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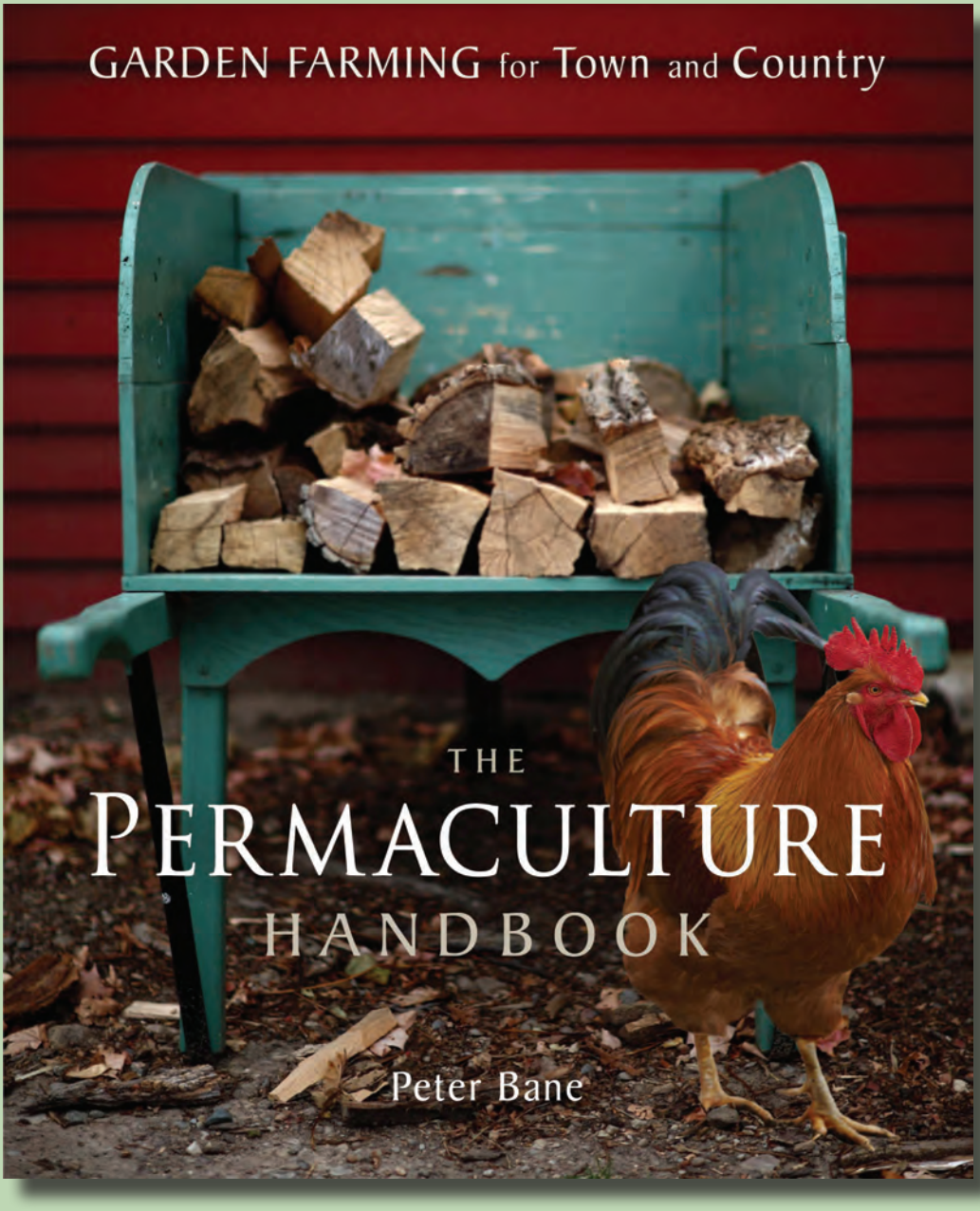

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The Permaculture Activist
November 2012 Issue #86

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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

Don't Eat the Yellow Snow

John Wages

I hope this old train breaks down,
then I could take a walk around
And see what there is to see
Time is just a melody
The wisdom's in the trees....not the glass windows....
from *Breakdown* (Jack Johnson)

IN WHAT I HOPE IS THE MIDDLE OF MY LIFE, I find myself remembering things my grandmother told me 40 years ago, when I was closer to the start. Among the many threads that connect me to previous generations is a story of how people used to make ice cream from the snow. "Nowadays," she said it tasted bad from all the pesticides and smoke in the air. "Don't eat the yellow snow"—good advice from Frank Zappa and my grandmother.

What do you do when all the snow is yellow, and it's the only way to make ice cream?

This dilemma isn't particular to the poor—we all live on the same planet. The One Percent breathe the same air as the Ninety-nine Percent, and relatively few can afford organically grown foods or quality vitamin and mineral supplements.

As civilization pollutes the earth to a tragic, immoral, and inescapable extent, the old classifications and statutory minimum requirements of vitamins and minerals can no longer sustain us in good health and vitality. We must pay attention to a wider variety of phytochemicals and their effects. From culinary sources come anti-cancer compounds like broccoli's sulfuraphanes, the lycopene of tomatoes, and the amazingly potent curcumin of turmeric root. From medicinal plants, we have more potent agents like the ginsenosides from *Panax spp* and catechins from green tea and cacao. Potency would seem to be the only difference between culinary and medicinal herbs.

When we're sick, we might go to a conventional doctor for a prescription, or take an herbal formula. Either way—we're looking for strong medicine and immediate relief.

The challenges we face mean that we should seek more potency in every meal. Instead of something to take when we're sick, medicine becomes something to eat every day.

Our food should be our medicine, and our medicine should be our food. —Hippocrates

Health depends on more than food and exercise. Genetics has much to do with how susceptible we are to disease, how quickly we heal, and how long we live. And while we can't do much about our genetic heritage, we can pay attention to environmental influences. These combine with socio-economic factors to nudge us toward health or disease.

A recent study (Olshansky, et al. *Health Affairs 31: 1803*. 2012) found that life expectancies of US adults with fewer than 12 years of education have not improved over the average of all adults in the 1950s and 60s. Disparities in life expectancy between white and black Americans were also striking. Combining race and education as factors determining life expectancy, the study found that white men with 16 or more years of education lived on average 14.2 years longer than black men without a high school education. The same comparison for women revealed a 10.3-year longer life expectancy for white women than for black women. These statistics aren't news—we've known that there are really two Americas for an unconscionably long time now. What was new and newsworthy was a drop in life expectancy among poor whites. A close look at the graphs in the report shows that life expectancy for under-educated white women has dropped by five years since 1990. Life expectancy for Americans without a high school diploma is actually dropping!

What lessons should we draw from this? Go back to school, get that PhD—and add an extra 20 years of life? Such studies tend to be depressing and give us little help at a personal level. We need structural changes in the economy and in public health.

Like genetics, socio-economic factors exert a dominant influence on our lives. Someone born into poverty must spend resources, time, and energy simply to overcome this fundamental handicap. Horatio Alger's stories of bootstrapping one's way from the street to success were an inspiration to millions, but actualized by few.

The stories in this issue reveal the many threads that contribute to health. Katherine Willow tells us how she established an holistic health clinic that emphasizes naturopathy and came to practice German New Medicine. Rachel Berry has rendered medicinals more accessible through a community-supported herb harvest and tincturing workshops. Sam Coffman's knowledge of plants with a purpose likewise could shorten the distance between knowledge and application for those in resource-poor settings.

Jill Henderson reminds us that many uncommon vegetables can contribute not only food to our plate, but nitrogen to our soils and seeds for the sprouter. Sprouting itself is a remarkable way to increase the vitamin content and unlock the minerals in seeds, and can turn staples like dry beans or wheat into green vegetables, even in the middle of winter. We should do more sprouting. Like sprouting, fermentation produces probiotics, whether in sauerkraut or craft brew. It may be that in the future, we'll do more fermentation, perhaps on a home or community scale, to produce raw materials like sophorolipids (natural, mild detergents) or ethanol and other types of fuel—beer too, of course.

Before reading Paul Stamets' article, I didn't know that sunlight could increase the vitamin D content of dried, as well as fresh, mushrooms. And, I thought it worked only with shiitake. Roman Shapla reveals an important, under-utilized resource in edible insects and, as a bonus, introduces us (or at least me) to the Japanese poet Nanao Sakaki.

We thank all our writers and hope these varied contributions to the theme of human health and nutrition will inspire and inform our readers. When in need, plant a seed. Δ

Naturopathy Centre Integrates Healing and Community

Katherine Willow

IT'S A SUNDAY MORNING IN EARLY AUGUST, and the air is still moist from the welcome rains that broke the recent summer drought. This was one of the worst dry spells farmers can remember in the Ottawa Valley.

I sit at my desk, nature returning to lush green outside my window, and let my thoughts go back 12 years to when my husband and partner, Mickey, was still alive, and we co-wrote our first article for the *Activist* (Developing Integrated Community Health Centres, *PcA* #45), describing our own project, the Carp Ridge EcoWellness Centre (CREWC), located on 190 acres of wilderness on the Canadian Shield overlooking peaceful farmland, half an hour northwest of Ottawa, Canada's capital.

Against many odds, I am still here directing CREWC, as we affectionately refer to ourselves. After Mickey died, it was touch and go, with me threatening to quit and sell the property every winter when the darkness resonated with the state of my soul. However, with the warm-hearted support of dedicated staff, volunteers, and patients, the centre has actually grown and continues to grow towards its original goal: to model, teach, and facilitate healing and sustainability for our local community.

...when we deeply heal old patterns of pain and negativity, allowing an expanded expression of positive thoughts and actions, the energy of our being is contagious.

Philosophy of the Centre

CREWC is founded in my values and beliefs. These drive me towards a vision that costs me everything; and gives back in the same measure. The centre originally arose from my own fears about our future on this planet. I dreaded what we seem to be heading toward and was motivated on behalf of my children and patients. I wanted to offer something other than a stressful, artificial life that goes against our biological and spiritual needs and is unable to sustain us either now or into the future. I wanted to model ways of life based on principles of healing and sustainable living. Fortunately, my motivation has shifted from fear of the future toward a positive desire to share the remarkable healing we see at the centre.

Sustainable and healthy living includes emotional healing, natural medicine, organic agriculture, backyard gardens, less fossil fuel use, and fewer noxious chemicals. If adopted by more people, these changes would turn our culture around. But it's not a popular direction, and I used to wonder at the potential for success in the face of our addictive and hectic modern lifestyle. Even those of us who understand and want a healthy way of life struggle with it at times!

After discovering the "hundredth monkey principle" and concepts of critical mass and tipping points, I drew hope that spontaneous change could arise from the actions of a small fraction of the population; this has been observed in both animal and human situations. Hope is essential, as those of us who yearn for a more natural and wholesome life are still in the minority among a culture of fast food, artificial materials, and ubiquitous screens, itself the product of a corporate and political agenda demanding more of the same.

Finally, I am learning that when we deeply heal old patterns of pain and negativity, allowing an expanded expression of positive thought and action, the buoyant energy of our being is contagious. Studies show that we affect each other all the way around the world.

What I see as essential to facilitate the conscious evolution of

Some CREWC staff in front of the clinic building: (left to right) Beth Scott (bookkeeper), Marlene Powers (executive director of charity), Matt Selic (gardener/builder), Kelly Bennett (assistant), Kealy Mann (naturopathic doctor), Julie Goeshl (childcare and housekeeping), author, Laura Tromp (clinic manager), Carla Brown (maintenance) Photo credit: Dave Ferreira.

our species is the process of becoming aware of and healing our inner tensions, learning ways that allow them to dissipate—as they are inclined to do—instead of acting them out in the world through dysfunctional relationships, addictions, aggression, and even our beloved causes.

This often unconscious pain leads to separation between people, illness, war, and environmental degradation. It manifests as a visceral fear for our survival, commonly seen as post-traumatic stress disorder (PTSD). In contrast, resolving inner issues and learning to relax leads to an inherently wise, open-hearted, creative cooperation, which in turn generates positive actions marked by natural order and grace.

As more and more of us understand and follow this path, we may come to the point where the whole human race starts to shift naturally, without effort, toward an harmonious and balanced existence. Perhaps our unused brain capacity will help us realize this potential.

So what have we been doing over this past decade?

Carp Ridge Natural Health Clinic

The clinic moved from the renovated garage attached to my home to a 4,000 sf recycled building that we moved from Ottawa and renovated with natural materials and a geothermal system for heating, cooling, and hot water. Rain barrels catch the flow from the steel roof to water our flower gardens. Large windows, original wood floors, and local art create beauty inside.

Our clinic is set up along the lines described in our first article, integrating four naturopathic doctors, including a resident, two talented massage therapists, a healing practitioner/tester, and an empathic healer. We refer back and forth with dozens of other practitioners around Ottawa and treat everything from colds to cancer. We also take pleasure in holding monthly open houses with free talks about natural medicine and weekend retreats for cleansing, meditation, and family healing.

We use a unique combination of therapies: Ayurvedic body typing; cutting-edge nutrition through food choices and supplements, including the use of amino acids to balance brain neurotransmitters that help mood disorders; herbal preparations to correct biochemistry and strengthen weak organs and tissues; acupuncture; homeopathy; emotional support and remedies in collaboration with counsellors; massage and craniosacral therapy to allow the body to release tensions and old emotions.

CREWC team in the garden. Photo credit: Dave Ferreira.

When my husband Mickey was struggling with complications from the treatments for his brain tumor, we learned about a startling new approach to illness called German New Medicine (GNM), which correlates emotional shocks with disease. More importantly, GNM shows that many symptoms we thought were pathological are actually part of the mechanism of healing. When we understand how this works, we can allow the symptoms to run their course instead of locking them into a chronic "hanging healing" as a result of fear and the suppressive use of drugs. We have seen amazing results with all kinds of conditions using GNM and hold monthly introductions to spread the word.

In the years since we began using GNM, we've saved our government health plan over $3 million, for the most part because many cancer patients didn't need their chemo, radiation, or surgery. We are still in awe and especially keen on seeing this new material researched by medical doctors so that it can be incorporated into the normal medical system.

German Natural Medicine shows that many symptoms we thought were pathological are actually part of the mechanism of healing.

Ultimately, our goal is to develop a teaching clinic that offers experiential programs on the integration of GNM with many different healing paths. To this end, we are computerizing patient records, as well as clinic systems, in order to organize cases and provide better services. I am writing a book on the subject to clarify the basic principles of GNM for both practitioners and the public.

Healing House program

When we started using GNM in practice, we found it difficult to advise patients in a manner that is often opposite to the current medical system. We needed an environment that supported holistic healing, with therapeutic nutrition, calming meditations, gentle movement, creative activities, and caring personal connection.

The Healing House (HH) model sprang from that need, a holistic alternative to hospitals, and became a reality when I moved out of my home in 2008 to care for my teen-aged daughter and her new baby in Ottawa for two years, commuting to Carp for

work. My staff took over the house and made it beautiful, and we invited our patients to come and stay!

In those two years, we served many types of patients from far and wide, with astounding results. After moving back to Carp (with grandson in tow), the Healing House continued in the apartment adjoining my home and in our spare bedroom. It will be expanded again once we build more homes on the property.

A necessary part of the HH program is the training of HH hosts, individuals who learn how to set up their homes to care for patients within the framework of natural medicine. Hosts do not provide medical treatment; this is overseen by practitioners. We are currently talking with the administration of one of our local colleges about running the course through them and then using that material in other colleges across Canada.

Ultimately, we want to have HH stays covered by our provincial healthcare system and other health insurances. To this end, we will set up computerized statistical analysis of our outcomes to compare costs of HH care with regular healthcare.

Community outreach

We originally set up a charity to run the holistic school that Mickey and I began for my daughters in 1999 and which went into hibernation in 2001 due to his health challenges. With the organization's resurrection in 2004, the new board expanded its mission to offer programs on health and sustainable living to the local community and to become a model for other communities. We also started the first Forest School in North America where children are outside for most of their days, learning in nature.

Facilities that serve the Learning Centre (LC) include a portable structure donated by a generous neighbour and renovated to be a healthy building with two composting toilets; six sleeping cabins, including two that are made of straw bales; a bath house with more composting toilets and showers for retreats; a yurt in the woods; two tents on platforms that can be used for programs; and a lovely trail through the ridge created by a local orienteering group that holds events here.

We've had numerous programs on all manner of topics related to health and sustainability, including a year of monthly dialogues on the challenges facing our community, looking at creative solutions to climate change, excessive fossil fuel use, sustainable construction, and our looming health crisis.

Now our board is planning a survey of needs for our area to help us clearly understand how we can apply our rich knowledge to serve our neighbours. We will approach other institutions in order to work together, asking schools, social services, churches, local businesses, farmers, and families what they see as their primary concerns a`nd needs. The information will be used to develop programs in partnership with our community to help groups in need such as youth at risk, struggling families, senior citizens, and people with illnesses.

We feel strongly about the importance of nutrition and gardening. In the clinic, we see many conditions—even serious ones such as inflammatory bowel diseases, arthritis, ADHD, and cancer respond to simple changes in diet—a powerful motivator to teach others how to prevent this misery. As food prices inevitably rise, and arable soil drastically erodes, it makes sense to encourage the use of gardens within a framework of permaculture principles.

Kids from our Forest Pre-school and Kindergarten with teachers, principal, and a parent. Photo credit: Dave Ferreira.

Organic garden

Our garden has grown in fits and spurts from a plot in our yard to approximately 7,000 sf with a deer fence, irrigation system, insulated shed, and double-dug beds. We often have volunteers staying in the strawbale cabins next to the garden who help us keep up and finish developing beds over the whole area.

Given that we have limited topsoil on this sweet planet, it seems natural to learn how to build more with composting to the point of eventually not needing any input from outside the property. Whole civilizations are said to have been extinguished by outgrowing their farmland; we are traveling on the same path with artificial fertilizers and pesticides.

Our bodies need over 70 different minerals to thrive, and regular farmers add only three: nitrogen, phosphorus, and potassium, as well as a host of toxic pesticides and herbicides. In my 30 years of naturopathic practice, I've watched the levels of minerals decrease and the toxins increase in people's bodies via hair analyses. This upcoming generation is projected not to live as

Naturopathic Medicine

Naturopathic doctors, or N.D.'s, have at least seven years of university-level education and are trained to act as general practitioners, assessing all conditions and referring to M.D.'s and hospitals as needed.

Naturopathic doctors create individualized treatment programs based on thorough history-taking, a physical exam, and lab tests, both conventional (like bloodwork and scans) and holistic (like hair mineral analysis, stool analysis, and regulation thermography). Treatments may include therapeutic nutrition, herbs, detoxification methods, homeopathy, Traditional Chinese Medicine (acupuncture and herbs), bodywork, emotional healing, and complementary/alternative cancer care.

Naturopathic medicine is covered by many work insurances. You can find a naturopathic doctor near you by contacting the American Association for Naturopathic Practitioners (www.aanp.org) or the Canadian Association of Naturopathic Doctors (www.cand.org).

long as their parents for the first time in 100 years because of the low quality of our food. It is obvious that growing at least some of our food would be brilliant, even if we only sprout seeds in the kitchen and collect some highly nutritious weeds from the lawn for herbal teas and to add to our salads.

This year we are planning to build a beautiful gazebo in the middle of the garden to be used as a space for teaching about organic gardening, running meetings, doing healing work, or simply resting after a treatment at the clinic.

Onsite eco-community

An important landmark for the centre was the creation of a new zoning title, that of an eco-wellness centre, allowing more homes and other buildings that serve our mission to be built on the property. We are currently working through the final coils of red tape to build three more homes for people who are working here and for new folks who want to join the project.

The houses are already designed and will be built as kits and moved here to conserve materials. They will be south-facing with overhanging roofs, well-insulated, and with walk-out basements. We were given a grant to research sustainable technologies and used computer modelling to pick the most important ones. Once built, we plan to use computers again to test the results to add more information to the field of sustainable housing.

Originally, we had greenhouses on the south face, but they were removed due to anticipated problems with summer heat and humidity. Instead, we will research and build a large free-standing greenhouse to experiment with growing throughout the year in this extreme climate. This will include experiments to use minimal energy for heating and raising fish.

Principal Jay Young and kindergarten teacher Heather Andrachuk with kids in the woods. Photo credit: Dave Ferreira.

During this summer's drought, we created a very simple greywater system using pans and buckets; this reduced our usual water consumption by one-third. Likewise, we want to explore simple methods of conserving heat and electricity that rely more on muscle power than technology. It is easy to build an eco-house when you have a lot of money to buy the different technologies available; we want to model affordable housing and think that more movement is better for our health than always pushing buttons—within reason!

Plans for the future...

All of our projects are designed with a sustainable local community in mind. We envision a creative network of holistic and sustainable businesses and households that serve each other and the mainstream of the community.

Imagine farmers growing organic, non-GMO food; schools teaching the benefits of supporting local and organic agriculture and offering healthy meals instead of junk food in vending machines; stores selling produce and healthy processed foods from the surrounding farms; families growing their own vegetables and getting together as in the past to dry, can, and freeze it for our long winters; families learning how to treat illness without drugs, using locally grown and wild-crafted herbs, diets, and other simple healing tools; people getting together for monthly healing sessions to improve their mental and emotional health, increase their energy, and decrease addictions; locally based emergency preparedness plans for the upcoming climate and economic changes on the horizon; microloans pooled by wealthy citizens in the area for people starting sustainable businesses, especially our youth; support for local sport, art, and culture to offset the addiction to virtual reality; spiritual study groups to develop ourselves on the deepest levels...

Utopian? Yes, it sure sounds like it as I re-read my words. We need to be careful not to preach, perpetuating the "us and them" paradigm or sounding as if we have all the answers. We need to avoid being rigid, perfectionist, or overly attached to the outcome. After all, we will harvest the fruits of our efforts for many generations into the future. We are not looking at a quick fix here!

Of course, I haven't written about all the challenges we've faced: personality conflicts, government restrictions, suspicion from neighbours, and expensive construction mistakes. However, as I finish writing in the dark of an early autumn night and listen to the singing of the coyotes outside my window, I doubt that there is anything I would rather do. Thank you for reading with me, and may your own life be on a healing path that you believe in wholeheartedly. Δ

Katherine Willow, N.D., is a fourth-generation naturopathic doctor who graduated from National College of Naturopathic Medicine in Portland, OR. She is founder and director of the Carp Ridge EcoWellness Centre near Ottawa (www.ecowellness.com). If you would like to contact the Centre or volunteer, please email info@ecowellness.com. Inquiries are welcome.

Sustaining Life and Liveliness

Seasonal Eating for Health

Tiffany Robbins

GET TO KNOW YOUR LAND and its native flora intimately if you want to take full advantage of its health-sustaining resources. A number of species with nationwide distribution are prized for their nutritive value. Folk wisdom honors some of these plants and makes their prescribed usage seem rather commonplace. Many landowners scorn other plant species as invasive pests, without recognizing the true value of the resource at their disposal.

After several years on our permaculture homestead in northeastern Pennsylvania, my partner Ross and I have discovered that both commonplace and lesser-known health-giving plant species can be found here. We have found that products from pasture-raised animals are also important for proper human health and nutrition. As many of the healthful plants we seek out are located in the outer zones of our property, we find it helpful to keep a calendar of their seasons of bloom and fruiting to remind us to go and harvest.

Let us take a seasonal overview of a few of the most important plant and animal resources you may have at your disposal, including ways that these resources can be preserved to maximize their value.

Root cellaring plays a crucial part in the healthful year—carrots, beets, and celeriac maintain life while in storage.

Early spring

Perhaps at no time of year is it more difficult or more crucial to obtain fresh, vibrant, life-giving nutrients than at the end of winter. While we must and do store enough food to get us through the coldest and darkest months, naturally some foods are canned or frozen and are not of the same quality as their fresh counterparts. So, in the early spring, we anxiously await the new green life that springs from the ground. On our farm we are fortunate to have an ample supply of two species that are nutritious as well as flavorful. The first is *Hesperis matronalis*, or dame's rocket. This prolific member of the mustard family thrives in woodland margins and is well known throughout the countryside for its showy and fragrant purple or white blossoms. Many people in our part of Pennsylvania erroneous call this plant phlox. The dark green or reddish purple rosettes of the biennial dame's rocket can be found in the earliest part of the spring or even dug right out of the winter snows. Frost vastly improves the flavor. We prize the tender leaves of these rosettes, which can be eaten raw or steamed. (As with all members of the *Brassicaceae* family, people with thyroid issues should avoid eating it raw, as this can further inhibit thyroid function.) Like mustard greens, they are high in vitamins B6, C, and E, as well as calcium and manganese.

The second early riser is the much-maligned nettle *Urtica dioica* plant. While even I feel a compulsion to curse this lovely plant whenever I have an encounter with it that leaves me burning from its sting, I still find this is my favorite plant of the springtime. The tender young shoots can be eaten raw, though this can sometimes result in a few stingers on the tongue. Steaming is a safer and delicious way to enjoy them; they also make an incredible pizza topping. Nettle greens are high in vitamins A, C, and D, as well as iron and choline.

Also in early spring, we await the freshening of our goats and the new supply of rich raw milk they provide. We prefer to breed our goats late, if possible, so that the kids are not born into the worst part of the winter cold. When kidding does not happen until May, however, it can feel like an eternity. Anytime a mammal gives birth, the first day of milk is rich with colostrum, an all-important immune-building nutrient especially compounded to give newborns the best chance of survival. Colostrum from pasture-raised animals is full of immunoglobulins that are also effective against many human pathogens. Harvesting colostrum from animals is risky, as it does deprive the newborn animal of a portion of its birthright. It should be done only if there is genuine need and acute human suffering. One may want to use colostrum in cases of lingering or recurring respiratory ailments,

Straining an extract of elder flowers.

or to combat a serious infection, such as staph or strep. But each drop should be treated as precious. No more than three teaspoons should be taken from goats. Up to four tablespoons can be taken from cows. Freeze colostrum immediately, and never expose it to high temperatures.

Spring, planting time

When it comes time for garden prep, it's handy that some of the weeds we need to remove from our garden beds also happen to be highly nutritious and refreshingly yummy. It's rewarding to pull these weeds out of the garden and then put them on a plate. One of our most prized weed competitors is the biennial *Arctium lappa*, or common burdock. We find that both the first-year roots and second-year shoots have a great texture and a fine taste somewhat reminiscent of sunchoke. We have used burdock in stir fry, soups, and as a roasted vegetable. It is high in vitamins C and E, as well as folic acid, niacin, and inulin, a subtle sugar or soluble fiber that doesn't provoke a pancreatic response. In traditional herbalism, burdock root is highly regarded as a blood cleanser.

Another weed competitor that we commonly eat is the young shoots of *Phytolacca americana,* or pokeweed. Many recommend that the shoots be boiled with a change of water, but we have eaten them lightly steamed or raw with no ill effects. Poke shoots are as delicious as asparagus, as well as being high in vitamin A.

Red clover doubles as a medicinal tonic and a nitrogen-fixing cover crop.

Summer

For us, summer is the time of year with the heaviest workload. Luckily, it's also the time of year when it is the easiest to be in good health. Indeed, health seems to pour from the sky, and the air seems filled with it in the wake of the glorious sounds of life all around. The biggest challenge for me is simply getting to the nutritious goodies that nature presents in a timely fashion, so that they don't go to waste. Gathering and preserving to prepare for winter ahead is absolutely necessary to ensure year-round health. Early summer presents us with challenges because the work of preparing for winter begins even before the garden has been fully planted.

One of the most important plants for wintertime health has volunteered to grow for us right outside our doors. This plant is the sacred elder, *Sambucus canadensis*, and it is known for its antiviral properties. Both blossoms and berries are important for immune support and can be harvested at the right time to be made into syrups. The leaves, twigs, and seeds of the elder contain a substance that the body metabolizes into cyanide. This can create a toxic build-up in the body, but if your syrups are used appropriately as medicine, this need not concern you. Because the flowers do not contain this substance, I opted to make my wintertime syrup this year from them rather than the berries.

Elderflowers are at their peak in early June. Look for flowers that are in their peak bloom and that smell particularly fragrant to you, which helps you gauge your compatibility with each particular plant. Always be sure to express your gratitude to the plant as you harvest from it, and never take all the blossoms. You may want to come back for the berries at the end of the season, and leave some for the birds who fill your garden with song while helping to keep your insect predators under control.

Garlic isn't called "poor man's penicillin" for nothing. We usually eat a raw clove of garlic each day throughout the winter.

Blossoms should be removed carefully to minimize the number of stems that make it into your brew. Shake off mature blossoms—they fall off easily, or snip them from the stem. I'm not sure how many blossoms I harvested this year, but it took just over 2 qt. (2L) of cold water to cover them completely in the bottom of a large pot. Cold-soak the blossoms for 24 hours, covering with a cloth to keep out flies. The resulting liquid is amber in color, and smells and tastes sweet and delicious. Strain your liquid and take the blossoms to your goats. (Hopefully they have also enjoyed your stems, twigs, and other leftovers, since elder is one of their favorite treats.)

Heat the elderflower extract just enough to dissolve your sweetener. Two quarts of liquid will need 10 cups (250mL) of raw cane sugar (like Sucanat) or 8-9 cups (about 2L) of honey. Also add 1 tbsp. (15mL) of vinegar. Avoid bringing your syrup to boil, but do heat it thoroughly and let simmer for 20-30 minutes. The resulting syrup will be surprisingly dark. You now have a yummy immune-supporting syrup to get you through wintertime cold and flu season. Either store it in the fridge or process for 5 minutes in a boiling water bath to seal canning jars. A similar syrup can be made later in the season by boiling the berries and then straining them.

Late summer and early fall

If you pasture-raise beef, lamb, or pigs for slaughter, then by fall, your work has come to fruition, and you are enjoying the delectable meats that are your due. But if you are wondering what to do with those large chunks of fat that seem entirely inedible to you, consider that the fat of pasture-raised animals is an excel-

lent storehouse for bio-available vitamin D. In fact, tallow, suet, and lard are the best wintertime source of vitamin D for those of us who do not have access to it via the creatures of the sea. We do not have the land or resources for keeping cattle, sheep, or pigs, but we have been fortunate to be able to barter locally for a supply of lard or tallow to get us through the months when we simply cannot get our vitamin D from the sun. Tallow, lard, or suet can be rendered in a slow-cooker or a low-temperature oven. And of course, your drooling dog is standing by to take care of the leavings that won't melt down.

Tallow and suet make excellent heat-tolerant greases for frying. Lard has many uses, but it makes superior pie crusts and biscuits. I have been known to use it in cookies as well.

Another resource we harvest this time of year is the blossoms of the red clover, *Trifolium pratense*. Wherever you are, I'm willing to bet you can find some red clover growing near you. The dried blossoms make a wonderful tea for the treatment of lung ailments. It's also a mild sedative. Red clover is known as an herb for women because it has a hormone-balancing effect. But recent research has shown that red clover may help to prevent heart disease and treat cancer, so men should also make this herb part of their daily cup.

The red hips of the multiflora rose are small but plentiful. You will find them sweet on the lips (especially after frost) and lovely against the backdrop of winter snows.

