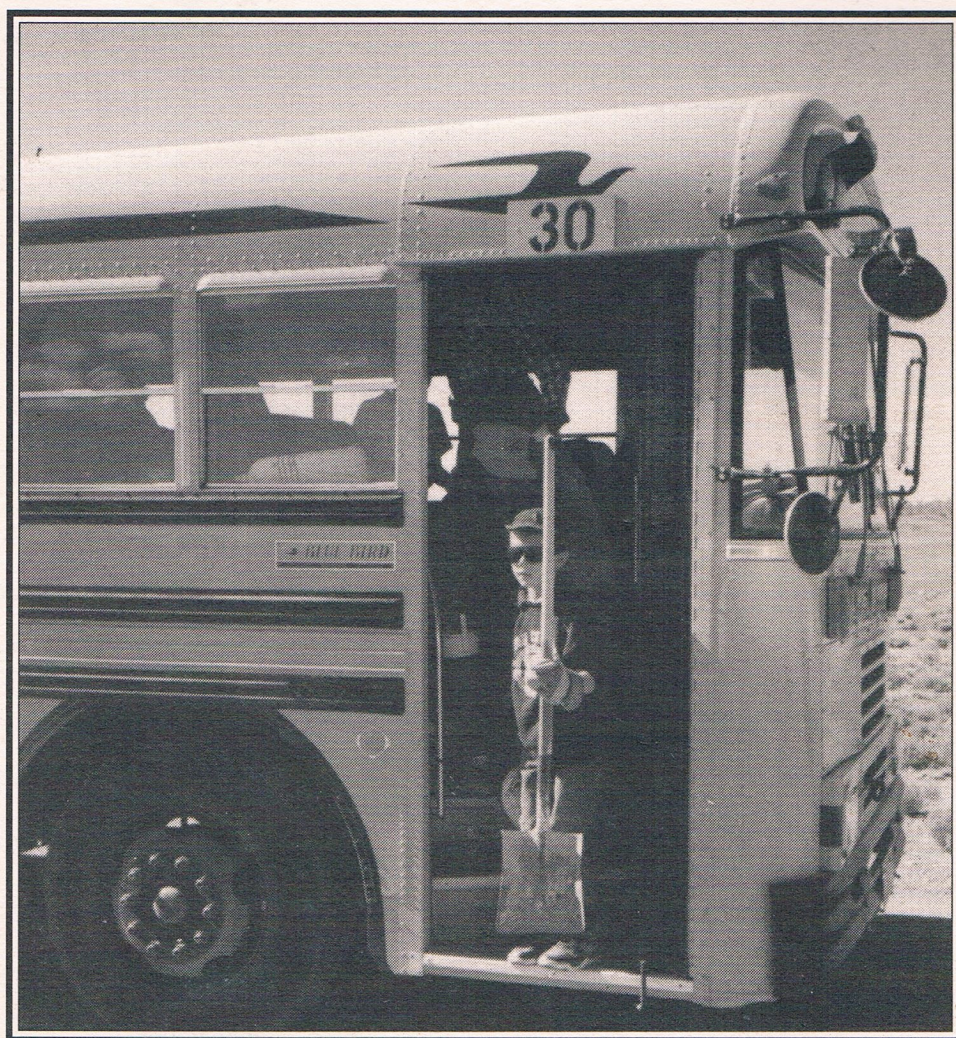




PERMACULTURE DRYLANDS JOURNAL

A selection of
18 of the best writings
about permaculture
pioneering and innovation
in drylands
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- **Patterns:
A Way of Seeing**
 - **Starting Small**
 - **Need a Home?
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 - **Treating People
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Two years ago, while looking through other people's garbage for salvageable junk, I came across one heck of a find. There, on the corner of 9th and University, just north of downtown Tucson, stood a decaying adobe bungalow. Built in 1919, the 746-square-foot house cut the one-eighth acre lot in half, leaving a good amount of yard space. Since the house was situated on an east-west axis, solar aspect was good. A separate one-car garage on the north edge of the property offered storage, and there were even a sour orange tree, a pomegranate, a white sapote, and three small chaste trees. It felt good, so I talked with my brother, Rodd. Together we made an offer on the house, and we bought it.

