Power, Urban
 Food, How to Change, Teaching for Change, Global Transform'n,
 City Repair, Escaping Job Trap, Argentine Recovery, Costa Rica Pc
 #49 Dec. '02 **Where is Permaculture?** Land-Rent Reform, 10 N. Amer. Sites, Cuban Ag,
 Rainbow Vall. NZ, Cacti/Succulents, Animal Self-Meds, Challenge to Pc
 #50 May '03 **Ecosystems**: Holmgren on Pc Mvmt, Hazelip & Syng. Ag, Chestnuts/
 Pigeons, Oak Savannas, Root Crop Polycultures, Alders, Fungal Ecosys.
 Humans & Wilderness, Indoor Ecosystems, Humid Tropics
 #51 Jan '04 **Trad'l. Knowledge & Regeneration**: Cataclysm & Collective Memory
 Genome Wisdom, *Waru Waru*, Biosculpture, Inuit Medc, Ferment'd Stimulants
 #52 May '04 **Aquaculture**: Ecological Aquac, Fish4Health, Dowsing, Pond
 Design, Greywater Biotreatment, N. Am. Polyculture, Management
 for Native Spp, Integrated Village Fisheries, Vietnam
 #53 Aug. '04 **Education**: Lifelong Learning, Edge-ucation, Albany Free School,
 Indigenous Education & Ecology, Ecocentric Pedagogy, School
 Gardens & Dances, Ecology of Learning, Brain Gym
 #54 Nov. '04 **Fire & Catastrophe**: Design Beyond Disaster, Opportunity, Rise of
 Globalization; Invasion Biology, Street Orchards, Community Food
 Security, Floodwaters Rising, Disrupted Climates
 #55 Feb. '05 **Learning from Our Mistakes**: Petrol Dependency, Village Design, Austral.
 Lessons, RTFM!, Trial&Error, Forestry Expmts, Owner-bldr, 10 Mistaken Ideas in Pc
 #56 May '05 **Tree Crops & Guilds**: Pine Nuts, Tree Vege, Acorns, Am. Chestnut,
 Honeylocust Silvopasture, Broadscale AgroFor, Bamboo, Willow, Socl. For.
 #57 Aug. '05 **20th Anniv.**: Challenges & Changes, USA Pc, Hawai'i Retrospect,
 Permaculture, Pc's Soft Edge, Gaia U, PINC, Oil Depl, IPC-7, Retrofit Suburbs
 #58 Nov. '05 **Urban Pc**: Urban/Rural Futures, City Zones&Sectors, Growing Food,
 Detroit Visionaries, Reblgd. New Orleans & Everywhere, Trans-
 forming a Military Base, Workers Co-op, Energy Descent.
 #59 Feb. '06 **Peak Oil**: Eco-Collapse & Trauma, Thom Hartmann, Pathways for
 Energy Descent, How Cuba Survived, Oil & Food, Biofuels,
 Cultivating Algae for Fuel, Relocalize!
 #60 May '06 **Land Use Past & Present**: Sust.Ag an Oxymoron?, Negev Bedouin,
 East. Woodlands AgroForestry, Pc Heals in India, Arocsanti Land
 Plan, Pop. Growth/Land Hunger, Mex. Reforestation, Rocky Mtns.
 #61 Aug. '06 **Unseen Kin-doms**: Observation as Design Tool; Soil Food Web, Bees,
 Mycelial Internet, D-I-Y Mycorrhizal Inoculum, Cover Crops as Bee
 Forage, Earth Energies, Local Currencies, Dead Zones, Birds at Risk
 #62 Nov. '06 **Art of Permaculture**: Painting, Writing & Pc; Ecoartists; Art, Activ-
 ism & Cmty; Street Theatre, Art & Bioremediation, Living Willow,
 Body as Zone 0, Art of the Found, Water Magic, Pc in Pop Culture
 #63 Feb. '07 **Building & Technology**: How to Dwell? Natural Bldg & the Law,
 Bldg Code, Strawbale in China, Cob in Armenia, Integrated Solar
 Heating, Cooking, Pumping; Self-Build, Nation-Scale Pc in Brazil
 #64 May '07 **Waste = Food**: Throwaway Econ, Strategy of Salvage, Peak Soil,
 Pigs & Waste Mgmt, Bikes, Soil & Garbage; Farm as Organism,
 Opportunistic Plants? Simple Biodigester, Waters of Spain, Vermiculture
 #65 Aug. '07 **Climate Change**: Shrinking Seas, Forests' Role in Climate, Urban
 Forests, Making Trees Pay, Rainwater Harvst'g, Indoor Gdns, Water
 Filtration, Changing Human Climate, De-Stabilizing Climate
 #66 Nov. '07 **Animals in Design**: Jumbo Shrimp, Pawpaw Patch, Alpaca, Insects as
 Food, Bees, Integrated NH Farm, Pastured Poultry & Rabbits, Urban
 Livestock, Predator Restoration, Complementary Animals, Agrichar
 #67 Feb. '08 **Kids in Pc**: School as Ecosystem, Pc Education, Pc to H.S. Students,
 Tlaxcalan Kids Make Seedballs, Gardening Kids, Fostering
 Research Skills, Bottled Water Boycotts, Feeding 8 Billion
 #68 May '08 **Plants on the Move**: Rethinking Non-Natives, Forest Migration,
 Black Walnuts, Saving Seed Savers, Grow a Cmty. Gdn, Neighbor-
 hood Greening, Healthy Honeybees, Biofuels & High Food Prices
 #69 Aug. '08 **Permaculture at Home**: Hawai'iian Cmty, London Forest Gdn,
 Suburban Renaissance, Calif. Campus, Phila. Orchards, Drinking
 Roofwater, Floating Island Bioremed., Bike Transport, Mississippi Pc
 #70 Nov. '08 **Ethics at Work**: BAU is the Enemy, 13 Princ. of People Care, Pc in
 Business, Ecovillages, White Man in India, Uganda Boarding School,
 No Waste Principle, Qual. Control, City Farming w/Runoff, Amaranth
 #71 Feb. '09 **Working w/Earth**: Hopewell Mound Water Mgmt, Belize, Road & Dam Bldg,
 Keyline, NW AgroFor, Pc&Landscape Arch, Earthbag Bldg, Low-Watt Fridge