Fall harvest season

If you've had a successful gardening year, now is the time when you are putting your vital root vegetables to slumber in the root cellar to get you through the winter. Root cellaring plays a crucial part in the healthful year, because root vegetables such as carrots, beets, and celeriac maintain life while in storage.

You'll also want to replant your garlic so that you have another beautiful life-sustaining crop for the next year. Garlic isn't called "poor man's penicillin" for nothing. My partner Ross and I usually eat a raw clove of garlic each day throughout the winter. When it comes time to replant, I'm always reluctant to see our big, juicy garlic cloves go back into the ground. But looking to the future is an important part of raising a healthy family.

This is also sauerkraut season for us. Sauerkraut is a great way to preserve the vitamin C in cabbage and increase the bioavailability of calcium and other minerals, while infusing it with life-giving probiotic microbes. Eating sauerkraut and other fermented foods is one of the best ways to balance and maintain intestinal flora. And remember, a healthy gut means a healthy you!

Winter (cold, cruel, and seemingly endless)

As the cold dark days of winter set in, both humans and plants find some much needed time for rest. Sadly, we humans cannot quite reach the same state of dormancy as our green allies outside. But there is one more resource that awaits us on the edges of our property, and it is only just reaching its maturity when December sets in. So no matter how cold and dreary, we must put on our boots, trudge through the occasional snows and head to the margins of our property. For there, along the edges of the land we maintain, we find a most abundant, flavorful, and strikingly beautiful source of vitamin C in the form of rose hips from the multiflora rose bush (*Rosa multiflora*).

The multiflora rose bush holds a special place in my heart. While I was growing up here in Bradford County, my grandfather would often walk with me around the property and point out the dozens upon dozens of bushes that grew all around. He would tell me about how the Pennsylvania Game Commission and Bureau of Forestry heavily promoted multiflora roses throughout the 1940s and 50s as "natural pasture fence that no animal could get through." If the farmers of my great grandfather's generation once planted multiflora in neat and tidy rows throughout our county, there is no sign of it now. They grow everywhere, all across the nation, and the Department of Agriculture considers them "an invasive exotic." You'll find the maligned multiflora at the top of the state's "noxious weeds" list. I chuckle at the irony of this, even while I wish that property owners could take a step back and realize what a treasure they have at their disposal. The red hips of the multiflora rose are small but plentiful. You will find them sweet on the lips (especially after being frosted) and lovely against the backdrop of winter snows. Enjoy! Δ

Tiffany Robbins lives with her partner Ross Gigee and their three sons on a small homestead in northeast PA. Her passions include feeding her family a healthful diet, enjoying the fruits that come when we work together with nature, and, occasionally, writing.

Rose hips, the high-yielding fruit of the multiflora rose, remain on the plant well into winter.

Reclaiming Plant Medicine

Rachel Berry

MANY OF US LIVE OUT OF TOUCH with our heritage of herbal medicine, depending instead on Western (allopathic) medicine for our healthcare. Allopathic medicine has its strengths—especially for acute injuries and illness—and provides some critical services that help people live healthier, longer lives. As a complete system of healthcare, however, it has many limitations. Especially as practiced in the United States, allopathic medicine is the center of a top-down, profit-driven industry. It relies on costly pharmaceuticals, surgical interventions, and complicated technologies; it is neither Earth-friendly, sustainable, nor accessible to all who need it. Focused on symptoms and visible conditions, the profit-dominated US medical system routinely fails to consider the whole person, while the allopathic model ignores or minimizes the importance to our health of complex interrelationships with other elements of the natural world: water systems, microbes, plants, and animals.

According to the World Health Organization, a majority of the world's people rely on herbal medicine as their primary source of healthcare. Herbal medicine is low-cost, easily accessible healthcare that an experienced family member, community herbalist, or even the patient can administer. The prevention and treatment of their own illnesses empowers individuals and communities, deepens their connection to the natural world, and decreases dependence on costly, wasteful, and often inhumane systems.

Herbal medicine is an essential tool in caring for the planet and for people. From simple home remedies to larger, community-scale resources for health and wellness, community herbalism is a growing area of importance among permaculturists and others striving to live in balance with nature.

A share distribution for the Wild Food & Medicinal Herb CSA, including (from bottom left) dandelion, yarrow, chickweed, miner's lettuce, wapato, manzanita blossoms, yellow dock, and wild mustard (center, rear).

A case study

To illustrate the importance of herbal medicine in our future, I can share my experiences while studying healthcare practices in an indigenous Tzeltal community in the highlands of Chiapas, Mexico. The town where I worked had been largely isolated from the influence of Western culture until the 1950s, when government schools and health clinics were introduced. Prior to that, the community lived in a self-sustaining fashion, self-reliant in food, building materials, and healthcare needs. Medicinal plants and shamanic healing had been the only sources of medicine; both were closely integrated with spiritual practice and a nature-based worldview.

Experiencing the healing power of medicinal plants provides an initiation of sorts that fosters a deep respect for the natural world, and opens doors into a more holistic worldview.

Two generations on, by the late 1990s, health practices had changed significantly. Most families had adopted a Western understanding of health and illness. Abandoning their community practices of herbal medicine, adopting Catholicism, and turning away from traditional shamanic healing, they now relied on a government clinic for healthcare. Despite these entrenched changes, a growing movement by some community elders sought to reinstate the lost practice of herbal medicine.

Why would anyone want to take a step backwards from modernization? The Tzeltal could see that Western medicine was not serving their community's needs. Health services at the government clinic depended on pharmaceuticals, often too costly to keep in stock at the clinic and unaffordable by community members. Distance was also an issue—treatment was centralized at one location. Community members were spread widely over an undeveloped terrain: seeking treatment at the clinic often meant a day's walk on a single-track footpath (not easy for a subsistence farmer or a sick person to manage). These two barriers alone—cost and transportation—decreased accessibility to healthcare. Common and treatable conditions like diarrhea, skin infections, and influenza, more frequently developed into debilitating or fatal disease, especially among the young and the elderly. In many

respects, the community's everyday health needs had been better met by the widespread use of traditional medicine.

I also suspect that the elders working to bring back herbal medicine in their community were motivated for reasons beyond increasing access to healthcare. The richness of the traditional Tzeltal nature-based worldview—nearly lost to the younger generations raised in Western schools and under the influence of the Catholic Church—could perhaps be revived by the practice of their traditional medicine. Experiencing the healing power of medicinal plants provides an initiation of sorts that fosters a deep respect for the natural world, and opens doors into a more holistic worldview.

Those of us living in modern societies can draw important lessons from this small indigenous community in transition. As the costs of healthcare and transportation continue to rise, and as more people seek sustainable, Earth-based alternatives to modern lifestyles, we can adopt the following strategies to help secure access to healthcare in our own communities.

Beginning in herbal medicine

Most modern people have grown up without anyone to teach us about plants that can help us heal from illness and disease. If anything, we have been taught to fear plants; we learned that herbal medicine was ineffective (or entirely unsafe!) and that Western medicine was the true, modern healer. The effects of these early teachings can be powerful. Even though humans have been using medicinal plants for thousands of years (in a beautiful co-evolutionary relationship), it is only through exposure to the plants and education about their medicinal properties that we can break through these modern conceits and reap the benefits of herbal medicine.

My own path of integrating herbal medicine into my life (that is, practicing it rather than just reading about it), began when I lived at a permaculture education center. My curiosity got the best of me when I decided I could make an herbal goat-milking salve we normally purchased from the store. I harvested the same herbs from the farm, infused them in oil, and combined them with melted beeswax from our beehives. It was that easy! My success was a revelation—I went running into the world of herbs, making remedies for myself, friends, and family.

After many years of self-study and a few herbal apprenticeships, I now consider myself a folk herbalist, or family herbalist, in that I treat most illnesses and discomforts at home, and offer my help to friends who ask for it. I believe this was an ordinary life-skill that many people possessed in our not-too-distant past.

You don't need years of training to start using herbs at home. With basic herbal know-how and a few good references for support, a family herbalist can treat several common health issues. With some experience, one can very reasonably expect to treat ear and bladder infections, soothe aggravated muscles and nerves, quicken fevers and promote healing from colds and flu, relieve the pain of insect bites and stings, treat yeast infections, provide support in the healing of injuries, and more.

Becoming your own herbal primary-care provider is a very empowering process! My own herbal know-how has enabled me to be more confident in the face of illness and injury, reduce my carbon footprint, and connect more deeply to the plant world. In addition, it has saved my family and friends the cost and inconvenience of doctor visits on several occasions. Most recently, my history of success with herbal medicine gave me the confidence to seek out herbal treatment for a severe case of chronic Lyme disease. Taking this "risk" (according to the dominant medical model) allowed me to regain my health and balance when treatment with Western medicine failed to do so.

Herbal medicine has much to offer our modern communities, especially in the face of rising healthcare costs, antibiotic-resistant pathogens, emerging bacterial diseases, and the search for reconnection and rebalance with the natural world. It's an extremely empowering and practical skill to reclaim.

Medicine in Your Garden

If you have a garden, it is likely that you already have numerous medicinal plants at your fingertips! Whether you intentionally cultivated these plants or not, they have multiple medicinal uses for you and your family. Below, I've listed a few ways each plant can be helpful:

Comfrey: Use the leaves and roots topically to promote the healing of cuts and wounds. Comfrey promotes proliferation of skin cells so powerfully that it's not recommended for deep wounds or punctures. The leaf, and especially root, is a nourishing treatment for hair.
Plantain: The leaves are excellent for pulling the venom out of bites and stings. Plantain leaves also can be used on cuts. Chew a few leaves and apply directly on skin. The seeds and hulls can be used as a gentle laxative.
Calendula: Extracts of calendula blossoms are a great healer for wounds, bruises, skin infections. Calendula is anti-inflammatory, anti-microbial, and anti-fungal.
Yarrow: Use the leaves to stop the bleeding of wounds, or use the flowers to help "sweat out" a fever.
Mullein: An infused oil with fresh flowers is an effective home remedy for ear infections. The leaves can be used as tea or inhaled in a steam for chest colds.
Yellow dock: The root helps support liver function, and can be taken regularly to promote healthy digestion.

The Wild Food & Medicinal Herb CSA

In our region, like many others, there is abundant food and medicine to be found in wild and weedy plants. Last year, we developed a Wild Food & Medicinal Herb course based on the popular Community Supported Agriculture (CSA) model. To each class meeting, we brought wild plants ethically harvested from private property in our region. Participants had the opportunity to see, touch, and taste each plant and to learn how to make it into food or medicine. Participants made medicinal salves, syrups, cough drops, herbal oils, and more, with local weeds and abundant native plants. It's a fun and engaging way to build interest in herbal medicine and know-how in the community! More details at www.sierralivingskills.com/?page_id=13.

Localize healthcare

Permaculturists are familiar with the term "food security" and understand the importance of a local food economy in a post-petroleum world. Increasing our use and understanding of herbal medicine provides a unique opportunity to localize our healthcare as well, and help provide "medicine security" in our future.

The organic cultivation of medicinal plants does not rely heavily on petroleum-based products; however, transportation remains an issue. Most bulk herbs sold in the US and other industrial countries come from faraway places, where it is typically less expensive to grow and process the plants. However, as transportation costs continue to rise, access to many herbs may become limited to those who can afford to pay the rising prices. Now is the time to begin localizing our herbal medicine, and begin experimenting with how to cultivate our most needed medicines locally. Not only does this provide "health security," but also, it allows us to connect with the plants and to learn more about how they work and how they can be used. It settles us more intimately into the ecological circuits of life.

There are many people and organizations in the US already working towards the localization of herbal medicine, creating the beginnings of a local herb economy in various regions, as illustrated by the following examples.

The Goldthread Apothecary in Conway, MA, offers over-the-counter consultations with an herbalist for everyday health needs. The apothecary is stocked with herbs from the nearby Goldthread Farm. The farm also provides a "Community Supported Medicine Share," offering local and seasonal herbal remedies to prevent and treat common ailments at home. For those who are interested in learning more, there is a "Farm to Pharmacy" apprenticeship program where participants learn about growing and processing plants, and making medicine, as well as how to use the herbs to support health and wellness. More details can be found at www.goldthreadapothecary.com.

Healthcare Alternatives for All Locals (HAALo) in Nevada City, CA, is a non-profit dedicated to increasing access to herbal medicine for local health needs. The HAALo herb shop offers over-the-counter herbal consultations and builds relationships with local herb farmers. HAALo offers trainings in do-it-yourself herbal medicine, health and wellness, and commercial growing of medicinal plants. More details can be found at www.haalo.org.

Sonoma County Herb Exchange, based in Petaluma, CA, is a local clearinghouse dedicated to providing the highest quality locally grown herbs, while connecting herb growers with medicine-makers in Sonoma and beyond. Read more about this collaborative project at www.sonomaherbs.org.

Chinese Medicinal Herb Farm, also near Petaluma, specializes in locally and organically grown Chinese, Ayurvedic, and other Asian medicinal plants. This farm, of a type that is rare in the US, has created a successful business selling to practitioners, product manufacturers, researchers, and the general public. Learn more at www.chinesemedicinalherbfarm.com.

St John's Wort (Hypericum perforatum), *more widely known as an anti-depressive, is also an excellent topical treatment for burns, sore muscles, and skin abrasions.*

Now is the time to begin localizing herbal medicine,...

Beyond these human-led efforts, Gaia appears to have a plan of her own for localizing healthcare. Many of the "invasive weeds" that have taken hold across the globe (often in response to the disturbed soil around human developments) are powerful medicinals that we may find increasingly helpful in our modern world. Dandelion, for example, is a blood cleanser that supports the liver in the removal of toxins. Another group of global and determined weeds, *Sida spp.* (wireweed, tea weed, fanpetals, and others) provide very potent anti-microbial activity that can be especially helpful in the treatment of antibiotic-resistant pathogens. St John's wort, bidens, and Japanese knotweed—all cursed for their tenacity—may actually be a blessing when it comes to supplying effective localized medicine. Get to know your herbs before you send them to the compost pile!

Herbal medicine worldview

For those of us who practice the principles of permaculture and respect the wisdom of closed-loop, integrated ecological systems, it is not a far reach to believe that we can find healing in the plants around us. Indeed, it makes perfect sense!

However, many of us—as creatures of modern society—have inherited a belief system that prevents us from fully trusting the plants as powerful healers. While we may be able to recognize this as true intellectually, we may find it difficult to seek out herbal treatment when we are ill and feeling vulnerable, or when our loved ones are sick and in discomfort.

How do we make this underlying shift in our belief system? This is the fun part—start getting to know your local medicinal plants! If you are new to medicinal herbs, find an introductory book or take a beginner's class. Begin making herbals you are likely to use every day, like a nutritive tea, or a soothing salve or skin cream. Work within your comfort level, and try to treat

aches and pains, minor scrapes and cuts, or common colds and flu. If you already have some good experience, find a new plant to explore or take a deeper look at a plant you already know.

Thankfully, herbal medicine is in the midst of a revival, with numerous educational opportunities through books, regional teachers, distance learning programs, herbal practitioners, and even village apothecaries. Books, classes, and teachers offer a great source of learning as you get started and then continue your practice. However, your own personal experience spending time with the plants and using them as medicine will offer the most potent teachings, and will do the most to alter the way you view healing in amazing and extraordinary ways. Δ

Resources

• Gladstar, Rosemary. *Herbal Recipes for Vibrant Health: 175 Teas, Tonics, Oils, Salves, Tinctures, and Other Natural Remedies for the Entire Family*. Storey Publishing. 2008.
• Cech, Richo. *Making Plant Medicine.* Horizon Herbs. 2000.
• Green, James. *The Herbal Medicine-Maker's Handbook: A Home Manual.* Crossing Press. 2000.
• Buhner, Stephen Harrod. *Herbal Antibiotics, 2nd Edition: Natural Alternatives for Treating Drug-resistant Bacteria*. Storey Publishing. 2012.

Rachel blends her background in community health, women's health, medicinal herbs, and permaculture to inspire and promote home-scale herbalism in Northern California. She can be contacted at Rachel@sierrabotanica.com. Read more at www.SierraBotanica.com.

Participants in the Wild Food and Medicinal Herb CSA learn how to use local weeds and abundant native plants.

Place Mushrooms in Sunlight to Increase Vitamin D

Sun-stroking Shiitake

Paul Stamets

VITAMIN D IS AN ESSENTIAL VITAMIN that boosts the immune system and plays vital roles in human metabolism. Did you know that tasty mushrooms are one source for vitamin D, and that you can naturally multiply their levels of it by exposing them to sunlight?

We evolved in more sunlight than most people receive today. We make vitamin D when sunlight hits our skin cells. Many people living in the northern hemisphere, however, suffer from lower levels of vitamin D during the fall, winter, and spring. Fortunately, you can make your own supply of vitamin D-enriched mushrooms by simply exposing them to sunlight. You can sun-dry or UV-zap store-bought or homegrown shiitake, maitake, button, and many other mushroom species. My personal preference is home-grown, organic shiitake. The high vitamin D levels generated will last for more than a year. Surprisingly, even sliced and dried mushrooms—including wild ones picked the year before—will soar in vitamin D when placed outdoors under the sun. Summer, from June until September, is the best seasonal window for people in northern latitudes to make vitamin D-enriched mushrooms!

Mushrooms have many helpful nutrients, including beta-glucans for immune enhancement...

Many physicians view low levels of vitamin D as a serious medical precondition. In extreme cases, vitamin D deficiencies can cause diseases like rickets. Insidious diseases, such as cancer, are immune-mitigated. Without adequate vitamin D levels, your immune system is impaired. To increase vitamin D levels and boost immunity, physicians often treat cancer patients with high daily doses of vitamin D—up to 4,000-10,000 International Units (IU), compared to the FDA-recommended Daily Value (DV) dose of 400 IU for adults over 50 years in age. Please consult your physician before taking such large doses (1 IU is equal to 40 micrograms).

New recommendations from the Institute of Medicine, a branch of the National Academy of Sciences, increase the recommended dosage to 600 IU per day for people up to age 70, and 800 IU for those over 70. Many naturopaths and physicians suggest ingesting at least 1,000 IU/day. A 2012 report in the *Journal of Clinical Endocrinology & Metabolism* combined the results of eight clinical studies and showed that older people taking 1,000 IU of vitamin D, in combination with 1,000 mg of calcium, for three years had a 7% reduced death rate (Rejnmark, 2012). When not ingesting vitamin D mushrooms, and especially when traveling, I take a 1,000 IU wild sockeye salmon vitamin D3/omega-3 product (www.vitalchoice.com) several times a week, or daily when I remember.

Shiitake mushrooms ready for natural vitamin D enhancement

The commercially common sources of vitamin D are vitamin D3 (cholecalciferol) that comes from sheep's wool (lanolin), pigskins, and some oily fish (mackerel, sardines, anchovies, herring, trout, and salmon). Mushrooms and animal skins create vitamin D when exposed to sunlight. Mushrooms are rich in the vitamin D precursor ergosterol, which UV-B (290-315nm) converts to ergocalciferols, also called provitamin D2. Mammal epidermis has cholecalciferol, which UV converts to D3.

Will the real vitamin D please stand up?

Which is better, Vitamin D3 or D2? T*he New England Journal of Medicine* published an exhaustive article comparing the metabolic pathways of vitamin D2 and vitamin D3 (Holick, 2007). Our enzymes convert both D vitamins into 25-hydroxyvitamin D, and then into the active form of 1,25-dihydroxyvitamin D in our kidneys. This form of vitamin D can bind to receptors in various tissues. One advantage of vitamin D3 is its longevity after ingestion—staying in the bloodstream for weeks compared to days for vitamin D2. However, for people taking vitamin D supplements several times a week, there seems to be no significant advantage in taking one form or the other.

Moreover, eating mushrooms packed with vitamin D2 confers many other health benefits. Mushrooms have many helpful nutrients, including beta-glucans for immune enhancement, ergothioneines for antioxidative potentiation, nerve growth stimulators for helping brain function, and antimicrobial compounds for limiting viruses.

While making your own vitamin D3 from sheep or pigskins may be possible, it is rather gruesome and technically difficult. Consuming vitamin D3 from fish is not an option for vegetarians. Vitamin D from mushrooms is vegan- and vegetarian-friendly, and you can prepare your own by exposing mushrooms to the summer sun. Mushrooms grown indoors have very little vitamin D but reserve great potential for hyper-producing it upon exposure to sunlight.

When we tested our mushrooms nearly a year after exposure, they preserved significant amounts of vitamin D2.

Here is a simple experiment we did one summer afternoon in Kamilche Point, WA. We compared vitamin D levels after several treatments of organically grown shiitake mushrooms, which had starting levels of 100 IU/100g. The first was dried indoors. The second set was dried outdoors in the sunlight with their gills facing down. The third set of mushrooms was dried outdoors in the sunlight with their gills facing upwards for full sun exposure. The most vitamin D was found in shiitake dried with gills up that were exposed to sunlight for two days, six hours per day. The vitamin D levels in these mushrooms soared from 100 IU/100g to nearly 46,000 IU/100g. Their stems, though, produced very little vitamin D—only about 900 IU. Notably, vitamin D levels dropped on the third day, probably due to over-exposure to UV.

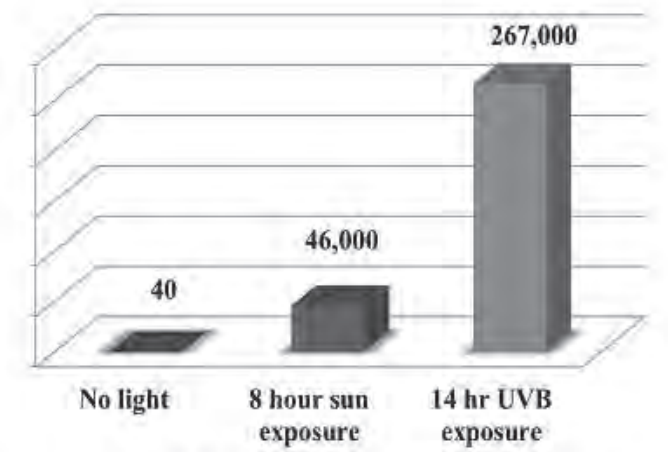
When we tested our mushrooms nearly a year after exposure, they preserved significant amounts of vitamin D2. I suspect values are much higher initially, gradually falling in time, consistent with reports by other researchers. This observation means that you can capture vitamin D in mushrooms and have a ready source of this important vitamin—and delicious mushrooms—through the fall, winter, and spring.

How much is possible?

How much vitamin D can 100g of fresh mushrooms make from sunlight? The answer is "a lot," but a lot more when mushrooms are dried, pulverized, and then exposed to UV-B lamps. (Caution: Using UV-B light lamps can cause damage to your eyes and skin. Do not attempt this without taking precautions.)

Robert Beelman at Penn State University was one of the pioneers who learned that pulsing high intensity beams of UV light could generate vitamin D (and also, bonus—surface-sterilize the mushrooms). Thanks in large part to his work, UV-exposed mushrooms—primarily the fresh button variety—are increasingly available in grocery stores. When we ranked the vitamin D concentrations of shiitake exposed to no light, exposed to sunlight with gills up, and exposed to continuous UV-B light after slicing, the results were impressive: more than a six-fold increase under UV-B compared with sunlight.

These results make sense. When mushrooms were sliced, more ergosterol-rich surface area was exposed. The indoor UV light was more intense than sunlight. The combination of these resulted in more vitamin D being produced. Although up to 12



Vitamin D (IU/100 g) Production in Shiitake Mushrooms Upon Exposure to Sunlight or UV

hours of sun exposure to upside-down (gills up) shiitake created 46,000 IU of vitamin D, I'm sure sliced ones would give you more, as the surface area would increase. However, the sun is a convenient source of UV-B, whereas setting up a UV-B light chamber is not.

But how?

Okay, okay—here's how to do it:

1. Obtain fresh organic shiitake, maitake, button, oyster, shimeji, or other mushrooms.

2. On a sunny day in June, July, or August, slice the fresh mushrooms. Arrange them evenly on a tray exposed directly to the sun from 10AM to 4PM.

3. Before nightfall, cover the mushrooms with a layer of cardboard to block moisture from dewfall.

4. The next clear day, repeat exposure to the sun from 10AM to 4PM.

5. Remove the mushrooms and finish drying (if necessary in a food dehydrator until they are crispy).

6. When thoroughly dry, store in a glass jar or sealed container. Adding a tablespoon of uncooked rice as a moisture absorber will help keep the mushrooms dry. The mushrooms should be good for a year or more, depending upon conditions.

7. Take 10g daily per person, about a small handful. Rehydrate in water for one hour. The mushrooms will swell. Then cook as desired.

How much of the vitamin D from consuming mushrooms makes it into the bloodstream? Comparing 26 people who took a vitamin D2 supplement to 26 others who ate vitamin D-enriched mushrooms four times per week for five weeks, researchers at the University Medical Center in Freiburg, Germany, found that the serum levels of vitamin D were similar. They used button mushrooms exposed to UV light that resulted in 20,000 IU/100g fresh weight. Subjects ingested 120g (~24,000 IU) fresh vitamin D-enriched mushrooms, which is about a quarter of a pound. Results showed that similar levels of vitamin D were absorbed into the blood in both groups: those who ingested a supplement in pill form and those who put freshly cooked mushrooms in soup. By the end of the study, both groups' serum vitamin D levels had increased to ~50 nmol/L, which is considered to be a healthy baseline level. A general consensus among health care practitioners is that you need to replenish your vitamin D so blood serum levels are between 50 and 125 nmol/L of 25-hydroxyvitamin D. Care should be taken to avoid over-supplementation, as serum levels over 125 nmol/L can be hazardous.

Not only are mushrooms wonderful sources of vitamin D, but also, they offer us many opportunities for maintaining and improving health. Whether you expose cultivated mushrooms, or wildly harvested edibles, both become jam-packed with vitamin D after light exposure. Mushrooms are truly super foods! Δ

References & Resources

1. NIH Office of Dietary Supplements Fact Sheet on Vitamin D. ods.od.nih.gov/factsheets/VitaminD-HealthProfessional.

2. Beelman, R. & M. Kalaras. Post-harvest Vitamin D Enrichment of Fresh Mushrooms. HAL Project# MU07018 (April 30, 2009), Penn State University. US Mushroom Council & Australian Mushroom Growers Association. mushroominfo.com/wp-content/uploads/PSU_Vit_D_Mushroom_Study.pdf.

3. Holick, M.F. Vitamin D Deficiency. *New England Journal of Medicine,* 2007; 357(3):266-81.

4. Institute of Medicine. *Dietary Reference Intakes for Calcium and Vitamin D*. 2010. Washington, DC.

5. Lappe J.M., Travers-Gustafson D., Davies K.M., Recker R.R., Heaney R.P. Vitamin D and calcium supplementation reduces cancer risk: results of a randomized trial. *American Journal of Clinical Nutrition.* 2007; 85(6):1586-1591.

One hundred grams (~ 3.5 oz.) of freshly cut shiitake mushrooms

6. Rejnmark, L. Vitamin D with Calcium Reduces Mortality: Patient Level Pooled Analysis of 70,528 Patients from Eight Major Vitamin D Trials. *Journal of Clinical Endocrinology and Metabolism.* Published online May 17, 2012, doi: 10.1210/jc.2011-3328.

7. Stamets, P. & G. Plotnikoff. Anticancer Medicinal Mushrooms Can Provide Significant Vitamin D 2 (Ergocalciferol). *International Journal of Medicinal Mushrooms*. 2005; 7(3):471-472.

8. Stamets, P. Notes on Nutritional Properties of Culinary & Medicinal Mushrooms. *International Journal of Medicinal Mushrooms*. 2005; 7(1&2):103-110.

9. Stamets, P. *Mycelium Running: How Mushrooms Can Help Save the World.* 2005. Ten Speed Press, Berkeley.

10. Urbain, P., et al. Bioavailability of vitamin D2 from UV-B-irradiated button mushrooms in healthy adults deficient in serum 25-hydroxyvitamin D: a randomized controlled trial. *European Journal of Clinical Nutrition.* 2011; 65:965-971.

Paul Stamets has been a mycologist for more than 30 years. Over this time, he has discovered several new species of mushrooms and pioneered countless techniques in the field of edible and medicinal mushroom cultivation. Paul has written six books on mushroom cultivation, use, and identification; his books Growing Gourmet and Medicinal Mushrooms *and* The Mushroom Cultivator *(coauthor) have long been hailed as the definitive texts of mushroom cultivation. Other works include* Psilocybe Mushrooms and Their Allies *(out of print),* Psilocybin Mushrooms of the World, MycoMedicinals®: an Informational Treatise on Mushrooms*, and many articles and scholarly papers. His newest book is* Mycelium Running: How Mushrooms Can Help Save The World*, available from Fungi Perfecti (www.fungi.com).*

Using Herbs for First Aid, Survival, and Preventive Care

The Herbal Medic

Sam Coffman

THE TITLE OF THIS ARTICLE may conjure a variety of images for the reader. For me, it summarizes my own experiences as a teacher and herbalist who has used plant medicine for over 25 years.

As a US Special Forces (aka "Green Beret") medic, I became very interested in plant medicine. Combining the "ditch medicine" or "survival medicine" approach of the Special Forces Medic with healing herbs (many of which are often used in one way or another by pharmaceutical companies in developing drugs), always seemed like a natural combination of healing modalities to me. Therefore, my approach both in this article and as a teacher and herbalist is usually based on starting out with a bare minimum (or complete lack) of medical supplies. If you can be successful in first aid or home medicine with almost nothing beyond local plant medicine, then you will have no problem being a very competent medic when adequate medical supplies are available.

Your goal may be simply to make sure your family has what's needed for sustained medical care in the closet.

The majority of illnesses and injuries I have treated as an herbalist are issues that often send people to an emergency room. This includes infections such as strep throat, cellulitis, staph, middle ear infections, urinary tract infections (UTIs), and injuries that range from sprains and strains to dislocations and simple fractures. Although plant medicine (phytotherapy) can be a very effective treatment for chronic illnesses and chronic, injury-related dysfunction, my personal focus has been emergent medical situations and preventive care. In addition to these uses of medicinal herbs, we teach a wide range of other subjects, including post-disaster survival, homesteading, wilderness survival, and primitive living skills at my survival school, The Human Path (www.thehumanpath.com).

Left: Twist-leaf yucca (Yucca rupicola)*—yucca roots macerated in water make an effective, yet mild, natural detergent for hygiene and wound-cleaning. Right: Pleurisy* (Asclepius tuberosa)*, most commonly known as a superlative herb for respiratory ailments, has many other uses.*

I would like to present this information to you from the perspective of setting up an herbal first aid station. What kinds of herbs would you need to do this, and why would you pick those particular herbs? Your goal may be simply to make sure your family has what's needed for sustained medical care in the closet. Or, you may want to create a first aid supply for your neighborhood, for a primitive camp, or maybe in the middle of an urban area after a major disaster, or a number of other settings—both post-disaster and day-to-day. In order to do this, let's walk through some of the most critical, fundamental aspects of how we would take care of loved ones, ourselves, or people with injuries and illness, using the medicinal plants that grow in our backyards and all around us—in the city and in rural or remote areas.

