

P E R M A C U L T U R E
 DRYLANDS
Journal



growing a permaculture

Vicki Marvick and Roxanne Swentzell

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ON THE COVER: *Flowering Tree* Permaculture Institute and home of Guest Editor Roxanne Swentzell. Photo by Roxanne Swentzell.

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Permaculture Drylands Journal

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GUEST ROOM:

ROXANNE SWENTZELL AND VICKI MARVICK, GUEST EDITORS



Roxanne, above; Vicki and daughter Gwen, below

Ten years ago, permaculture came into my life. I was powerfully attracted to the permaculture crusade. The earth was in danger—how could we not do all we were capable of to save her? For years, I buried myself in organizational work. There was always more to do: more courses to organize, more inquiries to answer, more fliers to send, more issues of the journal to publish.

Two and a half years ago I retired from this work to have a baby, build a house, and focus on implementing our permaculture plan. During eight years of effort my daughters had grown from toddlers to adolescents. Our new child caused me to reevaluate everything. Tentative steps toward healing taken over those busy years—almost in spite of myself—coalesced into focused intent. I had to admit to myself that in the pursuit of an idealized good, I had done harm. I had abandoned my children, my husband, and, most of all, myself. I had to accept responsibility for these things.

My original vision of permaculture as a crusade no longer fit me. (At the same time, I must acknowledge that the early teachers of permaculture received a very different reception than those who are teaching today. I am grateful to pioneers like my husband Tim Murphy, Joel Glanzberg, and Scott Pittman for their considerable sacrifices.) My personal vision of permaculture eventually expanded, encompassing my own healing process as an individual and family member, a process that has rippled out to other relationships.

As Roxanne Swentzell and I began working on this issue and I sat, trying to write about poultry and cisterns, I found there was something else I needed to write. The result was "First Garden." My thanks to Roxanne, Tim, my daughter Shannon, Ingrid Kelley and Kate Tieman for encouraging me to publish this very personal article, to Jean Ann Ravine (Eisenhower) for her sensitive editing, and to Ann Audrey for her lovely illustration.

This issue was born in an exchange of letters. During a time when I was struggling to find a new way of living, Roxanne and Joel's work at Flowering Tree spoke directly to my wounded spirit. Roxanne and I began to write to each other about many things: gardens and animals, children and marriages, traumas and joys. These letters helped me through a difficult time; they were a gift of trust. In reading the permaculture literature, I had always wondered "Where are the women, the children, the families?" I wanted this issue to reflect the refreshing directness of Roxanne and Joel's work at Flowering Tree. I also wanted it to speak to the landscape of the heart and soul and spirit, adding to the ongoing dialog which forms our collective vision of permaculture.

Vicki



I was a single parent of two small children, building a house on an old driveway lot in Santa Clara Pueblo in 1984. My goal was to make a home for me and my children—a home that would be comfortable year round. I designed a passive solar adobe house partly on paper and partly in my mind. Early one morning, still in my pajamas, I went out of the tent we were living in, and with a stick, drew out the foundation of the house. I spent the next year laying adobes, taking afternoon naps with the kids and making ceramic sculptures to sell in order to buy more building materials.

I met my permaculture teacher and later my husband, Joel Glanzberg, when I was starting on the roof. He wanted to grow a garden in my yard and I needed help with the roof. Joel was a permaculturist by then, and so was I, but I didn't know it until Joel put it into words. After about two years, we started the nonprofit Flowering Tree Permaculture Institute, and Joel began teaching permaculture in our home. Through the years, we have worked on creating a sustainable homestead. Today it is a very different place than it was on that morning when I went out with my stick to draw in the dirt.

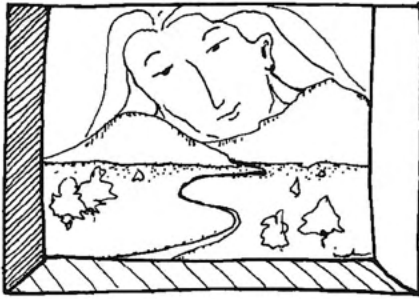
Besides being an excellent botanist and teacher, Joel is someone who wants to try out everything he has read in a book. I guess that I am the same way but I don't read much. Between the two of us, we've discovered a lot of old methods of doing things that are environmentally friendly, but aren't done much anymore. It's all about re-learning the skills that people used to know. We also set up and teach classes, workshops and tours. We published a small book called *Our Home, Flowering Tree*, along with a newsletter for the community called *droppings*.

We learn a lot in the process of trying things, more than can be said in words, but I think it can be felt as a re-connecting to the natural world around us and a kind of satisfaction and feeling of love for a place.

A year ago, I was asked by Vicki Marvick to co-edit this issue of PDJ. We both felt it would be helpful and enjoyable for readers to hear stories of adventures in living a permaculture life. I met Vicki in 1989 when Joel, Scott Pittman, and Vicki's husband Tim Murphy started teaching permaculture design courses together. The concept was still a very new one in the southwestern U.S. at that time, but these three men were sincere and determined enough in those early stages to really give permaculture some good roots to take off from. I think of them all with gratitude and respect, but behind the scenes was always Vicki.

Scott, Joel and Tim were "ground troopers," as Bill Mollison has called them, and I think of Vicki as someone who held the web of life together in order for those ground troopers to do their work. As time has gone on, that role has changed form but I believe Vicki still plays the role of connector. I am grateful for all her work throughout the years to help make permaculture a reality, and also for her friendship to me especially through hard times when I felt all alone. I am honored to co-edit this issue of the journal that Vicki helped to create to begin with.

Roxanne



*From
the
Editor*

Getting Closer

Two remarkable women take over this issue and shower us with the wisdom they have earned, sometimes painfully, since permaculture became central in their lives. They remind us of things that are easy to forget while searching for the best swale size or composting technique, or seeking ultimate truth in sector analysis.

What humanity has done to the planet it has done to itself as well. Our minds are polluted, our souls impoverished, and our joyfulness practically extinct. We sometimes don't realize how powerfully the technological mindset controls us because we were raised in it; we are too close.

That is why in our search for a way to reverse ecological damage, we can be easily distracted by the intellectual challenge whose answers lie outside ourselves in techniques, methods and information. We fail to notice that though we may be growing food and harvesting water, we're still in recovery as adult children of technoholics.

Roxanne and Vicki invite us to remember that healing the earth includes healing ourselves. Through personal insight and intimate story, they invoke the bigger picture -- the web of life we are all part of. They show how permaculture has helped them focus on what's real and growing in their own lives, and that our humanness is indeed a sector in the system.

I am pleased to take the *Journal* on this digression from its customary technical perspective. If permaculture is to be more than "another landscaping technique like xeriscape," we need to delve more deeply on occasion into the fullness of the system to which we belong. Thanks, Rox and Vicki, for the courage.

PROD — A New Source

Yankee Permaculture of Dahlonega, Georgia has begun publishing PROD (Permaculture Review, Overview, and Digest), a newsletter format digest of permaculture information and reviews of pertinent books, magazines and organizations. The publication draws on Yankee's international database of 2000 permaculture organizations and 670 publications. The \$18 one-volume

subscription includes four thematic issues of at least 4 pages each. The first issue is six pages and includes digests of articles on feeding tree leaves to livestock and on the use of bamboo in permaculture design. A listing of bamboo groups worldwide is included, along with an extensive directory agroforestry organizations, and reviews of related books. Sample issues are \$5, and PROD is also available on computer disk in various formats. For more information, contact Dan Hemenway, Yankee Permaculture, P.O. 672, Dahlonega, GA 30533-0672 (no phone number provided).

C'mon Down!

To the El Morro Land Blessing and Gathering

Stephen, Deborah and Matthew Malone of Tucson are inviting the permaculturists of New Mexico and Arizona (and points farther) to a day of honor, celebration and community participation on their land about three miles southwest of the El Morro National Monument in New Mexico. The date is Sunday, May 26.

The festivities will include a formal blessing of the land by Navajo elder and family member, Mr. Dooley Shorty. All are welcome to pitch in on preparation of the garden site, building some swales, and trading observations and ideas. The Malones will be moving to their the ten-acre site in 1997 to create their permacultured residence/business full time.

Veggie lunch and dinner will be provided, but please bring your own water. A few tent sites are still available on the land for either the 25th or the 26th, and other camping opportunities abound in the surrounding National Forest and Monument campgrounds. No pets, please. Call the Malones at (520) 624-6514 to RSVP and to get exact directions.

Permaculturing Rodale

The 320-acre Rodale Institute in Emmaus, PA is about to be permacultured! The basic design course taught by Bill Mollison March 23- April 6 introduced the Institute staff to the subject. Course participants also included experimental agriculture faculty from a number of universities. The next step will be to transform the Institute site into a permaculture demonstration site.

The Rodale Institute is the research arm of the large national organization which also publishes *Organic Gardening (OG)* and other periodicals, along with a long list of books on gardening and food production. It's too early to tell how much coverage permaculture will receive in *OG* itself. Publications from the Institute itself are mostly scientific and technical reports.

The Rodale Institute's decision to permaculture reconnects them with founder ----- Rodale whose experiments and interests would place him firmly in Mollison territory if he were around today. The Institute's excellent research facilities add a valuable resource to international permaculture efforts.

Permaculture Defined

The December issue (#24) contained a tiny notice inviting submissions of the shortest definition of permaculture. We were not deluged with suggestions, which caused us to forego the promised formal judging session at the February Breakfast in Santa Fe. However, the two submissions received were of such high quality, we felt they both deserved to be published (thanks, Jill and Kevin):

Permacultural is life.

— Kevin Dahl
Tucson

*With open heart
and open mind,
nature's logic
you will find*

-- Jill Lorenzini
Tucson

first garden

I have become acutely aware that how we image the body plays a central role in how we image the world—and that this in turn directly impacts how we view ourselves in relation to both.

—Riane Eisler

by Vicki Marvick

On a sunny August day, a small girl carries some coins out of a house and into a garden. Solemnly, she clears leaves and mulch from under a tree and digs a hole with her hands. She buries the coins deep, leaving a part of herself for safekeeping. As her hands delve into the moist earth, she smells its fragrance—a rich brew encompassing birth, death, and everything in between.



I am five years old. My mother and I are visiting her parents. Grandpa says that he will show me the root cellar. He leads me to a metal door in the ground back of the house. We go down steps. My consciousness implodes upon itself, folding itself into a tighter and tighter ball, until I am somewhere so far inside myself that no one can find me.

After my grandfather rapes me he presses three coins—a dime and two nickels—into my hand. Later, I bury the coins under the large trees in front of the house.

Lilacs and lavender flowers surround Grandma's house. I walk through her vegetable garden, my bare feet warmed by the dirt, reveling in the outline of a squash leaf, the rows of beans, the jungle of corn towering above my head. Here, I am safe. The colors of the plants—the myriad greens of leaves, the delicate palette of purples and pinks and whites—have a dimension beyond what my eye can see, what my mind can attach a label to. I have spent the last year in kindergarten, learning to reduce my perceptions to names. Where are the names for these colors? The colors and forms vibrate in my field of vision; I *feel* them as much as I see them. In this place, I enter the magic of these plants. I take in their presence like a cool drink after a forced march through a hot desert.

Although I have no conscious recollection of the abuse, it shapes my life. I go through childhood feeling that if I can just be perfect, can somehow never make a mistake, I will feel safe. I get the highest grades in my class, always. Yet my nighttime world holds demons. I struggle with nightmares and monsters in the closet, develop elaborate bedtime rituals, and often lie awake until two or three in the morning, too frightened to sleep. In my daytime world, I play with power. I protect children who are picked on and cultivate an intimidating stare. I develop a passionate interest in ballet, exulting in the feeling of pushing past the body's limits. In ballet, I control the pain. I view my bleeding toes and bruised feet as the price I pay for art, not as a form of self-mutilation. Self-inflicted pain feels good.

My daytime and nighttime selves do not ordinarily meet.

The person who cringes in terror every night has no connection with the defiant crusader, the beautiful clean lines of the ballerina. Although I don't remember what my grandfather did, my awareness of the magic of the plant world persists through childhood and into adulthood. I create my first vegetable garden—a row of radishes in a flower bed in back of our house—when I am six years old. In the years that follow, I don't feel at home in the world without a garden—some kind of garden—in my life. The colors, forms, textures, tastes and smells of plants bring me to a quiet place, a place of rest. A place where my disparate selves can just be. That awareness is a lifeline connecting me to that little girl, so small and so vulnerable.

For many years I receive clues that something is wrong.

I am seventeen. When I am raped by a boyfriend, I don't perceive it as rape. Isn't this just what happens to women?

I am twenty one. I drink heavily at parties, sometimes until I pass out. I have lots of meaningless sex, on my terms. I think of this as enlightened feminism.

I am twenty five. I am now a parent. In relating to my child, I struggle constantly with rage that seethes just below the surface.

I am twenty nine. A counselor listens carefully to my description of a difficult work situation. After I finish, she asks "Do you realize that whenever you say 'I feel angry' you smile?" I decide to get help.

As soon as I enter therapy I begin to dream.

I am walking the streets near the house where I grew up. I am very frightened. There is a man stalking me; he is a rapist and will hurt me. I enter my house and watch the street anxiously. I realize that if I keep my face frozen in a mask the man will not recognize me. The mask is the pleasant smile of a housewife in a floor polish commercial. I go back onto the street, confident that if I keep the mask of the nice girl in place, the rapist can't find me.

I am traveling along a road with an energetic toddler, a little boy, and a small baby in a carriage. We are searching for a key. Finally, we arrive at the home of a wise woman. Her home nestles in the earth, protected from storms and winds and clothed by plants. We enter the warm, womb-like house. This older woman, round and soft, radiates a calm strength. She hands me the key and says "Now you don't have to be so thin anymore. Now you can begin to feed yourself."

Through my dreams I become acquainted with my three-year-old self—a rambunctious toddler who is full of vitality.