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 ea; #40, 43, 48 -\$10 each. ^^Can/Mex. +\$45, Overseas +\$75.

Calendar

Weekends in May, Seattle, WA. Permaculture Design Course Weekend Series. EarthFlow Design Works. news@earthflow.org.
May 30-June 15. Bolinas, CA. Permaculture Design Certification Intensive. Regenerative Design Inst. 415-868-9681. www.regenerativedesign.org.
May 31-June 14. Paoli, IN. Permaculture Design Course. Andy Mahler. 812-723-2430. andy@blueriver.net.
May 31-June 13. Winlaw, British Columbia. Permaculture Design Course. Gregoire Lamoureux, Kootenay Permaculture Inst. Winlaw, BC, Canada V0G 2J0.
June 5-14. Portland, OR. Village Building Convergence. 503-235-8946. www.cityrepair.org/vbc.
June 8-20. Basalt, CO. Permaculture Design Course. Jerome Osentowski, Central Rocky Mtn. Permaculture Inst. 970-927-4158. jerome@crmpi.org. www.crmpi.org.
June 9-23. Brooks, ME. Permaculture Design Course. New Forest Institute. 207-722-3625. info@newforestinstitute.org.
June 14-26. Burlington, VT. Permaculture Design Course. Keith Morris. 802-999-2768. burlingtonpermaculture@gmail.com.
June 14-27. San Luis Obispo, CA. Hands-on Permaculture Design Intensive. EarthFlow Design Works. news@earthflow.org.
June 15-19. Laytonville, CA. Permaculture Design Course: Creating an Ecovillage from the Earth Up. Dan Antonioli. Laytonville Ecovillage/Living Mandala. 707-634-1461. dantonoli@earthlink.net.
June 16-24. Bolinas, CA. Orientation Workshop. Regenerative Design Institute. info@gaiainiversity.org
June 21-July 5. Unity, ME. Earth Activist Training. 800-381-7940. www.earthactivist-