This article is at best a brief overview. If you're interested in plant medicine, bear in mind that although you can learn some very practical and helpful skills quickly, it takes years of study to become proficient in the use of herbs. And even then, the amount of herbal knowledge that has been lost over the past several hundred years is enormous—there is always more to learn.

Sanitation and hygiene

Before getting into plants to use for acute care and illness, let's explore the fundamentals of hygiene. In health care of any kind, the most basic and yet highly effective set of skills relate to hygiene and sanitation. In a post-disaster situation, where sewage, dirty water, and garbage may be an integral part of your daily landscape, or on a rural homestead, where you may not have all the comforts of city dwellings, hygiene and sanitation are necessary and integral to medical care. For example, just being able to keep a wound clean, or being able to wash your skin that has bug bites or scratches on it, can mean the difference between healing and infection. It is far easier to avoid infection than to cure it. However, most of us who live in modern houses take this kind of hygiene for granted. Being able to wash or shower whenever you want is so commonplace that we don't put any

Wound Healing Phase	Herbs to Use
coagulation	astringent herbs: shepherd's purse (*Capsella bursa-pastoris*), oak bark (*Quercus spp*), wild geranium (*Geranium spp*), lantana (*Lantana spp*) (external ONLY!), bilberry (*Vaccinium myrtillus*), yarrow (*Achillea millefolium*), raspberry/blackberry leaf (*Rubus spp*), chaparral (*Larrea spp*) (all of these are used externally)
inflammation (on broken skin)	anti-inflammatory herbs such as: black cohosh (*Cimicifuga racemosa*), willow/birch/alder/oak bark, meadowsweet (*Spiraea spp*), chaparral (*Larrea spp*), horsetail (*Equisetum arvense*), aloe (*Aloe vera*), lobelia (*Lobelia inflata*), self-heal (*Prunella vulgaris*), lantana (*Lantana spp*) (external ONLY!), poke root (*Phytolacca americana*) (mostly external, some can be used internally as well)
proliferative	chaparral (*Larrea spp*), comfrey (*Symphytum officinale*), horsetail (*Equisitum arvense*), self-heal (*Prunella vulgaris*), poke root (*Phytolacca americana*) (all of these are used externally)
remodeling	comfrey (*Symphytum officinale*), vitamin E, horsetail (*Equisitum arvense*) (for external use)
anti-pathogenic	chaparral (*Larrea spp*), acacia (*Acacia spp*), honey (untreated), aloe (*Aloe vera*), echinacea (*Echinacea spp*), poke root (*Phytolacca americana*), lantana (*Lantana spp*) (for external use)
lymph/immunity	poke root (*Phytolacca americana*), blue flag (*Iris versicolor*), echinacea (*Echinacea spp*), red root (*Ceanothus spp*) (all for internal use)

plant that I use all the time is yucca. There are many yucca species, and all of them have a root that is very high in saponins. In fact, native Americans used yucca to make shampoo. Chopping the root (fresh or dried) and mixing with water creates a sudsy water that removes dirt very well.

Herbal wound treatment

Now that we've addressed hygiene, let's talk about the healing of external wounds once we've cleaned them. To help understand the body's process of healing a wound (puncture, tear, cut, abrasion), we can treat the process of wound healing as a series of phases. For example, healing a cut would follow approximately the following course:

1) coagulation (0-3 hours)
2) inflammation (3 minutes-3 weeks)
3) proliferative (3 days - 3 months)
4) remodeling (3 weeks-3 years)

These phases overlap, and the time for each one depends on the depth and severity of the wound, the body's immunity, age, health, diet, and stress.

We're also concerned with preventing wound infection. So especially during phases 1, 2 and even part of 3, we have to ensure that we are keeping the wound clean and using anti-pathogenic herbs as part of the treatment.

Just placing a pressure bandage or even manual pressure on a laceration will help stop blood loss (phase 1). However, there are other important goals we want to accomplish in helping an external wound not only to heal, but to heal quickly with a minimum of inflammation, infection, and scarring. Although wound healing can be broken into a series of phases, the herbalist must be aware of all the phases during any stage of wound healing. For example, you wouldn't want to tie up the wound with a filthy rag. This would reflect focusing with tunnel vision on hemostasis, or stanching blood flow (phase 1), but simultaneously

thought into how to duplicate this kind of cleanliness in our environment when it's not as simple as turning on the tap.

In addition to cleaning out wounds, you need to be able to purify water and sterilize bandages, instruments (tweezers, scalpels, needles—not for surgery, of course, but for common medical issues that require a sharp edge or point, such as deep thorns and splinters, abscesses, or embedded glass, coral, gravel, or other foreign material.)

Water purification can take many forms, from expensive filters to home-made filters, slow-sand filters, and boiling. The primary points to remember are:

• Pre-treat—get rid of turbidity first, and make the water as clear as possible as your first step in purification. You can accomplish this by straining through cloth, gravel, sand, or charcoal. After this pre-filtration step, the rest of the purification process will be more effective.

• Inactivate pathogens—boiling is the fail-safe method of purification when it comes to pathogens. You can kill all pathogens by exposing them to heat. Simply heat water to a rolling boil for a few seconds (as long as you're within a few thousand feet above sea level).

• Remove chemical contaminants—filtering water through charcoal is an effective way to remove many of the man-made toxins that can be in water from agricultural or other runoff.

Once you can consistently produce purified water, effective hygiene is possible. Heating water and adding a surfactant is a good way to clean the skin. In the absence of soap, some plants provide very good surfactant qualities due to their content of natural detergents called saponins. One

Immune-supportive herbs can be applied externally and often internally (depending on the herb)

creating infection, greater inflammation, and eventually worse scarring.

Providing herbal support to the immune (lymphatic) system will speed healing. Immune-supportive herbs can be applied externally and often internally (depending on the herb).

The following table presents some herbs, grouped by these stages of wound healing, that we can use for injuries including broken skin, cut/torn partial connective tissue, and even muscle from a laceration or deep abrasion.

Anti-infectious herbs

Aside from wound healing, human illness often involves some type of infectious agent. That's not to say that all illness is caused by pathogens only—a weakened immune system (through exposure to man-made or natural toxins, fatigue, hunger, sleep deprivation, or other forms of stress) and exposure to a pathogen tend to lie at the root of acute and chronic illness. We briefly talked about herbs that strengthen the immune system in the wound-healing herb chart above. However, what about herbs that are anti-pathogenic when taken internally?

There is a common misunderstanding that herbs are like antibiotics or steroids. You take the herb orally like a pill, and it directly kills all bacteria (good and bad), for instance. Although many herbs are highly anti-pathogenic, this is not an effective way to use herbs. Remember that the real goal when using herbs is to help the body's own natural immunity move back

Pathogen Type	Highly Effective Herbs
viruses	chaparral (*Larrea spp*)—herpes family viruses such as HSV 1 & 2, EBV, CMV, chicken pox, shingles yarrow (*Achillea millefolium*)—cold and flu, muscle aches, "sweating out" the virus elderberry flower (*Sambucus nigra*)—cold and flu, "sweating out" the virus goldenrod (*Solidago spp.*)—cold and flu, runny nose, sinus congestion boneset (*Eupatorium perfoliatum*)—antiviral, muscle aches, "sweating out" virus, immune & lymph support echinacea—immune & lymph support all sages/salvias—upper respiratory infections, throat, sinus
bacteria	usnea (*Usnea spp*)—staph, strep, tuberculosis oak (*Quercus spp*)—staph, esp. externally goldenseal (*Hydrastis canadensis*), algarita (*Berberis trifoliolata*)—*E. coli*, salmonella, cholera, typhus boneset (*Eupatorium perfoliatum*)—immune and lymph stimulant like echinacea, to fight bacterial infections echinacea—immune and lymph stimulant green chirayta (*Andrographis spp*)—especially spirochetes spilanthes (*Spilanthes acmella*)—immune and lymph stimulant, broad-spectrum anti-bacterial elecampane (*Inula helenium*)—broad-spectrum anti-bacterial garlic (*Allium sativa*)—broad-spectrum antibacterial acacia (*Acacia spp*)—broad-spectrum antibacterial
protozoans	goldenseal (*Hydrastis canadensis*), algorita (*Berberis trifoliolata*), Oregon grape (*Mahonia aquifolium*), green chirayta (*Andrographis spp*), spilanthes (*Spilanthes acmella*), acacia (*Acacia spp*)
worms	wormwood (*Artemisia spp*), black walnut (*Juglans nigra*), oak (*Quercus spp.*), areca palm (*Dypsis lutescens*), ginger (*Zingiber officinalis*), elecampane (*Inula helenium*), myrrh (*Commiphora momol*), goldenseal (*Hydrastis canadensis*), garlic (*Allium sativa*)
fungi	Oregon grape (*Mahonia aquifolium*), black walnut (*Juglans nigra*), wormwood (*Artemisia spp*), garlic (*Allium sativa*)

into balance so that it can heal itself.

Just as in allopathic medicine, identifying the type of pathogen is an important step in determining the herb(s) to use. Human pathogens generally fall into five classes:

• viruses: influenza, EBV, HIV, herpesviruses, varicella-zoster (chicken pox, shingles)

• bacteria: staph, strep, E. coli, many others

• protozoans: giardia, cryptosporidium, pathogenic amoeba

• helminthes ("worms"): round worms like hookworm, flatworms like tapeworm

• fungi: yeasts

Although it is necessary to oversimplify because of the limited length of this article, here are a few common herbs that, as antibiotics or immune stimulants, can provide palliative care for symptoms such as runny nose, muscle aches, or headache (see chart on the previous page).

Organ System or Disease Process	Medicinal Herbs
lower respiratory system (infections, coughs, etc.)	pleurisy root (*Asclepius tuberosa*), antelope horns (*Asclepias asperula*), elecampane (*Inula helenium*), horehound (*Marrubium vulgare*), mullein (*Verbascum thapsus*)
urinary tract infections (UTI)	uva ursi (*Arctostaphylos uva-ursi*), pipsissewa (*Chimaphila umbellata*), juniper (*Juniperus spp*), horsetail (*Equisetum arvense*)
liver (tonify & support)	milk thistle (*Silybum marianum*), burdock (*Arctium lappa*), dandelion root (*Taraxacum officinale*), Oregon grape (*Mahonia aquifolium*)
upper respiratory system, throat (infections, irritations)	sage (*Salvia spp*), echinacea (*Echinacea spp*), elecampane (*Inula helenium*), marshmallow root (*Althea officinalis*)
digestive system (infections, irritations)	goldenseal (*Hydrastis canadensis*), algerita (*Berberis trifoliolata*), Oregon grape (*Mahonia aquifolium*), marshmallow root (*Althea officinalis*)

Knowing how to make and use all of these preparation methods is as important as knowing the herb itself.

Common medicinal plant uses for body systems

We can organize medicinal plants according to their affinity or application to specific body systems. For instance, pleurisy root is an extremely effective relaxing expectorant, and is very good as a respiratory herb. Using another table, I'd like to point out some of the most common and useful medicinal plants as they are used for different organs, organ systems, or disease processes. Again, there is much more to this process than just taking an herb for a specific organ system or disease process that you read about somewhere (including this article). However, this is one way to explore the possibilities of healing herbs. (See chart upper right).

Elecampane. Photo by John Powers via Flickr.

How can you take herbs?

One of the advantages that herbs allow over conventional medicine is that the route of ingestion or absorption by your body can be much more varied. This allows us to place the herb or extract directly where it can be most effective. Taking an herb orally means that it has to pass through the digestive system before being absorbed into the bloodstream, then filtered through the liver, before finally exerting its effect. At The Human Path, we make tinctures (of alcohol or vinegar), glycerites, salves, oils, liniments, cough syrups, capsules, baths, poultices, plasters, suppositories, steam inhalations, eye washes, throat sprays, teas (infusions), decoctions, and more.

Knowing how to make and use all of these preparation methods is as important as knowing the herb itself. Often, direct application of the herb (or solution containing much of the herb) to the part of the body that needs it, means a much more effective pathway to help the body heal. Δ

Sam Coffman is founder and lead instructor of The Human Path, an ecology-based school in the San Antonio area that teaches wilderness living and survival skills, herbology, disaster preparedness, urban survival, outdoor fitness, self-defense, wilderness medicine, leadership, and more. Sam grew up exploring and learning about wilderness camping and woodcraft, as his family spent summers in isolated self-supporting wilderness camps due to his father's job as a field geologist. He studied botany and bioregional medicine both privately and at several outdoor schools in Colorado. He taught herbology and wildcrafting for the Boulder School of Natural Medicine and spent several years testing his own primitive living skills in the Rocky Mountains, on solitary survival excursions with no equipment but a knife.

A Permanent Food Source

Edible Insects

Roman Shapla

"You don't have a snail problem.
You have a garlic-and-butter deficiency."

ONE OF MY FAVORITE THINGS about teaching permaculture to kids is that they are free from most of the social conditioning that has led to our current ecological crisis.

A few years ago, our children were exploring the garden with a friend of ours. They came running up to us brimming with excitement. They'd discovered something delicious and wished to share it with us. As we wondered what new vegetable or herb had excited their palate, they shouted in unison, "Ants!"

Our friend, who had recently returned from Central America, showed them how to place a drop of honey in the center of a mint leaf. A healthy pinch of ants (easily found in the garden) were sprinkled on top and the leaf was then folded and eaten whole. As the kids ran off in search of more ants, I remembered the time a few years ago when tens of thousands of cicadas emerged from their 13-year dormancy and completely covered trees and buildings. The noise was absolutely deafening. People spent hours spraying, smashing, and hosing them away. In the midst of all this hysteria, two exchange students from China were calmly walking down the street, plucking cicadas to fill their bags. These young women were a living example of the principle, "The problem is the solution." My cross-cultural curiosity aroused, I decided to sauté some for myself and found them most delectable.

The author's eight-year-old daughter, Joya, feasting on a grasshopper.

No doubt a large factor in non-European attitudes toward entomophagy lies in the recognition that insects are extremely nutritious.

This experience resurfaced shortly after we moved to the Pacific Northwest, due to the abundance of snails in our garden. One evening when setting out a saucer of beer for them, I remarked how tragic it was that perfectly good beer was being wasted. Then it hit me—why not eat them? I collected a few dozen and placed them in a mason jar with cornmeal. Next, I moved them into a new jar with a carrot (to ensure their insides were thoroughly cleansed). The result: locally wildcrafted escargot!

Of course, such culinary forays require overcoming a minor mental hurdle, but this is easy once we acknowledge our attitude toward insects is socialized into us. After all, insects are eaten in almost every country around the world, with the US (and, to a lesser extent, a few European countries) being the major exception. But our relationship with bugs has not always been this hostile. "In pre-modern times," Wolf Storl writes in Culture and Horticulture, "the relationship between man and the little beasties has been one ranging from delight, to awe, to reverence, to respect." He goes on to add, "In many instances bugs were not considered in a negative sense at all, as children's rhymes and peasant sayings indicate. Some bugs were sacred to humanity." They have been a regular part of the human diet since time immemorial. No doubt a large factor in non-European attitudes toward entomophagy lies in the recognition that insects are extremely nutritious. They are an excellent source of protein, vitamins (including vitamin B12), and minerals, and tend to be low in carbohydrates. Often called "mini-livestock," insects are super-efficient at energy conversion—according to some reports, up to nine times more efficient than beef. When viewing insects as a form of catching and storing energy, the permaculture system begins to appear even more productive than originally planned. Additionally, unlike animals that are reared, insects flourish on their own accord making them one of the best ways to obtain a yield with the least amount of labor.

Out of more than 1,400 species eaten by humans, the most common are grasshoppers and crickets. Many are surprised to learn that Leviticus 11:21 encourages the consumption of these two (along with the locust and the katydid). A common argument in favor of entomophagy lies in the fact that our culture regularly

consumes lobster, crab, crawfish, and shrimp, all of which belong to the same biological group (the phylum Arthropoda) as insects. Remembering this will help integrate rather than segregate insects into our diets and ensure that we produce no waste.

Incorporating insects into our diets could be just one way of using small and slow solutions to the global food crisis. The UN has even creatively responded to change with a 2008 conference to promote the human consumption of insects.

In all honesty, one must admit that insects are already part of our diet. Sandor Katz notes, "everyone (including the strictest vegan) who has ever eaten anything has unintentionally eaten millions of insects," from contaminants in industrial production to tiny hitchhikers on your locally grown produce. There is even an FDA guideline of acceptable insect parts allowed. Perhaps it is time to use the edges of our gardens and value the marginal species. We can do this by applying self-regulation to our ethnocentric worldview and accepting feedback from indigenous cultures and young children. Δ

Grasshoppers
by Nanao Sakaki

Hi Fred!
You don't want to have
Vegetable garden this summer, do you?

-No, too many grasshoppers.

Why don't you eat them?

-Prairie Shrimp-!

Catch with butterfly net
Take off legs
Saute in butter
Eat with garlic and soy sauce.

Next morning
Give your shit back to the garden;
Now with numberless grasshoppers

Sing songs
Hop
Jump
Dance
Forever
January 28, 1981

Resources

1. The best place to find more information about entomophagy is the impressive Food Insects Newsletter edited by DeFoliart, Dunkel, and Gracer. It is packed with over 400 pages of traditional knowledge, modern science, recipes, nutritional comparisons, folklore, and even medicinal uses. Available from www.hollowtop.com,
2. Katz, Sandor Ellix. (2006). *The Revolution Will Not Be Microwaved: Inside America's Underground Food Movements.* Chelsea Green.
3. Sakaki, Nanao (1987). *Break the Mirror: The Poems of Nanao Sakaki*. North Point Press.
4. Storl, Wolf. (1979). *Culture and Horticulture: A Philosophy of Gardening.* Bio-Dynamic Literature.
5. www.food-insects.com
6. worldento.com

In all honesty, one must admit that insects are already part of our diet.... Perhaps it is time to use the edges of our gardens and value the marginal species.

Roman Shapla is an environmental educator living in Salem, Oregon, Cascadia Bioregion. In 2007, he founded the Children's Permaculture Guild to offer free kids classes on primitive skills and permaculture through cooperative games, natural art, and hands-on activities. He graduated in Anthropology and is presently working on his Masters in Education with a focus on designing a permaculture-based curriculum for public schools. Roman is also the editor of Kurent: A Journal of Permaculture for Children, Parents, and Educators. *He is currently working at a children's museum where he develops educational programs, classes, and camps for the 20,000+ annual visitors. He can be reached at kurentjournal@hotmail.com.*

Prime appetizers of tarantula and cucumbers.
Photo by istolethetv via Flickr.

Cultivating College Nutrition and Food Resilience

A Forest Garden on Campus

Macon Foscue

A UNIVERSITY IS A CENTER OF LEARNING where young minds gather to be ripened through contemplation of global systems, discussions between diverse perspectives, and unique personal experiences that shape growth and development. College is the first time many young students feel a sense of freedom and self-choice, along with the responsibility and apprehension that follow. For me it marked the beginning of a conscious look at the food I was putting into my body, where it came from, and the stories it carried. When I shone a light on the contemporary supermarket food system, I was shocked and distraught, yet inspired to find an alternative way to nourish bodily and mental growth. Now, three years later, after exploring the food systems that dominate much of our world, I've found that alternative in permaculture-based forest gardening.

In order to share the whole-systems, ecological approach of permaculture with the university community, I began a collaborative project to create a model forest garden consisting of a diverse range of fruit, nut, berry, and medicinal plants of all shapes and sizes, on the campus of the University of North Carolina in Asheville (UNCA). The story below offers a look inside our project, which brought an innovative form of landscaping to UNCA along with a new perspective on food and nutrition, one that reintegrates food systems with the natural ecology of the area.

Comprising natives and non-natives, the forest yields could be used in cooking classes and medicine-making workshops...

Visioning

The first step toward success in any project is to state an idea or vision that points toward a goal to pursue. The goal of our project was to provide a living example, in the form of a food forest, for use in teaching students, faculty, staff, and community members about permaculture principles. Comprising a variety of native and non-native species, the forest would have yields that could be used in cooking classes and medicine-making workshops, as well as for browsing by hungry college students and potentially future sales to on-campus dining services. An additional goal was to use the forest garden as a stepping stone for an even larger Edible Campus Initiative, to cover the campus in food-bearing plants.

A merry band of forest gardeners.

Gathering resources

With these goals in mind, I presented my idea to my faculty advisor, Dr. Dee Eggers, an Environmental Studies Professor, and created an undergraduate research project. Dee then scheduled a meeting with Melissa Acker, Landscape Director at UNCA, to discuss a possible location for the garden. Through collaboration with Melissa, we chose a prominent location, with full sun on a slight slope overlooking the rear entrance to the university. We also decided to apply for a $1,500 Green Grant through the Student Environmental Center (SEC) to fund the project. Funding for these is best facilitated by a knowledgeable faculty member who knows the ins and outs of the campus budgeting scene; adequate funding is essential for a successful campus forest garden project. Having access to funding greatly aids in quickly acquiring and preparing all the necessary components (soil amendments, plants, professional advice). While it's possible to plant a forest garden on a low budget, it takes more time. After the SEC approved the project grant, we began to reach out to other open-minded faculty members in related fields of study and to broadcast the idea of using the site as an educational tool.

Design

Not yet having a Permaculture Design Course under my belt, and being an enthusiastic, yet unripe permaculturist in my heart, it was only natural to reach out for help. I turned to local permaculture entrepreneur and university alumnus, Zev Friedman for

advice and pointers in the design process. Finding experienced regional permaculturists can be mutually beneficial. In exchange for a little university funding, they can offer in-depth knowledge on regional climate, soil, and appropriate plants: essential information for getting off to a good start. Using the permaculture principle of Observe and Interact, Zev and I began to assess what plants and earthworks we could use to manage the incoming energy (sunlight and water) in the most efficient ways. On a small site (roughly 4,500sf), we were limited in our ability to mobilize water resources: a major challenge would be keeping the young plants watered as they grew in full sunlight. Fortunately, the recently built Facilities Management building directly adjacent to the garden already had a rainwater catchment system, a direct example of the principle of Catch and Store Energy. Along with regular wood chip mulching, rainwater from this system would provide enough soil moisture retention to keep the roots of young plants from drying out. With this in mind, Zev and I assembled a list of trees, shrubs, herbaceous perennials, and ground covers to use in the garden. The principle of Integration tell us that it is not the diversity of components, but rather the diversity of beneficial connections, that lends a system stability and self-regulation. Using Zev's knowledge of symbiotic plant guilds and incorporating numerous species of nitrogen-fixers to boost soil nutrient content, we began to piece together a planting schematic. The final design called for 26 species of shrubs, trees, ground cover, and perennial herbs—a prime example of Use and Value Diversity.

Are we content to be grown with synthetic fertilizers and poisonous chemicals? Or do we want to be grown... in a forest that is healing the Earth?

To manage water during rainfall events, three swales and berms were designed very slightly off contour, to encourage percolation of runoff into groundwater, and to direct water towards moisture-loving plants (i.e., persimmons). Filling the swales with mulch and using them as paths would also demonstrate Stacking Functions, another aspect of Integration.

Site preparation

Before installation of the plants, a great deal of work had to be done to prepare the host soil. Prior attempts at growing grass on the site had been partly successful, thanks to leaf mulch that was tilled in during the previous winter. We began in the spring, and Zev's idea was to triple the organic matter content (using leaf mulch), while adding greensand (for potassium and trace nutrients), bonemeal (phosphorous), and gypsum (calcium sulfate) using funds from the Green Grant. Pelletized lime was applied to alkalinize the soil only in places not to be occupied by acid-loving plants. We had the help of the landscaping crew in procuring leaf mulch and tilling it, along with the other amendments, into the soil with their tractor.

Plant preparation

We gathered plants from several local sources in western North Carolina. The Useful Plants Nursery at Earthaven Ecovillage delivered about half; a personal friend and Outreach Coordinator for the Appalachian Center for Agroforestry, Frank Salzano, supplied most of the rest. Dr. Eggers contributed 12 blueberry bushes, and Zev brought a couple of hazelnuts, sochan (*Rudbeckia laciniata*), and comfrey into the mix. Our generous grant from the Student Environmental Center paid for all the plants. Due to commercial shortages, we were unable to acquire all 21 goumi berries called for in the design. Another last-minute change, a reduction of a 5' strip around the plot, gave us the opportunity to Adapt and Respond Creatively to Change. We tweaked the design slightly, moved some plants around, and with two days left before the planned workshop and installation, we were ready to go.

The site in February 2012.

Installation

A cool, blustery Saturday in late March saw the culmination of a year-long vision and three months of planning. The plan for the day was to have my project mentor, Zev, give his forest-garden presentation in the morning to an assembled group of volunteers and for us to put the theory into practice later in the afternoon. Twenty-three students, faculty, and community members listened to Zev's powerful message; after lunch, we walked out to the future forest garden. After a brief overview of the site, Zev and I presented the design and challenges. Then the work began. One team prepared planting mix from fresh llama manure that my faculty advisor and I picked up from a local farm, while another team started digging holes to plant the various trees and other plants. The landscape director and I had flagged all the locations of the plants beforehand, to help with coordination.

After an hour or so, when most of the plants were nestled in their new homes, mulching and swale-digging began. Mulch provides a protective barrier atop recently disturbed soil. The mulch prevents erosion during rainfall events, preserves soil moisture between rains, and suppresses weed growth around newly planted trees and shrubs. After three hours of hard work in the hot sun, one tends to become a little punchy. Our merry band of forest gardeners invented the "mulch song," laughed freely, and worked until soreness had crept into nearly all of our muscles. Over the course of an afternoon, a diverse group without much prior relation developed into a community, with a common goal and a vision to heal the earth. The effectiveness of such a group of determined individuals was clear—we had anticipated having multiple work days to complete the installation, but as the end of the day drew near, almost all of the installation work was finished.

Looking forward

There was one final work day in April when Dr. Irene Rossell's Plant Ecology class joined me in installing more plants and mulch on the site. This gave an opportunity to test a future model for the maintenance and expansion of the forest garden. This model will encourage professors to bring their classes out to the garden to learn from it and to give back, in the form of upkeep chores. During the summer months, it's been my job to keep track of the weather and to water the young plants when conditions become dry. Luckily, in southern Appalachia, we escaped the drought of 2012, and almost all the plants are doing very well.

Permaculture teaches us to Consider Succession when making plans—as ecosystems and communities don't stand still but are dynamic. Although I am very pleased with how far the campus has come, I don't underestimate the challenges that lie ahead. Coming into my final semester of university, I am working to expand the campus permaculture movement so that it will continue to grow after I have moved on. At this stage, education and maintenance are the two main priorities. We have already hosted two workdays this fall, and over 25 student volunteers have stepped up to help maintain the site by mulching and fertilizing. Working with a local graphic designer, we're planning to create signage to open up the garden to more individual educational exploration. In addition, we plan to bring tours into the forest garden to provide an example of an alternative to the modern industrial food system and to illustrate the diversity of yields that a forest garden offers. Through these endeavors, I hope to Observe and Replicate Natural Patterns, such as that of a tree. After growing and spreading its limbs for many years, the edible forest garden will one day blossom, dispersing its seeds, in the form of student permaculturists, onwards to new soil, where they can continue to grow and transform our world with a culture that is truly sustainable.

The site after installation. August 2012.

Although this project is just beginning to grow, I cannot help but offer appreciation to all the folks around the UNCA campus who have given their support. It is impossible to emphasize enough the importance of a network of allies to the success of a campus forest garden. Landscape Director Melissa Acker was enthusiastic about student involvement in landscaping projects, and although this may not be the case at every university, having a faculty advisor to vouch for the student goes a long way towards success. If I could do one thing over, I would have included more students in the design and planning phase with Zev Friedman. Although that might have made things logistically challenging, it would have secured a stronger sense of ownership to those who will remain after I graduate. Even so, I'm confident that the strength of the permaculture message will shine through to those who can see it and that they will carry the campus forest garden to new heights.

...I'm confident that the strength of the permaculture message will shine through...

Although the garden has only begun producing a few yields (strawberries, tea leaves, and lemon balm), harvests from the assortment of fruit, berries, nuts, and other edibles will increase each year until the garden reaches maturity. As we progress to that point, the garden will be become a demonstration of permaculture for all those who visit, showing the nutritious production potential that can be achieved almost anywhere. We are working to make edible landscaping the norm at UNCA, so that pawpaw patches and blueberry bushes line the academic buildings and fuel a range of student activities far into autumn with delicious, nutritious food directly from the source. Connecting the UNCA community to campus food production will raise the bar for other universities in our region and encourage an evolving perception of the reality that we are what we eat; are we content to be grown with synthetic fertilizers and poisonous chemicals? Or do we want to be grown with respectful appreciation and nourishing soil, in a forest that is healing the Earth? Δ

Macon Foscue is a graduating senior studying Environmental Sustainability, Consciousness, and Community, an Interdisciplinary Degree Concentration at UNCA in the Blue Ridge Mountains of western North Carolina. Macon is about to embark on an apprenticeship in permaculture to deeply clarify the natural web of connections and how we as humans can learn to live and adapt to changing habitats in congruence with all children of mama Gaia.

An Adventure in Home Brewing

Beer for Health and Happiness

Phil Wages

AS I SIT HERE WITH A HOMEBREW IN HAND (a friend's recipe for a bitter, which is a lighter English-style beer with low alcohol but high flavor), I reflect on what brought me to my status of future brewery owner as I find myself exploring the world of permaculture and contemplating my first magazine article. When I was asked to write "about brewing beer... and fermentation," the term permaculture had meaning for me, but not a terribly clear definition. Visions of sustainable practices, wind power, recycling, and gardening flooded my mind, and I settled on what I thought would be perfect for the permacultural mind: a description of beer making mingled with some instruction and just a dab of sustainable influence—all told through a firsthand account of discovering the craft beer culture and the world of homebrewing.

Hello, I love you

In 2004, I attended a friend's party and found a keg of Mac and Jack's African Amber Ale driven down from Washington State. Previously, I hadn't drunk beer at all because it just didn't appeal to me, but I decided to give it a taste anyway. Was I ever impressed with the complex flavors of the Mac and Jack's! From there, I quickly discovered the craft beer world, and spent a lot of time trying every new beer I could get my hands on.

Four years later, I had graduated to supplying craft beer kegs to parties (sometimes driving 45 minutes each way just to pick up a keg from local brewery Little Yeoman); at one such party, a friend suggested we could actually make our own beer, to which I replied, "Yeah! That'd be great!" A few months later, we were brewing a beer kit of Peat Smoked Porter and were quickly being blown away by the even more amazing flavors one could get from homebrewing. I knew one thing: we were doing this again!

Brewing requires a substantial brew kettle with temperature gauge. Here we're raising the temperature for the brew.

I had also learned that brewing beer brings people together. Maybe it's the sense of accomplishment one gets from the ritual of brewing, or maybe it's the social communion that always accompanies said ritual, but whatever the case, I'd learned that homebrewing was definitely more of a community event than a solitary endeavor.

...start small and slow, with a malt extract beer kit that can be found at any local brewery store on online.