I also get to know the small baby, the tomboy who just wanted to be with Daddy, and an older child who had to take care of her parents emotionally. And the wise woman, the seed of something yet to emerge.

I am thirty. I am watching a movie with my husband. In the movie, a troubled young woman experiences a flashback of her father molesting her as a child. Before he abuses her, he slips money under her door. As I watch this scene, something releases in my belly. My body is racked with sobs that feel as if they will tear me to pieces. I say to my husband in a small voice (whose voice?) "I think I was molested." Even though I hear this voice, there is another, dominant self that doesn't believe it and doesn't want to hear it.

I am thirty five. At a meeting to develop a business plan for Permaculture Drylands Institute, John Wallace asks me to name a monthly salary for my position. Anxiety spreads through my body. We agree on \$2000 a month. Anxiety mushrooms into panic. John asks me to type in "\$2000." Panic becomes terror. As my heart pounds in my chest, I tell John I need to figure out why I'm so afraid.

Later that year, I go through photographs in my parents' attic. Kindergarten pictures, first grade pictures. And then—there it is. A family portrait. Grandpa and Grandma, seated, under the trees. Aunts and uncles standing in the back row. My mother, young and smiling, with them. And me, standing next to Grandpa. His hand on mine. My body tensed, turned slightly away, poised for flight. My eyes looking out from somewhere deep inside. As I pick up the photo I remember. . .

I remember the root cellar—the smell, the darkness, the helplessness. I remember the coins, cool and hard in my hand. I remember the soil and the trees and the dirt warm under my feet in the garden.

I look at the little girl in the picture, and step by tentative step I begin to reclaim her as part of me. I see how young she was. I see there was nowhere to run and no one to listen. I would like to say that I was willing to listen to her, but the truth is I don't want to have anything to do with her. After all, I've spent a whole lifetime denying she exists. We develop our relationship gradually.

We start with honesty. For months I make time in the morning to sit in my garden and talk with her. For months, the only honest thing I can say is "OK, I showed up like I said I would, but I don't want to have anything to do with you." Gradually, almost imperceptibly, my feelings toward her soften. On Valentine's Day, I make her a valentine. I imagine holding her with the same tenderness I

feel for my own children. We both cry.

Slowly, my daytime and nighttime selves begin to come together. The nighttime self held the pain for so many years. The daytime self tried so hard to be perfect, to keep that mask in place. Eventually, a new self begins to emerge. She allows herself to feel, she lets the daytime self know it's all right to make mistakes, she lets the nighttime self know that pain can be released. She can be trusted to protect herself, and not to hurt others.

The wise woman from my dreams continues to speak. She encourages me to mourn my losses. To nurture myself, to spend time in my garden, to forgive myself. She says

The world is not a straight line. It is a web. Trust yourself to know where to go next. Find the center of your being and choose the path that calls to you. That path connects with every other path; they all lead to the whole, the one.

I am forty one. I sit down to write this article. For two weeks I think about it, dream about it, simmer it in the back of my mind. One morning I awaken, sit up in bed and turn to my husband. "I've just realized when I planted my first garden," I say. "When?" "When I buried my grandfather's coins under the trees."



I see that little girl so clearly in my mind. She has courage. She does the best she can. She ensures that she survives. She knows these coins, tangible evidence of her grandfather's violation, do not really belong to her. Somehow she knows the trees have power. They will encapsulate these symbols of her pain, and her grandfather's too, weaving roots around them for decades. They will hold the coins until she is old enough to transform them.

The little girl waits a long time for a seed to sprout. Roots grow underground long before anything appears on the surface. She must wait to be seen, to be acknowledged, to be held with genuine love. One day, a fresh green sprout emerges, then another. They grow, at first delicate and needing protection, later strong and secure. And one day, that garden bears fruit.

The wise woman looks at the little girl. She says

A seed may travel a long way before it reaches nurturing ground. Wind and water buffet it, harsh edges leave scars. It may travel through the belly of a beast on its way to a safe home. Weathered and worn, its tough outer shell finally softened, it finds a pocket of fertile soil where, at last, it can begin to grow.



Illustration by Ann Audrey

Safe Passage

for Bill

In the time before remembering
a child cries
My daughter runs to me, sobbing
"She hurt my feelings!"
"Your feelings!" you snort
"She hurt your feelings!"

Fog lifts
I glimpse
a small boy standing
alone on a beach
Fog rolls in

In the time before remembering
you say
"I see myself as a Viking"
I could not help but cut myself
on the edge of your pain
Angry for years
at what was given
and what was taken

Fog condenses on stone
I dream myself into existence
give birth to myself
from my own womb
of moist earth

The time before remembering
is over now
I let go
take my daughter's hand
and walk on
wishing that small boy
safe passage

Who will you be
when our need
does not shape you?

—Vicki Marvick

When I first started teaching permaculture in 1988, we were all very excited by it. We were also very taken with Bill Mollison and the possibility of following in his footsteps. We used his words and ideas to try to be the guru, the star, the one who knew. We had a lust for gold and fame and importance.

In that lust many things got lost or trampled over—people, families, relationships—all the things that permanent cultures are made of and made for. Following in Bill's footsteps, many of us early teachers lost our wives or nearly did. We missed some things, you know. First, that ground troops need to be highly mobile, expendable, and unattached. Second, that you cannot design a family to conveniently fit your well-thought-out design. The family is the wellspring at the center from which and for which everything else comes forth, and without which there is no point.

Enduring cultures have never sprung from an event or a movement. They evolve on almost geological time and are "as old as the hills."

—Joel Glanzberg

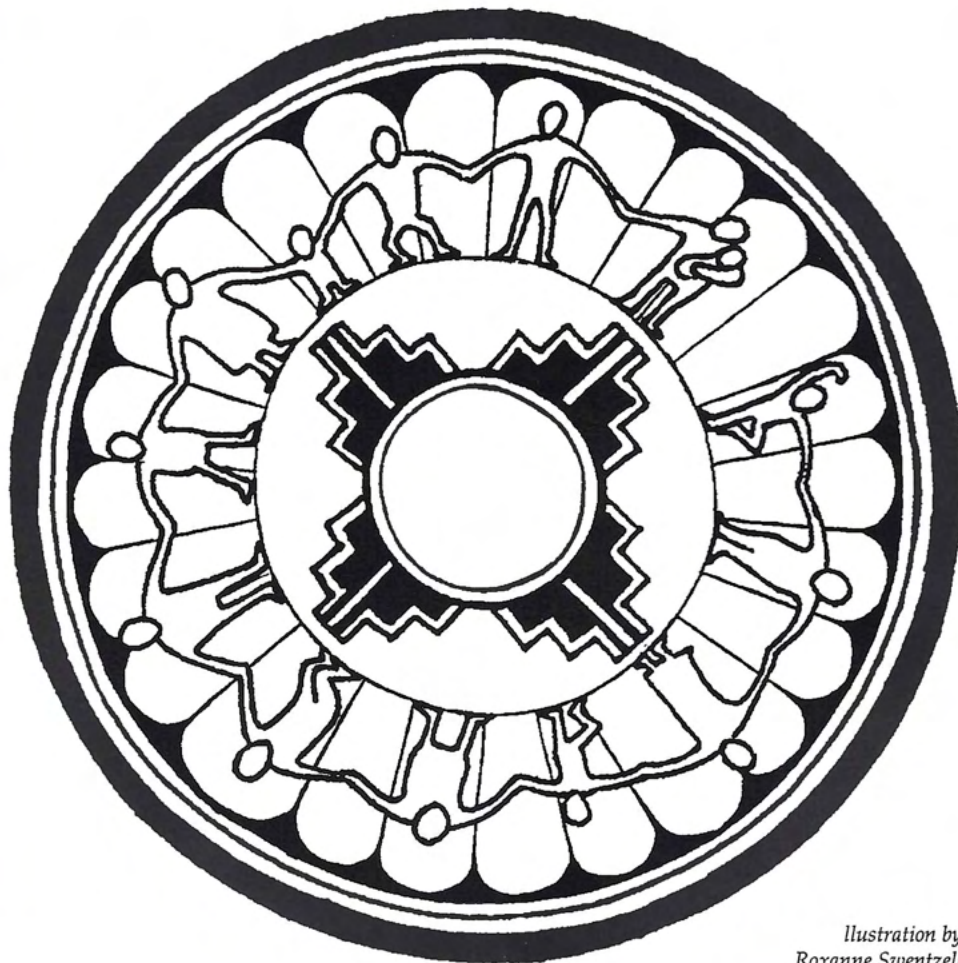


Illustration by
Roxanne Swentzell

RENTER'S DILEMMA

by Dyan del Gaudio

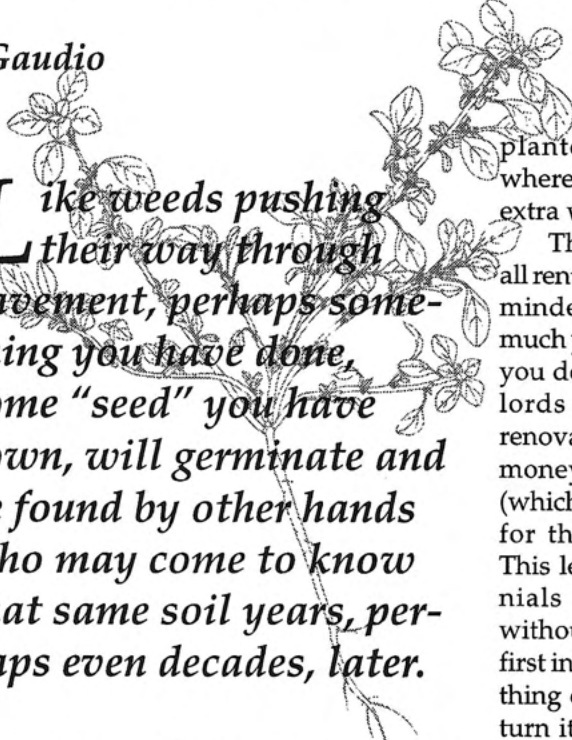
I sit here in suburban Colorado on a chilly night and think back to several years ago when I lived in Santa Fe. My home was a little pink adobe with a small yard. I would like to say that I planted a garden as soon as I moved in, but that's not true. I hesitated, especially after losing one garden after another, move after move. Could I muster up enough strength to invest my time, energy and love into yet another piece of land that was not legally mine? Springtime came with an answer: yes, I could.

My friend Mark was the previous renter, and both he and I worked the neglected ground. We noticed much of the property had been used like a parking lot. A small patch of green grass in the front yard was untrampled, along with a narrow strip adjacent to the house. This strip showed remnants of a garden, including one Oriental poppy, a lavender-cotton shrub and some pink-blooming soapwort cascading over a line of river rocks that separated the garden from the lawn. A Siberian elm tree had been in the front yard for a long time and provided a comfortable, shady spot to sit on the summer lawn.

Transforming compacted dirt into soil produces much sweat! We pounded away and eventually laid down five railroad ties at an arching angle, leaving areas between them for gardening. We hauled in horse manure and worked it into the ground to start creating topsoil. We then seeded the area with rye grass and buckwheat. This effort expanded the front yard by about three to four feet lengthwise.

Runoff was a problem for the driveway but provided an opportunity to harvest water. The land on the side of the house sloped slightly down toward the front of the yard, where the runoff attacked the already exhausted parking lot. We constructed three swales to catch the water, giving the land a chance to heal and become plantable. Again we added horse manure, planted rye and buckwheat seed and scattered a lot of straw all around.

When I moved in and decided to keep on growing, the yard was ready to be planted. The gardens between the railroad ties were filled in with green onions, broccoli, chard, garlic and a variety of flowers and flowering bulbs. I'd become fond of mixing food crops with flowers rather than keeping them segregated. The flowers attracted many beneficial insects and I enjoyed their beauty throughout the garden rather than only in one isolated spot. Sunflowers graced the swales, as did purple-pod string beans and a number of volunteer plants. Behind the swales, I added a huge circle in which I grew corn, beans, and squash. Tomatoes were



Like weeds pushing their way through pavement, perhaps something you have done, some "seed" you have sown, will germinate and be found by other hands who may come to know that same soil years, perhaps even decades, later.

planted next to the house where they benefited from the extra warmth.

Then it happened, what all renters dread, that subtle reminder that no matter how much you care about this land, you do not own it. The landlords decided they should renovate my place to get more money from the next renter (which would reimburse them for their "improvements"). This left a yard full of perennials that would languish without consistent care. My first instinct was to take everything out that I put in and return it to a parking lot. I de-

cidated against this because I didn't want to punish the land for having callous "lords." So several friends from Santa Clara hauled away my fence, which then helped house their sheep. Perennials that wouldn't survive on their own were doled out to friends, leaving me with one truckload to move to Colorado, next stop on the rental highway. I hoped the next renter(s) would want to continue gardening, but I could not know what their inclinations would be. I tried to cover some of the bare spots left by moving the fence and plants. I transplanted some of the abundant seedlings and young plants growing in and around the arroyo alongside the house. (Only plants that were prolific growers were used; I don't believe in disturbing wild areas.) I filled in the post holes with a few young chamisa and scattered biennial purple asters. My temptation to remove the railroad ties lost out to my desire to see one little piece of land remain a bit more intact than the way I found it. So I moved a rosebush, which had proved itself incredibly hardy, from the side of the house to the front. A few chamisa and asters found their way to the railroad tie gardens, enough to give the appearance that this was truly a garden space. A few green onions that would surely flourish were snuck in here, too.

The other rosebush became the center of the cornfield, and buffalo gourd seeds that had been scattered on the severely eroded hillside that led into the arroyo were beginning to sprout. Several trees that had been added had taken root and would be fine on their own.

A year before this, I had to leave a different home and garden; previous to that, it was a farm that was beginning to show signs of recovery after years of outright abuse and neglect. Each time my heart broke at the thought of not being able to follow through on something so promising as resto-

ration of the land and a chance for self-sufficiency. I felt guilty for abandoning the plants that were so lovingly added to the landscape, even though these things were beyond my control. Many people in similar situations must feel the same way and get tired of it all. But there is also something very satisfying in being able to look back and know that you tried. Like weeds pushing their way through pavement, perhaps something you have done, some "seed" you have sown, will germinate and be found by other hands who may come to know that same soil years, perhaps even decades, later.