training.org. info@earthactivisttraining.org.
June 25-29. Bolinas, CA. Extension Workshop (IESD & OLE). RegenerativeDesign Inst. info@gaiainiversity.org.
June 25-July 5. Unity, ME. Earth Activist Training. earthactivisttraining@gmail.com.
July 1-4. Bolinas, CA. Re-Evaluation Counseling Fundamentals. RegenerativeDesign Inst. info@gaiainiversity.org.
July 3-5. (Optional tours on July 1-2) East Montpelier, VT. 5th Annual Northeastern Permaculture Convergence. http://northeasternpermaculture.wikispaces.com/
To volunteer: Janice Walrafen. jwalrafen@verizon.net. To propose a workshop: Nicko Rubin. narubin@gmail.com
July 5-9. Bolinas, CA. Advanced Permaculture Design with Robyn Francis from Australia. Regenerative Design Inst. info@415-868-9681. regenerativedesign.org.
July 8-August 16. Northeast Kingdom, VT. Permaculture Design Course at Sterling College. Keith Morris. earthsurfing@yahoo.com.
July 11-24. Occidental, CA. Permaculture Design Course. Occidental Arts & Ecology Center. 707-874-1557. oaec@oaec.org.
July 11-22. Permaculture Design Course. FUGEa, l'Universite Populaire de Permaculture France, and Reseau de Permaculture Francophone de Belgique. Fabienne Delcorps. +33-49-21-25-45.
July 11-25. Cleveland, NM. Permaculture Design Course. Hummingbird Community. Robert Griffin. 575-387-5877. robert@globalfamily.net.
July 18-25. Orangeville, Ontario. Fundamentals of Permaculture. Russell Scott, Ecology Retreat Centre. Russell Scott. 519-942-8339. info@truesourceseminars.com.
July 18-31. New Mexico Permaculture Design Course Intensive. EarthFlow Design Works. news@earthflow.org.
July 18-19, August 15-16, September 12, 26, October 3, 10-11, 17-18, 24. New York, NY.

Urban Permaculture Design Course. Claudia Joseph, The New York Open Center, permie@earthlink.net.
July 26-August 2. Orangeville, Ontario. Permaculture Practicum. Russell Scott, Ecology Retreat Centre. 519-942-8339. info@truesourceseminars.com.
August 1-14. Cincinnati, OH. Permaculture Design Course. Braden Trauth. 513-541-4550. bradentrauth@yahoo.com.
August 3-7. Bolinas, CA. Ecology of Leadership Training. Regenerative Design Inst. 415-868-9681. www.regenerativedesign.org.
August 9-15. Cottage Grove, OR. 9th Advanced Permaculture Certification Course in Teaching. 541-342-1160. cascadiapc@gmail.com. www.cascadiapermaculture.org.
August 15-16. Ashland, OR. Training for Transition. Gaia U. info@gaiainiversity.org.
August 16-29. Paul Smiths, NY. Permaculture Fundamentals & Practicum. Tom Huber. Paul Smith's College. 518-327-6330. thuber@paulsmiths.edu.
August 17-25. Ashland, OR. Orientation Workshop. Thrivability Inst/JacksonWell-springs. info@gaiainiversity.org.
August 21-23. Sambourg, France. Festival de Permaculture 2009. permaculturefrance@free.fr.
August 24-27 Bolinas, CA. The Healing Power and Magic of Fragrant Plants. Regenerative Design Inst. 415-868-9681. www.regenerativedesign.org.
August 26-30. Ashland, OR. Extension Workshop (IESD & OLE). Gaia University. info@gaiainiversity.org.
September 1-4. Ashland, OR. Re-evaluation Counseling Fundamentals. Gaia University. info@gaiainiversity.org.
September 12-16. Basalt, CO. Permaculture Teacher Training. Jerome Osentowski. CRMPI. 970-927-4158. jerome@crmpi.org.
September 19-October 1. Basalt, CO. Permaculture Design Course. Jerome Osentowski. CRMPI. 970-927-4158. jerome@crmpi.org.
September 19-October 2. Occidental, CA. Permaculture Design Course. 707-874-1557 oaec@oaec.org.
September 20-October 2. Warren, VT. Yesterday Permaculture Design Certification. 888-496-5541. http://yesterday.org/
October 7-13. Lewellen, NE. Permaculture Design Course (2nd half). Jean Jensen. 308-778-5548. voa@lakemac.net.
October 11-23. IPC-9. Harare, ZIMBABWE. Permaculture Design Course. October 26-28. Pretoria, SOUTH AFRICA. Permaculture Conference. November 2-7. Mulanje, MALAWI. Permaculture Convergence. IPC-9 Secretariat, c/o The Regional Schools and Colleges Permaculture (RESCOPE) Programme, PO Box 32280, Chichiri, Blantyre 3, Malawi, Africa. +2651 831373, +2651 831363. secretariat@ipcon.org. www.ipcon.org.