So happy together

We continued brewing, and after three or four kits, I really wanted to design my own beer, and so did my cohorts. We developed a recipe for a Scottish style ale, which is a brew that can be very sweet, darker orange-brown in color, and somewhat high in alcohol. Showing our dedication to the craft, we bottled it on Easter Day with a hangover and dubbed it Zombie Jesus Scottish Ale. Two weeks later, once the bottles had been carbonated (to carbonate, you add boiled, and then cooled, sugar water in a fairly precise amount to the bottles, and the remaining yeast convert the sugar into CO_2; you can get exploding bottles if you use too much sugar or low carbonation if you use too little), it was time to taste, and taste we did. The beer was by far the best thing we'd ever made. We knew that recipe development would continue, but not for now because our fermentation space would be too warm during the coming summer. Most yeast need to work around 55-70°F (13-21°C), but none can really exceed 80°F (27°C) without creating fusel alcohol that will give you an incredibly bad hangover—even if you drink only one beer!

Just the two of us

In the meantime, I'd been looking for a private place for my wife and me that was out of town with a garden and hopefully woods. By 2010, we'd found what we were looking for: a 30-acre (12ha) mostly wooded parcel with wild blueberries, big white oaks, a pond that's possibly spring-fed, a garden area already begun, not to mention the countless supplies that were left behind

by the previous owner such as fencing, tools, and so on. It was truly the paradise we had been looking for, and it came at a great price. We seized the day and along with it I gained the opportunity to brew in my own home as we began a new phase in our lives.

Within a couple of months, we were settled in, and the brewing bug returned. I started making experimental batches of beer in 1½-gallon (about 3.75L) amounts such as coffee stout and pecan brown ale. After a period of such experimentation, I acquired better brewing equipment that would speed up the process and improve the flavors of my creations. I was beginning to learn the ins and outs of brewing as a business.

Thunderstruck

What does efficiency mean to a home brewer? Because you need to heat and keep 2-5 gallons (7-19L) of water at boiling for 2½ hours or more, you're going to use a lot of fuel, so you want to maximize your efficiency. I currently brew with propane, but beer can be brewed on an electric stove, over a wood fire, with an immersible electronic device, or any other way to get water to the boiling point, so that it kills all bacteria present and extracts the sugars and flavors that will change water, grain, and hops into beer.

To use as little energy as possible, I moved my brewing outside to a turkey-fryer propane burner; it works much faster and with greater volumes of water. On that system, I can brew 10 gallons (38L) at a time with similar energy costs as doing 3-5 gallons (11-19L) on the stove inside, and it's much quicker.

Let's get this party started

Most people begin homebrewing with malt extract as I did. Malted grains are grains that have been sprouted and then dried quickly to halt sprouting. This process develops the enzymes needed to convert starches into sugars that can be extracted from the grains during brewing. Malt extract is a commercial preparation that has already concentrated the sugars, base flavor, and color from the malted grains. Dried into a powder or in a concentrated liquid form, malt extract is ready to use for brewing. Despite its less-than-sustainable level of manufacture, malt extract is still the preferred way to get into homebrewing because it simplifies the process and allows anyone who can turn on the stove the experience of creating his or her own beer.

But surely once you have got your feet wet, you will want to switch to all-grain brewing (without extracts); you can even malt your own grain—something few commercial breweries do, and if you live in the right area, even grow your own grains! There are tons of articles online about how to do these things, but please don't try to do it all the first time, or you will likely be overwhelmed and not want to try it again.

Instead, start small and slow, with a malt extract beer kit that can be found at any local brewery store or online. Be sure you have the basic equipment: 3-gallon (19L) or bigger kettle, heat source, thermometer, plastic bucket with lid or glass carboy with cap, airlock, empty beer bottles, bottle caps, and a capper or "flippy-top" beer bottles. You'll also want a sink or similar sized area to immerse the kettle into ice and water. Once the beer (at that stage called "wort") is finished boiling, it needs to be cooled

Always invite friends to Brew Day.

to 80°F (27°C) or lower, so that the yeast will have its best start when you "pitch" it into the wort.

The end

Upon pitching the yeast, transfer the wort into a carboy or plastic bucket and put an airlock and cap on top of it. You'll want to store it ideally in the range of 65-75°F (18-24°C; I aim for 70°F). Too low and the yeast will go dormant (unless you are brewing with lager yeast, then the range is 45-55°F or 7-13°C); too high and you'll get bad flavors and the dreaded fusel alcohol. Within a few hours (it shouldn't take more than 24, or your yeast may not be viable), bubbling should start in the airlock. Now you know the yeast is working. If you have it in a clear carboy, you will actually see the beer bubbling and flowing furiously inside!

Depending on the beer you're brewing, it can ferment for anywhere from one week to two months or more. When it's done, it's time to get out your sanitizer (a product you really need to buy) and sanitize everything, including your hands. If you touch something not sanitized, sanitize your hands again—you should probably wear gloves! You will then be bottling your beer. Clean your bottles, sanitize them, along with the caps and siphoning hose (if using one), and dry it all in a sanitized area (I use a freshly cleaned towel on a counter top).

You will also need to boil about ¾ cup of corn sugar (or table sugar, although this is less ideal) for 5 gallons (19L) of beer. Once boiled (stirring the whole time so that it doesn't caramelize), you need to cool it to that magic 80°F (27°C) or lower. Put the covered pan into the sink and surround with ice and enough water to match the height of the sugar-water level. After 5-30 minutes, it will be cool, and you will mix it with the beer.

Next, start filling your bottles, leaving about an inch or so of empty space, and cap each bottle after filling it (a two person assembly line is perfect)—40-55 bottles later, you'll be cleaning your fermentor... and waiting another 1-3 weeks for your beer to be ready.

After that first week of conditioning the beer in a room temperature environment, you need to pop one open, enjoy your masterpiece, and determine the carbonation level. If it seems like too much, then the beer should be put in the fridge to stop it from making more CO_2. If it's somewhat flat (as is most likely at this point), wait another four to seven days, and check another one. Within two to three weeks, the beer should have a good carbonation level. If not—well, something didn't work right! Fortunately, that doesn't happen too often, so by this time you can be enjoying your first homebrew. On the other hand, I invested in kegs because they are so much quicker in all respects: cleaning, filling, carbonating, and dispensing, but I recommend you start with bottling because it's cheaper, and it makes you appreciate the process.

Thom's Bitter Ale

Amount: around 5 gallons (19L)
Style: standard/ordinary bitter
Specific gravity: 1.035 (about 3.3% alcohol by volume)

Ingredients & directions
Fill your kettle with 2½-3 gallons of water (or up to 6 gallons if you have a big enough kettle) and turn the heat on. Put the following crushed grains into a muslin or cheesecloth sack and put into the water:
1 lb. Maris Otter Pale Malt
8 oz. Dark Crystal Malt (Simpsons)

Bring the water to 145-156°F (ideally 150°F or 66°C for this beer), and hold it there for about 20 minutes, then remove the sack and put the spent grains in your compost (or make dog biscuits out of them).

Start bringing your water to a boil. At 180°F (82°C) or higher, you can SLOWLY start adding the:
3 lb. Light Dry Malt Extract

Stir constantly as you add it (easier with two people). If it starts to "swell up," turn the heat down, or it will boil over creating a mess (and a tragic loss of some of your beer). Keep stirring until all the sugar lumps are gone and the foam subsides.

Once you reach a boil, you will add these at the indicated intervals:
0.50 oz Challenger hops (add immediately.)
0.25 oz Challenger hops (add at 30 min.)
0.25 oz Challenger hops (add at 45 min.)
1/2 tsp Irish Moss (add at 45 min.)

When you reach the end of the 60-minute boil, cut the heat, put on the clean lid, and set the kettle in a plugged sink that can withstand that level of heat. Fill in around the kettle with ice as much as possible, then fill the sink about halfway up the ice with COLD water. This creates an ice-water bath (32°F or 0°C), which is colder than ice alone (around 39°F or 4°C). The liquid water aids in convective heat transfer. If possible, occasionally rock the kettle gently or stir it with a freshly sanitized spoon to speed things up.

Once you get down to 80°F or below, pitch the yeast into it and mix well by stirring:
1 pkg. SafAle English Ale (DCL/Fermentis #S-04) Yeast

Put your cap or lid and airlock on your bucket or carboy, place in a cool area, and wait until bottling day! Δ

Work it now

The first session of the brewing process with a kit should take about two hours; then cooling the wort to yeast-pitching temperature needs anywhere from 30 minutes to four hours. For the most part, you'll be sipping on a cold one while waiting for things to happen and maybe plucking a tune on your guitar. The actual work probably amounts to less than 30 minutes during that time. The bottling stage may take a couple of hours (kegging can be as little as 30 minutes if you're fast).

Aside from much needed inebriation, what more will homebrew do for you? It will also increase social activity because others will want to see what it's all about, and it might even blossom into an entire club! Brewing your own beer also saves money. A typical five-gallon batch will yield about 50 beers which is just over two cases. Buying similar quality beer would cost $64 or more, but the kit might cost you only $20 or $30, and if you switch to all grain and buy 50 lb. grain sacks, you could get it down to as low as $10 for that 5 gallons, and it will be that much tastier not only because of cheaper and superior ingredients, but also because of the sense of satisfaction you get at the end of the day knowing, "I made this." Δ

Phil Wages—an avid homebrewer since 2008—plans to open Wages Brewing Company in West Plains, MO, with a focus on efficiency through sustainable practices. You can reach him at ipabrewer@philwages.com or on Facebook at Wages Brewing Company.

Traditional Foods for Pregnancy, Birth, and Nurturance

Growing Wise Children

Leigh Senna

THE FULL MOON AND HER GLOW held the evening in grace and protection. A thick, rolling stream of fog meandered at the base of our neighboring foothills. I was outside, my body was birthing a child, and I was strong and present. A short six months before conceiving my daughter, I learned about the nutritional work of Dr. Weston A. Price. To him, and the amazing and growing Nourishing Traditions movement, I owe thanks for a healthy and vibrant body, and a daughter whose body grows in the most sturdy and resilient way.

Babies are typically ready for fresh vegetables at 6-8 months.

A year earlier, my adventure had begun as I left my nest in Decorah, IA. Driving west, I knew the earth in these uncertain times needed the best of me, and my logic declared that I start with the terrain of my body. I asked myself: How do I eat without relying on fossil fuel? How can my daily routine not only nourish and sustain me, but also contribute to a thriving regenerative cultural system? I was hungry for skills, information, techniques, methods, and ways that sustained an integrated and alive body, that acknowledge Earth as primary, and that grew culture purposefully, from the ground up.

As I studied nutritional information and permaculture practices, I began to wonder—there must be a relationship between human health, soil health, animal health, and plant health. If permaculture meant a permanent culture, then at least that would require healthy bodies that could nurture healthy children! A resilient permaculture system should produce health, which it seemed to me had best been described by Dr. Price, based on his studies of traditional diets around the world. This could provide a sound foundation for permanent culture by providing a strong food heritage for our children.

Through his nutritional research, Weston A. Price discovered that all indigenous cultures eating a traditional diet received some ten times the fat-soluble vitamins and four times the minerals of peoples eating a Western diet of the same period (he published his research in the 1930s). Price also discovered that though the various cultures he studied ate very differently, all followed the same principles in their diets, and all of them were extremely healthy at the time he encountered them. He was a dentist and documented health by photographing dental arches (an indicator of skeletal competence and nutritional adequacy). The faces of the traditional adults and children he portrayed showed radiant happiness and vitality. These people knew how to eat to maintain their physical and genetic inheritance so that they led vibrant lives and passed on strong genes.

These were the principles of traditional diet he discovered:

• No refined or denatured foods were eaten.

• All traditional cultures consumed some sort of animal protein and fat.

• Total fat content varied from 30-80% of daily calorie intake, and only 4% of that was polyunsaturated oil. The rest was from saturated and monounsaturated fatty acids including butter, lard, tallow, coconut oil, olive oil, and chicken, goose, and duck fat.

• The diets were rich in minerals and fat-soluble vitamins (A, D, E, and K).

• In all traditional cultures, some animal products were eaten raw.

• Traditional diets showed a high food-enzyme content from raw meat and dairy, and fermented fruit, vegetables, and fish.

A well nourished child grows to become a well nourished adult who, in turn, is capable of nourishing the earth.

• Seeds, grains, and nuts where eaten were soaked, sprouted, fermented, or naturally leavened in order to neutralize anti-nutritive factors in these foods such as phytic acid, enzyme inhibitors, tannins, and complex carbohydrates.

• Nearly equal amounts of omega-6 and omega-3 fatty acids were eaten.

• All primitive diets contained salt.

• Traditional cultures consumed animal bones, usually in the form of gelatin-rich bone broths.

• Traditional cultures made provisions for the health of future generations by providing special nutrient-rich foods for parents-to-be, pregnant women, and growing children.

The young bodies of our babies are grand and magnificent creations. Our children can be strong, sturdy, present, adaptable, aware, and peaceful. One of our most important tasks as parents is to nourish our growing children. A well nourished child grows to become a well nourished adult who, in turn, is capable of nourishing the earth. It is time to come home to a nourishing food tradition that grows healthy guts and healthy minds, that creates a permanent and sustaining agriculture, and crafts a meaningful connection between our sustenance and the bioregion that gifts us with our food. What a beautiful and bold task as we raise our young ones! Fortunately we have nutritional support and thorough guidance as we wake up each morning and tend to our bodies. The Weston A. Price Foundation provides information indicating the importance of nutrient-dense whole foods, resilient food choices for pregnant and nursing mothers, and food introduction guidelines for nourishing our growing children. I am honored to share these guidelines that have grown wise children and sustained humans for thousands of years—guidelines that will, deliciously, nourish your growing baby!

Salt is critical for digestion, as well as for brain development, and is safe and great to share with our babies in small...quantities.

Introducing new foods

Four to six months

Babies produce enzymes and digestive juices that work mostly on proteins and fats—the milk from a healthy mother provides up to 60% of its energy in the form of fat. (7) A baby should be breast-fed for at least a year. If this is not possible there are recipes for home-made formula in the *Nourishing Traditions* cookbook that is compatible with the needs of your young one. (1) A baby's earliest solid food should come mostly from animals, because the immature digestive system is better equipped to supply enzymes for digestion of fats and proteins, rather than carbohydrates. Soft-boiled egg yolks (rich in brain-nourishing substances) can be added to your baby's diet as early as four months. (1) If your baby reacts poorly to egg yolk at this time, discontinue and try again one month later. As you begin to introduce foods, it's important to go slowly and be observant. Every baby will have its own response to different foods. It's best to introduce new foods one at a time, and to feed that same food for at least four days to monitor the possibility of a negative reaction.

Cholesterol is vital for the insulation of the nerves in the brain and the entire central nervous system. It aids digestion of fat by increasing the formation of bile and is necessary for the production of many hormones. Since the human brain is so dependent on cholesterol, it is especially vital during this time when brain growth is rapid. (2) The best choice for our babies are yolks from pasture-fed hens or ducks that are fed organic grain and flax meal, fish meal, and plenty of insect forage. And remember that we're just feeding the yolk at this time! The white is the portion that most often causes allergic reactions, so wait to give egg whites until after your child turns one. (1,3) And remember to put a pinch of salt on that egg yolk! Salt is critical for digestion, as well as for brain development, and is safe and great to share with our babies in small pinch-like quantities. Use unrefined salt to supply a variety of trace minerals.

Raising healthy children makes for happy children more in touch with the earth.

Four months is a good time to offer fermented cod liver oil (also extremely important for brain development with its omega-3 fatty acids DHA and EPA, as well as vitamins A and D). Start with 1/4 teaspoon of fermented cod liver oil, doubling the amount at 8 months. Use an eye dropper at first; later your baby can take cod liver oil mixed with a little water. (4)

At six months

Begin to give cooked and puréed meats and organ meats at six months, and even earlier if your baby is very mature and wants food. Grass-fed meat will help ensure an adequate intake of iron, zinc, and protein with the decrease in breast milk. (5) Try adding small amounts of grated, raw organic liver (which has been frozen 14 days) to the egg yolk after six months.

Introduce a variety of fruits at this time: mashed, raw avo-

cado, melon, mangoes, and papaya. Cook high-pectin fruits such as peaches, apricots, apples, pears, cherries, and berries to break down the pectin, which can be irritating to the digestive tract. Another excellent and yummy food to introduce during this time is baked custard of raw milk and cream, egg yolks, and fruit.

Foods like cereals, grains, and breads are quite challenging for our little ones to digest...

At six to eight months, introduce vegetables. Carrots, sweet potatoes, and beets are excellent first choices. Steam and mash all vegetables, and add a liberal amount of fat, such as butter, lard, or coconut oil, to provide fat-soluble nutrients and to aid in digestion. (7) Feed your baby a touch of buttermilk, yogurt, or kefir from time to time to familiarize her with the sour taste. Lacto-fermented roots are another excellent food for babies at this age. (1)

At eight months

Our babies can now consume a variety of foods including creamed vegetable soups, homemade stews, and dairy foods such as cottage cheese, mild harder raw cheese, and raw cream and milk. Raw egg yolk, from pastured hens, is an excellent food to add to your baby's diet (and to your diet too!). A great way to incorporate this food is to add it into a smoothie of yogurt or kefir and berries.

At one year

Grains, nuts, and seeds should be the last foods introduced to babies. These foods have the most potential for causing digestive disturbances or allergies. Our babies are growing immensely throughout these foundational years—and so are their digestive systems. Babies produce only limited amounts of enzymes (which are necessary for the digestion of food); it will take over two years for carbohydrate enzymes to flow fully. Foods like cereals, grains, and breads are quite challenging for our little ones to digest—introduce them last. Even then, a common traditional practice involves soaking grains in water and a little yogurt, whey, or buttermilk for 24 hours. This process increases enzymatic activity in the food and begins breaking down some of the harder-to-digest components. (1) The easiest grains to digest are those without gluten like brown rice. When introducing grains, soak them for at least 24 hours and cook with plenty of water for a long time. This will make a slightly sour, thin porridge that can be mixed with other foods. (6) After one year, you can give babies nut butters made with sprouted nuts, cooked leafy green vegetables, raw salad vegetables, citrus fruit, and whole egg.

Eating is a joyful, sustaining time, a time for honor and celebration, and a time for intimate connection with our loved ones and ourselves. As a young woman within this modern mainstream culture, I inherited a food understanding that was seasoned with self-judgment, regimentation and control, scant proportions and ingredients, disconnection between food and soil, and values misplaced on quickness of meal preparation versus quality of ingredients. We now have the joyous burden of recycling time-

tested food and nutrition concepts into a solid and sustaining food culture. And what a better place to begin than with our children's bodies and our own. It is such a rewarding and pleasurable act to enliven my kitchen, my body, and my daughter's body with traditions and foods that are whole, nutritious, fulfilling, and alive—sounds like the perfect recipe for growing wise children! Δ

Resources

1. Fallon, Sally. *Nourishing Traditions*. NewTrends Publishing. 1999.
2. Sears, William, MD, Sears, Martha, RN. *The Baby Book.* Little, Brown, and Company. 1993.
3. Smith, Lendon, MD. *How to Raise a Healthy Child.* M. Evans and Company. 1996.
4. Thurston, Emory. PhD, ScD. *Parents' Guide to Nutrition for Tots to Teens*. Keats Publishing. 1979.
5. Krebs, Nancy. Dietary Zinc and Iron Sources, Physical Growth and Cognitive Development of Breastfed Infants. *Journal of Nutrition.* 130:358S-360S. 2000.
6. Cowan, Tom MD. *Feeding Our Children.* Found at www.fourfoldhealing.com.
7. Allbritton, Jen CN. *Nourishing a Growing Baby*. Found at www.westonaprice.org/childrens-health/nourishing-a-growing-baby.

Leigh is passionate, reverent, and devoted to the creation of an earth and people full of bioregional and bodily health and resilience; where Gaia is approached in true sustaining relationship, where culture grows fecund from soil and sun of each unique and wondrous place, where sustenance is cultivated from the hands it sustains, and where our relationship with nature feeds our imaginations and produces relevant and sustaining art and ritual with bountiful and beautiful aesthetics. She spends her days with these visions in mind and guides her choices from this place. Leigh is the garden and kitchen manager at Aprovecho, a nonprofit, sustainable living and permaculture homestead located in Cottage Grove, OR (www.aprovecho.net). She is also one of the founding members of Clear Water Sanctuary, a newly forming permaculture community located on the Olympic Peninsula. She is a mother, no-till/grow-soil gardener, eco-somatic therapist and dancer, Weston A. Price devotee (www.westonaprice.org), and a good neighbor. Contact her at mayleighbe@gmail.com.

Dairy goats provide fresh milk, and also expose the developing immune systems of young children to various allergens.

Round the Table

Rhonda Baird

ONE OF THE THINGS I've loved best about working with children and permaculture has been the work of making and sharing food. Due to health concerns, I eat what is often called a Paleo Diet. My children eat more in line with the Nourishing Traditions food culture. One of the things my daughter insisted upon doing this fall with her brother was making bread. I watched them measure carefully, knead the dough, and dance with anticipation while they waited for it to rise and then fill the house with a delicious aroma. Out of the oven, they snacked on the bread smothered in butter and local honey.

Gooey goodness dripping from his chin, my son started to sing a song of thankfulness for the sun and the grain and the bees and the cows. My daughter joined in with her own gratitude to mothers and to insects that pollinate, to the wind that blows through the grain, and the rain that falls, to the soil and all that it holds, to the moon and the stars and the turning of the seasons, to the trees. And they both chimed in about the animals. We might have gone on for a long time, but by then it was time to beg for another slice of warm heaven.

Rhonda Baird, homeschools, designes permaculture systems, teaches permaculture design courses, and four times a year helps to create this magazine. She is most grateful for each of those opportunities.

A Versatile and Healing Herb

Fenugreek

Jill Henderson

MOST GARDENERS have never heard of fenugreek, even though this versatile herb has been lighting up the culinary scene for thousands of years. Fenugreek (*Trigonella foenum-graecum*) is an ancient herb from the Legume family (*Fabaceae*) and is sometimes referred to as foenugreek, bird's foot, Greek hayseed, or goat's horn. While rarely seen in modern gardens, fenugreek is herb, spice, vegetable, and medicinal plant—all rolled into one.

Grown primarily as an arid-land crop in countries such as India, Nepal, Argentina, France, and Spain, fenugreek does very well in areas with low rainfall, making it an excellent xeriscape plant. Its pretty, upright habit and rounded, blue-green leaves also make fenugreek quite attractive as an addition to more traditional perennial gardens and border plantings.

Fenugreek is widely used in the Middle East, Germany, France, and the Mediterranean. This herb was brought to the Western US during early colonization, but has slowly been forgotten by gardeners and herbalists alike. However, fenugreek is an incredibly useful and hardy plant that deserves a much stronger presence in the kitchen, the medicine chest, and the garden.

Fenugreek is a tender annual with lightly hairy, wiry, hollow stems. While the plant has a delicate, slender appearance, it can often reach up to 2' (61cm) tall under ideal growing conditions.

Fenugreek's ovate, trifoliate leaves (groups of three) are reminiscent of other members of the legume family, including clover, beans, and peas. The fragrant, cream-colored flowers are borne at the leaf axils and resemble those of the common garden pea. The flowers produce thin, erect, 6" (15cm) pea-like pods that contain approximately 16 angular—almost square—seeds. When ripe, the seeds are tan to yellow-brown and have a distinct fragrance when crushed.

Seed pods of fenugreek. Courtesy rfarmer via Flickr.

Growing this delicious and flavorful herb is as easy as growing green beans.

True fenugreek is sometimes confused with another related plant known as blue fenugreek, sweet trefoil, or blue-white clover (*Trigonella caerulea*). As its name implies, blue fenugreek has blue clover-like flowers, which makes it easy to identify. Sometimes called the curd herb, many cultures have used it for curdling milk as part of cheese-making. Native to the mountainous regions of Eastern Europe and the Caucasus, blue fenugreek is used in the same way as true fenugreek.

Growing this delicious and flavorful herb is as easy as growing green beans. Select an area of the garden that gets full sun to light afternoon shade. Soil should be neutral to slightly acidic (pH 5.3 to 8.2) and well-drained. Like other legumes, fenugreek does best when sown directly in the garden in mid-spring, after all danger of frost has passed. If sown while the soil is too cold or too wet, growth will be slowed considerably. To speed germination, soak the seeds overnight and plant 1/4" deep and 2-4" apart. Allow 5-10 days for germination. Once seedlings are 2" tall, thin to 5-6" (10-15cm) apart.

Anyone who has ever shelled peas or dry beans already knows how to harvest fenugreek. Pick the pods after they turn from green to tan, and the dry seeds can be heard rattling inside. Remove the seeds from the pod and spread them out in pans or on screens in the shade until they are very hard and completely dry. Never dry seeds in full sun, especially if you want to replant or sprout them. When seeds are completely dry, they will shatter when struck with a hammer. It is important to store dried seeds in a cool, dark place until ready to use or replant. Avoid storing seeds in glass jars to prevent mold. Properly dried and stored, seeds are viable for two to three years.

Many herbs and spices benefit from dry roasting, and fenugreek is no exception. Raw, dried fenugreek seeds have a slightly bitter taste, but when quickly heated in a skillet, the flavor becomes sweet and nutty. To dry-roast, preheat a heavy skillet over medium heat until a drop of water on its surface sizzles and evaporates quickly. Add whole or cracked fenugreek seeds all at once, and stir continuously for about three to five minutes or until fragrant. Remove the seeds from the pan immediately. Once cooled, finely grind them, or soak them overnight, then pulverize into a paste—much the way one prepares chickpeas. Keep in mind that any dry-roasted spice will not store well for very long. Roast small amounts as you need them.

The flavor of fenugreek blends wonderfully with all types of fruit, baked or stewed vegetables, meat, seafood, pastries, cookies, breads, pies, cream cheese, dressings, dips, spreads, and sauces. Widely used in Middle Eastern cuisine for thousands of years, fenugreek lends its unique flavor to curry powder blends, Bengali five-spice, and dishes such as chutney and halva. In North America and many other countries around the world, fenugreek is silently spicing up foods such as pickles and bread and is the flavoring of choice for maple-flavored foods, candies, and syrups. Fenugreek is also used in imitation flavorings such as caramel, vanilla, and butterscotch.

Aside from the seeds, the fresh or dried leaves of fenugreek are often used in dishes like curry, dahl, and chutney. The leaves also lend themselves to vegetables, rice, meats, soups, stews, and eggs. Use untreated seed to grow sweet-spicy sprouts and micro-greens that are excellent in salads, slaws, and sandwiches. The young bean pods and stem tips can be eaten raw or lightly steamed.

In addition to being edible, fenugreek is also medicinal and has been used by traditional healers the world over as an effective anti-inflammatory, antipyretic, digestive aid, emollient, and hypotensive. It is often used today to stimulate lactation in nursing mothers and, ironically, to increase libido.

The seeds are very high (up to 40%) in mucilaginous fiber. This slippery substance acts as an emollient and anti-inflammatory and is used to soothe, soften, and protect irritated skin and mucous membranes. It is very useful for coughs, sore throats, and fever. A gargle made with fenugreek soothes a sore throat and is said to help ease the pain and inflammation of cold sores, canker sores, and swollen taste buds, as well as reduce general pain and inflammation.

Fenugreek seed, approved by the German Commission E (therapeutic guide to herbal medicine use by licensed medical professionals), is used in the prevention and treatment of cardiovascular disease by reducing cholesterol absorption and triglyceride and blood sugar levels, and by lowering high blood pressure. Crushed or powdered seeds are used to treat boils, cysts, bruises, sprains, and swollen glands, and they are often used as an emulsifier in food and drugs.

The chemical make-up of fenugreek is oddly similar to that of cod liver oil, and decoctions of fenugreek are used to treat constipation and other situations where cod liver oil might be used. The seed infusion is an excellent digestive aid.

Leaves of fenugreek resemble those of other legumes like soybeans. Photo by Miles Collins.

The ground or powdered seeds of fenugreek can be encapsulated or taken directly by mouth with water in doses of 1 tsp. (3.7g) with each meal, for a total of 4 tsp. (15g) per day. Tincture seeds using the 1:5 ratio. The suggested dosage for tinctures is 1-2ml, up to three times per day. To prepare a decoction, simmer up to 2 tsp. (7.4g) of finely ground seed in 1 cup (237ml) of water for 20 minutes. Remove from heat, and allow to steep for an hour or more. Take 1 cup (237ml) up to three times a day, adding anise seed or honey to improve the flavor. The crushed or ground seed is soaked in hot water or milk until soft and used as a poultice (*The Healing Power of Kitchen Herbs: Growing & Using Nature's Remedies*, Jill Henderson, 2005).

Oddly angular fenugreek seeds are good for planting, cooking, or sprouting. Photo by Sanjay Acharya via Wikimedia Commons.

In addition to being edible, fenugreek is also medicinal and has been used by traditional healers the world over...

Be aware that fenugreek seeds are a natural source of diosgenin, a bio-identical plant form of the female hormone progesterone. Traditional healers have induced childbirth with fenugreek; therefore this herb should not be used by anyone who is, or expects to become, pregnant. In addition, insulin-dependent diabetics should consult their doctor before using fenugreek medicinally. Using more than 100g of fenugreek daily may cause mild intestinal upset, loose stools, and maple-scented urine or perspiration. There have been reports of mild skin irritation. Otherwise, fenugreek is considered to be an exceptionally safe medicinal herb.

With all of the wonderfully diverse properties that fenugreek brings to the table, it is amazing that more people don't grow it. This simple little plant from the Legume family is vegetable, green, herb, spice, and medicinal—all rolled into one! Δ

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Learning from Taxonomy

Choosing Plants and Animals for Edible Landscapes

Kyle Chamberlain

AGROFORESTRY HAS THE POTENTIAL to revolutionize food production, yet it has been slow to catch on. This may be partly due to the intimidating number of species used by the field's botany-savvy pioneers. Nursery catalogs have begun catering to us, by offering a colorful cacophony of novel plants, but the hype isn't entirely helpful in planning functional forest gardens. I've yet to learn of any comprehensive method for selecting an optimal assemblage of plants. The prevailing method seems based largely on whim, influenced by plant fads.

How do we decide what plants to use in our food forests? A number of authors have submitted impressive plant lists. Considering the countless thousands of edible plants in the world, we should not expect any list to be comprehensive. Any such list necessarily reflects the biases of the author. The upside of this ambiguity is the great potential for originality. Every small region of the world—even every forest garden—can incorporate unique useful plants used nowhere else.

Lomatium macrocarpum, *a wild root vegetable, shows the enlarged storage organ typical of a disturbance-dependent forb.*

But dinner (and our reputation!) is on the line. We need a way to be certain there are no glaring gaps in our food forest ecologies. How can we be sure our botanical bases are covered? I've found what seems to be a comprehensive approach to selecting, not only trees and shrubs, but also other kinds of plants, and even animals, for our permaculture systems.

This method considers the relationships among living things, the study of which is called taxonomy. When I started studying edible plants, I learned one species at a time. This was a slow way to proceed, given that there are hundreds of edible plants in my home region.