The experience one gains from truly practicing permaculture is so much more valuable than only reading about it. If you want to know how something grows or how a swale works, then it is important to try these. It has actually worked to my benefit to rent on land that has been neglected; every landlady/lord I had was more than happy to see the grounds improved, even though there were times it was incredibly difficult to work within their parameters of what was "acceptable." When I think back to my time in

Santa Fe, I have learned to let go of my anger in losing that garden. Instead, I remember the satisfaction of knowing that one piece of land has a little less parking lot and a little more garden. That feels good.

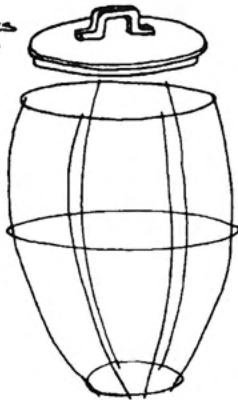
I sip my hot chocolate and once again it is time to scan the catalogs, review current inventory of seeds collected and saved, and plan a garden. I'm still a renter (along with my husband) of a small house with a little piece of land. My old friend Mark has decided that he will garden wherever he is, as long as he can. I agree—there are many plants I want to grow and so much I have to learn.

Our plot has been terraced and planted for two summers now. This third season, I look forward to picking my produce and relaxing in my yard to the smell of fragrant flowers amid the sight of their many colors. Even as a renter, it is possible to create a sense of place no matter how fleeting. This is where I am and this is a piece of land for which I can care.

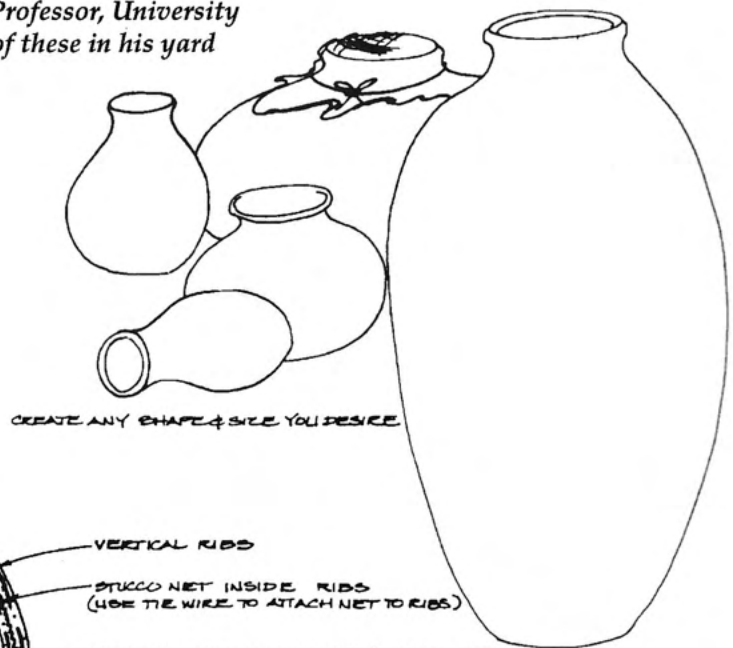
Building a Water Jar

by Rocky Brittain (Designer and Assistant Research Professor, University of Arizona College of Architecture). Rocky built one of these in his yard using creosote branches for ribs.

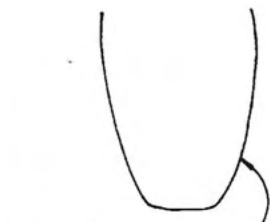
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- VERTICAL RIBS
- STUCCO NET INSIDE RIBS (USE TIE WIRE TO ATTACH NET TO RIBS)
- PREPARE CEMENT SLURRY & SOAK BURLAP, CANVAS, RAGS, OLD SHEETS, ... POSSIBLY EVEN NEWSPAPER WILL WORK — PLACE OVER STUCCO NET TO FORM A SHELL OR BACKING FOR FERRECEMENT (SIMILAR TO PAPIER MACHE)
- AFTER BACKING SHELL HAS SET ATTACH STUCCO NET OVER OUTSIDE OF RIBS
- PLASTER INSIDE AND OUTSIDE NET WITH FERRECEMENT (1 PART CEMENT TO 2 PARTS CLEAN MORTAR SAND). APPLY 1 OR MORE COATS TO ACHIEVE DESIRED THICKNESS AND FINISH TEXTURE. PARTIALLY FILL COMPLETED URN WITH WATER, KEEP OUTSIDE DAMP AND COVER WITH POLYETHYLENE TO CURE
- "THOROSEAL" INTERIOR TO ASSURE A LEAKPROOF URN (NOT REQUIRED)
- OIL FINISH, PAINT OR LEAVE NATURAL EXTERIOR FINISH

REFERENCE: FERRECEMENT WATER TANKS AND THEIR CONSTRUCTION BY S.B. WATT, 1978, ISBN 0-903031-51-5, IT (INTERMEDIATE TECHNOLOGY) PUBLICATIONS, INTERMEDIATE TECHNOLOGY DEVELOPMENT GROUP OF NORTH AMERICA, INC. (DEPT. N), P.O. BOX 357, CROTON-ON-HUDSON, NY, 10520.

The Man Who Farms

W A T E R

by Brad Lancaster



While traveling through Southern Africa this past summer I heard of a man who was farming water. I set out to find him without much of an idea of where I was going. Soon I was packed in a colorful old bus roaring through the southern countryside of Zimbabwe at about 30 miles per hour. The scenery was beautiful with rolling hills of yellow grass upon red earth and small thickets of twisting, sometimes umbrella-like trees. I faded in and out of sleep until nine hours later we were in Zimbabwe's driest region. We crested a pass of low lying semi-desert vegetation to see below us a vast highveld prairie of undulating hills covered with dry grass and often capped with barren outcroppings of granite. Trees were sparse. I was reminded of the open grasslands of southeastern Arizona. In fact, all was covered by a wonderful expanse of clear blue sky as one would see in the arid southwest. The bus crept down into the dry grassland and stopped in the small rural town of Zvishavane. This was the area where the water farmer lived, but as the sun was setting I walked off to find a spot to lay my sleeping bag and went to sleep.

In the morning I hitched a ride with the local director of CARE International. She took me to a row of single-story houses. One of these was the simple office of the Zvishavane Water Resources Project (ZWRP). There on the porch, reading the Bible, sat the water farmer.

As my ride came to a stop he sprang up with a huge smile and warm greetings. Here at last was Mr. Zephania Phiri Maseko. When he learned of how far I had traveled he burst into a wonderful laugh. He told me that lately visitors from all over the globe seemed to be pouring in almost daily. Nonetheless, each one is an unexpected surprise.

In the landrover bouncing over worn and eroded dirt roads towards his farm Mr. Phiri was talking, laughing and gesturing—endless streams of poetic analogies and stories. The best story of all was his own.

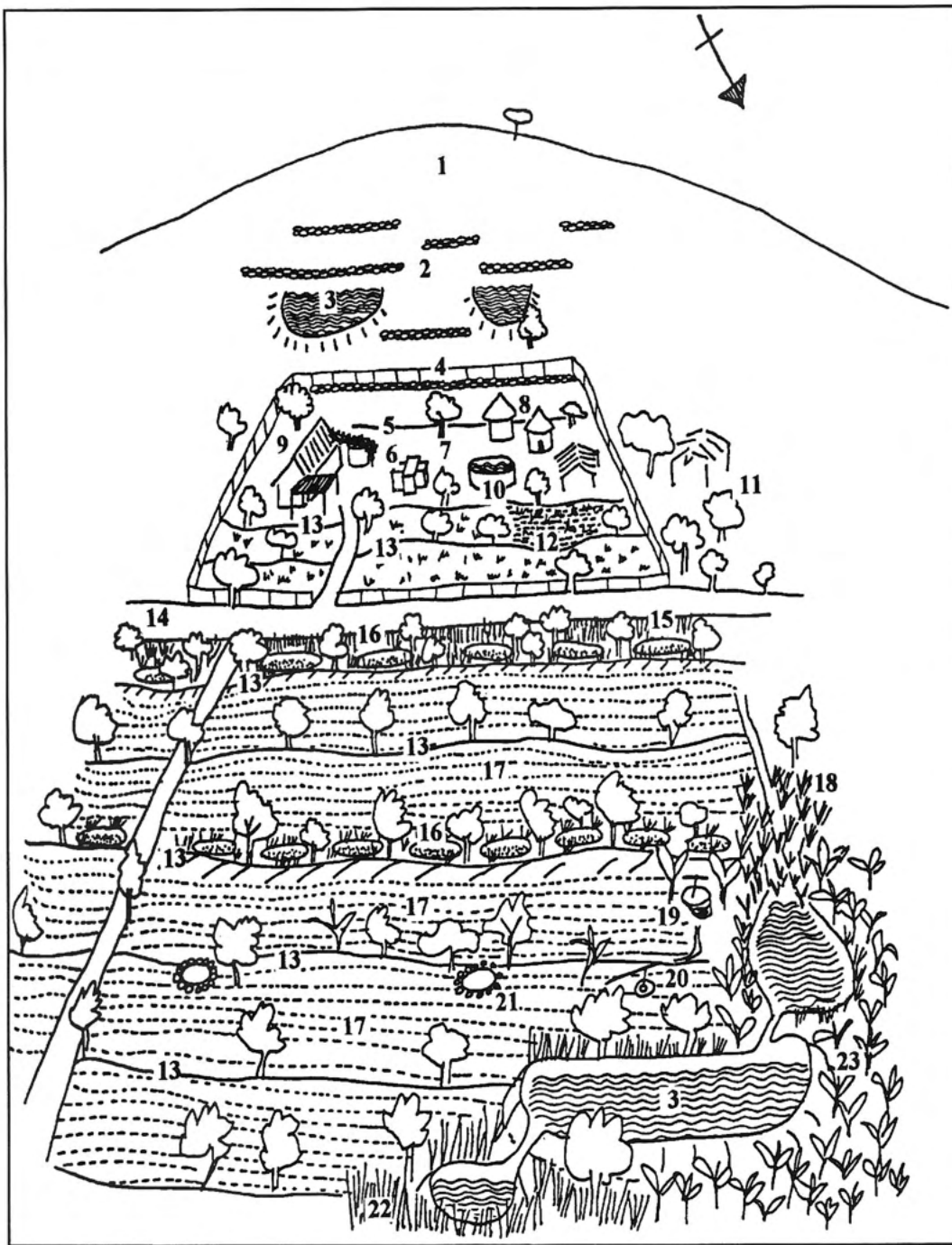
In 1964 he was fired from his job on the railway for being politically active against the White Rhodesian government. He was told by the government that he would never work again in any position.

Having to support a family of eight, Mr. Phiri turned to the only two things he had, a 3-hectare family landholding and the Bible. He didn't just use the Bible for spiritual guidance or inspiration, he also used it as a gardening manual. Reading Genesis he saw that everything Adam and Eve needed was provided by the Garden of Eden. "So," thought Mr. Phiri, "I must create my own Garden of Eden." Yet Mr. Phiri also realized that Adam and Eve had the Tigris and Euphrates rivers in their region, but he didn't even have an ephemeral creek. "So," thought Mr. Phiri, "I must also create my own rivers." He has done both.

His farm is on the slope of a hill facing north-northeast (remember this is in the Southern Hemisphere). The top of the hill is a large exposed granite dome from which storm runoff once freely flowed. The average annual rainfall is 570 mm (just over 22 inches). However, as Mr. Phiri points out, this is an average based on extremes. Many years are drought years when the land is lucky to receive 12 inches of rain.

When he began it was very difficult to successfully grow crops let alone make a profit due to the frequent droughts and zero equipment or capital for irrigation from groundwater. He spent time observing what would happen when it did rain. In small depressions and upslope of rocks and plants the soil moisture would linger longer than in areas where sheet flow went unchecked. Thus began his self education in rainwater harvesting and his work. Over a period of 30 years he has created a sustainable system that provides all his water needs from rainfall alone.

"You start catchment upstream and heal the young before the old/deep gullies downstream," says Mr. Phiri. Beginning at the top of the watershed he built unmortared stone walls at random intervals on contour. Acting much like gabions, these walls slow the flow of storm runoff as the water moves through the spaces between the stones. This makes the water running off the granite dome more manageable as it is directed to unlined reservoirs, which like everything else were built with nothing more than hand tools and the sweat of Mr. Phiri and his two wives. The larger of the two reser-



KEY

1. Granite dome
2. Unmortared stone walls
3. Reservoir
4. Fence with unmortared stone wall
5. Swale/terrace
6. Outdoor wash basin
7. Chickens and turkeys run freely in courtyard
8. Traditional round houses with thatched roofs
9. Main house with vine-covered cistern and ramada
10. Open ferrocement cistern
11. Kraal—cattle and goats
12. Courtyard garden
13. Swale
14. Dirt road
15. Thatch grass and thick vegetation
16. Fruition pit in large swale
17. Crops
18. Dense grasses
19. Well with hand pump
20. Donkey pump
21. Open unmortared wells
22. Reeds and sugar cane
23. Dense banana grove

Illustration by Silvia Rayces from a drawing by Brad Lancaster

voirs Mr. Phiri calls his immigration center. "It is here that I welcome the water to my farm and then direct it to where it will live in the soil," laughed Mr. Phiri.

"The soil," he explains, "is like a tin. The tin should hold all water. Gullies and erosion are like holes in the tin which allow water and organic matter to escape. These must be plugged."

Mr. Phiri's "immigration center" is also a water gauge, for he knows that if it fills three times in a season enough rain will have infiltrated into the groundwater to last for two years.