Send Event and Calendar Listings for Issue #73

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LETTERBOX



Fukuoka and Our Work

Dear *Permaculture Activist*,

I felt it would be useful to share a story with you about Fukuoka and the early interface with Permaculture.

I had been living in Japan on and off, for about two years, starting at the end of 1968 through the end of 1972. My then girlfriend Carol Bright had heard of an unusual rice farmer who supplied the Church of World Messianity with unpolished brown rice. Hitching south, we visited Fukuoka for part of a day. He gave me an autographed/calligraphed copy of one of his books. He seemed somewhat

lonely, and had a deep longing for his work to be known.

When I went on further south, I gave the book to Carol and asked her to give it to Bill Dean in Kyoto whom I thought would appreciate it, as he was working with natural farming in Western Kyoto. Sometime later on, Larry Korn showed up in Kyoto. Bill showed him the book and told him about Fukuoka. Larry went to visit.

The rest of the story is pretty well known, other than I mentioned that I had met Fukuoka in Japan, when I first met Bill Mollison (as his host for ONEARTH on Maui in 1981). Bill had great admiration for Fukuoka, and wanted to meet him.

In 1986, at the Permaculture Designers' Convergence and at the later public presentations at Evergreen College in Olympia, Washington, Bill and Fukuoka San, got to hang out together and do joint presentations. When I told Fukuoka San in Japanese the story of his book, he was very touched and had me write my name down for him.

The clarity and intensity with which Fukuoka perceived nature, and allowed it to grow within him, gave him an unusual depth of

purpose and intuition.

Another story.

Michael Howden,
Olinda, Maui, Hawai'i

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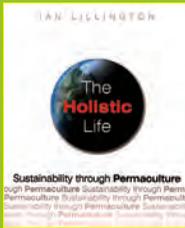
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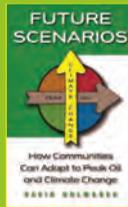
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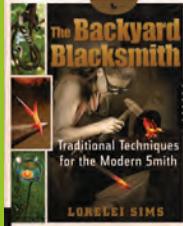
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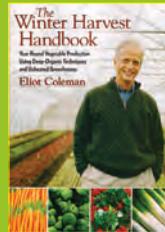
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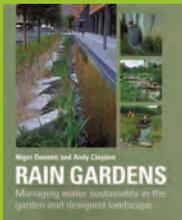
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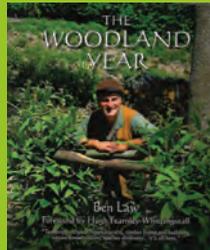
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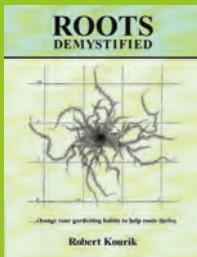
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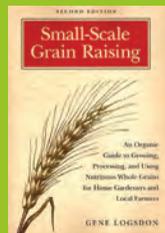
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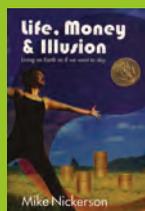
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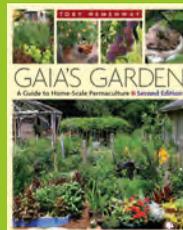
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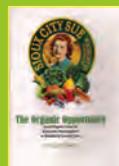
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