Then, a book called *Botany in a Day*, by Thomas Elpel, forever changed my understanding of botany. Tom's book is a guide to recognizing the patterns of plant families and genera. It illustrates how these closely related groups of plants often have similar properties, employ similar ecological strategies, and relate with people in similar ways. For instance, the many species of pines, aside from looking somewhat alike, generally have edible seeds, produce pitch, and are seral (an intermediate stage) in succession. We could view all pine species as variations on a theme.

Taxonomic wisdom

I was never able to look at ethnobotany in the same way. While many of my favorite ethnobotanies contain over a hundred species, these species generally fall into just a handful of families. The ways human cultures related to particular species over thousands of years are part of a larger picture. Beyond the time span of ethnobotany, taxonomy can show us how plant families have co-evolved with our mammalian relatives for many millions of years.

The ascendancy of mammals is tied very closely to the proliferation of flowering plants that occurred as the reign of the dinosaurs ended. By allying with birds and mammals, using new adaptations like fruit and nectar, plants started a revolution we can thank for our very existence. Our primate ancestors certainly could not have existed without the flowers and fruits of the forest canopy. By 66 million years ago, a time when our own ancestors resembled tree shrews, plants such as palms, and trees like walnuts and oaks had already evolved their familiar forms. These and other plants have shaped us and our animal relatives; and we have shaped them, for at least that long. These beautiful, sophisticated relationships have long sustained us all.

How can we apply taxonomic wisdom to our designs? After reading *Botany in a Day*, one of the first things I did was identify the native plants used by local indigenous groups, and sort them into families. It became clear for instance, that most of the root vegetables belonged to the Lily, Carrot, Sunflower, and Purslane Families. It may be that certain families are particularly well adapted to particular regions.

I was then curious about domestic root vegetables. It turns

Agroforestry Species List
Columbia River Basin Bioregion

(eastern Washington and northern Idaho, USDA Zone 6)

Barberrry Family
- Oregon grapes *(Berberis spp.)*
  - *B. aquifolium**
  - other wild and cultivated species

Basswood Family
- basswoods, limes, lindens *(Tilia spp.)*
  - American basswood *(T. americana)*
  - linden *(T. x europa)*
  - little-leafed linden *(T. cordata)*
  - large-leafed lime *(T. platyphyllos)*
  - many other species

Beech Family
- oaks *(Quercus spp.)* **
  - burr oak *(Q. macrocarpa)*
  - Gambel oak *(Q. gambelii)*
  - Garry oak *(Q. garryana)* *
  - holly oak *(Q. turbinella)*
  - hybrids (some noted for vigor & yield)
  - other oaks (many spp worldwide)
- chestnuts *(Castanea spp.)*
  - sweet chestnut *(C. sativa)* **
  - Chinese chestnut *(C. mollisima)* **
  - American chestnut *(C. dentata)*
  - Japanese chestnut *(C. crenata)*
  - hybrids (including cultivated varieties)
  - chinquapins (tiny edible nuts)
- beeches *(Fagus spp.)*
  - (beeches have small edible nuts)

Birch Family
- alders *(Alnus spp.)*
  - red alder *(A. rubra)*
  - Italian alder *(A. cordata)*
  - white alder *(A. rhombifolia)* *
  - mountain alder *(A. incana)* *
  - green alder *(A. viridis)* *
- hazels/filberts *(Corylus spp.)*
  - filbert *(C. avellana)* **
  - American hazel *(C. americana)*
  - tree hazel *(C. colurna)*
  - beaked hazel *(C. cornuta)* *
  - other hazels

Bladdernut Family
- bladdernut *(Staphylea pinnata)*

Buckthorn Family
- buckbrush *(Ceanothus spp.)*
  - *C. sanguienus* *
  - *C. velutinous* *
  - *C. integerriumus* *
  - other buckbrush species
- raisin tree *(Hovenia dulcis)*
- jujube *(Ziziphus ziziphus)* **

Cactus Family
- prickly pears *(Opuntia spp.)*
  - *O. compressa*
  - other hardy species

Chocolate Vine Family
- chocolate vine *(Akebia quinata)*
- blue bean *(Decaisnea fargesii)*

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out that many of them fall into the same families. For instance, onions, shallots, leeks, and garlic are all in the Lily Family. Perhaps we can learn how these common vegetables might fit into our local ecologies by studying their wild relatives.

Next, I searched resources like the *Plants for a Future* database (www.pfaf.org) for patterns in wild root vegetables throughout the world. Again, I found that most of the species fell into just a few families, with an occasional outlier. (Most of the outliers are obscure wild foods, but one important outlier is the potato. There aren't many root vegetables in the Tomato Family!) I learned of some unfamiliar plant families that were important elsewhere in the world. It became clear that I'd overlooked some empty niches.

My growing understanding was already yielding powerful perspectives.

Evidently, for plants in the business of making food, it's often a family business. It must be a successful survival strategy to have been replicated by so many related species. But why have some groups decided to feed us, while most others do not?

The Carrot Family provides insight. This family includes a wealth of wild and domestic root vegetables, like carrots, parsnips, and yampah. It would seem to be a benevolent family, if not for a few deadly poisonous species like water hemlock. Hemlock makes it clear that associating with animals is not the family's only option. The rest of the family must have good reason to be our friends. Being a predominantly biennial and perennial family, the Carrots rely upon stored carbohydrates in their roots to re-sprout in the spring. This ability gives them a competitive edge over annuals, which have to build everything from scratch every year. Yet these stored carbohydrates also appeal to animals. The fact that this strategy proliferates, in spite of inevitable depredations by animals like ourselves, suggests that wild root vegetables not only tolerate, but benefit from, losing a few of their number to animals. Putting up with hungry animals may be well worth occupying the special soil conditions we create with our digging and trampling. And perhaps rooting animals, like boars, bears, marmots, gophers, and humans, are helping these edible plants in other subtle ways. If this were not true, such plants would have become extinct long ago.

Rich parklike understory in old-growth red cedar forest.

The breeding of plants for edible qualities is a not-so-subtle way to get food from plants. However, breeding has merely magnified plants' natural tendencies to feed us. Agriculture did not invent food—millions of year of coevolution did.

The major groups of plants that feed us all have similar stories. They'll feed us, but they want something in return. There are qualities intrinsic to us and to them that favor partnerships. Fruiting plants want their seeds dispersed; some root vegetables and greens require soil disturbance; nuts want to be stashed where they can germinate—all these plants need nutrients that mobile animals can concentrate. Most of our food plants are ecological underdogs that thrive best in the animal-dominated ecologies associated with humans. Plant families may cater to one animal partner over another, but they are

not picky, and must tolerate the occasional freeloader. (Thus, the humans who first colonized continents already inhabited by other mammals and large omnivores found ample indigenous plant foods.)

After my initial exploration of edible plant databases, I felt closer to my goal of learning all the important plants I could use in my food forest, here in the Inland Northwest of the US (Columbia River basin of eastern Washington and northern Idaho). Anytime I learned of a new edible plant, I read what I could about its family. More often than not, an edible plant has edible relatives. I also used field guides and databases to pore through local plant lists organized by families, to learn all of their edible species. Wikipedia has begun to organize its entries of organisms taxonomically, which is tremendously helpful.

I focused my study on fruits, nuts, and root vegetables. Only a few types of plant foods are calorie-dense enough to sustain people (fruits, nuts, roots, seeds, and a few others, like cambium and syrup). I ignored greens for the most part. Greens provide important vitamins and minerals, but few calories. Any good survival instructor understands this caloric hierarchy. I also chose to ignore the seeds of annuals, as our relationship with them is relatively new, and unhealthy in many respects.

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Lessons of co-evolution

We are most likely to have developed tolerances to the food organisms with which we've co-evolved for the longest time. These foods will tend to be healthier for us than those with which we haven't co-evolved as long. The Fig (Mulberry) Family, for instance, provides a staple food for many of our primate relatives in the Old World Tropics, and probably has for millions of years. American mulberries, being in the same family, are thus likely to be very healthy for us, even though they come from outside of the Old World Tropics. The potato, on the other hand, was first encountered by humans less than 14,000 years ago, and became widespread only a few hundred years ago. There is nothing like the potato in the Old World tropics, where we evolved. If our ancestors had consumed potatoes for a long time, perhaps we would have become tolerant to the toxins found in raw potatoes, or perhaps the potato would have changed its chemistry to better suit its human partners. As it is, we've had to adapt culturally, detoxifying the potato through cooking, where we haven't adapted biologically. It's a grand experiment. It is worth noting that foods requiring complex harvesting or preparation processes probably don't have a long-standing relation-

Citrus Family
- bitter orange *(Poncirus trifoliata)*

Dogwood Family
- dogwoods *(Cornus spp.)*
  - Cornelian cherry *(Cornus mas)* **
  - Chinese dogwood *(Cornus kousa)*
  - native species (edible) *

Elm Family
- hackberries *(Celtis spp.)*
  - *C. laevigata*
  - *C. occidentalis* *
- elms *(Ulmus spp.)*
  - Siberian elm *(U. pumila)*

Gingko Family
- gingko *(Gingko biloba)*

Grass Family
- bamboos (many genera)
  - green bamboo *(Phyllostachys nuda)*
  - other hardy bamboos

Gooseberry Family
- currants and gooseberries *(Ribes spp.)* **
  - black currant *(R. nigrum)*
  - red currant *(R. rubrum)*
  - domestic gooseberry *(R. grossularia)*
  - golden currant *(R. aureum)* *
  - jostaberry *(R. x nidigrolaria)*
  - white currant *(R. glandulosum)*
  - other wild species

Grape Family
- grapes *(Vitis spp.)*
  - domestic grape *(V. vinifera)* **
  - riverbank grape *(V. riparia)* *
  - other wild grapes (many hardy species)

Heather Family
- salal and wintergreens *(Gaultheria spp.)*
  - salal *(G. shallon)*
  - wintergreen *(G. procumbens)*
  - other species
- blueberries & huckleberries *(Vaccinium spp.)*
  - northern blueberry *(V. corymbosum)* **
  - wild huckleberry (many spp) *

Honeysuckle Family
- honeysuckle *(Lonicera cerulea var. edulis)* **
- elderberries *(Sambucus spp.)*
  - blue elderberry *(S. caerulea)* *
  - American elderberry *(S. canadensis)*
  - black elderberry *(S. nigra)*
- viburnums *(Viburnum spp.)*
  - nannyberry *(V. lentago)*
  - highbush cranberries *(V. trilobum, V. edulis,* and *V. opulus)*

Kiwi Family
- kiwis *(Actinidia spp.)*
  - hardy kiwi *(A. arguta)* (many cultivars) **
  - arctic kiwi *(A. kolomikta)*
  - silver vine *(A. polygama)*
  - other species

Lily Family
- yuccas *(Yucca spp.)*
  - banana yucca *(Y. baccata)*
  - other yucca have useful products

Maple Family
- maples *(Acer spp.)*
  - sugar maple *(A. saccharum)*
  - other maples (for syrup)

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ship with us.

My study of taxonomy eventually yielded a list of cold-climate plant associates by family (specifically, plants hardy to USDA Zone 6). The list of the families I came up with could be used, with subtractions anywhere colder than Zone 6. In places warmer than Zone 6, my list of families makes a good start, but will need additional families. My list becomes less relevant nearing the subtropics, where the chill-requiring species must be subtracted. But there is no reason a list like mine could not be created for the tropics. It would have far more families, but it would be better than a species list, which might take days to read!

The process of assembling this list yielded further insight. Any given family or genus usually includes a number of species, each adapted to a unique climate or soil type. For instance, many oak species are good acorn producers, but only a few oaks are adapted to my particularly cold and dry conditions. My locality has no native oaks, but cousins from similar climates include the Burr, Gambel, and Garry oaks. I've decided to work with only these species because, while I may be trying to maximize diversity, functional diversity is better served by planting only the most appropriate types from a given group. A diversity of families trumps a diversity of species.

self with women, trees, vegetables, dogs, and ducks, I am much better off than if I surrounded myself with only men or only chimpanzees. The greater the differences, the better!) The tragedy of modern orchards is that they are almost exclusively comprised of Rose Family species: apples, pears, plums, cherries, apricots, peaches, and almonds. Even when interplanted, these popular fruits form a kind of monoculture, competing for the same resources and sharing only diseases. An understanding of taxonomy is crucial to ending this dangerous monotony.

Functional taxonomy—our animal associates

The animals we eat also fall into neat groups with similar functions and habits. My list focuses on terrestrial herbivores, squirrel-sized and larger. Herbivores should be our focus, because they are far more productive than predators. Predators also compete with us, as we are predators ourselves. Most human cultures do not consume many terrestrial vertebrates smaller than squirrels, for good reason. However, small invertebrates may be very worthwhile. There are very few substantial herbivorous, native, freshwater fishes; predatory fish can be quite productive, we should make an exception for them. My list of animals applies broadly to all

Taxonomic lists provide us with a better understanding of the kinds of plants and animals that make the best associates. But their most crucial revelation is a vision of our optimal habitat.

The greatest competition any organism faces is from individuals similar to itself. Plants from different families will have very different needs. By representing every family or genus with just one or two of the best adapted species, we minimize competition and maximize potential for beneficial interaction. (If I surround myself with women, trees, vegetables, dogs, and ducks, I am much better off than if I surrounded myself with only men or only chimpanzees. The greater the differences, the better!) The tragedy of modern orchards is that they are almost exclusively comprised of Rose Family species: apples, pears, plums, cherries, apricots, peaches, and almonds. Even when interplanted, these popular fruits form a kind of monoculture, competing for the same resources and sharing only diseases. An understanding of taxonomy is crucial to ending this dangerous monotony.

Herbivores, like plants, occupy various complementary niches. Ungulates may graze or browse to varying degrees. Some of them even specialize in lichen. Some herbivores are aquatic; some are arboreal. All make good eating. No ecology can

An example of native parkland: ponderosa pine (edible cambium and seeds), serviceberry (delicious fruits), arrowleaf balsamroot forbs (edible taproots, shoots, seeds), with native grasses.

function without animals, and animals are particularly important members of ecological communities to which humans also belong. We should regard any design that does not incorporate animals as seriously flawed.

If we can see our living associates as fitting into functional groups, with specific ecological "desires," we can relate to them synergistically (and save ourselves a great deal of work). Our associates can also relate synergistically with each other, and with the native biota where we live, resulting in an ecological community. Humans belong to a particular kind of community, which we can restore with the help of carefully chosen associates.

The savanna garden

Taxonomic lists provide us with a better understanding of the kinds of plants and animals that make the best associates. But their most crucial revelation is a vision of our optimal habitat. A habitat that could integrate all of these associates would be an ideal place for humans to live. Some communities in nature more closely resemble this ideal than others. I believe the type of community that best integrates all of our associates is a park-like or savanna community.

Savannas and parklands take many forms as animal-dominated ecologies, in which plant life is heavily regulated by herbivores. Savannas played a crucial role in human evolution, and our mastery of them enabled us to colonize the world. Today, city parks epitomize our ideal outdoor environment. These man-made landscapes mirror our chosen habitat of the past: the savannas of East Africa. The lush, short grass, widely spaced trees, and flowery displays hearken to our ancestral hunting and foraging grounds.

In a savanna, our prey animals, grasses, fruit and nut trees, and nutritious forbs exist together in a self-maintaining system. Browsers prune the forest; grazers compost the productive grasses; small animals transport seeds. Fire may also play an important role in regulating vegetation. Fertility constantly cycles. A savanna perpetually renews itself—neither grassland nor forest, it represents a dynamic balance between forces. Some elements of a healthy savanna include the following elements:

- mature trees, widely spaced, tolerant of fire, often tap-rooted, which may yield edible mast (from the Beech, Walnut, and Pine Families among others)
- abundant nitrogen-fixing trees, bushes, and forbs, reliant on disturbance, providing some browse (Pea, Birch, Oleaster, Buckthorn, and Rose Families)
- scattered flowering trees and shrubs, yielding fruit, reliant on animal dispersal, provide browse (Rose, Fig, Dogwood, Honeysuckle, Oleaster, Buckthorn, Gooseberry, and Birch Families)

In a savanna, our prey animals, grasses, fruit and nut trees, and nutritious forbs exist together in a self-maintaining system.

- edible forbs, non-grasses, including root vegetables of many families, rely on disturbance and nutrient concentration
- grasses, the principal food for large grazers, cycling nutrients deeply in the soil, are heavily reliant on herbivores for disturbance and nutrient cycling
- large herbivores, the primary managers of vegetation, choice prey of humans, keystone species of the savanna
- small herbivores disperse seeds, occupy niches kept open by larger herbivores, provide backup prey for humans
- fire has played a more important role in vegetation regulation since the extinction/marginalization of large herbivores (ongoing since the Pleistocene); will be of low severity in healthy savanna where species are highly fire-tolerant
- humans, a keystone predator, contribute to fuel reduction, provide conscious plant dispersal, have created only minor disturbances until recent centuries
- other predators, better than humans at concentrating and regulating herds of herbivores, provide a check on over-grazing and over-browsing; they also provide humans with a healthy respect for their place in nature

The structured agroforestry system that most closely mimics savanna is called silvopasture, where animals are grazed among widely spaced trees.

Mulberry Family
- mulberries *(Morus spp.)*
  - white mulberry *(M. alba)* **
  - red mulberry *(M. rubra)*
  - hybrids (incl. popular cultivars) **
- che *(Cudriana tricuspidata)*

Nightshade Family
- wolfberries *(Lycium spp.)*
  - goji *(L. barbarum)* **
  - wolfberry *(L. ovatum)*

Oleaster Family
- silverberries *(Elaeagnus spp.)*
  - Russian olive *(E. angustifolia)*
  - silverberry *(E. pugens)*
  - autumn olive *(E. umbellata)* **
  - goumi *(E. multiflora)* **
  - ebbingii hybrid *(E. x ebbingii)*
  - other hybrids
- sea buckthorn *(Hippophae rhamnoides)* **
- buffalo berries *(Shepherdia spp.)*
  - soopolallie *(S. canadensis)*
  - buffalo berry *(S. argentea)* *

Pawpaw Family
- pawpaw *(Asimina triloba)* **

Pea Family
- honeylocusts *(Gleditsia spp.)*
  - honeylocust *(G. triacanthos)*
  - other honeylocusts
- pea shrubs *(Caragana spp.)*
  - Siberian pea shrub *(C. arboresens)*
  - dwarf pea shrub *(C. pygmaea)*
  - other species
- locusts *(Pseudoacacia spp.)*
  - black locust *(Pseudoacacia robinia)*
  - New Mexico locust *(P. neomexicana)*
  - other rare locusts
- redbuds *(Cercis spp.)*
- inedible leguminous trees and shrubs
  - tree lupine *(Lupinus arboreus)*
  - brooms *(Cytisus spp.)*
  - Kentucky coffee *(Gymnocladus dioicus)*
  - maackias *(Maackia spp.)*

Persimmon Family
- persimmons *(Diospyros spp.)*
  - Amer. persimmon *(D. virginiana)* **
  - date plum *(D. lotus)*
  - Asian persimmon *(D. kaki)* (not hardy)
  - hybrids (for hardiness)

Pine Family
- pines *(Pinus spp.)*
  - Korean stone pine *(P. koraiensis)* **
  - singleleaf pinyon pine *(P. monophyla)*
  - pinyon pine *(P. edulis)*
  - Siberian stone pine
  - Swiss stone pine *(P. cembra)*
  - Siberian dwarf pine *(P. pumila)*

Rose Family
- mountain mahoganies *(Cercocarpus spp.)*
  - curl-leafed *(C. ledifolia)* *
  - birch-leafed *(C. montanus)*
- strawberries *(Fragaria spp.)*
  - domestic *(F. x ananassa)* **
  - *F. virginiana* *
  - *wild species*

continued on page 41

Where did all the savannas go?

Several types of ecosystem can replace savanna if natural regimes of disturbance are altered. In very cold climates, or in summer dry climates, conifer forests are the antithesis of savanna. If not checked by an herbivore/grass alliance, or by fire, dense stands of inedible conifers will dominate. Conifer dominance tends to limit nutrient cycling. Many old-growth forests, with their widely spaced trees, fire tolerance, and thriving understory, more closely resemble savanna than the dense forests managed for timber production.

The land cannot reach its highest potential without its unique native vegetation.

In humid temperate climates, deciduous forests encroach on savanna, much as conifer forests do in colder, drier zones. However, deciduous forests have a more productive understory due to high nutrient cycling. Also, many deciduous overstory species have edible products. These typically mixed-age stands of trees will naturally create successional mosaics, and may require less drastic management.

In arid climates, the absence or mismanagement of large herbivores can cause savanna to degrade to desert scrub or poor grassland. Savanna benefits from brief, high-intensity grazing and browsing. But constant pressure from herbivores, even at low intensities, does not permit grass or palatable woody plants to regenerate. Conversely, the removal of large herbivores can severely damage nutrient cycling.

In extremely cold climates, healthy grassland may degrade to acidic heath in the absence of large herbivores.

Of course, climax forests and desert scrub are crucial to planetary health and provide the best possible cover for some climatic regimes. It would be folly to advocate against any particular ecotypes or any species. Within the human habitat we cultivate, native plants (even conifers or desert shrubs) must be incorporated and allowed to fulfill their ecological roles. The land cannot reach its highest potential without its unique native vegetation. In fostering our own habitat, we must exercise due influence, nudging nature, rather than replacing it. Most ecologies are capable of multiple alternate states, some of which will be more savanna-like; fostering these is appropriate where people live. But people ought not to live everywhere! Savanna is best suited to low elevations, deep soils, and gentle topography. If we are to replace anything with contrived edible ecologies, it ought to be agricultural fields, which now monopolize the prime real estate.

Of course, healthy wetlands, freshwaters, and oceans also have much to offer humans, forming the ideal complement to our terrestrial habitat. Healthy stewardship of these ecologies is a rich topic beyond the scope of this article.

Ironically, our prime habitat, the savanna, may be the most crucially endangered ecosystem. Estranged from our own natural habitat, people have become increasingly dependent on broadly destructive interactions with the living earth. The marginalization and extinction of large game animals, the cessation of indigenous land-use practices, the near ubiquitous cultivation of suitable soils, the mismanagement of fire and grazing, and the intensification of the timber industry, have all contributed to the decline of our vital habitat. The seemingly wild land that remains is actively degrading, as grasslands become deserts, and woodlands become overgrown tinder boxes. If we cannot restore our own habitat, we may destroy all the others.

Developing agroforestry systems has the potential to become more than just an eccentric hobby. Done well, this is an opportunity to rescue one of the planet's most endangered habitats—our own. Δ

Kyle Chamberlain is a desperate, malcontented human being. He works to restore human habitat in the Inland Northwest of the US. He can be reached at practicalnaturalist@gmail.com.

bitterbrushes *(Purshia spp.)*
bitterbrush *(P. tridentata)* *
cliff rose *(P. stansburiana)*
other species
roses *(Rosa spp.)*
R. rugosa
R. woodsii *
other species
brambles *(Rubus spp.)*
raspberry *(R. ideaus)* * **
blackberries (hundreds of species) * **
black cap *(R. leucodermis)* *
thimbleberry *(R. parviflorus)* *
salmon berry *(R. spectabilis)* *
hybrids
other species (including many ground cover types)
stone fruits and almonds *(Prunus spp.)*
domestic plum *(P. domestica)* **
American plum *(P. americana)* * **
Canada plum *(P. nigra)* **
mirabelle plum *(P. cerasifera)* **
other wild plums
sweet cherry *(P. avium)* **
sour cherry *(P. cerasus)* **
bush cherry *(P. tomentosa)*
chokecherry *(P. virginiana)* *
other wild cherries
domestic apricot *(P. armeniacia)* **
wild apricots *(P. mandshurica & others)*
peach and nectarine *(P. persica)* **
true almond *(P. dulcis)* **
almond hybrids **
hybrid stone fruits (pluots and others)
chokeberries *(Aronia spp.)*
black chokecherry *(A. melanocarpa)* **
cherry-leafed *(A. prunifolia)*
cottoneasters *(Cottoneaster spp.)*
many species
prinsepias *(Prinsepia spp.)*
P. sinensis
P. uniflora
P. utilis
juneberries *(Amelanchier spp.)*
Saskatoon berry *(A. alnifolia)* * **
A. lamarkii
A. stolonifera
A. arborea
other species
hawthorns *(Crataegus spp.)*
C. arizole
native species *
other cultivated and wild species
mountain ashes/rowans/service fruits (Sorbus spp.)
Rabina mountain ash *(S. aucuparia)*
service fruit *(S. domestica)* **
hybrids
native species *
other wild and cultivated species
pears *(Pyrus spp.)*
domestic pear *(P. communis)* **
other pears **
apples *(Malus spp.)*
domestic apple *(M. sylvestris)* **
wild apples and crabapples
medlar *(Mespilus germanica)* **
quinces *(Cydonia spp.)*
domestic quince *(C. oblonga)* **
other quinces
flowering quinces *(Chaenomeles spp.)*
many species

Soapberry Family
yellowhorn *(Xanthoceras sorbifolium)*

Sumac Family
sumacs *(Rhus spp.)*
smooth sumac *(R. glabra)* *
staghorn sumac *(R. typhina)*
other sumacs
pistachios *(Pistacia spp.)*
pistachio *(P. vera)*
other pistachios (for rootstock, pollinators)

Walnut Family
walnuts *(Juglans spp.)*
English walnut *(J. regia)* **
black walnut *(J. nigra)*
butternut *(J. cinerea)* **
heartnut *(J. ailantifolia var. cordifolia)* **
hybrids
hickories (Carya spp.)
pecan *(C. illinoisensis)* (hardy types) **
shellbark hickory *(C. laciniosa)* **
shagbark hickory *(C. ovata)*
other hickories
hybrids

* *native to the bioregion*
** *staple/important food crop*

Not All Nitrogen-Fixers Are Created Equal

Eric Toensmeier

NITROGEN-FIXING SPECIES are a cornerstone of food forestry and other permaculture practices. Through a partnership with symbiotic microbes at their roots, these plants can turn atmospheric nitrogen into fertilizers that are useful to themselves but also become available to neighboring plants over time through root die-back, leaf fall, and chop-and-drop coppice management. While it does not replace the need to bring in phosphorus, calcium, and other nutrients depleted by harvests, this strategy provides a free source of an essential fertilizer.

Martin Crawford's book *Creating a Forest Garden* and his guide *Nitrogen Fixing Plants for Temperate Climates* are excellent resources for calculating the percentage of nitrogen-fixers needed in order to supply all required nitrogen just from plants. Martin estimates this at 25-40% of plants in full sun or 50-80% of plants in shade, depending on the nitrogen needs of the crops being grown.

Now I'm going to throw another wrench into your calculations. I've known for some time that the amount of nitrogen fixed varies widely among species, but I recently discovered that the USDA plants database gives information about the amount fixed by many, many species native and naturalized to the United States (plants.usda.gov/adv_search.html). They classify species as high (160+ lbs/acre), medium (85-160 lbs/acre), or low (1-85 lbs/acre). Note that there are a few species that might represent data entry errors. For example, Phragmites is listed as a nitrogen-fixer, though I've been unable to find another reference to this being the case.

...if you harvest a heavy crop from a nitrogen-fixer, you've probably taken most of the nitrogen with you...

It's interesting to note that many of the most hated naturalized species turn out to be incredibly efficient nitrogen-fixers. In fact the "high" N-fixing category is a rogues gallery of successful dispersive species, like Russian olive (*Elaeagnus angustifolia*), kudzu (*Pueraria lobata*), and Scotch broom (*Cytisus scoparius*). I decided to use the database to generate lists of native and non-native N-fixers and categorize them by their efficiency.

In many cases, there's a strong temptation to use nitrogen-fixing species that are also edible. I'd like to point out that if you harvest a heavy crop from a nitrogen-fixer, you've probably taken most of the nitrogen with you, though this may not be the case with fruits as much as it is with beans and leaves. This is another good reason to use efficient native nitrogen fixers even if they're not edible. On the other hand, if what you really need is nitrogen,

Red alder (Alnus rubra)*, a "high" nitrogen-fixing native, coppiced with sea kale in my garden.*

there are very few native species in the high category, making a good case for white clover and other non-natives. Though not all native plant enthusiasts would believe it, I've spent decades promoting underutilized native plants. While you may choose to grow pears and peaches (which are non-native) in your food forest, there is no particular reason to grow a non-native N-fixer over a native one, all things being equal. In fact, I tend to assume that native plants have a network of visible and invisible relationships with other organisms of all kingdoms, making them more desirable to use whenever possible. I think with the information these databases have provided, we are in an excellent position to promote particular native N-fixers for use in permaculture projects.

With that said, let's look at a few tables I put together for different regions of the country and then review some of our top native candidates. The astute reader will note that there are very, very few natives in the high category. I would speculate that there may be few anywhere, but that they are spreading around very, very successfully.

I'd like to profile a few of these US native nitrogen fixers that have a broad range of applicability.

• **Red alder** *(Alnus rubra)* grows throughout much of western North America, particularly near the coast. It coppices readily, at least if you start when it's young and do it frequently. Unlike most alders, it does not require wet feet. It can also handle partial shade. Here in my garden in Massachusetts, it dies to the ground

during winter and resprouts up to ten feet the following year. According to the database, this is the only tree native to North America that fixes over 160 lb./acre of nitrogen per year. Although you might think that other alders are equally powerful, the genus actually shows up in the high, medium, and low categories.

• **White prairie clover** *(Dalea candida)* is a native clover of the prairies that extends some into the eastern forest region. It is used to make a tea, but it had never crossed my mind as particularly significant, given the hundreds of species that grow in the prairie. Now I know that the USDA database states that this is the only herb native to North America that fixes over 160 lb./acre of nitrogen per year. Though it wants full sun and can handle fairly dry soils, I'm going to try to find room for some of this little-used native in my garden. It deserves a place in the spotlight. Interestingly, like alder, members of this genus can be found in the high, medium, and low categories.

• **Buffaloberry** *(Shepherdia argentea)* is native from New York to California. It is fairly drought-tolerant and suckers extensively. It produces very high volumes of edible fruit, though you need both male and female plants to get it. It can coppice, although Jerome Osentowski reports that at his high-altitude Colorado site it does not do so reliably. USDA rates this as a medium N-fixer. The related *S. canadensis* and *Elaeagnus commutata* (silverberry) are also medium N-fixers and are native over wide swaths of the continent.

I'd love to hear about your experiments using the database (or this article) to select native nitrogen-fixers for your area. As for myself, I have a new tool to make sure that the N-fixers I select will be the best available for the job. With these new data, I can make a strong case for growing some native species that are currently little used. Δ

Eric Toensmeier is the author of Perennial Vegetables *and the coauthor of* Edible Forest Gardens Volumes 1 & 2. *He has a wealth of knowledge when it comes to food forestry, permaculture design, and useful plants. A version of this article, with expanded tables of native N-fixers, previously appeared on Eric's blog (www.perennialsolutions.org).*

False indigo (Amorpha fruticosa)*, a widely-adapted, medium, native nitrogen-fixer.*

Eastern bayberry (Morella pensylvanica), a medium nitrogen-fixing shrub native to eastern North America.