The smaller reservoir directs water via a culvert to an above ground ferrocement cistern which feeds his courtyard in dry spells. He also has a ferrocement cistern, shaded by a lush granadilla creeper, collecting water from his roof. Aside

from these two cisterns all other water harvesting structures on the farm aim to infiltrate the water into the soil as soon as possible. Near the home is an outdoor wash basin from which all greywater is drained to a covered, unmortared, stone-lined, underground cistern where the water quickly infiltrates.

From the top of the watershed to the bottom there are numerous water harvesting structures such as check dam walls, gabions, terraces, swales, and fruition pits.

The government had put in large swales many years ago throughout the region, but they had put them just off contour so that they'd stop sheet flow erosion and carry the storm runoff to a central drainage. The erosion problem was solved, but all the lands were being robbed of their water. So Mr. Phiri dug large "fruition pits" about 10' x 6' x 4' in the basins

“Slowly implement these projects and as you begin to rhyme with nature soon other lives will start to rhyme with yours.”

of all his swales. When it rains the pits fill with water and the overflow runs into the next pit and so on up to his property line. Long after the rain, water remains in the fruition pits percolating into the soil. Around the pits thatch grasses are grown for erosion control, building, and sale.

Many thriving fruit trees have also been planted by Mr. Phiri along the swales to provide food, shade, and wind breaks. They're watered strictly by rain and the rising groundwater in the soil. As Mr. Phiri explains, "I am digging fruition pits and swales to plant the water so that it can germinate elsewhere."

"I have then taught the trees my system," continues Mr. Phiri. "They understand it and my language. I put them here and tell them, 'Look the water is there. Now, go and get it.'" No basin and berm for holding and denying water is put around them, but rather roots are encouraged to stretch out and find water.

A diverse mix of open pollinated crops such as squash, corn, peppers, eggplant, reeds for baskets, tomatoes, lettuce, spinach, peas, garlic, onion, beans, granadilla, mango, guava, and paw paws, along with such indigenous crops and trees as matobve, muchakata, munyii, and mutamba are planted between the swales. This diversity gives him food security for if some crops fail due to drought, disease, or pests others will survive. The use of open pollinated varieties enables Mr. Phiri to collect, select, and use his own seed from one year to the next.

Nitrogen fixing plants abound. The pidgeon pea is one example, and is also used for fodder and mulch. Mr. Phiri has found that fertilized soils don't take and/or hold water well. As he says, "You apply fertilizer one year, but not the next and the plants die. Apply manure and nitrogen-fixing plants once and the plants continue to do well year after year. Fertilized soil is bitter."

The food and fruit Mr. Phiri produces is anything but bitter. He's been generous in his abundance, giving away trees to anyone who wants them. Unfortunately, as Mr. Phiri points out, the majority of the trees he gives away die when people do not implement rainwater harvesting techniques before planting. He propagates his trees in old rice and grain bags near one of three open wells near the bottom of his property. Mr. Phiri describes the open wells with another analogy. "Water is like blood—it is always attracted to the wound. Gullies are wounds. Blood goes to the wound to coagulate and heal it. It does this with gabions and swales where the gully is filled with fertile soil." With this knowledge Mr. Phiri dug his three wells at the bottom of his land knowing the water harvested throughout his land would seep into the soil and make its way to the wounds below.

The soil is his catchment tank. In times of drought his neighbors' wells go dry (even those that are deeper than Mr. Phiri's) yet Mr. Phiri's wells always have water "into which I can dip my fingers," for he is putting far more water into the soil.

Except for one well, which is lined with a hand pump for household water use, the others are all open and lined with unmortared stone. "These wells," explains Phiri, "are those of an unselfish man. The water comes and goes as it pleases, for you see, in my land it is everywhere."

In times of severe drought Mr. Phiri will draw from these wells to water annuals in nearby fields. He uses a donkey pump, also known as an Egyptian Shaduf, which is simply a hand pump that uses an old tractor tire to pump the water. A crank opens and closes a bladder (the tire) like an accordion, creating the needed suction. A lush natural wetland lies below the wells at the lowest point of Mr. Phiri's property. Here, Mr. Phiri practices aquaculture in a series of three reservoirs. As the smaller two dry up the fish are harvested or relocated to the largest. It is also here that Mr. Phiri densely grows bananas! Dry lands all around him, yet here on Mr. Phiri's farm is a thick forest of bananas! Sugarcane, reeds, and grasses such as elephant grass are also grown on and leading up to the banks to hold the soil. His livestock benefits from the dense grasses, grown to sift the water as it enters the reservoirs. This prime fodder is reserved for his cows when in calf.

When Mr. Phiri began he was forced to appear in court three times for violating laws that prohibited cultivation in wetlands. These were laws that had been around since colonial times. Finally, on his third court appearance he was able to convince the magistrate to come see his farm. Upon seeing Mr. Phiri's work the magistrate was so impressed that he dropped all charges on the spot.

Within the soil of the farm lie the Tigris and Euphrates rivers; the reservoirs are where they surface. The cycle of Mr. Phiri's Garden of Eden, starting to be noticed after 30 years of obscurity and sometimes scorn, continues to grow. Of the last three decades Mr. Phiri says, "Sure, it's a slow process, but that's LIFE. Slowly implement these projects and as you begin to rhyme with nature soon other lives will start to rhyme with yours." He and the NGO he created, the Zvishavane Water Resources Project, are spreading his techniques. He has influenced CARE International in his region to the point that, rather than giving away food, they now implement Mr. Phiri's methods so that people can grow their own food.

He has also gone to schools where the teachers were striking due to lack of water and the harsh conditions in dusty, wind-scraped classrooms. He taught the teachers and students how to harvest the rainfall, and together they've turned the schools into lush gardens and now have no reason to strike. "Remember children are our flowers," says Mr. Phiri, "give them water and they will grow and bloom."

Mr. Phiri's project is very much at the grassroots level (a big reason why it works), yet the Zvishavane Water Resources Project is always in need of funds. If you'd like to help write to Mr. Zephania Phiri Maseko, ZWRP, PO Box 118, Zvishavane, Zimbabwe.

Building a House for Bread

by
Roxanne Swentzell

*Just do it.
You'll learn by
doing it.*

—wise person

The Spanish peoples brought the bundté to the Indians when they came up from Mexico in the 1500's. They are typically known as *horno*, by the Spanish, but here at Santa Clara Pueblo, we call them *bundté*, which literally translates as "bread house." These ovens are still commonly used among the Pueblo Indians today. We have a lot of ceremonies that require feeding large numbers of people, and the bundté is very useful because it can bake a lot at once.

It has been argued that the bundté uses a lot of wood. I would agree if you are comparing this oven to a solar oven/cooker, for instance, but if you are baking bread in your gas or electric oven, I would have to say that you are a fool if you think a conventional oven is more sophisticated. Sophisticated in wastefulness and detachment, yes, but not in efficiency. The bundté is not covering anything up to look "clean." It's just what it is so you know what is going on—how much wood you are burning to feed you.

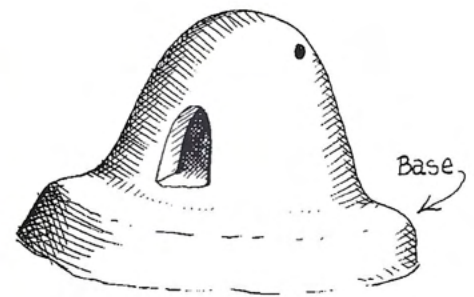
I appreciate this sort of bluntness, because when things are at this basic level, I believe we humans feel more capable. Mud is something we all know, at least as children, and we all have gathered sticks and started a fire at some point in our lives. So there, you have all the necessary skills to make a

bundté. If we can stay at this level of thinking, we can accomplish things we thought took experts. So with this four year old child inside you, lets make a house for bread.

A bundté can be as big or as small as you want, though if it's too big you may want to move into it instead of cooking in it, and if it's too small, it's sometimes difficult to get the fire burning strong enough from lack of oxygen. A six foot diameter base will make an oven that can cook about 15 to 20 loaves of bread at a time. An eight foot base can bake about 30 to 40 loaves. So think about what you will need.

Remember to place your oven where it will be easy to get to from your kitchen and far enough away from any plants that may get burned by hot smoke or cinders. Don't put it in a dip where water collects or under the drip line of your roof. It's just common sense, but it's amazing how we all forget these simple things sometimes.

You will need a base. This could be a cleared flat spot on the earth or it could be a built-up platform. The reasoning for a raised platform is so you don't have to bend over too much if the floor of the oven is raised to two or three feet. These raised bases have been built out of rocks, adobes, cinder blocks, cement—probably anything that will hold the weight of the oven.



The bundté at Flowering Tree connects gracefully with the west patio wall.

Good Mud

- 10 shovelfuls of sandy clay
- 4 shovelfuls of sifted ashes from your fireplace
- 3 shovelfuls of sifted dry manure (cow or horse is fine)

Mix all these dry, then add water until it makes nice mud for baking mud cakes with. We like mixing this mud in a hole in the ground with a bunch of barefooted kids.

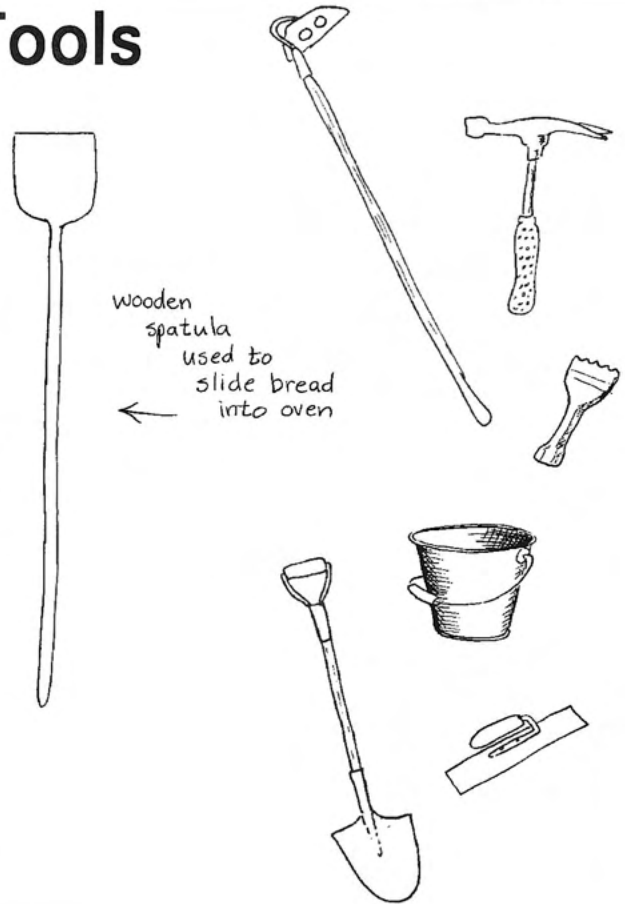
So after the base is established, you need to collect flat river stones. These are the hard, rounded stones you can usually find in river beds or arroyos. Collect enough to cover the floor of the oven. (If you can't find stones, fire brick can be used.) These stones will help the oven's floor hold heat for a more even baking.

You then cover the stones with a coat of mud. This coat will usually crack a lot but that's all right, it's just the first layer to hold the rocks in place and to start to make a flat floor.

Bundtés have been made out of brick or stone but I will describe how you make one out of adobes (sun-dried mud bricks).

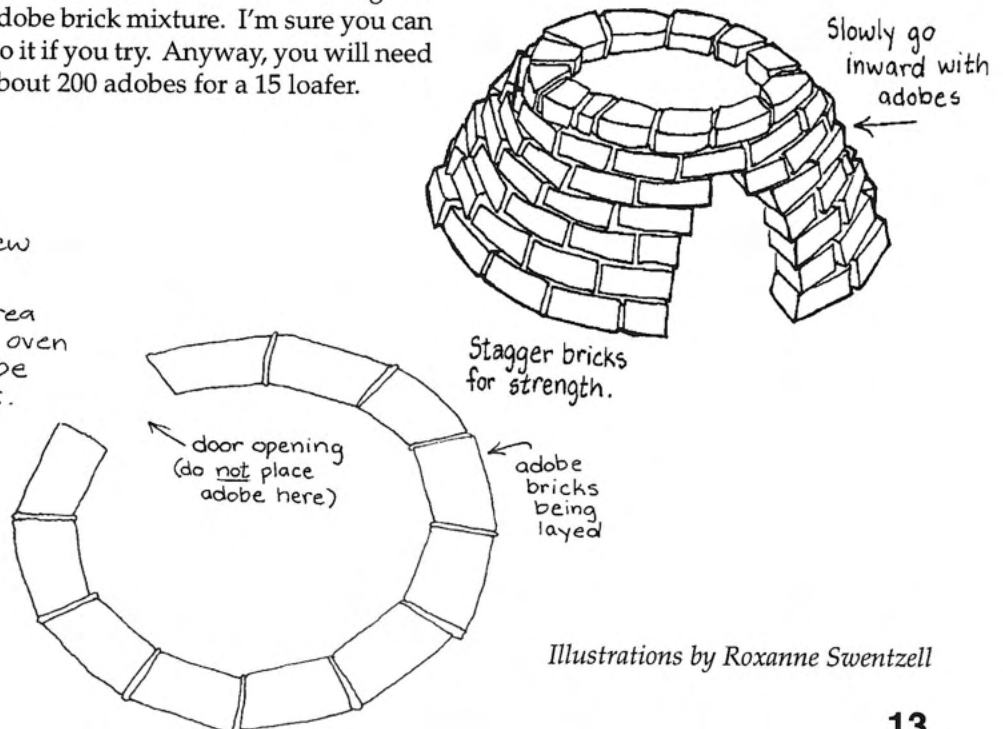
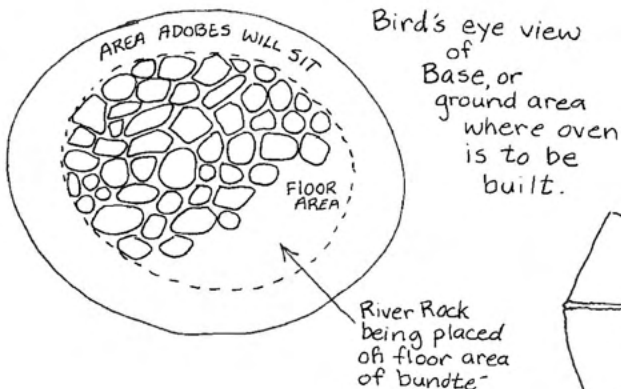
Useful Tools

- hammer (one with a straight hook side)
- cement chisel
- shovel
- hoe
- wheelbarrow
- trowel
- bucket
- lunch
- some children



DO NOT use stabilized adobes. The stabilizing factor is asphalt which tends to melt and drip when heated up. If you don't have a source to buy adobes, you will need to make your own. I won't go into that process but you will have to experiment with different clay/sand combinations to find a good adobe brick mixture. I'm sure you can do it if you try. Anyway, you will need about 200 adobes for a 15 loafer.