What we didn't get were water, electricity, sewer, heating or cooling, functional doors and windows, ceilings, a decent roof, floor, toilet, telephone or fresh linen. This wasn't so much a house as a humdinger of a fixer-upper on the waiting list to be condemned. As it turns out, it was to become more than the largest salvage operation we'd ever undertaken, and also, an incredible classroom.

The summer monsoons came and wreaked havoc around town.

Streets were flooded and winds blew down over-irrigated ocotillos in landscaped gravel yards, along with the occasional telephone pole.

Chaos? No, harvest!

When we started our project, we lacked real experience and knowledge in such areas as roofing, electrical, plumbing and carpentry. While friends read novels, we read how-to manuals. We also asked plenty of questions. Friends like carpenter John Andrews, network mama Barbara Rose and others were indispensable. Rodd and I were to do 90% of the work on the house ourselves. We'd be saving money and learning, the entire way.

The summer monsoons came and wreaked havoc around town. Streets were flooded and winds blew down over-irrigated ocotillos in landscaped gravel yards, along with the occasional telephone pole. Chaos? No, harvest!

Need a Home? Dive a Dumpster!

by Brad Lancaster



Planting beds are dug in caliche, filled with compost and soil. Shade cloth stretches over the beds.

Rodd and I pounced on these free resources. We took down the chain link fence around our property and planted a living fence of ocotillo canes and agave flower stalks (see *PDJ* Issue 22). On either side of the fence we started planting a 10'-wide noise, pollution, light and privacy buffer that doubled as wildlife habitat. The native plants used had medicinal, food, habitat, bee forage and nitrogen-fixing value. The saguaros, barrels and cholla cacti were salvaged from areas slated for clearing.

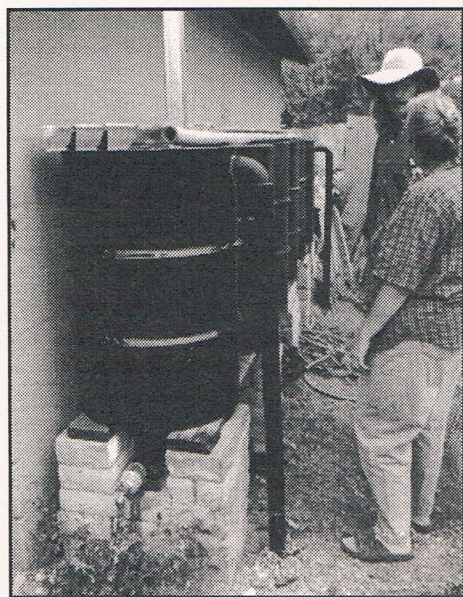
We traded the chain link fencing at the salvage yard for used 2' x 4's to extend the overhang on our gabled roof, which further protects our walls from rain and summer sun. To complete the job we replaced multiple layers of toxic asphalt with a corrugated steel roof for rain water harvesting.

Neighbors were starting to notice. Actually, they couldn't help but notice as we would wave enthusiastically at anyone who ventured by to show we were friendly and neighborly. We discovered we have great neighbors and have received physical help, security, advice, plants, hot meals and beer as we plugged away. Gary from across the street came to inspect our progress and offered us his sagging

carport/ramada if we'd be willing to dismantle it. The carport became a lumber rack, work bench and bicycle ramada. There wasn't quite enough wood for the ramada roof; I rounded up a few plywood signs from the recent election and the roof was done, making for a great sleeping platform and rainwater catchment. An old pallet became the ladder and scavenged steel railing became the bike rack.