The Benefit of Ordeal

Albert Bates

LEAVING RIO DE JANEIRO, site of the UN Conference on Sustainable Development, we mulled the meaning of what we had witnessed, but could hardly put it any better than Charles Eisenstein in his excellent summary, Why Rio+20 Failed. http://charleseisenstein.net/why-rio-20-failed/

> *You know folks, I'm a bit worried about my 16-year-old son, Jimi. When he was 13, he grew three inches. When he was 14, he grew five inches. When he was 15 his growth slowed to three inches, and no matter how much I feed him, now he isn't growing at all past his current six-one. Could someone please tell me how to achieve sustainable growth for my son, so that he can keep getting bigger forever?*
>
> *... Our consciousness has shifted from the early-20th century ideal of conquering nature. However, our institutions, whether money or politics, are not yet in accordance with our changed consciousness. They trap us into behavior that no one really chooses and render us helpless to avert our collision course with catastrophe. That is why it is so important to question the blind ideological assumptions—articularly that of sustainable growth—that underlie those institutions.*

Redefining development

If there was hope from the conference, it was perhaps best expressed by Uruguay's President José Pepe Mujia at the plenary session. Mujia grasped the global problem and put his finger on what really holds us back. http://www.youtube.com/watch?v=3cQgONgTupo

Are we governing globalization, or is it governing us?

> *All afternoon we have been talking about sustainable development and we've been talking about bringing huge amounts of people out of poverty. So what are we thinking about in all of this? The patterns of production and consumption that we aspire to at the moment are those of the rich societies. Now, what would happen to this planet, I ask myself, if the Hindus were to have the same numbers of cars per family as the Germans do? How much oxygen would be left to breathe? The world has today the material elements that it needs for people to live in adequate comfort. Does it have the resources to be able to spend as much as the rich societies spend and use or not? We need to have a discussion about this.*
>
> *Our civilization has to do with competition and the market. Natural resources are an expressive process, but the market has produced mercantile societies that demand that growth be explosive. And it's led to our globalized view of the world, and a globalized market. But are we governing globalization or is it governing us? Can we speak of solidarity and say that we are all pulling in the same direction when we have economies that are based on unfair and unsustainable competition?*
>
> *... The process we have before us is so huge that it encloses colossal. This great process is not political. Man does not govern this. Man does not govern the forces that man has released. It is the other way around. Those forces are governing man and life because we didn't come to this planet to develop ourselves in a material way. We came to find happiness, because life is transitory, it is very short. And life is what is fundamental. But if life is going to run away from me, if all I'm doing is working to buy things to consume more, if the society of consumption is the energy driving everything, where does this go? If consumption is stopped or reduced then the economy slows down, and if the economy slows down then there's stagnation. But consumption is the very thing that is consuming the planet. And people want to sell more and more. So we enter the vicious circle of the throwaway society....*
>
> *We need to fight for another kind of culture.... Seneca said that a poor person is not someone who doesn't have very much but the person who continues to need more and more and to desire more and more. So it's a cultural issue.*
>
> *So I salute the efforts that have been made here and the agreements that have been concluded.... [but,] the water*

Terra Phoenix Permaculture design team: Paul Kearsey, Klara Watherston, Doug Bullock, Dave Boehnlein.

crisis and the degradation of the environment—these aren't causes. The cause is our model of civilization that we ourselves have set up. What we have to revise is our own way of living. My country has 3 million inhabitants, a little more, 3.2 million. But we have some of the best cattle herds in the world and the best sheep herds in the world. My country exports meat and milk products. Almost 80% of the land of Uruguay is suitable for farming. My brother workers were formerly working 8 hours but now they work only 6 hours. But they have to have two jobs so they end up working more because they have to pay for the all of the things that they've bought, the cars and other things. It's like rheumatism that is eating away at the body and taking away life. Is this the destiny of human life?

Development cannot fly in the face of happiness. It should promote human happiness, love, human relations, relationships between parents and children and friends. Life is the most important. When we fight for the environment, the first element of our environment is human. Our human environment is human happiness.

The Temple of the Way of Light in the Peruvian Amazon near Iquitos, reached only by foot trail after a river passage.

Entering Elendil

From Rio, the great metal condor carried us over Lake Titicaca and the Nazca Runes before descending into the upper Amazon, and alighting at Iquitos, a sprawling shantytown of Honda moto-rickshaws and crumbling buildings. The contrast could hardly be starker—between the shiny high-rise hotels, haute cuisine restaurants, and high-end hookers parading their wares off the Copacabana to the mud, stink, and sweat of an overgrown logging town struggling to cope with constant in-migration of rural indigenous peoples losing their ways as the jungle gets divided up and sold off in commodities of land, oil, timber, ore, fish, and produce.

From Iquitos, we moto'd the muddy track of Calle las Flores to Santa Clara and passed up the snaking bends of the Rio Nanay by wooden dory to a nondescript river bank that marked the start of a trail to the village of Tres Unidos. If you omit the lost luggage in Lima or having to drink airplane water from plastic bottles, this was our first real ordeal of the journey, a sweltering, hour-long mud-slog along a river trail that had itself been river a few weeks before (with the Andes glaciers melting, the Nanay reaches higher levels in the rainy season than it has in the memory of village elders), to finally emerge, as if entering Elendil, in a cluster of trails between grass-roofed buildings known as the Temple of the Way of Light (3.44.309 S, 73.21.458 W).

...whatever we do should promote human happiness, love, human relations, and relationships between parents and children and friends.

The Temple of the Way of Light

There we joined the company of a skilled permaculture team from Terra Phoenix Design, Dave Boehnlien, Doug Bullock and Paul Kearsley, who had been on the ground for many months and had produced a preliminary master plan for a model in Amazonian permacultural sustainability. The plan encompassed the various elements of the owners' vision—the Temple, a healing center employing traditional Shipibo medicines and rituals, including *ayahuasca*; the Chaikuni Permaculture Institute; and a budding residential community, née ecovillage. The entire site nests within a local community of mestizo people, Tres Unidos, who are neighbors, employees, and partners in business with the Temple community.

Used to living in the so-called First World, many would find the spare accommodations of these jungle lodges difficult, but we are used to this sort of thing, and our hearts went out to the stout *porteros* who daily trek in and out with heavy loads of rice, beans, water, toiletries, and all of the construction material—wooden planks, bricks, mortar, and cement—from which the temple continues to grow.

The Temple ceremonies themselves follow a pattern established by the Shipibo healers, wherein at an appointed hour up to 21 "patients" arrive to one of the large *malokas*—thatch-roofed round auditoriums enclosed with mosquito netting—in which are arrayed an equal number of freshly sheeted mattresses, arranged in a circle. Beside each bed is an ashtray and a vomit bucket, and just outside one door is a bathroom in case the purge comes at the bottom end of the intestinal tract. Medicine is carefully administered in participant-specific doses, lights are

doused, and the evening begins. After about 45 minutes, when everyone is experiencing the rush of DMT into the bloodstream, the healers begin to chant their *ikaros*. Each, and there may be as many as seven *"unis"* (those with knowledge) will move around the circle from bed to bed, singing to each patient while they diagnose their needs and to call forth spirits to aid in fashioning remedies.

Subjectively, the process for the patient invariably begins with an ordeal. The drink itself is somewhat unpleasant tasting. Within the first hour, it produces physical reactions such as agitation, alternating hot and cold sweats, nausea, dizziness, and vomiting. There may be quite wild and vivid hallucinations. It can be acutely uncomfortable and unsettling, even for experienced voyagers, but one passes through these stages and gains insights, heals from within, and usually emerges with a deep appreciation for what has been accomplished.

At the appointed hour, up to 21 "patients" arrive at one of the large malokas *for a healing ceremony.*

Ordeal as ritual

We have a friend who is a veteran of the Sun Dance ceremony in the Lakota tradition of the plains Sioux. Although he is Mohawk, he married into a Lakota *teospaye* and adopted his wife's traditions. The Sun Dance is a very grueling ritual, and he is not a young man any more. His hair is gray like ours. He has much scar tissue on his chest where, after days of dancing, the eagle claws suspending him on leather thongs from a pole—the tree of life—tore loose and ripped through his skin. We can only imagine what it must have been like with the foreknowledge of that ripping open of his chest in a prior year to sit and have his chest pierced again, deeply, and the thongs lovingly attached once more.

There are rituals in both the Catholic and Islamic traditions involving atonement by self-flagellation. On the Day of Ashura, some Shi'a whip themselves with metal chains and spikes in the Zanjeer Zani ritual of mourning for Hussein. In the Hindu pilgrimage of Sabari Malai, a journey of 40 miles over blazing hot ground must be made barefoot, and the majority of those walking get blisters and cuts on their feet and knee and ankle sprains. The same for many of the Guadalupeños who walk, run, or crawl long distances across Mexico each December to show their devotion to the Virgin of Guadalupe.

In an interesting essay on the SubBondage Net (http://www.leathernroses.com/generalbdsm/chrismgoingdeepsix.htm) author Chris M. links these sado-erotic rituals to our human psycho-physiology. "Over the eons," he writes, "our nervous systems evolved, at least in part, to rescue us from bad situations. Upon injury, the nervous system jabs the brain with a message guaranteed to grab attention. Pain jolts the human beast into immediate action—a roaring scream, sudden spasmodic motion, fight or flight—all good things if, let's say, a sabertooth tiger takes an experimental bite of your posterior. Here's why it matters to us: To keep pain from crushing your ability to react, the brain floods the body with pain-fighting natural opiates, hormones, enzymes, and adrenaline. And as any well-seasoned bottom knows, this response produces all sorts of fun: feelings of excitement, arousal, clarity—even out-of-body or dream states. In short, the body's natural response to injury can be harnessed to create intense and mysterious sensations. When framed and emphasized by rites and rituals, these natural responses would naturally be ascribed to supernatural powers.

Brown rice diets, giving up pleasures for Lent, asceticism, hermitage, celibacy, fasting, and vows of silence or poverty have much in common with marathons, extreme sports, martial arts, the whirling of Dervishes, the Aboriginal walkabout, hard labor, boot camp, fraternal pledge hazing, and body building. The common theme is ordeal. You can sometimes reach a mountain summit by auto-road, chair-lift, gondola, or cog railway, but even with the great views of distant peaks and valleys, it is not the same experience of exhilaration, or the sense of self-reward that follows a long, exhausting hike or rope-work over difficult terrain.

So each time we resolve to "never again" punish ourselves with such sacrifice, pain, fatigue, and sweat, we wipe all that resolution away in the instant that we reach our goal, when we have our moment of light and love and ecstatic remembrance that this is what life is all about. This is what we are here for. As José Pepe Mujia reminded us, whatever we do should promote human happiness, love, human relations, and relationships between parents and children and friends.

Perhaps the pain and disappointment of Rio+20 and all the other conferences that promised so much and delivered so little are mere ordeal, the prelude to the ultimate awakening. We can only hope so, because from within the moment of the ordeal, all we ever have to go on is faith and perseverance. Δ

Albert Bates has been a member and resident of The Farm since 1972. He is a retired attorney, paramedic and graphic artist, and director of the Ecovillage Training Center, a project that teaches skills for regenerative ecological design of the built environment. He founded the Ecovillage Network of the Americas and is past president of the Global Ecovillage Network. He travels, teaching permaculture, and serves as an advisor to community sustainability projects on six continents. Among the books he has written are Climate in Crisis: The Greenhouse Effect and What We Can Do*, and* The Post-Petroleum Survival Guide and Cookbook: Recipes for Changing Times, *and* The Biochar Solution: Carbon Farming and Climate Change.

From the Regions

Ancient Patterns, Modern Practices

The Fires of Abundance

Deston Denniston

FIVE THOUSAND YEARS AGO, it was the commonest of sense: the food was in the prairie edges, and maintaining those edges was the key to prosperity. This viewpoint wasn't peculiar to one valley—native Americans actively managed the whole Pacific coast, indeed both American continents, for this effect. From the southeastern hardwood savannas to the oak-edged prairies of the Pacific Northwest, fires that were often intentional maintained the density and composition of forest edges. The continent was on fire, and indigenous Americans liked it that way.

After the Ice Age glaciers receded, leaving vast grasslands in their wake, indigenous people saw the forest encroaching into grasslands abundant with game and wild foods. They observed that frequent, low-intensity fires burned enough of the dead wood and prairie invaders to prevent bigger fires that burned everything. Low, fast fires leave charcoal and seeds. Hot, lingering fires leave ash. Ash suggests the soil has been sterilized, making regeneration difficult. Low-to-the-ground, fast-moving, low-intensity fires covered the continent, stopping forests from closing in. These burns enriched, rather than sterilized, the soils. Within the margins of this intensively managed forest, prairie edges grew unprecedented abundance.

Gifford Pinchot and John Muir debated natural resource management before Congress 100 years ago. Pinchot championed conservation management and sustainable extraction and stewardship, while Muir championed preservation and abstinence. Muir believed that "wilderness" should be left to its own devices and that such undisturbed wilderness will inspire us. Pinchot believed that maintenance is close to godliness, that stewarding resources is paramount to culture, and that studied, diligent observation and adaptive management are key not only to the prosperity of the western states, but for the preservation of nature in general. The debate has gone back and forth like a tennis game ever since.

Two hundred-foot walls of fire that do not leave functional edges, but broken gashes, ash-white and sterile, are jaunting across North America. Colorado's Waldo Canyon wildfire of 2012 burned a mere 18,000 acres (7,300ha). The California wildfires of 2007 and 2008 burned 2 million acres (800,000ha), while the Murphy Complex fire of 2007 in Nevada and Idaho burned 653,000 acres (264,000ha). The further back one looks, the smaller the number and average acres of burns tend to be. Two hundred years ago, through much of the inhabited West, fuel loads were burned off before they became a catastrophic problem. Low-intensity, high-frequency fires prevented the conflagrations common to our modern forests.

Strategically placed, controlled, low-intensity fires can maintain semi-open woodland savanna, with productive prairie-forest edges. Photo courtesy of Nathan Waldren, veteran and permaculture advocate.

Unlikely fire managers

The fire managers of Turtle Island were hundreds of dissimilar tribes with several dozen languages, socio-cultural structures, and belief systems. The practice of burning prairies softly maintained productive forest-prairie edges, and provided cultural boundaries. It also fed the fire-wielders well. The first people rarely burn now, after so many blankets and wars. The forests have closed in, the fuel loads are built up—one spark, and fires burn out of control.

Joint Base Lewis McChord (JBLM) burns. Located between Tacoma and Olympia in southwest Washington, JBLM hosts the lion's share of heritage prairies—roughly 14,000 acres (5,700ha) of the 20,000 acres (8,100 ha) that remain of the original 150,000 acres (61,000ha) of South Puget Sound prairies. Somehow, almost accidentally, these vestigial fingers of the historic Tenalquot Prairie have remained not merely intact, but actively fire-

managed. They boast some of the most intact ecosystems of the historic prairie region. However, they are not managed for food, nor are the surrounding forests managed for timber—they're managed for training soldiers in tactical deployment.

Small arms tracer rounds light the woods afire with clockwork regularity. Tank and artillery practice often results in flare-ups. In addition, the Department of Defense (DOD) forestry crew enacts prescribed burns to maintain the forest-prairie edges so that soldiers will have a variety of environments in which to train. The fires burn with low intensity, sweeping the ground, clearing fuel loads, and enriching the soil with char. Char improves soil structure and provides niches for bacteria, nematodes, insects, and other arthropods. The prairie's sky-flora edge is home to butterflies such as the Taylor's Checkerspot and the Mardon Skipper, and birds such as the Streaked Horned Lark. The Golden Paintbrush, a wonderful wildflower, and the Mazama Pocket Gopher, live much of their lives in contact with the rocky soils, while the Western Grey Squirrel lives above, among the oak and fir. In the waters of JBLM, the Oregon Spotted Frog sings its mating songs and lays its eggs. All these species are threatened or endangered; many thrive because of the burns.

The Tenalquot has burned for thousands of years. This is no natural, pristine, or wild habitat, but uniquely man-made, a cultural modification that has, quite accidentally, been maintained by military training. Mere miles away in Tillicum, Spanaway, and Yelm, the species listed above have been extirpated. In most regional national forests and even many heritage reserves, these species are rare, or conspicuously absent. The JBLM bomb range is not the Zone 5 your permaculture guru told you about. The DOD's land management and cultural teams at JBLM, along with state Fish and Wildlife and Ecology Teams, saw what was happening. They began to coordinate around managing the landscape for Endangered Species Act protection and research at JBLM. They knew immediately that they were obliged to enjoin Tribes as partners. It's important to understand what management patterns work, both for landscape and partnerships. So far, the partnerships managing JBLM have produced some of the best outcomes for endangered species nationally. A layered and rich engagement between these agencies and the Tribes, with all of the difficult politics and nuance one can imagine, has been created. The policy and practice of burning maintains the pattern of active management that has kept the Tenalquot from vanishing under the forests' advance for perhaps 12,000 years while many of the rich ecosystems of our once fire-managed continent have been erased by development, "natural" forests, suburbs, or farmlands.

A century after Muir and Pinchot debated the fate of the forests, we see the result of Muir's preservationist ideals playing out in vast portions of the American West. As smoky as it is with all these catastrophic fires, one thing is clear: Pinchot has the winning word in this century-long debate.

VETS CAFE

Across the western states, farmers, environmentalists, forestry professionals, rangeland mangers, fisheries, tribes, conservation professionals, soil scientists, and agronomists are looking for ways to abandon fossil fuel-intensive landscape management patterns adopted in the last century, and instead to employ ancient wisdom in land management so as to better prepare for and manage fire. Veterans stand in a prime spot to revision the practice of broad-scale landscape management in the US. As the last few summers of fire storms have shown, the landscapes of the West demand skilled technical practitioners capable of split-second thinking and fearless fellowship in the face of emergent and catastrophic events. Fifteen fire trucks had to defend 1,700 homes in the Waldo Canyon fire. Hundreds of homes were lost. Meanwhile, veterans, proven in performance of hands-on technical skills requiring highest accuracy under stressful conditions, sat unemployed and unasked, while at the ready.

Pragmatic actionaries who will practice effective resource management and cultural self-sufficiency must be eco-savvy and have excellent restoration skills. That is one reason why we are training veterans in permaculture. Another reason: vets are hungry for it. The courses offer a chance to reconnect and reaffirm oneself as a part of a natural system—something that time in the armed services can challenge and confound. Healing the landscape and the self are two reasons why veterans are coming on board with permaculture trainings. We still want to serve, but we've gotten a lot clearer in our understanding of what the call to service means. We hearken back to the Civilian Conservation Corps, a heritage we embrace and the legacy we want to offer.

Pinchot championed conservation management and sustainable extraction and stewardship.

The Veterans Education and Training in Conservation, Agriculture, Forestry, and Ecology Program (VETS_CAFE), began working with veterans in August 2012 to support both tenured and those in transition from military service to civilian employment. The VETS_CAFE program delivers education that prepares veterans for national transitions of land management policy by providing the best access to the most relevant Conservation, Agriculture, Forestry, and Ecology practices of our time. Salmon-safe farming, riparian management, prairie restoration, sustainable agricultural production, Forestry Stewardship Council-certified forestry, and more are included in our curriculum.

If you're a veteran interested in accredited studies leading to a matriculated degree, or a certificate program that will enhance your professional repertoire, or a graduate student interested in veterans studies and issues, please accept our invitation and contact us to participate in this program. Δ

Before and after his service in the US Army, Deston lived and worked on small family farms in western Washington. He is currently partnering to develop the VETS CAFE educational program for veterans interested in conservation, agriculture, forestry, and ecology. Deston is an honorably discharged 50% disabled veteran who served in the US Army from 1988-90. To find out more, please contact him at abundancepc@gmail.com.

Movement Musings

What Getting Started in Permaculture is Really Like

An Ode to the Unperfect

Crystal Allene Cook Marshall

SENDING IN THAT CHECK culled from our meager wages to attend our first PDC, my husband Edward and I knew a few things for sure: we were lucky—damn lucky. We had a chance to regain at a fair price the farm property in North Carolina he lost with his first marriage. Despite our incredibly good fortune, we knew, though, that he absolutely could not repeat the effort from 1992-2002, working 70-80 hours a week to produce wholesale organic vegetables, flowers, eggs, chickens, and pigs and still going broke. Moreover, we didn't have the cash flow to fix many of the problems on the property or to invest in expensive equipment. Edward also lamented the isolation he'd felt when living on the farm. We knew that community had to be our central goal.

The PDC course we took in upstate NY at the Hancock Permaculture Center was a 15-year dream in the making for Edward. He'd first heard of permaculture in 1993, but as a young farmer with a family to feed, could not justify the cost of a course. Far from appearing a dashing permaculture paradise, the Hancock Center centered more on the actual community of people in Hancock. We had our lectures and discussion in one participant's apartment, and our design site was located elsewhere, with people who really needed land-management assistance (water had inundated their property in the spring). We had site visits to yet other locales, and wrapped up our final presentations in a refurbished old schoolhouse. The permaculture practice was out in the community—an experience we treasured and that jived with our own goals.

We scraped the wood to reuse in the next building project.

Flash forward. After our last permaculture weekend at Hancock, Edward and I arrive back to this property ignored for ten years, the rich fields he'd built now covered in brush and forest, the sharecropper's house rotted through the center, the back property littered with piles of someone else's garbage, and most of the low land covered with an invasive ivy. Despite this greeting, we were bright-eyed and bushy-tailed; fortunately, we were armed now with 14 chapters of Bill Mollison's tome as our guide. When we felt pulled by problems in every direction, we found ourselves leaning on a few key permaculture principles. These restored our sanity when starting a permaculture center from scratch out in the country seemed like something only insane people might attempt.

A commitment first to Zones 0 and 1

As a young farmer, Edward never had time to finish the drywall or tiling under the tub. So I kept at it—if community was our first goal, we had to make this place people-friendly—first to us, our family, and from there, to the wider net of people in the community. So, when we started crying and heaving while picking up the carpenter ant-infested spray insulation in the attic: the answer lay in Zone 0. When we cleaned the mouse-infested kerosene heater to keep from freezing in winter: more Zone 0. In times when we fought and thought our situation would never turn around, and we'd rather be out there, on the land, doing anything but this: still Zone 0. With the mistakes and the mess-ups and the DIY learning curve: you guessed it—Zone 0. When Edward frets that we don't (yet) have mandala fountains, eco-boardwalks, lush trellises of Three Sisters, or hugelkultur tumbling down the hills, we're making a little progress: Zones 0 and 1.

One other key permaculture principle kept us going: protracted and thoughtful observation. At least a dozen times in the last year, we were convinced A, B, or C had to happen, and when the weather changed, or we found a different material, we gained a whole new view on how to continue a particular project.

Next on our list—share the surplus. A wise teacher of mine once said that giving should be from a place of abundance, after the self is full. To me, an important part of permaculture involves needing less. However, it is also about honoring the incredible

good fortune and abundance right there before our eyes. On the day we discovered the carpenter ants, I put a celebration and inauguration party on our calendar—seemed like a forward-looking thing to do. Through this and beyond, we focused on what we already knew and could give back to the community. We reached out to non-profits and other groups to bring what we knew to them rather than only having people come to us. We kept finding surplus to share.

of how things often really get started—two people standing in an empty lot, looking at each other and the bare dirt with broken bottles scattered about, and these folks saying to each other, "now what?"

I want more of the "perma-kerplop," rather than the "perma-perfect." I want more about how failure made people stronger because they could find permaculture solutions. I want to sing the praises of the screw-up, the missed chance, and the untimely turn.

We often don't commend the losers—but this essay is an ode to you who tried and failed and got back up to try again. I sing this to you, the "perma-unperfect." May you prosper. I sing your praises—despite the goof-ups and bumpy landings, you found a way to keep at it! Thank you for getting up again and going to it! Δ

With her husband Edward, Crystal runs the We Are All Farmers Permaculture Institute, focused on making permaculture affordable and accessible in the Appalachian-Piedmont regions. She has worked in education and non-profits for way too many years. Currently, she is also pursuing a PhD, studying the fate of mining and factory town communities and the policies that affect them.

I want more of the "perma-kerplop," rather than the "perma-perfect."

The problem is the solution

I can still hear our PDC instructor Andrew Leslie Phillips saying in his Aussie accent, "Woods grew over the fields? Make a food forest. Squirrels ate the first seeds you bought? Start eating squirrels. Septic system about to flop out? Change to humanure. Can't afford all of the fencing for goats? Get pigs." And so on the list goes.

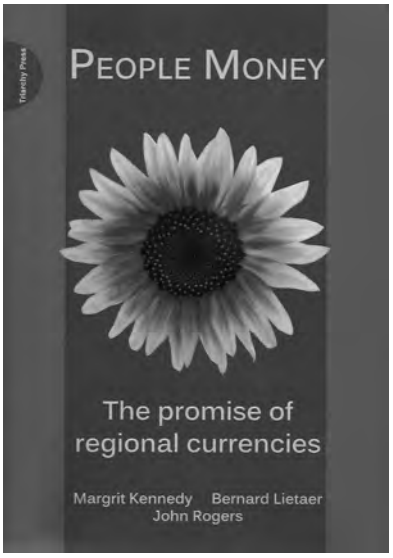
Did Edward and I magically come to these conclusions above? Without our permaculture training, instead of turning around Zones 0 and 1 the first year, we would have only dug a couple of holes and took turns burying each other in them.

We both love watching online videos of cool permie projects. We love to imagine the teeming permaculture projects we will have helped facilitate in the community and also here at our place. Yet, our experience is probably like that of many others. We got lucky and found ourselves with some land or a plot of dirt or a window planter or ...? In any case, I would like to honor the permaculture "unperfect." Rather than a slate of videos and articles about how to build the permaculture perfect, I would love to see a lot more videos and learn of more experiences where things blow up in someone's face, and there is resilience to keep on keeping on. I want to see videos where the whole project flops, someone cries, and then they find their way back to a permaculture principle that brings them insight. I want more

Reviews

Learn to Make Your Own
Review by Peter Bane

MARGRIT KENNEDY, BERNARD LIETAER & JOHN ROGERS
People Money: The promise of regional currencies
Triarchy Press. Axminster, Devon. 2012. 251 pp. pap. few illustrations. £20.00.



Regional or local currencies as they are sometimes called in North America are little known and less understood. Most readers of this magazine or individuals with an interest in economic justice and social development will have heard of a few examples: Ithaca HOURS, a prominent effort from the 1990s, the Lewes pound—a recent Transition-linked issuance, or the LETS system—which is not one regional currency but a model for many. There are hundreds of others worldwide ranging from neighborhood scale voucher systems in Brazil to a billion-franc electronic trading network in Switzerland called WIR, in operation since the 1930s. This book reports on a vast range of them. It provides perhaps the best up-to-date compendium of examples and lessons on the subject.

The authors arguably include the world's foremost authorities on currency creation; their collaboration on this title is fortuitous. Margrit Kennedy, a German architect married to European permaculture patriarch Declan Kennedy, wrote one of the earliest and still best-known titles on the dilemmas of money, *Interest- and Inflation-Free Money* in 1987, when she realized that no truly eco- or sustainable building could be done without a reformation of the debt-based money system. Bernard Lietaer worked for the Belgian Central Bank in the run-up to the release of the euro and was intimately involved in designing the convergence mechanism that brought the original 12 currencies together. John Rogers began his work with local currencies among depressed Welsh mining communities and now consults and teaches worldwide.

Regional currencies have as their principal purpose the rebuilding of tattered

social capital in communities decimated or merely marginalized by the modern economy. The mechanisms they use are many and varied, from ledger books to elegant local notes, and simple scrip to debit cards and computer software. The aim is to get people trading with each other, working where they had previously been unable to do so, and mobilizing sidelined or neglected resources within the community. The need for this is great and growing, and the authors are to be commended for persevering against all odds to bring a promising social technology to greater public awareness. It is not far fetched to imagine a global financial crisis that might pull much of the world's money supply out of circulation within the next two years. Greece is in the stew today, Spain is teetering, and what is now deeply troubling the euro-zone may soon be a global contagion. It would be extremely helpful if many community leaders, including elected local officials, were familiar with the possibilities of regional currencies and would be ready to roll them out soon.

Regional currencies, because they enable people to "monetize" underused resources, don't compete with national or transnational currencies like the euro. Instead, they enable people without ready access to money to reenter the social fabric, building resilience for everyone in the process. Businesses in many locales have found local currencies allow them to tap unused capacities, thus improving profits. The most familiar mechanism paralleling regional currencies are the frequent-flyer miles of the airlines. These help build customer loyalty while exploiting the unused seat capacity of planes already flying. Restaurants could do the same in a way that blended regional and national money. Most have a marginal meal cost around one-third of retail: staff salaries, rent, and utilities are fixed, and about a third is profit. To obtain half the cost of a meal in national currency and the other half in a regional currency would represent a net gain. Full restaurants are always more attractive to customers than half-empty ones. And satisfied customers who feel they've gotten a bargain are more likely to return.

Whether regional currencies enable elders to obtain cooking, shopping, or cleaning assistance, put unemployed teens to work running a community cafe in exchange for time credits that enable them to attend local entertainments, or let people sell off unused furniture, get their hair done, or repair a roof, they demonstrate the magic of money—something we often take for granted—to knit communities together. In small, intimate, and traditional communities, work, favors, surpluses, and goods are exchanged very often without any money, but with a running sensibility of paying forward for what one will receive in due course. In the modern world of larger cities and distant relations, however, such close-knit communities are rare. Money enables people's natural gregariousness and social instincts to come forward legitimately. It symbolizes value and worth that we bring to exchange. In a world increasingly clouded by monetarist cries for austerity, hundreds of millions, soon to be billions are without ready access to money or to enough money to meet basic needs. This effectively shuts them out of society and expands the economic crisis, threatening the legitimacy of governments everywhere. Regional currencies could turn this tide, helping to create financial microclimates in which local economies could shelter during the storms now gathering on every horizon.

The most familiar mechanism paralleling regional currencies are the frequent-flyer miles of the airlines.

People Money has the feel of a workbook. It is crisply organized with subheads and bullet points, illustrated sparely but rich with case studies from every quarter of the world and of every type. An example I found inspiring tells of South African Tim Jenkin's escape from the notorious maximum-security Pretoria prison at the height of apartheid. He had been a white clandestine operative for the African National Conference in the struggle against the Afrikaaner regime and was caught. He escaped, fled to London, and after Nelson Mandela's long walk to freedom, returned to his native country full of hope for social transformation. He and many others were sorely disappointed to see movement in that direction constrained. Chancing upon a report of a Local Exchange Trading System (LETS) in Australia that highlighted its potential to help the unemployed, he set up a similar scheme in Johannesburg which sputtered out after about a year, once outside funding failed. He didn't give up, and by 2003 he and others had helped spawn six local exchange systems around the country. The next year they began linking them up. The Community Exchange System (CES) had by 2012 grown to support 395 local systems in 43 countries as LETS administrators around the world found its software a friendly and economic way to circumvent cumbersome bookkeeping chores and allow them the freedom to organize and promote the growth of their own systems. CES now has over 22,000 individual accounts and nearly 3,000 family, non-profit, and corporate accounts. It is an example of the potential of the Internet to facilitate community currencies by bringing down transaction costs.