Mix some mud and use this for your mortar. Plopping a layer of mud around the perimeter of the base, you can start laying your adobes. You will need to cut the adobes to fit the circle



Illustrations by Roxanne Swentzell

as you go up. You can cut the bricks with the back end of the hammer or with the cement chisel. *Remember to leave an opening for the door.*

As you go up, slant the bricks slightly inward and also set them in some from the last layer. About 3/4 of the way up, leave a hole about the size of your fist for the smoke to escape through.

As you get closer to the top, the angle at which you cut the adobes will get sharper, until the "key stone" (last brick) goes in. Don't worry about some irregularities or points sticking out, these you can knock off with the back of your hammer or ax after the mortar has been allowed to dry for a day or so.

Now you can plaster your bundté with a couple layers of mud. It's not so important to make the inside walls smooth, but you can stick one of the children (or yourself) inside the oven with a bucket of mud to stuff into any big holes.

When this is done, mix one more batch of mud for the floor. This should be troweled as smooth as you can to make a nice floor that is easy to slide things on and easy to sweep clean.

You can make a door out of wood or use a stone that is shaped to fit into the opening of the oven. Also, find a rock to fit the smoke hole, though people often plug it with an old rag.

Let your oven dry before building a fire in it.

TO BAKE BREAD: Sticks are preferable to logs for heating the oven. We use all the pruned branches off our trees for cooking with. So, open the smoke hole and door and start a fire inside the bundté.

Depending on the size, weather, and wood, the timing for heating up the oven may vary. You may see cracks in the oven walls. This is all right—it's just the heat expanding the oven and a lot of the cracks will disappear once it cools off again. (You can rub mud into the ones that don't if you want). Build a hot fire. When the inside walls of the bundté are white-ish then you know it's ready.

I like to spread my burning coals evenly on the floor of the oven to heat the floor evenly. The floor is going to be the hardest part to heat.

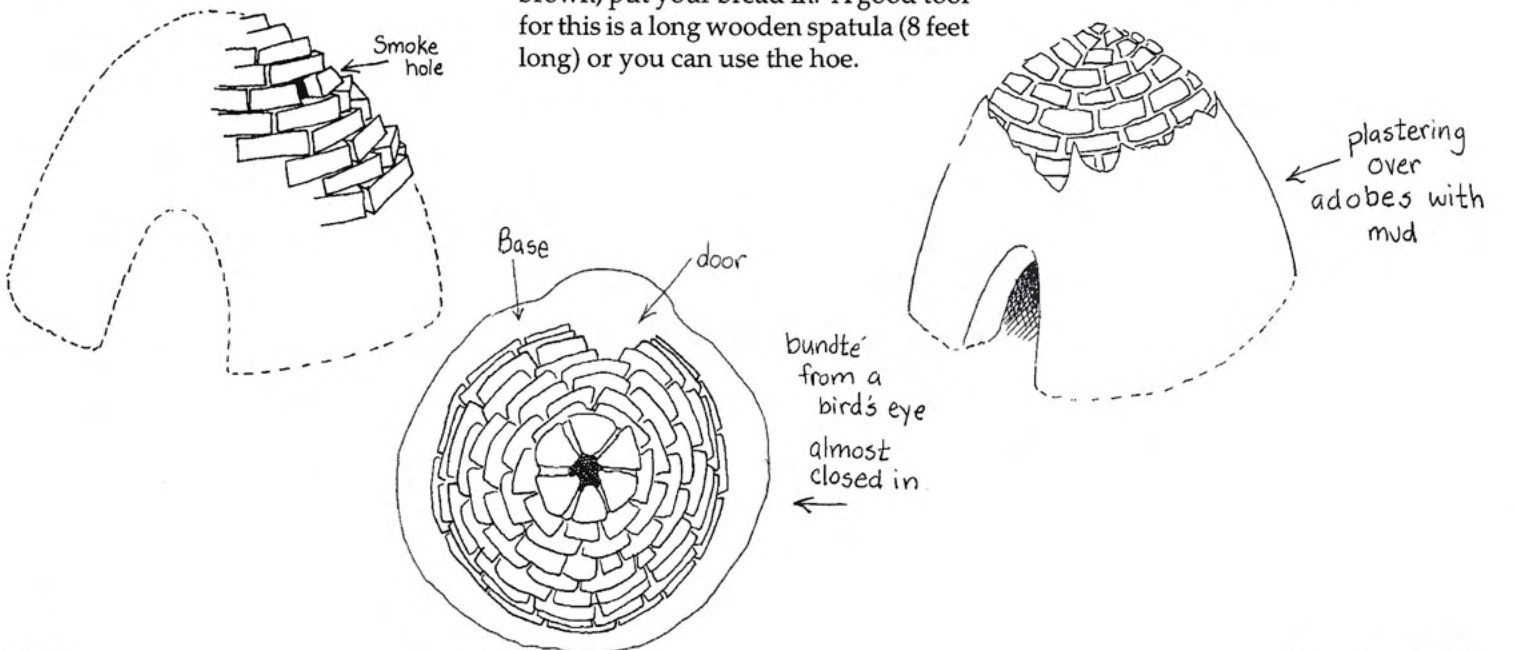
Some people use a dampened mop to sweep out the coals. I like using a hoe so that I don't cool the floor off with the water. If the tops of the bread tend to burn, I may splash water up into the top of the oven. Sometimes my grandma lays a wet towel on the outside top of the oven to cool the roof. You will have to play with what works for you. Remember that each oven is different and each oven has to be gotten familiar with.

Quickly clean out the oven and test it with a piece of paper or corn husk by throwing it into the oven and seeing what happens. If it burns, it's too hot and you need to wait a little before putting the bread in. If it turns a nice brown, put your bread in. A good tool for this is a long wooden spatula (8 feet long) or you can use the hoe.

Close up the door and smoke hole. Put a wet gunny-sack or towel on the inside of the door so that the door doesn't get too hot. In about 15 minutes, check the bread. You may notice hot spots and need to move things around in there to accommodate what you're wanting.

Bread is usually done in 20 minutes. If you move quick enough you may get another cooking out of it.

You can cook other things besides bread in your bundté. Sometimes I heat up the oven in the morning, take the coals out, put a turkey, potatoes, carrots, squash, etc., in a big pan in the oven, close it all up tight, leave for the day, come back in the evening and have a hot meal to eat. The nice thing about cooking meats in the bundté is that they don't burn.



“Your Refrigerator Quacks!”

I had a friend come visit a few weeks ago, and upon opening our “refrigerator” she exclaimed, “Your refrigerator quacks like a duck!”

I said, “What you are hearing ARE ducks.”

I once had a big two door, ice-making, top-of-the-line, commercial refrigerator. It plugged into that socket in the wall and hummed day-in and day-out, happy as a refrigerator could be. The noise was driving me crazy.

Joel read about other ways to keep food cool without a refrigerator. So, one day we sold our refrigerator and bought a galvanized metal trash can with a lid. We dug a hole outside the kitchen door and buried the trash can so that the lip was only about 3 inches out of the ground. We lowered our “perishables” into this can and put the lid on.

It worked just fine except for two things. First, no one wanted to go outside and reach down this hole for the butter. And secondly, after a few days, those little black sugar ants that have plagued us since the day we landed on this unclaimed land, found a way into the can to eat our “perishables.”

Well, Joel, still not wanting to give up on this experience, I mean, experiment, made a fancy metal overhang that encircled the can near the top. Under this overhang, he put car grease to catch the ants and keep them from getting into our food.

It worked just fine except that it also caught everything else. After sand, dirt and leaves made a nice bridge for the ants, Joel admitted defeat, but not for long.

Soon, he came up with another idea. If we could use air blowing through wet swamp cooler pads into a insulated box, we could have a “Joel-made” refrigerator.

The box was beautifully made, and we had everything set up. But, as we tried to get the pads to wick up water, or have the water drip down through them, we were hit with the conflict between ideas and physical reality. “IT DOESN'T ALWAYS WORK THE WAY YOU THOUGHT IT WOULD!”

It didn't all go to waste though. The box spent many years as a work table in the shed and just a year ago, Joel turned it over and made a smoker box, for smoking meat in.

As defeat often comes with a kind of depression, we were kinda in a refrigerator depression after this, wondering if we had done the right thing by selling our “top-of-the-liner,” and wondering if permaculture was some kind of big joke, and maybe we should both go get a “real” job.

While we were busy in self-loathing, time went by and before we knew

it, months upon months passed without having a refrigerator at all! While we were wondering to do next, we kept on living and after about four years, I learned something basic: We didn't NEED a refrigerator. Our “perishables” didn't perish as fast as refrigerator-believers would have you believing they do. Food in our house never sat unused inside some back shelf of some refrigerator. We ate what there was because it was still on the table or counter the next morning, right in our view.

Because we only bought raw unpasteurized milk, what the kids didn't drink, we turned into cheese. Eggs that aren't washed can last, unrefrigerated, for a month. Butter stayed soft, but I find it easier to use that way. And meat doesn't go bad overnight, or over two nights, and by then we've eaten it.

Refrigerators are a very new invention to this world, and this led me to wonder what did people do before refrigerators existed? It helped us to learn more about canning and drying foods to store.

After about seven years we decided to finish the kitchen cabinets. We had been camping and had bought ourselves an “IGLOO” (insulated ice-box) to carry food in the car. It wasn't very insulated and we had to keep it in the shade to keep it cool. We thought, “If only it was more insulated and sat in a cool spot all the time, it would work great.” Then we thought of the kitchen cabinets (don't ask me how these two go together but they did).

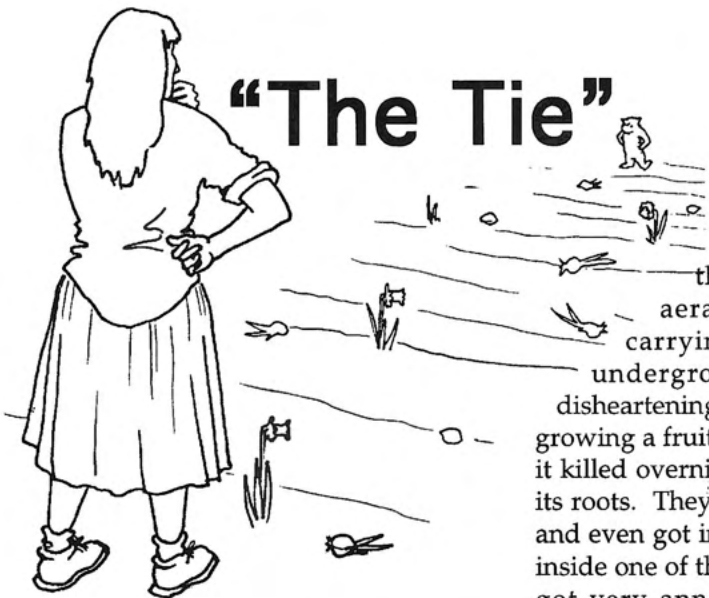
We could insulate one of the compartments of the cabinets, and put two holes out the north side of this insulated box. These two holes would go through the north adobe wall of the house, right over the back pond where it stays cool! BINGO!

We did it, and it worked and still works. We don't have to crawl in a hole outside, fight ants, struggle with water hoses, and fancy gadgets. It's simple, easy to understand, looks good, and works. Plus, we got over our hang-up about NEEDING a refrigerator. So now, it's clearly a luxury, but a non-destructive one.

by Roxanne



Stories
from
Flowering Tree



"The Tie"

What is a pest, anyway? "An annoying person or thing," says the American Heritage Dictionary. What is it in the world of Permaculture? Something that we haven't understood our right place with, yet?

When there is no more "pest" in the world, we will either all be dead or we will have learned how to live in balance and harmony with the way this planet works. Until then, we struggle to understand our right place in it all from trial and error. I suppose we will continue this process of learning how to stop trying to control our environment, and instead learn to let go and experience it again.

When you make a lush abundant place in the middle of a very harsh environment, every bird, rodent, insect, wild and domestic animal, and plant in the area, plus the neighborhood children seem to gather in your yard. This has been the story of Flowering Tree. Some of these unexpected visitors have consisted of cows, coyotes, squirrels, snakes, toads, frogs, water spiders and plants, bats, gophers, and many wild species of birds, and grasshoppers.

Now some of these were nice surprises, and some of these were "not understood completely" and were called "pests." And some of these I thought were nice surprises but turned out to be "pest," like the peacock that showed up one day and stayed. But that's another story.

There is one story I do want to tell about a "pest" that taught me about myself being a "pest" in the end, a story about the gopher.

Even if you hear things about gophers aerating the soil and carrying nutrients around, underground, it's pretty disheartening when you spend years growing a fruit tree from seed to have it killed overnight by a gopher eating its roots. They dug holes everywhere and even got into the cold frame, and inside one of the house plants! We all got very annoyed when trying to irrigate, the water suddenly disappeared down a gopher hole only to come up where you don't want it to. Those damn gophers were messing up the order and master plan of our Permaculture Heaven!