The temperature was dropping so we turned to our heater—the sun. Our gas water heater was removed, and a pantry took its place. We called Tobin Schneider and Bill Cunningham who had designed a passive "bread box" water heater that needed testing. One-inch duct board insulation heat taped to a double thickness of 2" makes the box. Tempered double-glazed patio door glass set at a 45° angle (for maximum solar gain in the winter) seals the box. Inside is a stripped-down gas water heater tank painted black. The black tank absorbs and stores the sun's heat. The box rests on a cradle of sheet metal stripped from the tank. City water pressure moves the water through the whole system. There are no moving parts. We have no backup source of heating water, so the City required us to build two boxes to meet code.

When it comes to heating the house, we really get complex: we use our south-facing windows. Seventy-five percent of the windows were termite ridden and rotten. Most we replaced with double glazed windows. The old glass was saved for solar ovens and cold frames. To cut down on summer heat gain, we got rid of all west-facing glass except for the kitchen window (shaded by our neighbor's



Fifty-five-gallon drums harvest water from the garage roof. (photo courtesy of Brad Lancaster)

house three feet away) on which my other brother Mark painted us a view. All windows can be opened for maximum ventilation. Our extended roof overhang keeps direct sunlight from penetrating our south glass, yet in winter the sun is low enough on the horizon to enter and warm us—especially in the south-facing Arizona room.

In the Arizona Room, Rodd uncovered the only concrete slab in the house. It was an awful surface. Rather than refloor, he cleaned it and stained it with ferrous sulfate (available at any agricultural store). Improvement! The floor looked great and now the darker concrete mass was still exposed for better storage of the passive solar heat. *(The process is as follows: Mix two parts water to one part ferrous sulfate. Brush it on the floor, let it sit one week and then rinse it off. Oil the floor with one part boiled linseed oil to one part turpentine. Let it dry and wax it. That's it, although I hear red wine can be used instead of iron.)*

To further boost winter heat gain, we built a low, sloping retaining wall of local granite blocks facing the Arizona room (the house sits

2.5' lower than the south half of the property). We collected the rocks for free when we visited our parents, as a developer had formed a rock pile when blading the desert nearby. We avoided using cement in the wall by sloping it and keying the rocks well into each other. The rock wall stops erosion, creates microclimates for a greater diversity of plantings, and acts as a high mass heat bank for our home.

This is a great feature for winter, but not summer, so we put in a rounded rebar trellis (see article by Silvia Rayces and Laurence Cohen, *PDJ* Issue 19). To do this, 0.5" rebar is stuck 1-1.5' deep in the ground and bent into a curve before attaching it to the roof overhang. The 6" concrete mesh we bought for scrap is attached to the rebar, completing the trellis structure. There we grow edible annuals such as Magdalena Big Cheese Squash which cover the trellis in the warm months. The transpiring vegetation shades and cools the house while providing food. The season's first frost kills the squash, giving us mulch, and clearing the trellis to allow full solar heat gain in the winter.

The squash is watered by a 1,200-gallon cistern which collects rain water off our roof. It's an oval, ferrocement septic tank elevated 2' above the highest point of our property with earth and rock. This allows us to water by gravity feed—no pumps, no maintenance, no moving parts. The cistern is located along the fence line where our neighbor has a rental cottage. In this location, the cistern acts as a fire break, a privacy screen, and a temperature moderator for our orange tree just to the north. The tree shades the cistern and drops leaves for mulch.

Organic droppings and prunings from around the yard and neighborhood were mixed with manure delivered to us free from an overflowing stable. All was composted and then spread as a 1' deep mulch in all planting areas. This alone cut all watering needs by two-thirds.

Rodd replumbed the house, and I rewired it. A low-flush toilet was installed to meet code, and we could now read on porcelain of our own rather than that of the public library down the street. I still don't feel comfortable, however, yellowing city drinking water via the toilet, so the yard plants usually receive my water. We are also researching composting toilet designs we can implement to give the trees and ornamentals a little humanure too.