Activists keen to sharpen their skills will find in these pages a trove of useful examples in sharp detail, from the Brixton Pound to the Argentine barter networks to the Dane County (Wisconsin) Time Bank to the Bavarian Chiemgauer and the Scottish Business Network. More than just a catalog, however, the book aims to compare, contrast, and draw lessons from the successes and limitations of the various cases it presents. The authors recognize the importance of liberating money from the death-grip of central banks and the elites they serve. Perhaps no cause could be more urgent today.

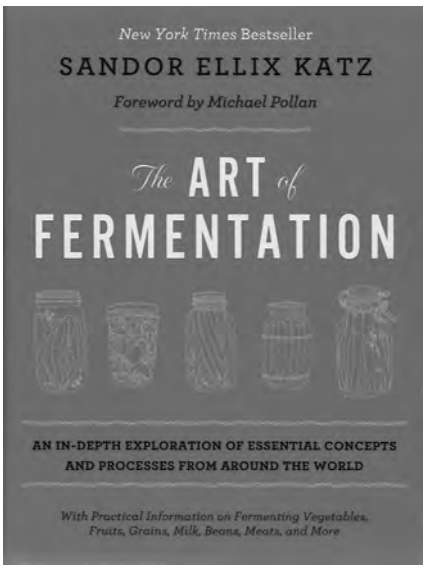
Money, in its creation and operation, has remained an arcane subject since goldsmiths began issuing certificates of deposit more than 600 years ago. Those who have the greatest stake in the present financial system—you can guess who they are—have the strongest motivation to ensure that the public remain utterly ignorant of money's power and its function. *People Money* intends, by highlighting alternatives, to penetrate that obscurity and bring the true power of money back into the the commons.

Until this is done, there is little likelihood that modern societies can transform their organization to accord with their nominal ethics or to meet the real needs of most people. While wealth was expanding during the 20th century, it was possible to neglect the worst effects of government monopoly money, but now that energy and wealth are contracting, it becomes more urgent with each passing month that we reclaim the power to create the means of exchange between people. Money is a powerful lubricant and stimulant for the growth of social capital, or community connectedness. As financial capital and manufactured capital are destroyed, only social and ecological capital, and the growth, health, and inspiration of people can begin to fill the gap they are leaving behind.

Recommended for community organizers and political campaigners at every level, this book is unlikely to receive optimal distribution. At present it is available by web order from the publisher in Britain. With shipping, costs to North American readers will run a bit over $30. Δ

Microbial Bliss
Review by Peter Bane

SANDOR ELLIX KATZ
The Art of Fermentation
…with practical information on fermentating vegetables, fruits, grains, milk, beans, meats, and more
Chelsea Green.
White River Jct. VT. 2012.
498 pp. cloth. color plates, line drawings. $39.95.



When new members began formal entry to Earthaven Ecovillage, we required them to tell their life stories. The manner was left to the applicant. It became a truism in the community that those with the longest lives attained the gold standard of delicious brevity (appreciated by a group long on meetings), while the young were filled with the enthusiasm of every detail. Sandor Katz's masterwork is replete with a richness rarely seen in literature, so I shall have to restrain my praise, the better that you should have time to savor the wonders of the original.

The Art of Fermentation is a cookbook and a beautiful one. In its originality and comprehensive vision, as well as its simplicity and inner calm, it bears comparison with the great works of Beard or Child. Unlike most cookbooks, this one is not filled with recipes. Yes, you will find in here precise instructions for making Sourdough Chocolate Devastation Cake, and other wonders I shall leave you to imagine, complete with metric and traditional measures, but in the main Katz offers a narrative exploration of the world's heritage of ferments great and obscure. This includes, of course, explanations and descriptions emphasizing qualities but not neglecting quantities.

Three chapters present the domain of ferments, benign and potent alliances that humans have forged with microbes over the millenia: the power of culture, the basic tools and methods. The remainder unveil the many arenas of ferment outlined in the book's lengthy subtitle. Of these, some greater weight is given to vegetables. In delicate but densely populated terroirs such as sauerkraut, kimchi, carbonated alcohols, yogurt, tempeh, miso, kombucha, and sourdough, the author offers troubleshooting tips for the unlucky and the timid.

In the decade or so since he has been investigating edible microbes and what they do to food, Sandor Katz has tapped and nurtured an enormous network of correspondents whose collateral research has informed this work. Much of the book reads as a polylog with his many fellows around the world, reminding us that microbial cultures, while they may not need us to survive, have happily entered into a kind of symbiosis, and that we—you the reader the newest guest in the house of culture—have become their hosts and translators.

Combining scholarship with first-hand investigation, travel, and conversation, and ranging over languages, cuisines, economy, and biology, Sandor lovingly connects the past with contemporary creativity; the same force that generated the world's great food palettes still graces its tables today.

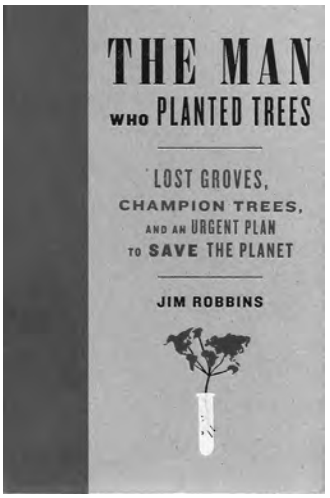
Readers of *Wild Fermentation,* Katz's earlier and still popular introduction to the subject, will discover new material throughout this book, including chapters on fermenting flesh foods. I found considerable satisfaction in the short but important chapter 13 on commercial applications. As a microfarmer attempting to convince my local officials that our suburban plot needs a multifunctional barn and that we know best how to use it, the many informative stories of bureaucratic harassment (and sometimes support) resonated keenly. Always, it seems, cultural pioneers risk becoming scapegoats for ignorance, prejudice, and the fears of the past.

Not to be held back from the lively edge, in his concluding chapter Katz offers short but insightful looks at ferment in non-food areas: agriculture including livestock and the ferment of urine, seed-saving, pest control, bioremediation, waste management, medicine, skin care, fiber and the building arts, dyeing, and the dead, that is, the disposal of bodies. I have no doubt we would all be enriched should any of these become the subject of his next book. This one is indispensable. Δ

Tree Wisdom
Review by Peter Bane

JIM ROBBINS
The Man Who Planted Trees
Lost groves, champion trees, and an urgent plan to save the planet
Spiegel & Grau. NY. 2012.
216 pp. hardcover. color endpapers. illustrated. $25.

The original book of this title has become famous among tree lovers the world around; author Robbins (and his publisher) have taken a calculated risk in offering a new view of humanity's dream of the trees. The first "Man Who Planted…" was an artful construction of that dream based in myth and not in fact, but it achieved a truer-than-truth quality that has kept it alive for millions. This incarnation of the story is rooted solidly is fact. Robbins is a science writer for many of the most esteemed of establishment journals, including the *New York Times* and *Scientific American.* He doesn't live in the metropolis, however, but keeps at least one foot in the wild lands of the Northwest.



Nominally the story of Michigan nurseryman David Milarch and his near-death calling to preserve the world's champion trees (those biggest and oldest of each species), this book weaves a broader tale of tree miracles, salvation, and tragedy into the narrative of Milarch's unlikely life, near death, and halting, persistent progress toward his calling. A skeptical Robbins, encountering his protagonist's account of returning from the dead, had to assure himself that Milarch was not merely a crank. Apparently, more than three million Americans have reported profound and life-changing experiences from close encounters with death: the phenomenon is almost commonplace, has received significant scientific study, and no longer connotes either madness or archaic religiosity. As attested by his close associates, Milarch was apparently reorganized electrically through his transit of the edge-of-life realms—he now seems to have a wildly disruptive effect on computers and other electromagnetic equipment. The vision he pulled in (or that pulled him back) continues to put fire in his eyes.

As natural history, the book offers a fresh look at slow-developing but powerful processes to bring tree science out of obscurity.

As he interpreted it, that calling was to collect cuttings from the world's great trees and clone them, because the world's fate depends on the resilience of its forests, and those are now and increasingly devastated by high-grading, clearcutting, and other forms of mining their wealth. Calling the present remnants "the runts of the runts of the runts," Milarch has sought out national and state champion trees from the odd corners of the country where they linger, and more recently has travelled to collect germplasm from the world's great forest avatars. By cloning he expects to reproduce the successful genetics of the originals, undiluted by sexual reproduction, all the while acknowledging that DNA is only part of the story.

Recounting the ups and downs of Milarch's doing the impossible with nearly no money and little more than passion and the goodwill of receptive audiences, Robbins takes us on a roller-coaster ride from obscurity to grandeur and back to austerity. Whether Milarch is on a journey of spiritual purification or being used by angels to toss the world a life preserver, we may never know, but this book is most interesting for the insights it offers into the function and miraculous power of trees and forests. Many of the apocrypha passed along in permaculture courses resurface here, authenticated by the careful research of a professional science journalist: trees make much of our rain and they communicate with each other in ways we can't see but can track with instruments and by experiment; trees saved New York City more than $6 billion dollars in protecting and improving its water supply. More startling to me was the revelation that trees are generators of vast amounts of phytochemical aerosols that don't merely make the rain, they fight pests and can make humans and all other higher animals either sick, or as in most cases it seems, maintain potent well being. Apparently a walk in the woods isn't just a funny book on hiking, it's a prescription for preventing or even curing cancer and heart disease.

I found this book in a shop in Traverse City, Michigan, not far from where David Milarch and his family live, but the story it tells leads to remote and fascinating places all over the globe, from Ireland to Africa to the Sierra Nevada of California. The people, like Milarch, who love trees are a distinctive and impassioned fraternity: they will need no encouragement to appreciate the work Robbins profiles. As natural history the book offers a fresh look at slow-developing but powerful processes to bring tree science out of obscurity. In many ways our ignorance of trees is an inexcuseable blindness. For those of us with hope that a runaway climate can be lassoed and tamed once again, support for the planting of new forests on a heretofore unimagined scale is entirely welcome. Robbins, as the subtitle suggests, is one of those who believe that in planting trees lies the salvation of the world. He goes a long way in this book to making his case that human health, soil repair, pollution cleanup, and vastly more have their anchor of hope in the roots of trees.

A book to be shared with friends, *The Man Who Planted Trees,* is hopeful but provisional. Its success, and not merely in the marketplace, depends on the support of us all. Δ

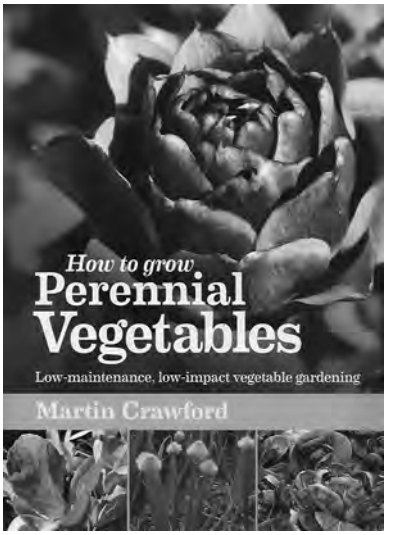
Are You Still Tilling?
Review by Peter Bane

MARTIN CRAWFORD
How to Grow Perennial Vegetables
Low-maintenance, low-impact vegetable gardening
Green Books. Totnes, Devon. 2012. 224 pp. full color. illustrated. $26.95.

Martin Crawford has gone farther down the path toward a permanent agriculture than virtually anyone working in the temperate regions of the world. That he has done so systematically, both trialing plants and reporting his findings to the world, is a boon for all permaculture designers. In this book he lays out the case for and the methods of growing perennial vegetable crops. Fruits and nuts have long provided most of the calories eaten from perennials, and with their dominance of cultivated woody systems, are likely to continue doing so for a long while. Perennial vegetables, however, could begin to transform ordinary gardening in the direction of permanent systems. This book explains how substantial yields of carbohydrate and not merely of mineral- and vitamin-rich leafy greens can be had from plants that needn't be dug each year.

The advantages of perennials are many, the disadvantages real enough but few. Tillage is a tremendous contributor to the oxidation of humus and the buildup of carbon dioxide in the atmosphere, a major driver of catastrophic climate change. Whatever we can do to reduce this is worth considering. Soil fertility is more easily built in non-tillage systems but weed management, while not more onerous overall, requires different approaches. Placement and the relationship of neighboring plants over time must also be more carefully considered than in settings where everything is wiped away with the onset of cold weather. Crawford addresses all these issues. Permaculture designers, and especially those interested in forest gardens and other tree-based systems will find the planting diagrams, plant architecture suggestions, and plant lists and profiles herein to be invaluable.

As with his great book *Creating a Forest Garden,* Crawford here presents a relatively brief section of systematics: theory, structural considerations, timing, maintenance issues, soil development, the use of mulches, methods of propagation, etc., followed by a much more expansive section of plant profiles, some 140 in all. These consist of herbs, vines, shrubs, and trees from which the leaves or flowers are eaten. Each profile gives a paragraph of description and origins followed by cultivation notes, culinary uses, and maintenance and potential problems. There is a color photograph of the vegetable in every profile.



Placement and the relationship of neighboring plants over time must be more carefully considered than in settings where everything is wiped away with the onset of cold weather.

The information in the book is both well-researched and has been tested by the author in his own gardens. It thus represents a valuable addition to the literature of permanent agriculture.

Though Crawford's research plots are located in a very mild section of SW Britain, the variety of plants profiled includes many that are hardy to very cold zones including northern parts of the US and southern Canada. North American readers will find many of our native plants among the global cornucopia on display here. There seems to be enough variety that an entire vegetable diet could be assembled from the selections presented. This is aided by Martin's inclusion of what he calls "replant perennials," among which he counts potato and sweet potato, as they will regrow from tubers missed and left underground. While the many valuable annual food crops to be found in humanity's cultural heritage are unlikely to be abandoned soon, this collection presents a serious challenge to those who would assume that perennial systems can only make a marginal contribution to the world's nutrition.

Martin has privileged his British readers with the language conventions of the UK and European English, but reasonable concessions to North American readers are included. The description of *Medicago sativa,* for example, is listed under 'Lucerne,' but a reference is also given under the heading 'Alfalfa.' Lindens are 'Limes' and so forth, but this is for the most part, simply a pleasant stimulus to cultural expansion, and not a great hindrance to using the book.

While many of the plants listed are also to be found in Eric Toensmeier's fine *Perennial Vegetables,* this selection is both larger, and it seems to me more sharply focused on cool climates. A helpful and practical handbook for all gardeners, *How to Grow Perennial Vegetables* is also an invitation to a promising and valuable branch of horticulture most of us have scarcely begun to explore. Δ

Brother, Can You Spell 'Paradigm'?

Review by Peter Bane

JAMES ROBERTSON
Future Money: Breakdown or Breakthrough?
Green Books. Totnes, Devon. 2012.
192 pp. paper. $24.95

Along with his American colleague Hazel Henderson, British author James Robertson is the dean of holistic economics. Now in his clear-eyed 80s, and despite a distinguished early career in the Colonial Office following an Oxford education, he is modest enough to set out his experience at the opening of this book, as a basis for his authority. Early involved in the de-colonization of Africa and other imperial territories, he sees the deliberate and planned relinquishment of old power structures that preceded colonial independence as a model for the kind of change he hopes will happen in the national and international monetary systems. A management

consultant who assisted the Ministry of Defence to rationalize support services when the three military branches were merged administratively, he went on in private work to assist "the big banks,"—presumably the big British banks—to prepare for electronic financial transfers early in the computer age. As a co-founder of The Other Economic Summit (TOES), and a colleague of both E.F. Schumacher and Ivan Illich, he has been deeply involved in movements for fundamental social and environmental transformation for some 40 years. This is likely to be his last major work.

Future Money is written, in the author's words, "to achieve a less primitive level of understanding how the money system works, as the Copernican Revolution did for our understanding of the solar system; and then to identify and carry out practical reforms to bring

money values more closely into line with human values and purposes in the 21st century." In the book, Robertson lays out some lessons from the history of money, then explores the disjunction between the money system today and the ethical values that would support human life in the next 100 years. On this basis, he then sets out what he sees as the needed reforms in national, international, and local money. His seventh and final chapter briefly treats a few lingering economic myths: Capitalism v. Socialism, Economic Growth, the Gold Standard, and Cap-and-Trade schemes. In case you can't guess from this rogue's gallery, the author doesn't think much good of any of them. He concludes the book with a few remarks about political action for reform and an appendix explaining the historical role of Georgist economics and the Social Credit movement, two phenomena of the 19th and early 20th centuries that aimed in broadly the same direction as the author suggests we must now move.

The diagnosis and prescription that Dr. Robertson offers are radical but not complicated: national governments, meaning civil servants under the control of elected officials, should reclaim from private banks the primary role of creating money. Private banks, it has been shown unarguably in the last four years, have no interest in the public good, no motivation to ethical or even lawful behavior, and no particular claim to intelligence, even in serving their own corrupt purposes. In addition, national governments, individually and in concert, should adjust their tax and spending policies to discourage bad environmental behavior and liberate self-directed work. He articulates the arguments for these simple propositions, and they are many.

The diagnosis and prescription are radical but not complicated: national governments should reclaim from private banks the primary role of creating money.

Regarding the first point, readers must first understand that virtually all money is created by debt, when commercial banks lend money. Their ability to lend more money than they have on deposit, called *fractional reserve banking,* and the consequent requirement that governments back them up with promises to insure depositor funds against bank runs, merely codify shady practices that emerged in centuries past as paper money, issued by agencies of deposit (banks and others) came to replace coin, bullion, and other real assets. There is no moral or practical justification for such shenanigans any longer. Money today is leant by banks primarily to projects and customers who are likely to use it in the most socially and ecologically exploitive manner, as this is typically the route to high profit. Why accord the privilege of directing society's investment capital to sociopathic and block-headed institutions and actors? Government could do little worse and it can be thrown out on its ear every few years if necessary. Central banks, under the control of national governments can determine the level of money needed by their societies and simply create it, debt-free by issuing money to the treasury to spend for public purposes, determined in due course by legislative deliberation.

By handing to the private banks the privilege of creating money, the taxpayers subsidize to the tune of hundreds of billions of dollars these criminal syndicates (and this is before bailouts). The creation of money as debt requires the economy to grow (even though the shrinking base of natural capital—including fuel—ensures that it can no longer do so) because, while money is created to make loans and is extinguished when the principal is repaid, no money is created by the banks to pay the interest they charge. This must come from extracting additional natural or social capital, leading to greater ecological exploitation and indebtedness of the public. This is as simple as gravity and just as inescapable so long as money is created by debt. In addition, as we have seen, the wrong projects are funded, speculation is encouraged, and left to run its own evolution, this monetary system, the one we have today, winds up as a global casino in which most of humanity are the losers.

The chief objection usually offered to this straightforward reform proposal is that governments will use the power to create money for purposes contrary to the public good, that more money will be spent than can find useful work to do or goods to bring to market, and that inflation will result. This is quite a fatuous claim, and considering where it comes from, largely self-serving. Governments are presently spending vast sums of money, much of it borrowed from banks and other wealthy interests, to fritter away on war, with no evidence of inflation resulting. Indeed, borrowing costs are near all-time lows. So we have today conditions exactly

contradicting what is feared. Public money is wasted on destructive and expensive boondoggles, public indebtedness is thereby increased, and no inflation is resulting. Why, pray tell, if we gave an income subsidy to all citizens directly (Ben Bernanke's famous "money dropped from helicopters" scenario) would we do any worse?

Regarding the second broad reform of public finances, Robertson suggests that taxes should be shifted off of incomes, profits, value-added, and other financial rewards for useful work and enterprise (goods), and put instead on activities that subtract value from common resources such as land, forests, fisheries, minerals, and the environment's capacity to absorb pollution, i.e., the destruction of ecosystems and the release of carbon into the atmosphere (bads). Much of this revenue, he recommends, should then be distributed not as perverse subsidies, e.g. to the oil and gas industries or to destructive forms of commodity agriculture, but directly as a citizens' income and not as dependency-creating payments linked to work search or poverty levels. This would enable many more people to create self-employment, stimulating local economic vitality and reducing externalities such as commuting. More creative and socially appropriate work and production would result.

These ideas are simple but profound and they are not unique or original to Robertson. What he has done in *Future Money* is state them clearly, repeat them several times in different ways, and lead us to draw our own conclusions about how they should be implemented. About action, he is less than optimistic, as revealed in the book's subtitle. The good doctor is well-versed in the global ecological crisis and he writes from the broadest possible perspective. While taking nothing away from the seriousness of climate change and resource depletion nor from the impassioned arguments made by their critics, Robertson points out what Richard Heinberg and others have also said, that a breakdown of the world's financial systems may indeed be the proximate global crisis and the tipping point that throws civilization under the bus.

What changes are needed this book makes clear. How they are to be realized is far less certain. The author suggests that growing global connectedness and alliances of once distant groups facilitated by the Internet may help bring about monetary reform. He reminds us that women and youth, though together a global majority, are decisively disadvantaged by the present money system, which is essentially a puerile game played by overgrown boys with a vitally important public utility, our money.

The book's sections on the creation of international and local money, while important and thoughtful, will be of less use to most. National-level monetary reform is closer to hand and should be the primary focus of activism. Robertson suggests that it would be quite a simple process to empower the Bank of England, for example, which used to be a fully private institution and has been nationalized with no apparent harm, to issue the national money entirely instead of merely its banknotes and coins (about 3% of the supply). If one prominent nation did this, and the U.K. is a good candidate, the possibilities for others to do so would expand geometrically.

One realm of action, not considered herein, is the proposal, well-articulated by Ellen Brown, for US states to charter their own state-owned banks, as North Dakota has done. While not able to issue currency, these banks could dramatically affect the availability of money in their territories and move the national dialog toward the ideas Robertson proposes.

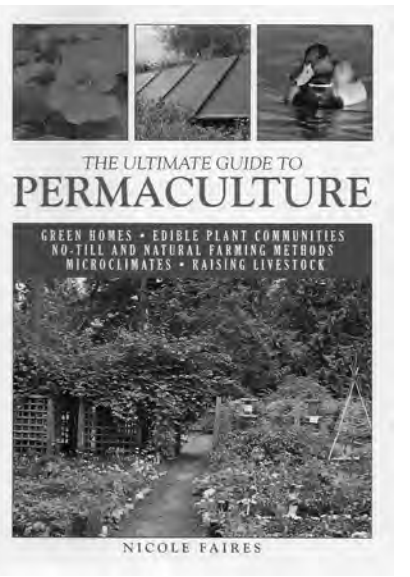
The problem with monetary, tax, and spending reforms, despite the urgency with which they need to be implemented and the cogency of the author's arguments, is that the pressures to bring such changes about are diffuse and come from people who have, for the most part, lukewarm enthusiasm for them, while the opposition to change is well-funded, keenly focused on maintaining its privileges, and deeply in bed with policy makers. Must we tumble over the precipice to achieve a new consensus, and would any action at that point still be possible? This is the terrible dilemma we face. Δ

Good Teachers Matter
Review by Peter Bane

NICOLE FAIRES
The Ultimate Guide to Permaculture
Skyhorse Publishing. NY. 2012.
330 pages. pap. all color. $16.95.

Despite its attractive appearance, with all color photos and a modest price, this book fails to deliver anything that its title implies. It is neither the last book on permaculture nor the essential one. In fact, it's not much about permaculture at all.

Nicole Faires lives with her husband and three daughters on a 37-foot bus, rambling around the countryside of British Columbia. She confesses that her writing helps to fund their otherwise ungrounded but grand adventure. She wrote a book (I have not seen it) for Skyhorse in 2011 called, not surprisingly, *The Ultimate Guide to Homesteading,* based presumably on her early years spent hobby farming in Montana rather than on the possibilities of living out of 350 petroleum-powered square feet. This latest "Ultimate" guide, rich with photos of drying tomatoes and fuzzy rabbits, might be considered a kind of sequel to her first book. Better it had been so titled without the pretense of representing permaculture in any way. I suspect a nudge from her publisher



wanting to stake a claim to an expanding niche in the book trade, and perhaps from her husband, who "would not let her quit yet," wanting another book advance to keep the show on the road.

Ms. Faires makes no claim to having studied permaculture in its traditional setting: she has almost certainly not taken a 72-hour permaculture design course (PDC). Rather it seems she did a crash literature search and study. Her

Bibliography cites Mollison's several books, Holmgren's *Permaculture Principles,* Jacke and Toensmeier's *Edible Forest Gardens,* Toby Hemenway's *Gaia's Garden,* and for some of the inner workings of the movement, websites of Midwest Permaculture explaining the design course curriculum and the meaning of the Certificate. It appears that at the most she may have viewed NCSU professor Will Hooker's online Introduction to Permaculture. All of these are reputable sources that should have provided a better understanding of permaculture than Faires offers in her book. It is no sure thing that someone sitting through the PDC will come out an articulate and insightful exponent of permaculture, but this book is testimony to the long-held permaculture view that no one who has not sat the course has any authority to represent the discipline. At the very least, we should demand this woman's bona fides and then, if indeed there is a Certificate in her background, take up with her instructors why they did such a lousy job of telling her what permaculture is about.

I would like to report that there are useful bits of something in this book, but I fear to recommend people read it for any purpose other than to get a demonstration of how absolutely addled the common American mind can be when it attempts an unguided, unscientific, and disrespectful exploration of sophisticated systems of knowledge. It appears that Ms. Faires took her myriad clippings from literature, threw them in the blender and poured the results into a tray, making paper in the process. Anyone who attempted to follow her direction from this gobbledygook would tie themselves in knots if they could even get past laughing. Dip in almost anywhere and the claims are breathtakingly ignorant. Under "Soil," page 105, the author writes correctly that "Over time, any soil can be changed and improved." She goes on to confound her own claim in the next sentence, "This means that you could theoretically put your Zone 1 garden anywhere you want, although scoping out where the best soil is makes more sense." No, Ms. Faires, it does not. Putting your garden wherever you want is not permaculture. Putting your garden by your home and your home in the best location for movement of air, water, and collection of solar energy, not to mention affordable access to roads and cultivation areas, is the essence of homestead design from a permaculture perspective. Soil is far less important than a host of other factors. Following the good soil (and using it up) is the bad old habit of small-minded farmers from time immemorial.

A section on Establishing the Forest Garden System, pg. 113 reveals this gem: "When the weeds have been broken down and the soil seems ready for planting, fence off the area and begin growing legumes and shrubs that grow well in your local climate and that are useful to you, such as comfrey." Comfrey is of course neither a legume nor a shrub. Appallingly bereft of any horticultural knowledge, Faires blithely doles out meaningless advice by the paragraph. "Once these plants have become well established, it takes simple but careful management to make the garden sustain itself. Pigs and other animals may be allowed to forage, the trees produce fruit and mulch, and the smaller plants can be harvested on an ongoing basis." A more absurd caricature of permaculture would be hard to create.

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In telling the tale of permaculture's origins, the author makes many ludicrous and insulting claims: permaculture is for hippies; taking a design course will always expose you to pagans and earth-worshippers (this must be why she avoided it so scrupulously); David Holmgren always argued to include religion in permaculture (as a proper reading of the literature reveals, he is a self-professed non-believer and the son of atheists who has nonetheless written with subtlety and insight about the historical conflict and integration of science and spirituality now emerging across our global civilization), and most revealingly, "it is sometimes difficult to find an experienced and knowledgeable permaculture teacher." Well, that certainly opens the door to whatever the cat wants to drag in, doesn't it?

Claiming to be saving this promising but benighted subculture from itself, and making permaculture thereby "more inclusive," Faires makes up her own principles for it, despite having supposedly read co-author Holmgren's *Permaculture Principles and Pathways Beyond Sustainability.* Most authors, she avers, would list 12 or more principles, but she has "combined some of these together for simplicity." (That means she traded the permaculture cow for seven beans and planted them.) What we get is such rubbish as #6: "If there is pollution, then the system goes into chaos," which I suppose is true because she has proven it by writing this book. At best, this adage may be a description of living on a bus with three children. Faires' principle #7 is equally fatuous if somewhat more convoluted, "Societies, systems, and human lives are wasted in disorder and opposition. To stop this vicious cycle, we only use what we can return to the soil and build harmony (cooperation) into the functional organization of a system." My heavens, for someone driving around in a metal box, she seems to have a breathtakingly cavalier attitude about reality. Her explanations of ecosystem science and patterns display equally hopeless idiocy: "We must become intensely observant of the natural world and clever enough to use what we discover. Cycles exist in both space and time, taking up area on land and spanning months of the year. The growth of life on a piece of land is also not flat but vertical as well." As singer-songwriter Fred Small once said, "Some folks you can't satirize, you just gotta quote 'em."

The Witch from Wasilla may have been potentially more dangerous to US presidential politics than our good Mrs. Malaprop threatens to be with her "ultimate permaculture" (this sort of thing certainly would put a stop to it…), but the same advice about lipstick on a pig comes to mind. Apart from donating the lovely color photos to underfunded grade school teachers for use as collage, these books should be pulped, not read—every last one

EVENTS

Permaculture Design Course
Kenya

Dates: December 4-17
Location: Rusinga Island, Kenya
Description: This course is part of an integrated strategy for reforestation, food security and land regeneration on Rusinga Island. The course will be led by international Permaculture Teacher Lesley Byrne together with PRI-Kenya teachers. Lesley has worked with the Permaculture Research Institute of Australia and has extensive experience using permaculture in a development context through her award winning work in Cambodia, Jordan, Afghanistan, and Uganda. Learn design principles to create sustainable systems for water harvesting and conservation, building soil fertility, the use of composting and natural fertilizers, creating productive and biodiverse food systems for improved food security, health and nutrition, appropriate technology, and much more.
Instructors: Lydia Neilsen, John Valenzuela, and Dave Shaw
Cost: $250-$750 US, includes tuition, meals, and accommodation. Some scholarships available.
Contact: Sheena Shah
Permaculture Research Institute of Kenya
sheena@pri-kenya.org

Permaculture Design Course
Trinidad

Dates: November 9-18
Location: Trinidad, West Indies
Description: Wa'Samaki Permaculture is sponsoring this PDC. What a graduate receives at the end of the course is an understanding of how the whole design system works and what may be needed from other sources to make the system work. The Permaculture designer does not need to have all the skills necessary to implement a design, but must be able to recognize what skills are needed and where to source them independently. The PDC is now run over a 10-day period and provides an intensive exposure to the principles of Permaculture design. Students come together on a Permaculture farm or site and live there for the duration of the workshop. The course has been condensed to 10 days from the traditional 14 day period by increasing the contact hours each day.
Instructors: John Stollmeyer
Cost: $1,000
Contact: wasamaki@tstt.net.tt

Permaculture Design Course
Southern Oregon

Dates: Dec. 8-9, 2012; Jan 12-13, Feb. 16-17, Mar. 2-3, 23-24, Apr 6-7, 2013
Location: Little Applegate, OR
Description: This weekend PDC presents an array of solutions, tools, and strategies for moving into a low-carbon way of living sustainably on the only planet we have. We will learn to design home centered economies that support a community culture of life celebration. This is the full certificate course covering the permaculture curriculum set out by Bill Mollison, along with lots of local knowledge and applications. Participants will learn to apply regenerative permaculture principles and patterns to design an integrated homestead, energy and water systems, forestry, and healthy communities.
Instructor: Tom Ward with Karen Taylor, Melanie Mindlin, and guests
Cost: $650; $575 if reg. by 11/11
Contact: sassetta@mind.net
541-482-7909
www.siskiyoupermaculture.com

Advanced Permaculture Course
Southern Oregon

Dates: January 21-26, 2013
Location: Little Applegate, OR
Description: Social Forestry connects villages and communities to their forested water catchment basins. We have lost our sense of living with forests as friends. This Social Forestry course will explore reconnecting with forests through ecological knowledge, the use of hand tools and woodscrafts, seasonal festivals and work cycles, childrens' stories, pilgrimages, and stewardship covenants. We will learn ecological assessment, carbon sequestration methods, restoration forestry, and the crafts and products that can be enjoyed while re-establishing our heart space and wonder in the woods. Hands-on activities include basketry, tin can stoves, loading and firing charcoal kiln, coppice, species assessment, forest mark-up and stand examination and underburning.
Instructor: Tom Ward
Cost: $460 by 12/28; $550 after
Contact: sassetta@mind.net
541-482-7909
www.siskiyoupermaculture.com

Permaculture Design Course
Bahamas

Dates: February 5-15, 2013
Location: Bahamas
Description: Enjoy yoga and permaculture study in the Bahamas!