So after a few of these episodes, it was WAR. We started planting trees in wire baskets to protect them from gophers and started setting traps—gopher traps, that is, down gopher holes. "Kill" is the word that I hummed helping Joel set the traps.

Well, gophers are pretty smart little guys and we learned that they knew all about gopher traps from their great grandparents long before we were born. They knew just how to make them go off without getting caught by pushing dirt up against the trap until it would snap. Well, we had to learn how to out-smart them.

Meantime, we were hearing about all kinds of gopher control methods such as feeding them chewing gum which will clog up their intestines and they will DIE. Or, feed them raisins which will bloat up in their stomach and they will DIE. Or put out poison in which they will DIE. Anyway, killing was on our minds and Joel heard of a method using propane gas.

So out he went with a propane tank to KILL gophers. The propane is heavier than air so it sinks—like into a gopher hole. So he was out there filling up gopher holes with propane gas.

Then he lit it on fire. BOOM! The ground jumped all around but we didn't find any blown-up gophers. I think we aerated the ground some, though.

Then Joel decided to stuff alfalfa on the up side of the gopher trap and cover the whole thing over with dirt. Well, it worked. We all raced out to see our first dead gopher. Poor thing, it got stabbed straight through with the spikes of the trap and we all felt kinda depressed.

This began our next stage, where we didn't dance around singing songs of death for gophers, anymore. We were kinda quiet about it.

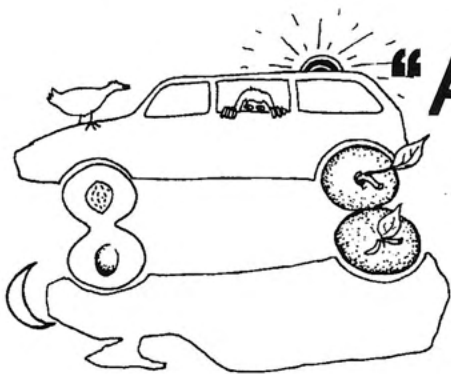
Joel was irrigating one day and the water flooded a young gopher out of his hole. Joel said it looked confused and wet. Well, he went for it with the shovel to cut it in half, but the next thing I knew, he had scooped it up and put it in a box. Rosie (my daughter) wanted to keep it as a pet, but I told her it would bite her. She told me, "That's all right, I'll just pet it with a stick." I said, "No you won't." We took it way up the canyon and let it go.

Our bathroom has a big solar window looking out into a courtyard. Joel was taking a bath one morning and while he was looking out the window, he saw a gopher climb out of the ground right in the middle of his "precious courtyard!" He climbed out of the tub, grabbed the 22 and carefully opened the door—aimed, fired, the gopher dropped dead and Joel went back to his bath. Later he told me that after it dawned on him what he had done, he felt like a murderer, and was sick of killing gophers.

Meantime, we started planting daffodils around places we didn't want gophers in. After watching what would happen for a few years, I was pleased to announce that daffodils worked at keeping gophers away. Gophers hate the smell and taste of daffodils. Now this was more my style of control and I ordered hundreds of daffodil bulbs and started putting them all over the place.

Last summer, feeling rather smug and confident about this discovery, I





"A Truly Permaculture Car"

Joel came with a 1972 Subaru station wagon. It sat in the front yard mostly and collected blowing leaves and dust. Joel left the driver's window rolled down to let the heat escape during the summer months.

One year, we got a few Bantam chicks at the feed store, to see how this breed would do roaming free with all the wild pueblo dogs in the area. When they got old enough, we would open the chicken coop during the day to let the birds roam the yard catching what insects they could find. When it started to get dark, the birds would go back into the safety of their coop for the night, all except one.

This one hen went wild on us, though she stayed in the yard. When the other birds started laying eggs we knew that this hen would be laying too. This began the wild egg hunt, with the kids, Joel and I looking through the bushes, the shed, under boards, across to my aunt's house, inside, outside, everywhere we could think with no luck. As summer came to an end so did our dry season. I suggested to Joel that he roll up the windows of his car before "things" started to grow in there from the rain. So he did.

Well, it didn't take long before we heard a lot of complaining. Our wild hen was loudly squawking as she paced back and forth across Joel's Subaru, staring into the windshield, desperately trying to find a way in. I've never in my life seen a more upset bird. She was very panicky and frantically screaming about it.

We went out to take a closer look at what was inside that she wanted to get to so badly. On the floor of the driver's side of the car was a pile of eggs. We quickly rolled down the window again and backed off. That hen flew into that car as fast as she could, made some strange noises and came out a very contented, relieved bird.

Later that year we were needing Joel's car to drive. My car was sick. We had to go through this routine of checking the floor for eggs before we stepped in, leaving the window open when we got back home, and getting home in time for the "event."

Well, time went on and chickens came and went as did this one, but Joel's Subaru was still sitting in the heat of the driveway catching leaves, and making a shady place for all the dogs to lay under.

As more of our food was being grown here in our yard, we were needing to learn more about how to preserve it all. We decided we needed a solar dryer like the one we saw up at the High Desert Research Farm. We spent months trying to design a good one on paper. Back and forth we went,

brainstorming, but never coming up with a final plan that felt right to both of us.

It was Joel's permaculture mind that moved into action as we all climbed into "my car" to go somewhere, one hot summer day. The heat waves were wrapping themselves around us as we opened the car door. I could literally see Joel's brain working as he felt that heat and then looked over at his Subaru that we had almost forgot existed by then.

So the next thing I knew, I was cutting up peaches, apricots, tomatoes and plums, and Joel was lining the inside of his car with the cut halves. The back seat folded down to make a perfect flat area. He could regulate the moisture level and air current through the car/solar dryer by rolling the windows up or down slightly. It was perfect as long as we didn't need to drive it during harvest time.

*Silly ole'
Mind
Can't seem to
let go enough
to know
the Way.
When the Way
is smiling
back at us
every day.*



took a whole sack of daffodil bulbs down to this field we have by the river that is "infested" with gophers. We had planted a cover crop and it was slowly disappearing into gopher mounds.

I walked throughout the field, planting my bulbs every three feet, already celebrating inside the defeat of gophers without using the word KILL.

The next week I went back. All I

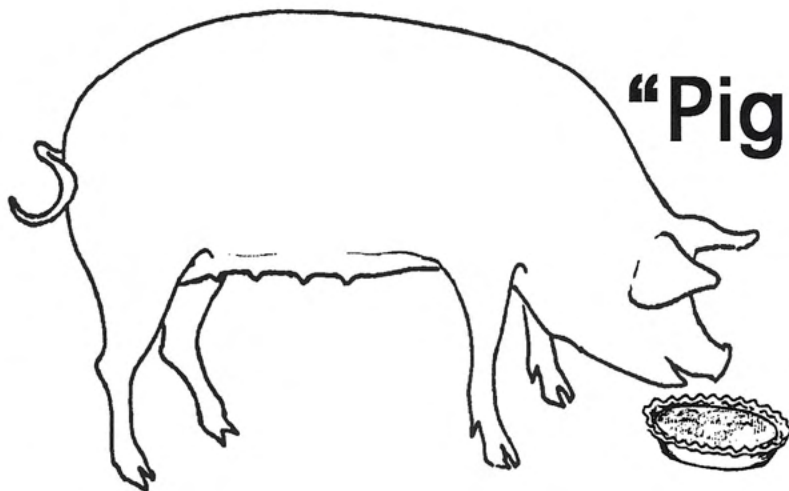
could do was sit down and laugh. Every one of my bulbs had been carefully pushed up out of the ground from below. The field was scattered with daffodil bulbs. Well, at least I knew for sure that gophers hate daffodils.

I had met my match. I pushed the bulbs all back into the ground and the gophers pushed them back out. We did this back and forth until half of the

bulbs were dead and half of them did manage to take root and bloom. It was a tie.

I guess through it all I learned that there are ways in which we can all live together without obliterating each other, and how interesting life is with all these "pests" in it.





“Pig Pig”

Well. . . Joel read that pigs are useful for plowing up an area and tearing up plants that you don't want. He consulted for this woman up in Taos about her pasture that had been taken over by bindweed. He suggested to her helper, Derek, that he try out some pigs to get rid of the bindweed. Derek took his advice and got four little pigs. He moved them around the pasture in sections using electrical fencing. It was working somewhat when the relationship between Derek and this woman went sour, and Derek was told to “get rid of the pigs.”

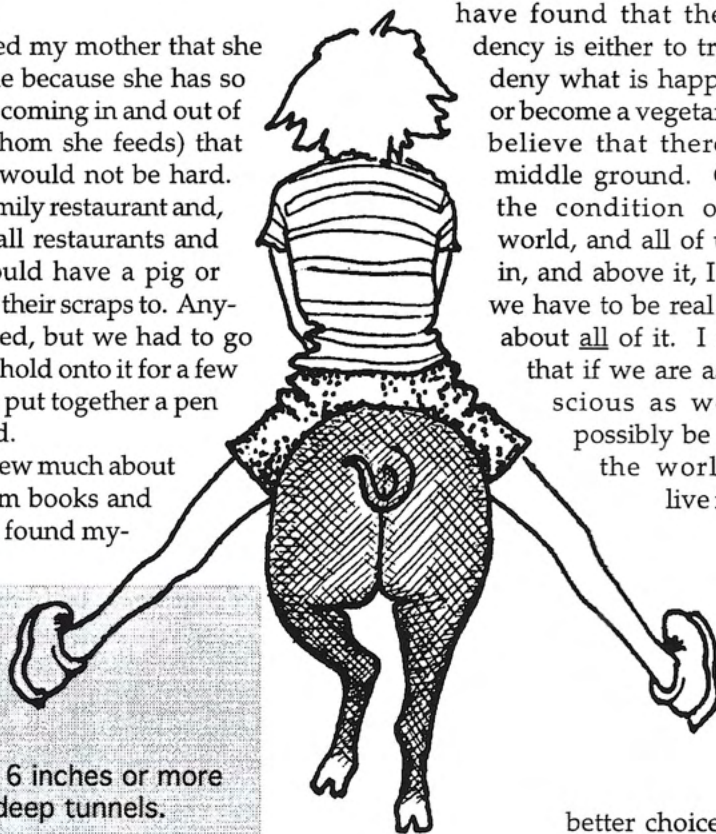
I convinced my mother that she should get one because she has so many visitors coming in and out of her house (whom she feeds) that having a pig would not be hard. She is like a family restaurant and, in my mind, all restaurants and cafeterias should have a pig or two to feed all their scraps to. Anyway, she agreed, but we had to go pick it up and hold onto it for a few days until she put together a pen for it. I agreed.

I never knew much about pigs—just from books and pictures, but I found my-

self out in this pasture with a rope headed for a pig—a real one! I like bacon, and pork chops and chili stew with pork meat in it, but this “pork” was looking back at me and knew just what I was up to. I found myself feeling guilty in the presence of those eyes. The books didn't tell me that there's someone “in there” that looks back at you with very humanlike eyes!

After many years of dealing with all kinds of “farm” animals, I have never, never failed to find myself in this difficult situation. Should I stay open and caring or should I get “cold” in order to “get the job done?” I

have found that the tendency is either to try and deny what is happening or become a vegetarian. I believe that there is a middle ground. Given the condition of the world, and all of us on, in, and above it, I think we have to be real sober about all of it. I figure that if we are as conscious as we can possibly be about the world we live in, the



Pig-Raising Recommendations

A very strong cage. Bury heavy gauge wire 6 inches or more into the ground. Pigs I've known can dig some deep tunnels.

Logs or boulders. Pigs like to push things around, like heavy objects.

Mud hole or water trough. Pigs are related to ducks, but are actually cleaner than ducks, and love to keep their skin nice with mud baths.

Straw bales. Our pigs have liked to make nests of straw to sleep in. In the winter they cover themselves with straw to keep warm. A bale a month (don't open it for them—it's half the fun for them to open it themselves) is a good idea. They will soon turn it into compost and their cage won't even smell.

Pigweed. Our pigs ate almost anything including left over pork chops. But a cheap way to help feed a pig is to grow some pigweed. This “weed” grows just about anywhere and pigs really do like it. So do sheep, but that's another story.

better choices and moves we will make. So with this logic in mind, I went forward trying not to deny anything.

“Yes, Pig Pig, I'm gonna tie you up with this rope and put you in the back of my truck, take you far away from your brothers and sisters and give you to my mother who will fatten you up and then eat you.” Then I felt terrible but I told it, “I am sorry but this is still what I'm gonna do.”

Pig Pig got her name naturally.

After Pig Pig whispered to her brothers and sister, they figured out how to pull the rope off of her before we got her to the truck. After a few of these escapes, we had her. She threw

up and shit all over the back of the truck all the way home with the kids sitting next to her, making disgusted faces. We got home and put her in with the sheep, for now. Well! Those sheep were fit to be tied! How dare we insult their pristine world with a PIG! And that pig went straight for their water tub and climbed in!

I fell in love.

"Maybe I'll keep her for a week before I take her to my mother's," I thought.

I had never had so much fun watching an animal in all my life. Pig Pig was incredible in every sense of the word. Everything she did was done with the utmost pleasure and full-heartedness. She was All there, All the time. She taught me how to "be here now." I watched her for hours.

My mother saw the sparkle in my eyes when Pig Pig was mentioned, so she stopped building the pig pen, realizing that the pig wasn't leaving my yard real soon. Pig Pig never did go to my mom's. The furthest she went was down to the creek when we would all take walks together. Pig Pig would lead.

No book can ever tell you what you can expect when you take on an animal—any animal, really. Raising Pig Pig was a unique experience unlike any I've ever had or ever will have. I think that we as people forget that every animal is different, even of the same species, just as every person is different. So take what you read and hear from others with a grain of salt and instead check it out for yourself.

So back to my story. . . Joel wasn't too thrilled with having this very intelligent, uncontrollable, unpredictable beast to deal with suddenly, especially when he got thrown into a ditch by her and got some nasty scratches on his head when Pig Pig decided to use him as a bridge to cross the ditch.