Toilet aside, our bathtub was also being filled with water, and it pained us to watch it all go down the drain. That water had to be harvested! Problem was, the tub drain was lower than the rest of the property. So we ran

a 0.5" vinyl tube through the window jam, with one end suction-cupped to the bottom of the tub and the other end lying under the winter-deciduous black mission fig which shades the bedroom in the summer. A simple hand pump gets the siphon going, and that's it. If I want to use the tub water on the north side of the house, I hook the hose to an old 0.5" irrigation line that deposits the water on a couple of Asian pears and a loquat.

Back inside the house, we chipped off what remained of the crumbling plaster. On the ceilings and interior frame walls, we cleaned the old, existing wood lath and patched where needed with pieces of wood lath salvaged from holes we cut for skylights. On the interior side of the adobe walls, we keyed for new plaster by grooving channels 0.25-0.5" deep along the existing horizontal mortar joints. We then replastered both wood-lathed surfaces and grooved adobe walls with dual-purpose gypsum (it's easier to work with and has a slower setting time than other gypsum products) mixed at 3 parts mortar sand to 1 part gypsum, adding water to make a thick milkshake consistency. Pre-moisten the surface to be plastered and apply. This old-time method rids the need for chicken wire, dry wall or joint compound which is all too often used when plastering adobe. With the plaster dry, we put in the baseboards, trim and shelves fabricated from wood salvaged from nearby dumpsters. The walls were primed eggshell white and then washed with paint we made ourselves on the advice of Barbara Rose. Paint recipe: equal parts boiled linseed oil and turpentine mixed with natural mineral pigments used for coloring concrete. We then washed the desired color(s) on the walls with rags or a sponge.

All that remained was the old Douglas fir floor. Layers of old carpet and linoleum had been peeled up to find lots of termite damage. As it turns out, the floor joists were resting on dirt. So we crawled under the floor and started digging. We excavated a 2-3' crawl space under the entire floor. This provided us with a cool storage for our home brew, and the termites were denied direct access into the house. We also applied beneficial nematodes which eat termites, but not earthworms.

We used the soil from the subfloor excavations to build the base for the cistern, and to build berms to both block some of the noise coming from the bordering street and to harvest rainwater. The termite-damaged flooring was then replaced with flooring our neighbor had just ripped out of his house. The flooring was sanded then oiled with a mix of 1 quart boiled linseed oil, 1 pint white vinegar, and 1 quart turpentine. Once dry, the floor was waxed.

We moved in and hooked up our ceiling fans, our sole source of mechanized cooling. My partner Marci and I then made exterior window shades from hemp vine and salvaged hesperaloe flower stalks from the university research fields. We built more rebar trellises on which we're growing grapes and bougainvillea. We shaded the perimeter of the house even further by extending a shade cloth (blocking 47% of the sun) from the house to the garage. We took support poles from our old chain link fence and bolted them flat against the ends of the rafters on each structure, and stretched shade cloth between them with clothesline.

Under the shade cloth, we dug sunken garden beds through solid caliche earth and built raised paths around our mini-orchard with the dug-up caliche. This, in turn created sunken planting basins that would harvest runoff. Caliche acts like decomposed granite, as it doesn't get muddy or blow away. The beds dug through the caliche were then partially filled with good soil and salvaged composted manure. The surrounding soil was graded to drain rainwater from the house and the garage into the garden. A gutter on the far side of the garage diverts rainwater to six salvaged 55-gallon barrels we got from a bakery. The barrels are elevated by bricks we pulled from a torn-down store.

We incorporated an herb spiral into our kitchen garden, watered by submerged, unglazed *ollas*. The chipped and damaged *ollas* we bought were cheap. A rock lid cuts evaporation while water seeps through the *olla* directly to the root zone of the plants. The herb spiral sits next to our worm/compost pit which is covered with an old carpet.