We as humans have the ability to re-design the world we live in. All it takes is desire, know how, will, and time. Even if it takes 50-100 years, the change can begin with each one of us and the effects of our work can have beneficial consequences for generations to come.
Instructors: Bill Wilson
Cost: $995, tuition only.
Contact: Sivananda Yoga Ashram
530-272-9322
800-469-9642
yogafarm@sivananda.org

Advanced Design Course
Online

Dates: April 1-June 14, 2013
Location: ONLINE
Description: Join in this project-based teaching that builds on the curriculum of the Permaculture Design Course. Each student chooses a design project track from one of four areas: broadscale rural farm or ranch, urban neighborhood or community development, educational institution or organization, or commercial property and business devleopment. Students will conduct an in-depth site analysis and draft a design document to be completed halfway through the course. The document will be reviewed and a research topic assigned to fill in knowledge gaps related to the design. The student will revise all or part of the design based on the research, creating an extensive project portfolio and receiving instructor and student feedback throughout.

This course is run through the Oregon State University extended campus Blackboard system and consists of readings, narrated PowerPoint and video presentations, assignments, and written feedback as well as one-on-one video chat communication. Students will post their assignments on blogs and will receive feedback from an instructor and other students.

This course is for PDC grads who want to deepen their design fluency in a guided and supportive structure. This course will enhance your permaculture design literacy and give you more confidence to design professionally in diverse situations.
Instructors: Andrew Millison
Cost: $744, texts required.
3 college credits
Contact: Andrew Millison
541-752-9118
amillison@gmail.com
www.beaverstatepermaculture.com

Permaculture Design Course

Southern Oregon

Dates: February 9-March 16, 2013
Location: Ashland, OR
Description: Weekends: Includes pruning and grafting workshop. You will gain real-world design experience with your group design project. A typical course day is half classroom and half hands-on. Bring your work clothes and get ready to learn by doing. You will engage in a real permaculture site design for your final project.
Instructors: Chuck Burr and Larry Korn.
Cost: $790 before Jan. 11, $990 after.
Contact: Southern Oregon Pc. Institute
Chuck Burr
541-201-2688
courses@sopermaculture.org
www.sopermaculture.org

Permaculture Design Course

Southern Oregon

Dates: July 28-August 10, 2013
Location: Ashland, OR
Description: Two-week Intensive PDC, 72-hour international curriculum plus seed saving workshop: crop planning, propagation, harvesting, threshing, and cleaning dry and wet seeds.

You will gain real-world design experience with your group design project. A typical course day is half classroom and half hands-on. Bring your work clothes and get ready to learn by doing. You will engage in a real permaculture site design for your final project.
Instructors: Chuck Burr and Larry Korn.
Cost: $1,350 until 8/9; $1,550 after.
Contact: Southern Oregon Pc. Institute
Chuck Burr
541-201-2688
courses@sopermaculture.org
www.sopermaculture.org

Permaculture Design Course

Northern California

Dates: November 4-11
Location: Grass Valley, CA
Description: Join us at Sivananda Yoga Farm for the culmination of our 4th annual permaculture design course. This course will not only deliver the foundational educational experience for understanding permaculture design and earning a permaculture design certificate, but all involved will have the unique opportunity to experience it within the context of a practicing Yoga community.

A hands-on workshop will follow November 12-16, for an additional fee. On-line work is required prior to attending this course.
Instructors: Bill Wilson and Mike Kluk
Cost: $995, tuition only.
Contact: Sivananda Yoga Ashram
800-469-9642
yogafarm@sivananda.org

Advanced Course

Southern California

Dates: November 27-December 1
Location: Cuyama, CA
Description: Applied Watershed Restoration increases your working knoweldge of water harvesting, erosion conrol, and stream restoration practices. Acquire the critical skills needed to recognize the root causes of watershed problems and identify the best opportunities to make improvements. Learn how to assess, design, plan, and implement projects that use runoff as a resource. Directly apply these new skills during the practicum and gain exposure to cutting-edge watershed restoration methods including natural channel design, induced meandering, and agroecological restoration. Included are keyline design and application.
Instructors: Craig Sponholtz and Owen Hablutzel
Cost: $595 includes tuition, materials, meals, & camping.
Contact: Quail Springs Permaculture
805-886-7239
info@quailsprings.org
www.quailsprings.org

Permaculture Design Course

Southern California

Dates: October 28-November 11
Location: Cuyama, CA
Description: Immerse yourself in permaculture in action with this 14-day learning journey at Quail Springs' 450-acre site nestled in the Southern California mountains! Share in the joy of community learning and changing the world together. Take home the ability to design and create stable and resilient systems that provide food, water, shelter, and energy needs while regenerating ecology, community, and economy. Topics include: small-scale food production, natural building, animal husbandry, composting toilet systems, alternative economics, community building, nature awareness, garden-to-table cooking, and much more! Families are encouraged to attend.
Instructors: Warren Brush and guests
Cost: $1,450, includes instruction, camping and meals.
Contact: Quail Springs Permaculture
805-886-7239
info@quailsprings.org
www.quailsprings.org

Earth Activist Training

Northern California

Dates: January 6-20, 2013
Location: Cazadero, CA
Description: This two-week residential intensive offers a broad-brush overview of the regenerative design principles of permaculture. From inoculating mushrooms and digging swales to building with natural materials and sheet mulching the land, students have ample opportunity to experience these principles firsthand. Throughout the course, students work in small groups to incorporate what they are learning into real-world permaculture design projects.

Green solutions are sprouting up all around us, but permaculture shows us how to weave them together into systems that can meet human needs and regenerate the natural world. EAT is practical earth healing, with a magical base of ritual and nature awareness; teaching that integrates mind and heart, with lots of hands-on practice and plenty of time to laugh.

The course culminates in the presentation of each group's design project—which earns each student a Permaculture Design Certificate (required for any advanced course of study). This is Earth Activist Training, a rich array of solutions, tools, and strategies to redesign our world.

Immerse yourself in this richness through classroom theory, hands-on practice, inner experience, and community. Don't forget that it's fun, too! Many find it life changing.
Instructors: Starhawk and Erik Ohlson
Cost: $1,600-$1,900 sliding scale
Contact: Earth Activist Training
800-381-7940
www.earthactivisttraining.org

Send Event and Calendar Listings for Issue #87 (February)
Weeds to the Rescue
by the December 1st deadline to:
Address: pcaeditor@comcast.net

Permaculture Design Course

Central California

Dates: November 2012-October 2013

Location: Santa Cruz, CA

Description: Are you looking for an empowering and sustainable way to create change in yourself, the land you live on, and your community? Permaculture is a design science rooted in the observation of natural systems. The principles of permaculture teach us how to design ways of living that have the stability and resiliency of natural ecosystems. We have solutions that are available on any scale, and we can make a change that will reach out to future generations.

The PDC offered at the Santa Cruz Waldorf School will be integrated with the Waldorf School community as well as being connected with the UCSC agroecology community, Transition Santa Cruz, and the Live Oak Grange. The course will include discussion of Rudolf Steiner's teachings on agriculture, known as Biodynamics. We will also explore Steiner's thoughts on the human-nature connection and land stewardship, as well as business, economics, and the three-fold social order. This collaboration will be a dynamic and community building experience.

Instructors: Lydia Neilsen, Dave Shaw

Cost: $1,050 early-bird Discount, $1,185 course tuition.

Contact: Dylan Squires
415-868-9681
info@regenerativedesign.org
www.regenerativedesign.org

Advanced Design Course

Northern California

Dates: November 2012-October 2013

Location: Bolinas, CA

Description: Regenerative Design Institute is pleased to launch our long-awaited Advanced Permaculture Design Practicum Series. This project-based training builds on the foundational 72-hour PDC curriculum to enhance your design literacy, knowledge base, and professionalism.

Professional, quality designs are needed to transform our landscapes and move our cultures into the transition. This course supports students in actively participating in the changes needed.

Instructors: Lydia Neilsen, John Valenzuala, and Dave Shaw.

Cost: $1,425

Contact: Regenerative Design Institute
www.regenerativedesign.org/permaculture-in-action

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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:** EcoAquac, Fish4Health, Dowsing, Pond Design, Greywater Biotreatment, N. Amer. Polyculture, Manage for Native Spp, Integrated Village Fisheries, Vietnam
#53 Aug. '04 **Education:** Lifelong Learning, Edge-ucation, Albany Free School, Indigenous Ed. & Ecology, Ecocentric Pedagogy, School Gardens & Dances, Ecology of Learning, Brain Gym
#54 Nov. '04 **Fire & Catastrophe:** Design Beyond Disaster; New Opportunities; Globalization; Invasion Biology; Street Orchards; Community Food Security, Floodwaters Rising, Disrupted Climates

Permaculture Design Course

Central California

Dates: November 2012-October 2013
Location: Santa Cruz, CA
Description: Explore permaculture through the seasons of the year and join in with the Santa Cruz Waldorf community at this course. The 12-month program begins the first weekend in November and continues one Sunday per month through October 2013.
Instructors: Lydia Neilsen and Dave Shaw.
Cost: $1,185
Contact: Regenerative Design Institute
www.regenerativedesign.org/courses-events/four-seasons-santa-cruz

27th Annual

Permaculture Design Course

Colorado Western Slope

Dates: June 16-29, 2013
Location: Basalt, CO
Description: Study permaculture with a renowned group of teachers at one of the continent's premier demonstration sites. Discover the power of 30-year old permaculture systems. See cutting-edge greenhouse technology supporting tropical ecosystems at 7200' in the Rockies. Explore mature forest gardens grown on soils built up from naked bedrock.
Instructors: Peter Bane, Adam Brock, Jerome Osentowski, and Kelly Simmons.
Cost: TBD, includes camping and all meals
Contact: Jerome Osentowski
Central Rocky Mountain Permaculture Institute
970-927-4158
jerome@crmpi.org
www.crmpi.org

Back Issues of *The Permaculture Activist (continued)*

#55 Feb. '05 **Learning from Our Mistakes:** Petrol Dependcy, 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; Permatecture; 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; Rebldg. New Orleans & Everywhere; Transforming a Military Base; Workers Co-op; Energy Descent.

#59 Feb. '06 **Peak Oil:** Eco-Collapse & Trauma; Thom Hartmann; Pathways for Energy Descent; How Cuba Survived; Oil & Food; Biofuels; Algae for Fuel; Relocalize!

#60 May '06 **Land Use Past & Present:** Sust.Ag an Oxymoron?, Negev Bedouin, East. Woodlands AgroForestry, Pc Heals in India, 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, Activism & 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, Neighborhood Greening, Healthy Honeybees, Biofuels & High Food Prices

#69 Aug. '08 **Permaculture at Home:** Hawai'ian Cmty; London Forest Gdn; Suburban Renaissance; Calif. Campus; Phila. Orchards; Drinking Roofwater; Floating Island Bioremed.; Bike Transport; 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

#72 May '09 **The View from Abroad:** War, Oil & Snails in Nigeria; Green Tech Future, Ethiopian Water Mgmt.; Shrinking Forests; Food Exploration in Caucasus; Maya Agroforestry/Biochar; Pc to Trinidad; Bridging Cultures in Brazil & India, Pc Schools in Africa; BuggerBug in Liberia

#73 Aug. '09 **Bioregionalism:** New Paradigm; Rocky Mtn. Wildlands; Wild Elephants; Organizing Houston; Heirloom Seeds; L.A. Gdns; Reclaiming Commons; Transition Hohenwald, Tenn.; BioCongress Saga; Diversity at Home

#74 Nov. '09 **Energy Descen**t: In the Home; Transition Communities; Pc in Mexico; Biochar; US Consumption Dropping; Making Fuel Alcohol No More Throwaway Economy; EcoTechnic Future

#75 Feb. '10 **Local Food:** A City & Regl. Food System; Working Family on 5Ac; CSAs & Wild Foraging, City Backyd Gdng.; Food Bank Gardens & Orchards; Salt Collecting; Growing Regional Staples; City Grains.

#76 May '10 **Soil Fertility:** Permaculture Way of Soil; Biochar; Sheet Mulch; Hawai'ian Soil Farming w/ Worms; Demystifying Humanure; Urine Fertilizer; Crop Rotations; Mushrooms Build Soil

#77 Aug. '10 **Eco-Nomics:** Measuring Many Forms of Capital & Quality of Life**;** Bob Swann & Invisible Structures; Bioshelter Market Garden; Green Collar Economy; Pc & Finance; Pc Inst., Cert. & Diplomas

#78 Nov. '10 **Water Wise:** Restoration Engineering; Watershed Relations; Colorado Runoff Gdns; Cisterns in Saudi Arabia; Energy Use & Water; Trad'l. Mexican Catchment; Rooftop Garden; Home Water Consvn.; Making Swampy Land Productive; Sunken Gdns in Nigeria

#79 Feb. '11 **The Urban Frontier:** Indoor Denver Farm; Rooftop Food; Return to Your Hometown; Urban Ecovillage; City Bees; Urban Pc Projects Start Pc Farming: Mark Shephard; Index to *PcActivist* issues 24-40.

#80 May '11 **Designing for Disaster.** Collapse Mitigation; Global Storming; Responding to Major Events; Stabilizing the Climate; Self-Care in a Disastrous World; Ensuring Food Supplies; Living through Drought

#81 Aug. '11 **Hidden Connections in the Garden.** Neighborhood Garden; Urban Ag on Empty Lots; Food=Land Access; Indigenous Practices; Hoarding Seeds; Deep Raised Beds; Greenhouses; Urban Wild Edib.

#82 Nov. '11 **Growing Staple Crops.** Broadscale Farming; Local Grain & Mkts; Non-Tillage Beans/Corn; Pigs and Potatoes; Pole Beans; Rice in Vermont; Perennial Staples; Garden Farming; Acorns & Chestnuts.

#83 Feb. '12 **The Economy of Wood.** Polewood; A Northwoods Economy; Basketmaker's Landscape; Ligurian Alnoculture; Wood as Fuel; Clearing Woodland; Black Locust; Perennial Staples, Pt. 2.

#84 May '12 **Home and Hearth.** Domestic Permaculture; Natural Building; Roundhouses; Hearthfire; Retrofits; Home Economy; Homeschooling; Drylands Pc; Nova Scotia Homestead.

#85 Aug. '12 **There Goes the Neighborhood.** Argentine & Uruguayan Projects; Neighbd. Pattern Lang.; Com'ty-Supported Solar; Food Security; SENS House at Berea; Multi-Farm CSA; Broadscale Restoration; Fracking & Common Rights; Relocating Intentional Community.

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Permaculture Teacher Training

Southern Colorado

Dates: July 29-August 2, 2013
Location: Salida, CO
Description: Five-day residential course with permaculture teacher's certification. Develop teaching skills with hands-on exercises that build confidence and ease. Learn to stage educational events. Well-seasoned instructors with half a century of collective teaching experience will offer classroom opportunities and personal support to help stretch your capacities. After course completion, optional mentorship program will be available. Tuition includes meals and camping; nearby motel available for additional fee.

Register early because course size is limited. Permaculture Design Course certification is a prerequisite.

Instructors: Peter Bane, Sandy Cruz, and Becky Elder
Cost: $TBA; monthly prepayment plan available 1/1/13.
Contact: Sandy Cruz
719-539-7685
sandy@hialtpc.org

Permaculture Design Course

New England

Dates: Jan. 19-21; Feb. 16-18; Mar. 23-24; Apr. 13-15, 2013
Location: Amherst, MA
Description: This is another fabulous course, offered in a weekend series format, with hands-on practice in the gardens and ecological design practice. Also offering a guided permaculture design process from client interviews with on-site design clients, to site assessment and design generation. There will be time to meet and work with some of the best permaculture designers from the Northeast, and an opportunity to gain your certificate in permaculture design.

The Sirius Ecovillage is a retreat center offering organic meals, gardens, greenhouses, energy efficient and natural buildings, trails for hiking, snow shoeing or cross country skiing, sauna, and much more!

This course can serve as an independent study course for students enrolled in one of five colleges in Massachusetts!

Instructors: Kay Cafasso, Mark Krawczyk, Keith Zaltzberg, Ryan Harb, Walker Korby, Llani Davidson, Jono Neiger, Eric Toensmeier, and more!
Cost: TBD; College credit avail.
Contact: ecologicalgardens@gmail.com
http://www.freewebs.com/kcafasso/permaculturecourses.htm

Advanced Design Course

Southern Colorado

Dates: July 22-July 26
Location: Salida, CO
Description: A unique 5-day residential certification course offered by seasoned instructors. Although permaculture design courses are available across the North American continent, there are still relatively few practicing designers with strong skills on the ground. Appropriate for anyone wanting to deepen into permaculture design, this course will also encourage designers and design teams to establish professional practices in the field. Opportunity for in-depth design of physical sites and invisible structures. Additional coaching and mentorship may be available after course completion. Tuition includes meals and camping; nearby motel available for additional fee. Register early in 2013 because course size is limited. Permaculture Design Course certification is a prerequisite.

Instructors: Peter Bane, Sandy Cruz, and Becky Elder
Cost: $TBA; monthly prepayment plan available 1/1/13.
Contact: Sandy Cruz
719-539-7685
sandy@hialtpc.org

Permaculture Design Course

Hudson Valley

Dates: June 22-29; Aug 19-26, 2013
Location: Rhinebeck, NY
Description: Enjoy the wonderful setting and facilities of Omega Institute: sanctuaries, gardens, book shop, cafe, lake, swimming, meditation classes, yoga classes, etc...

This comprehensive, internationally recognized permaculture design training offers you a thorough understanding of how to assess a landscape for ecological design and how to design a more productive and ecologically balanced living environment.

Permaculture aims to design human systems that mimic and regenerate natural ecosystems. During this training, you learn about enhancing the ecology of your own backyard, find out how to mimic natural systems by linking elements into functional networks, and explore how to create and improve thriving ecosystems that nourish the natural landscape, feed the human spirit, and strengthen our communities.

Register and pay for Part 1 and Part 2 at the same time and save $200 off tuition for Part 2.

Instructors: Dave Jacke, Kay Cafasso, Connor Stedman, Ethan Roland
Contact: ecologicalgardens@gmail.com
http://www.freewebs.com/kcafasso/permaculturecourses.htm

Permaculture Design Course

Wabash Valley

Dates: May 19-June 2, 2013
Location: St.-Mary-of-the-Woods, IN
Description: Join an experienced permaculture teaching team working with a dynamic staff at the White Violet Eco-Justice Center run by the Sisters of Providence. Students will have the opportunity to cover the PDC material while gaining hands-on experience with the CSA, alpaca farm, the certified organic farm, and certified forests. The synthesis of this teaching team, the center, and the leadership of Indiana University creates a fast-paced, fun course with a great deal of hands-on time to balance the lectures. Outside of lecture and programmed activities, everyone becomes the teacher with nature connection skills such as cordage-making, identification practices, and the ever-popular Talent Show.

Instructors: Peter Bane, Keith Johnson, Rhonda Baird.
Cost: TBD; College credit available
Contact: White Violet Center for Eco-Justice
812-535-2930
www.spsmw.org

Permaculture Design Course

New England

Dates: July 13-August 2, 2013
Location: Amherst, MA
Description: Learn how to create sustainable, productive, and beautiful human environments using natural ecosystems as models. Permaculture is an evolving and expanding design system for ecological living, integrating plants, animals, buildings, people, and communities. Through experiential, participatory, field-based, and classroom learning, participants will explore the relationships between personal, social, and ecological sustainability in the rich context of life at the Sirius Community - an educational and spiritual ecovillage in scenic western Massachusetts.

This intensive three-week course balances rigorous and engaged academic learning with hands-on fieldwork, site visits and design practice. The academic curriculum focuses on design as an ecological process, assessing natural systems, and weaving integrated solutions to local and global problems. Faculty guide students through the design of projects beginning with interviews of clients, needs assessment, development of real solutions, and culminates in a formal permaculture design and presentation.

Instructors: Kay Cafasso, Jono Neiger, Llani Davidson, and guests
Contact: ecologicalgardens@gmail.com
http://www.freewebs.com/kcafasso/permaculturecourses.htm

Calendar

October 28-November 11. Cuyama, CA. Permaculture Design Course. Quail Springs Permaculture. 805-886-7239. info@quailsprings.org.
November 2012-March 2013. Bolinas, CA. Ecology of Leadership. www.regenerativedesign.org/courses-events/ecology-of-leadership-bolinas.
November 2012-October 2013. Santa Cruz, CA. Permaculture Design Course. Dylan Squires, 415-868-9681, info@regenerativedesign.org.
November 2012-October 2013. Bolinas, CA. Advanced Permaculture Design Course. www.regenerativedesign.org/permaculture-in-action.
November 3, 17. Marin County, CA. Tracking and Nature Connection Series. www.regenerativedesign.org.
November 4-11. Grass Valley, CA. Permaculture Design Course. Sivananda Yoga Ashram, 800-469-9642, yogafarm@sivananda.org.
November 9-11. Missoula, MT. Inland Permaculture Conference. http://inlandnorthwestpermaculture.com.
November 9-18. St. Ann's, TRINIDAD. Permaculture Design Course. wasamaki@tstt.net.tt
November 27-December 1. Cuyama, CA. Applied Watershed Restoration and Introduction to Keyline Design & Application. 805-886-7239. info@quailsprings.org.
December 4-17. KENYA. Permaculture Design Course. Sheena, sheena@prikenya.org.
Dec. 8-9, Jan 12-13, Feb. 16-17, Mar. 2-3, 23-24, Apr 6-7. Little Applegate, OR. Permaculture Design Course. sassetta@mind.net, 541-482-7909, www.siskiyoupermaculture.com.
January 6-20, 2013. Cazadero, CA. Earth Activist Training. www.earthactivisttraining.org.
January 6-20, 2013. Cazadero, CA. Earth Activist Training. 800-381-7940. www.earthactivisttraining.org.
January 15, 2013. Online. Gaia University Orientation for International Diploma of Permaculture Design. www.gaiauniversity.org, info@gaiauniversity.org.
Jan. 19-21; Feb. 16-18; Mar. 23-24; Apr. 13-15, 2013. Amherst, MA. Permaculture Design Course. ecologicalgardens@gmail.com.
January 21-26., 2013 Little Applegate, OR. Advanced Permaculture Course, Social Forestry. sassetta@mind.net, 541-482-7909, www.siskiyoupermaculture.com.
January 26-April 6, 2013, Saturdays. Austin, TX. Permaculture Design Course. http://www.austinperm.com/courses/winterspring-2013/
February 5-15, 2013. BAHAMAS. Permaculture Design Course. Sivananda Yoga Ashram, 530-272-9322, 800-469-9642, yogafarm@sivananda.org.
February 9-March 16, 2013. Ashland, OR. Permaculture Design Course. SOPI. Chuck Burr, 541-201-2688, courses@sopermaculture.org, www.sopermaculture.org.
April-May, 2013. Asheville, NC. Ecological Design-Build Lab. Janell Kapoor. 828-279-1955. info@kleiwerks.org. www.kleiwerks.org.
April 1-June 14. ONLINE. Advanced Permaculture Design Course. Andrew Millison. Beaver State Permaculture, 541-752-9118, amillison@gmail.com, www.beaverstatepermaculture.com.
May 19-June 2, 2013. St.-Mary-of-the-Woods, IN. Permaculture Design Course. White Violet Center for Eco-Justice. 812-535-2930, www.spsmw.org.
June 16-29, 2013. Basalt, CO. Permaculture Design Course. CRMPI. Jerome Osentowski, 970-927-4158, jerome@crmpi.org, www.crmpi.org.
June 22-29; August 19-26, 2013. Amherst, MA. Permaculture Design Course. Omega Institute. ecologicalgardens@gmail.com.
July 13-August 2, 2013. Amherst, MA. Permaculture Design Course. Sirius Ecovillage. ecologicalgardens@gmail.com.
July 22-26, 2013. Salida, CO. Advanced Permaculture Design Course. Sandy Cruz. 719-539-7685. sandy@hialtpc.org.
July 28-August 10, 2013. Ashland, OR. Permaculture Design Course. SOPI. Chuck Burr, 541-201-2688, courses@sopoermaculture.org, www.sopermaculture.org
July 29-August 2, 2013. Salida, CO. Permaculture Teacher Training. Sandy Cruz. 719-539-7685. sandy@hialtpc.org.

Permaculture Design Course

South Texas

Dates: January 26-April 6; Saturdays
Location: Austin, TX
Description: This course includes classroom instruction, hands-on projects (including your site design project), presentations by guest instructors, and field trips. For more details about the content, scroll down this page. We look forward to having you in our class! The Winter/Spring 2013 Course will take place at Green Gate Farms, and at the Center for Maximum Potential Building Systems. Both venues are in east Austin.

This is a commuter course. Along with classroom instruction, we have hands-on projects (including your site design project), presentations by guest instructors, and field trips. Always come prepared to spend at least some time outdoors. Lunches are BYO/potluck.

Instructors: Dick Pierce
Contact: http://www.austinperm.com/courses/winterspring-2013/

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Community

WANTED: Families and Individuals for new community in Uruguay. For more information please see (P.E.A.T.) under www.transitionthroughPermaculture.jimdo.com or contact Bruce Kirk directly at www.trumbag22@hushmail.com. Our community goals will be self-reliance, education, and consultancy.

WENDELL, MA - Build yuor own green home or restore small antique school house on land trust land. Only $19,000. Permaculture encouraged. Rural, progressive community in western Massachusetts. Land held in trust by non-profit. www.vclt.org.

Business For Sale

FOR SALE: PERMACULTURE HERB FARM, Boulder, Colorado, www.willowwaywellness.com/pc, ziaparker@yahoo.com

Connections

PEN-PAL WANTED to share inspiration and friendly conversation. Write: Antone Chacartegui #83206, ICI-0, A1-201B, 381 W. Hospital Dr, Orofino, ID 83544.

PEN-PAL WANTED for friendship. Please write: Don R. Cox 1053156, 9601 Spur 591, Amarillo TX 79107-9606

Situation Offered

ECODHARMA COLLEGE seeks permaculture teacher, preferably with an established Buddhist practice. Teachers will comprise a workers' collective that lives in intentional community. info@ecodharmacollege.org

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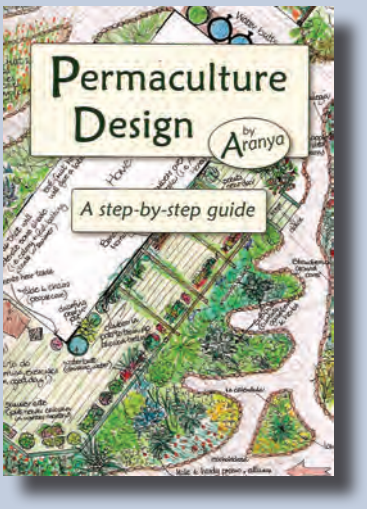
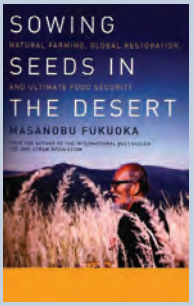
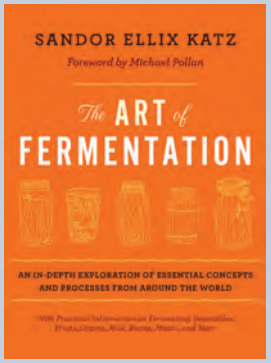


An accessible workbook and guide to both design process and methods by an experienced and active UK teacher, this newly published work brings together invaluable insight to observation, mapping and surveying, client interview, analysis, recording information, placement of elements, design concept, presentation to clients, implementation, and evaluation. It puts extra attention on design for invisible structures.

Permaculture Design
A step-by-step guide
by Aranya
2012. 191 pp. paper.
$25

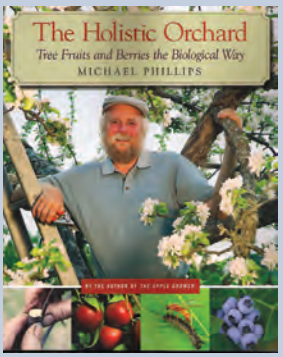


Sowing Seeds in the Desert
Masanobu Fukuoka
2012. 168 pp. pap.
$22.50

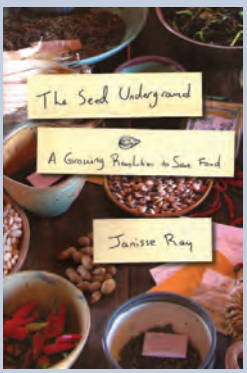


The Art of Fermentation
Sandor Katz
2012. color plates.
528 pp. cloth. $39

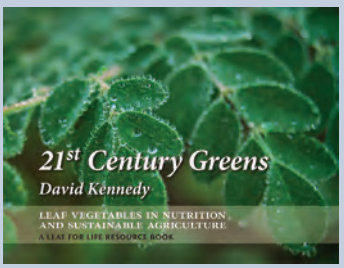
Independence Days
A Guide to Sustainable Food Storage & Preservation
Sharon Astyk
2009.
348 pp. paper.
$20



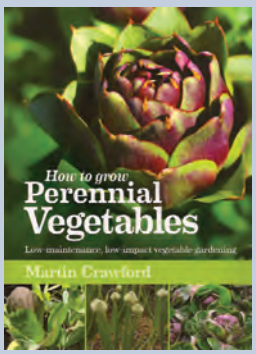
The Holistic Orchard
Michael Phillips.
2012. 414 pp. paper. all color. $40



The Seed Underground
A Growing Revolution to Save Food
Janisse Ray
2012.
217 pp.
paper. $18



21st Century Greens
David Kennedy
2011. illustrated.
257 pp. paper. $24



How to Grow Perennial Vegetables by Martin Crawford
2012. all color plates.
224 pp. paper. $27

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