It was surprising how that pig never failed to figure out how to escape whenever it decided. And Pig Pig could really lay on the "charm" as soon as we (in our moments of frustration) decided that she was "big enough," like after she dug up all the potatoes.

We tried to get her to dig up an area of bindweeds by staking her to a post with a harness on a five foot long rope.

Well, we learned that the ground has to be wet before a pig can do a good rooting job, but when the ground is wet, so is the pig, and when a pig is wet it gets very slippery. At this stage, Pig Pig would wind her rope tight against the post, then, being shaped like a pointy-ended potato, she would slide herself right out of the harness and go see what the other animals were having for lunch.

Well, after Pig Pig reached six months old and 400 pounds, we did decide that she was "big enough." Joel told me I had to do the dirty work of killing her because it was my big idea to keep her. To go from loving, caring for, protecting and feeding this "friend" of mine to figuring out how I was going to kill her was quite a change. I knew I needed to do it. I knew from the beginning that I was gonna have to kill her one day, but now the day was here. Because I considered her my friend, I knew out of respect for her that I would do it myself and stay "open" to her all the way through.

We borrowed a pistol from a friend.

I made Pig Pig her favorite thing to eat—pumpkin pie.

Early in the morning we all went out to her pen (she was actually there) and I gave her the pumpkin pie. She ate it with her usual pleasure enjoying every last crumb. I enjoyed watching her for the last time. Then I shot her in the head. I shot her twice because I wanted it to happen as fast as possible. Then we watched her die.

People ask me how I could eat something I knew so well. I ask them, "How can you eat something you don't know so well?" We ate Pig Pig for about one and a half years and savored every last piece. We knew she would've, too. If I hadn't known her, her meat wouldn't have meant very much to me, it would just be some pork meat. But when we would have a meal with Pig Pig in it, our respect and gratitude to her would put a blessing on the meal and we would remember her in all her moods, and smile. And sometimes we would cry.

***Pig Pig, your Spirit is with us
Your Will is stronger than all this***

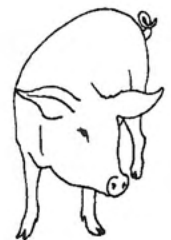
***Thank you for your appetite
that gave me such joy.***

***I thank you for the meat
I took from your bones.***

***You are a reminder to
me of myself***

***To remember the Spirit
in all things***

***and our Will to exist
and our turn one day to
be just flesh and bones.***



SPONGE LADDERS

A Water Harvesting Method for Establishing Perimeter Shelterbelts on Sloped Sites

By Chris Meuli

Many of the water harvesting concepts in drylands permaculture assume a sizable amount of land. Some of us are blessed with modest-sized parcels in the one-quarter to ten-acre range. The smaller the site the more the edge effect is emphasized, because the ratio of the perimeter to the total area of the site increases as the site gets smaller.

Our neighbors are close. There is little space to modify the vectors that affect zones one and two on our small sites. Fortunately, perimeter shelter belts of trees and shrubs can be extremely useful translators in the landscape, and sponge ladders for water absorption can help establish these vital shelter belts.

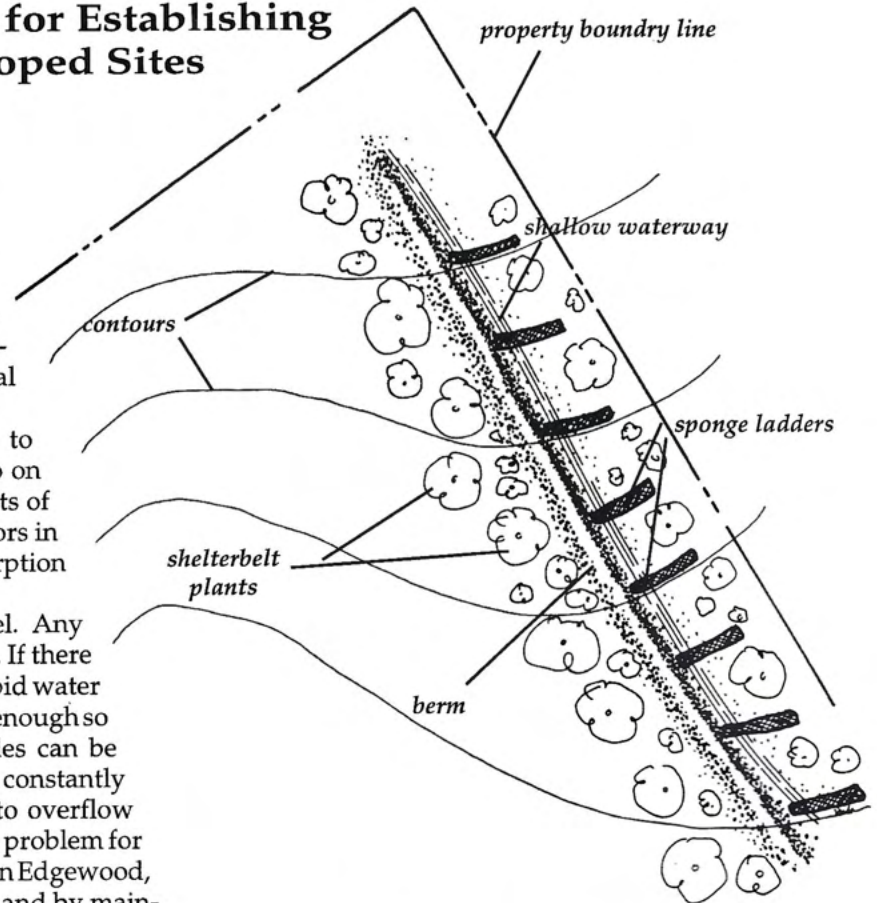
The challenge is that very few sites are level. Any perimeter shelter belt is unlikely to be on contour. If there is any significant slope, it is difficult to hold the rapid water runoff from infrequent but heavy rain events long enough so the water can soak into the soil. Fishscale swales can be useful, but they have to be carefully monitored and constantly reworked so they don't silt in, allowing water to overflow away from the shelter belt. I've struggled with this problem for over a decade on a moderately steep eight-acre site in Edgewood, New Mexico. Through many small interventions and by maintaining close observation, the sponge ladder solution has evolved.

The sponge ladder uses a series of very short, deep swales to collect and store water along a shallowly dug waterway that runs off contour. The waterway guides the water parallel to the property boundary so it can soak into the shelter belt soil. Sponges placed at 6 to 15-foot intervals along the waterway slow down and absorb water, making it available to the living soil and the nearby plants. The "sponges" are trenches dug on contour to a depth of 15" - 20" that are 10" - 15" wide and 2 to 6 feet long. They are packed with straw, leaves, grass clippings or any type of organic material that will quickly soak up water and slowly release it over time.

The top of the fully mulched sponge is even with the bottom of the waterway; this allows all surplus water to run down the waterway to the next sponge. This greatly increases the absorption of water along the edge of the property and facilitates the establishment of the perimeter shelter belt.

I dig sponge ladders with a shovel, using the soil to form a berm that parallels the waterway. They may be redug and remulched every 3-5 years to renew their absorptive capacity. This rich loam can be used as a soil dressing in the shelter belt or elsewhere.

Using sponge ladders can help us establish perimeter shelter belts of trees and shrubs that require little care or added water. These shelter belts act as permeable barriers for a variety of natural vectors such as water, wind, sound, animals and light. They also attenuate our exposure to local manmade nuisance vectors like noises, odors, dust and nocturnal light pollution. They attract a variety of birds and animals and help us harvest detritus and water from our up slope neighbors. They should be pleasant and beautiful and can further increase the amount of edge on our site. They are easy to establish and provide a great opportunity to observe water flow patterns over time.



Sponge ladders are dug on contour. Shelterbelt plants on this site (at 6700' altitude) include austrian pine, scotch pine, rocky mountain juniper, eastern red cedar, apache plume New Mexico privet (forestiera), and a possible invader species, black locust.

Chris Meuli is a physician, the grandson of a conservation rancher, and a lifelong resident of New Mexico. His inherited interest in the land led him to permaculture literature in 1981; he is a graduate of the 1992 design course in Eldorado, NM.

PDI Basic Permaculture Design Course Schedule 1996

Permaculture Drylands Institute Basic Permaculture Design Courses cover all aspects of permaculture design in drylands. They consist of a balance between hands-on experience, classroom time and design practicum. Dynamic exercises encourage pattern recognition—noticing the links between plants, animals, climate, landforms and all of the other elements that make up natural and man-made systems. These patterns are then used as the basis for design work.

The courses focus on dryland communities, addressing existing neighborhood "problems" such as stormwater flooding. Students learn to "read" the landscape, to map and analyze energies affecting a site, and to develop integrated designs for sustainable systems. The weekend format of the courses promotes integration of course material into students' daily lives and allows hands-on design work in their respective homes.

Course Topics include agroforestry, appropriate technology, building design, design principles and patterning, dryland gardening principles, ecosystem restoration, energy conservation, home garden design, observation and site analysis, permaculture philosophy and ethics, regenerative economics, soils and erosion control, village design and water harvesting.

Arizona

Autumn '96 Design Course—Tucson; four alternate weekends (short sessions on Sundays) and two separate half-day tours in town. Get-acquainted potluck October 5; Course weekends: (I) October 12&13; (II) October 26&27; November 2, half-day tour; (III) November 9&10; November 16, half-day tour; (IV) November 30 & December 1. Contact Barbara Rose (see listing above).

Colorado

Spring '96 Introductory Weekend Design Course—Durango, June 8 & 9. Contact Ron Margolis at (970) 259-3369.

New Mexico

Summer '96 Design Course—Taos, four alternate weekends: June 15&16, 29&30; July 13&14, 27&28.

Autumn '96 Design Course—Albuquerque, four alternate weekends: September 7&8, 21&22; October 5&6, 19&20.

Fee for any complete design course is \$450 and the first weekend can be taken as a separate introductory session for \$125. For complete schedule and other information on courses in Colorado and New Mexico, contact Permaculture Drylands Institute, P.O. Box 156, Santa Fe, NM 87504-0156 USA (505) 983-0663.

Additional Courses and Workshops

Earth Plasters Course—Tucson AZ, April 28. One-day workshop (9AM to 3PM) on earth, gypsum and lime plasters for inside and out. Instructors: Barbara Rose and Brad Lancaster. \$50. Takes place at Tucson Mountain Permaculture Center.

Rammed Earth Water Storage Tank Workshop—Tucson AZ, May 4&5. 9AM to 5PM each day, \$150 (includes lunch and snacks). Hands-on building of above-ground tank and pond catchment. Workshop will take place at the Tucson Mountain Permaculture Center.

For further information on these courses, contact Barbara Rose at 8945 Scenic Drive, Tucson, AZ 85743 (520) 744-9305.

Advanced Permaculture Design Course, November 11-17, 1996. Sunglow Ranch, Pearce AZ, Instructors Tim Murphy & Ben Haggard. Intensive instruction in the philosophy and techniques of ecological design, building on the foundation of the Basic Design Course. Subjects include: Broad scale land-use planning for drylands; advanced pattern application; site assessment; ecological village design; establishment of a functional, ethical business; development of a professional design and report; relations with clients, the public, and zoning authorities; other advanced techniques. Sunglow Ranch is a retreat center south of Tucson, nestled in the "sky island" biotic communities of the Chiricahua Mountains, one of the most biologically diverse areas of the Southwest. Prerequisite: Basic Permaculture Design Course. Cost: \$500 (early registration \$450) including all meals and lodging. Contact Vicki Marvick (520) 824-3465.

Community Calendar

Permaculture Breakfasts

Local permaculture communities are meeting for breakfast once a month to network and connect. The setting is informal -- talking, eating, a few announcements. Everyone is welcome. The following are scheduled:

Albuquerque, NM: Second Thursday of the month (April 11, May 9, June 13, July 11, August 8), 8:00AM at EJ's Restaurant (Silver at Yale).

Santa Fe, NM: Fourth Tuesday of the month (April 30, May 28, June 25, July 30, August 27), 8:00AM at Tortilla Flats Restaurant (Cerrillos Road at Calle de Cielo).

Tucson, AZ: Just getting organized. Call Barbara Rose at (520) 744-9305 and help her make it happen!

PDJ is happy to list all breakfasts and other regular community gatherings. Call Ingrid Kelley, Editor, at (505) 820-9210.

A New Degree in Permaculture

by Michael Kramer

Las Vegas Vocational Technical Institute (LVTI), a community college in Las Vegas, New Mexico, has initiated an innovative Certificate program in Sustainable Resource Development (SRD). The SRD program trains participants in the basic skills and techniques of soil conservation, watershed management, sustainable agriculture, appropriate technology, land use planning, and rural community and economic development, within the whole systems frameworks of both permaculture and biodynamics.

The program, which began in January of 1996, offers seven core and numerous elective courses. To earn the Certificate, students must take a minimum of 11 courses over a three semester period. They can then work toward an Associate in Applied Science Degree in General Education, with a declared major in Sustainable Resource Development. All courses earned toward both the Certificate and the Degree are transferable to agricultural degree programs at New Mexico State University.

Students learn about both historical and newly established methods in agriculture and rural development. The program seeks to continue the growth of Northern New Mexico's agrarian traditions: self-sufficiency; community interdependence and service; and rural trades, industries and arts. Students are preparing for careers in

"Institutionalizing Permaculture"

There has been some discussion among permaculture teachers and students about what it means to institutionalize permaculture. Some are concerned that within traditional higher education institutions, permaculture may become a fragmented body of knowledge categorized as a narrow academic discipline for the purpose of training specialists in limited career fields. Furthermore, permaculture is so interdisciplinary in its very nature that it would be diluted, misrepresented, or even suffocated if forced to conform within an academic department. It is feared this approach to permaculture might lead to outcomes we don't want like careerism, expertise syndrome, and too much theory instead of the lifestyle revolution many of us feel is necessary and which currently has significant momentum around the world.