A basic principle of permaculture—turning waste into resource—enabled Rodd and me to buy our house and then to fix it up! Diving through dumpsters for materials, reusing resources on site, and repairing this old adobe ourselves has saved us a bundle while giving us skills, knowledge, and a confidence we didn't have before. We now have far more than we would have had, if we had somehow been able to purchase a new property, and all for a fraction of the impact on the earth. Is that dumpster starting to smell good yet?

This article first appeared in Winter 1996/97, PDJ Issue 27.

Brad Lancaster teaches, consults, designs and implements permaculture. "As a tree ain't much without roots," he says, he is involved in many community-related projects such as his neighborhood association, the organic neighborhood garden/mini-orchard/nature park, tree plantings (incorporating water har-

vesting of course). He is also working on a water-harvesting publication with Vicki Marvick, Barbara Rose and Ann Audrey Phillips.

For more information, you can reach Brad by mail at 813 N. 9th Avenue, Tucson, AZ 85705. He asks that you include your address, phone, and/or e-mail—and that you understand if it takes some time before he can respond.

Update:

It has been four years since Rodd and I purchased our property and two years since I wrote the "dumpster" article on our project. In that time, we've planted more than 75 different native and non-native, food-producing trees and shrubs that thrive on our water-harvesting/soil-building methods. We were starting to get pressed for space on our little urban lot, so we expanded out into the 20'-wide public right-of-way to the east and south of our property. Through the creation of mulched, curvilinear, water-harvesting basins and diversified plantings, we've formed a wandering path just off the street. With the path complete, grinning pedestrian traffic doubled within a week. The trees in this area were planted during a neighborhood street tree-planting we helped organize. Three such annual plantings have brought neighbors together and put in over 300 trees. A 1974 Davis, California study showed that street trees alone can cool urban neighborhoods by 10°F in the summer months! That said, if you're tired of high summer utility bills get off your climate-controlled butt, hang out with your neighbors, and PLANT some air conditioners!

Maybe paint one too—white-washing our house made a cool difference. We made our own—5 parts water, 3 parts type S lime (which we found in an alley), and 1/4 part boiled linseed oil; mix and let sit 15 minutes; stir occasionally and apply with a heavy brush (will become less transparent once dry); apply second coat; enjoy a beverage—you're done. Using this method we painted the whole exterior of the house for just \$20!

Our other cooling strategy cost us \$5. We built a solar oven out of garbage (cardboard, foil, old window glass), and Marci brought neighbors and friends together to build an adobe oven. This keeps cooking heat out of the house, delicious food and tasty wood-fired bread in our bellies, and community relations strong during community cooking and baking gatherings. Neighbors fuel the earth oven too as we burn their yard prunings.

The cooks have been further fueled by Burrito, Enchilada, Fajita, and Tamale—our egg-generating chickens. The chickens for the most part eat from the yard and the many poultry food-producing plants in the landscape (see Tim Murphy's poultry matrix in PDJ Issue 12&13, Fall/Winter 1990/91). They also get our kitchen scraps (bless their little hearts—they're dumpster divers too).

The birds sleep in a coop made entirely of salvaged materials. Honey bees live right next door in a top-bar hive box made from scrap wood (using this method and making two tools you can easily begin beekeeping for less than \$50).

A curvilinear adobe/glass bottle wall gives the animals a little privacy while giving us more microclimates in which to plant, and a noise buffer from the street. All adobes were made on site, while the bottles came from underneath local drinking trees.

Adobe work can build a sweat, so we built a spiral outdoor shower screened by salvaged tree cuttings, found palm fronds, and recycled 6" remesh as a structural element. All greywater drains by gravity directly to the fruit trees shading, screening, cooling, and feeding the animals and those taking a shower.

Thanks to the shower, we're smelling a lot better these days and the dumpsters are smelling as wonderful as ever!

—Brad Lancaster, 1998