These concerns are, of course, valid. However, the most important priority of permaculture is simply to change the way people think about living on the planet. There are countless ways that people can come to understand living a life patterned after nature. How people modify their current lives to make this transition, and what people choose to do with this knowledge is a choice that no one group ought to judge. If permaculturists are to model the guilds we plant, then we must certainly allow for a variety of approaches through which permaculture is taught, learned and practiced. Permaculture belongs to people of all ages and in all contexts. As long as the integrity of the philosophy and methodology is preserved, the movement will develop into a more permanent culture which is only strengthened by its diversity.

—Michael Kramer

sustainable agriculture, natural resource management, renewable energy, home construction, land use planning and landscaping, food production and processing, and other economic development ventures. It also provides participants with techniques to take control of their lives and live in harmony with nature.

Current course offerings include an extended version of the traditional introductory permaculture design course (students who complete it receive a Permaculture Drylands Institute certificate); Biodynamic Farming Systems, hands-on diversified small-scale farming; and Appropriate Technologies, which teaches design and construction of renewable energy systems for both structures and agriculture. Courses to be offered in the coming semesters include Permaculture Design II (advanced design); Land Use and Resource Management (bioregional watershed, range, and public lands issues); Rural Community Development (economics and other invisible structures); and Principles of Small Business Management. Among elective courses being offered are Straw Bale Construction; Adobe and Stone Construction; Hand and Power Tools; Site Layout and Construction; Maps and Surveys; Introduction to Auto CAD; Beginning Spanish and Introduction to Early Childhood.

The SRD program occupies a 12-acre portion of the LVTI campus, an area that was previously used by the now defunct horticulture program. The site features an 8000-square foot horticultural building (including a commercial greenhouse), a water system, an orchard, crop fields, a spring source, and ponderosa forest. Campus faculty and interested community members who participated in a permaculture design course on the site developed the current plan to transform the entire property into a working farm school that models easy-to-use techniques of food forestry, renewable energy and building systems, animal husbandry, biointensive gardening, water harvesting, land use planning, and culturally relevant economic development.

The site will also house the college's Early Childhood Education program in a new structure adjacent to the horticulture building. An energy efficient straw bale building will be constructed this spring and summer by students and faculty from SRD and other construction trades programs on campus. The 3000 square foot building and large walled garden area will function as a day care facility and child study laboratory, allowing young children to engage in play and work related to the functions of the farm. It will also educate parents and Early Childhood Education students about appropriate indoor and outdoor learning environments. This innovative integration of the Early Childhood Education and Sustainable Resource Development Departments within this site will ground the concepts and techniques of sustainable settlement design into a context of family, culture, right livelihood, and celebration.

Planning is also underway to construct an adobe and stone Cultural Arts and Trades building on the site. This facility will be used to teach food processing and those cultural arts and crafts which are based on the cultivation and preparation of products from the site. Demonstrating these skills as part of the academic program will contribute to economic development for the region.

The program currently includes students of 16 to 24 years, from diverse backgrounds. Ten of them are pursuing their studies as paid Youth Conservation Corps workers. These students are enrolled full-time in all courses, and they also have additional work responsibilities implementing the current permaculture design for the 12-acre site. Considering that most people have to pay significant sums of money to take permaculture and other agricultural and design courses, it is significant that this vital information is being imparted to young people (and therefore their friends and relatives) who would not easily gain access to it otherwise. This will further broaden the sustainable design movement and help more people take charge of their lives.

Michael Kramer has been teaching permaculture to teenagers and young adults since 1990. He is a member of the Permaculture Drylands Institute teaching team in New Mexico. For further information about the Sustainable Resource Development program at Luna Vocational Technical Institute, please call Coordinator Mark Feedman at (505) 454-2593.

The Acceptance of Permaculture

by Gary Bentrup

As designers, we sometimes tend to overlook the sociological factors that encourage public acceptance of permaculture. For permaculture to be accepted by the mainstream, we must explore

and incorporate the sociological factors that will encourage society to embrace it.

EDUCATION: Acceptance of permaculture design is dependent on people's understanding and appreciation of the ecological principles that are incorporated into a project. Ecology as a design basis will result in complex relationships where for

example, energy and food production will be interrelated to water reuse. Education is an ongoing process where we develop an awareness of the environment and our relationship to it. Skills and commitment follow with the ultimate goals being informed decision making, responsible behavior, and constructive actions regarding a sustainable lifestyle. Consequently, education is vital to the acceptance and success of a permaculture installation. For example, two housing projects in Berlin, Germany incorporated greywater recycling systems that needed to be maintained by the tenants. One project held classes on the reasons for the system, how it worked, and the maintenance it required. The other residential project only held a brief introduction to the system. The housing area that incorporated the educational continuum encouraged acceptance in a successful system while the other project was not able to develop commitment and thus became inoperable.

INTEGRATION: Permaculture encourages the integration of necessary processes such as energy production and waste disposal in the closer context of our everyday lives. When society segregates these elements, people lose the necessary understanding of these processes and their impacts which results in unsustainable approaches to these issues. However, if waste disposal is not delegated to the edges of cities, but rather made a component of our urban life, a more responsible ethic would evolve. We would see the end result of our waste and would incorporate measures to reduce and reuse our waste stream. Integrated systems can become a source of pride and motivation in a community that can act as a catalyst for other aspects of sustainability. For integration to succeed, designers must seek creative ways to promote public acceptance and support as we bring these processes back into the realm of everyday life.

MINIMAL DISRUPTION: Shifting toward a sustainable society will require some major changes in our lifestyles. However,

permaculture design is most effective where it incorporates a graceful and natural approach to the transition. Designers can make a significant contribution by paying attention to the details of life and focusing first where minimum changes can produce maximum effect. When a sustainable design project requires only minor habit change, the project stands a better chance of being accepted by the users. The architects for the Audubon Society's headquarters in New York understood this principle and thus set about to create a recycling system that was user friendly. Their solution was four separate chutes on every floor that carry recyclable materials to the recycling center in the basement. This system was easily adapted into the office routine and has proved quite successful. If the tenants were required to carry the material to the basement, the recycling effort would most likely have diminished.

OPEN-ENDED: If our designs are truly based on ecology, they must be open-ended and therefore capable of evolving. It is critical that we do not see our designs as static but rather as flexible enough

to allow for change. On a social level, designs should be adaptable to meet changing conditions within family or working arrangements. On the physical level, an open-ended design should acknowledge and accept inherent changes in a guild planting as it cycles through succession. This open-ended approach should encourage users' participation and interaction with the design, and ultimately support acceptance.

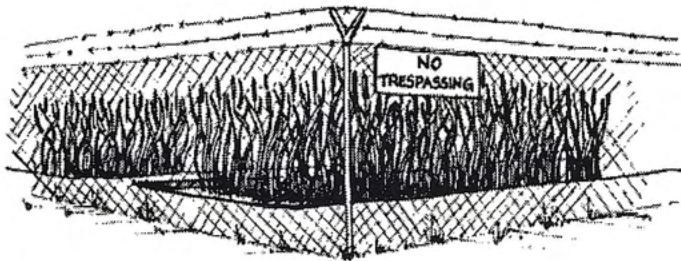
AESTHETICS/EXPERIENCE: In our enthusiasm to produce permaculture-based projects, we may overlook the inherent aesthetic qualities that can result from sustainable design. For example, many constructed wetlands being built to treat waste water are rectangular basins full

of monotypic stands of cattails surrounded by chain link fence. What a missed opportunity! Instead, permaculture should be a celebration of processes and relationships. These systems can be based on natural wetlands with incredible diversity and can become an amenity for the community rather than an eyesore. However, we must push beyond the creation of a picturesque image of

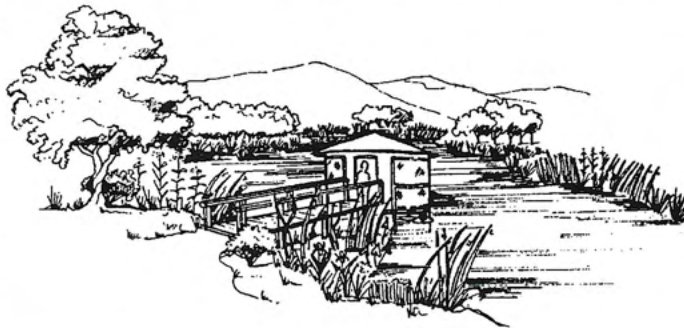
ecological design and strive toward creating experiences that encourage interpretation of interrelationships between society and nature. Experiencing permaculture can provide for lessons and interpretations that will be critical in our shift toward a sustainable society. Only by creating beautiful sustainable designs that invoke a variety of interpretations and experiences will the public understand and desire permaculture.

From this brief discussion of sociological factors that support permaculture design, it is clear there is a close interrelationship. Obviously, this list is not meant to be inclusive but rather a starting point for designers to begin a dialogue on sociological factors that need to be woven into the fabric of our designs. The journey toward sustainable society may be a long and difficult one, but by consciously addressing the factors that encourage acceptance, we will be able to hasten this transition. As designers we have a responsibility and a mandate to create sustainable landscapes, buildings and cities that are so beautiful, so ecologically sound, and so emotionally satisfying that we will want to embrace sustainability in all aspects of our lives.

Gary Bentrup is a landscape architect and illustrator who works for an environmental consulting firm in Boulder, CO. He'll soon be pursuing graduate studies in watershed management and landscape architecture at Utah State University.



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- Advanced Eco-Village Design:** April 26-28, Cerrillos, NM. Max Lindegger, Instructor. \$300. Contact Earth Works Institute, P.O. Box 750, Cerrillos, NM 87010; (505) 471-7122; fax: 471-4810.
- Advanced Permaculture Design Course:** May 3-5, Fossil Rim, TX. Bill Mollison and Scott Pittman, Instructors. Water catchment and livestock. Contact Cross Timbers Permaculture Institute, RR1, Box 210-A, Glen Rose, TX 76043; (817) 897-9402.
- Adobe/Solar Home Workshop:** May 3-5, Santa Fe, NM. Mark Chalom and Quentin Wilson, Instructors. \$330. Contact Adobe/Solar Associates, P.O. Box 22248, Santa Fe, NM 87502; (505) 474-4800 for workshop brochure.
- Natural Building Colloquium and Faire:** May 1-5, Kingston, NM. A five-day event geared toward architects, builders and educators, featuring hands-on workshops and presentations of earth/straw/pumice/plastering methods, and lots of networking. Contact Catherine Wanek and Pete Fust at the Black Range Lodge, Star Route 2, Box 119, Kingston, NM 88042; (505) 895-5652.
- Cob Home Building Workshop:** May 18-24, Taos, NM. \$450. Contact the Cob Cottage Company; Box 123, Cottage Grove, OR 97424 (541) 942-2005; fax and messages: 942-3021.
- Practical Homescale Renewable Energy Systems (one-day workshops):** May 18, September 21, Darby, MT. Basic principles of heating and cooling space and water, and electricity production for home and farm using micro-hydro, photovoltaics and wind generators. For details and complete course list, contact Shelter Resources Institute, 179 Leavens Road, Darby, MT 59829; (406) 821-3221.
- Healthy Housing Coalition Meetings, 1996:** May 19, August 11, November 3, Santa Fe. Guest speakers and information exchange. Call for topics and locations: Paula at (505) 471-5314 or Ann 466-3622 (Santa Fe) or Patrice at (505) 281-1263 (Albuquerque area). Healthy Housing Coalition information line: (505) 989-2565.
- Permaculture Intensive Design Course:** May 25-June 2, Navajo/Hopi Reservation, AZ (Four Corners Area). Native American focus; \$250 (free for Native Americans). Contact Black Mesa Permaculture Project, P.O. Box 26195, Tucson, AZ 85726; (520) 629-9122.
- Straw Bale Wall Raising Workshop:** May 31-June 2, Pearce, AZ. Load Bearing Style; Steve Kemble & Carol Escott of Sustainable Systems Support, Instructors. Contact workshop sponsors Gerald & Leslie Rutledge, P.O. Box 856, Pearce, AZ 85625; (520) 826-3529.
- Household Waste Systems (one-day workshop):** June 1, Darby, MT. Composting toilets, greywater, and other systems. An advanced 3-day workshop may also be scheduled. Contact Shelter Resources Institute at (406) 821-3221 (address above).
- Top Bar Hives:** June 1 & 2, Cerrillos, NM. Instructor, Marty Hardison. \$100. Contact Earth Works Institute, P.O. Box 750, Cerrillos, NM 87010; (505) 471-7122.
- The First Women's Natural Building Symposium:** June 1-8, near Grants Pass, OR. \$200-\$300 sliding scale, including meals. Saturday, June 8 will be a Women's Natural Building Fair; \$5 for the full afternoon. Contact Groundworks Natural Earth Home Building, P.O. Box 381, Murphy, OR 97533; (541) 471-3470.
- Earth Works Summer Internship Program:** June 12 (beginning), Cerrillos, NM. 8-week work/study residential program; 2-week permaculture course included. Call (505) 471-7122 for application information (Earth Works address above)
- Women's Cob Workshop:** July 13-19, Cottage Grove, OR. \$275-\$350. Contact Groundworks, (541) 471-3470 (address above) or Larry at 818 Lost Valley Lane, Dexter, OR 97431; (541) 937-3351.
- Permaculture Basic Design Course (intensive):** June 16-29, Cerrillos, NM. \$650. Contact Earth Works Institute, (505) 471-7122 (address above).
- Watershed Restoration:** August 24-25, Cerrillos, NM. Instructor Christopher Peck. \$100. Contact Earth Works (505) 471-7122 (address above).
- Women's Cob Workshop:** September 1-7, Grants Pass, OR. \$200-\$300. Contact Groundworks, (541) 471-3470 (address above).
- Clean and Efficient Home Wood Heat Systems:** September 28-30, Darby, MT. Masonry heaters, hydronic systems, waterstoves, and others. Contact Shelter Resources Institute at (406) 821-3221 (address above).

(for Permaculture Drylands Institute courses and schedule, see page 21)



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