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Home magazine

practical ideas for self-reliant living

July/August 2001

No. 70

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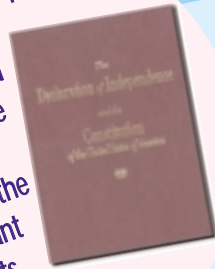
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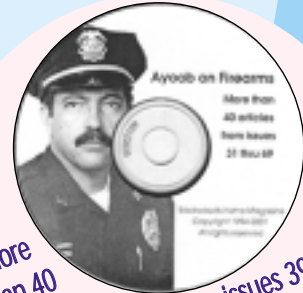
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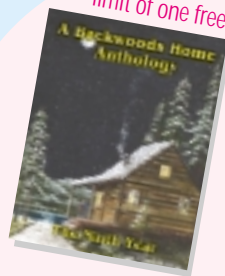
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Backwoods Home Magazine

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Backwoods Home Magazine is written for people who have a desire to pursue personal independence, self sufficiency, and their dreams. It offers "how to" articles on owner-built housing, independent energy, gardening, health, self-employment, country living, and other topics related to an independent and self-reliant lifestyle.

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ABOUT THE COVER

The cover for this issue is a rendering, by the artist Don Childers, of a flag retirement ceremony conducted by a troop of Cub Scouts. The ceremony took place in a public park on a summer's evening not long ago. As the author, Don Fallick, explains in his story (which begins on page 36), it rained that day and the rain stopped just before the ceremony began. Childers captures the moment described by Fallick when a mood of sorrow and patriotism stirred the hearts of those present and set lasting memories on a gathering of Cub Scouts, their families and friends, and curious onlookers who just happened to be fortunate enough to stop by.



FEATURES

Self-sufficiency

18 Living the outlaw life: Freeing your inner outlaw By Claire Wolfe

Are you a law abiding citizen? Think again. Claire Wolfe points out that there are now so many laws that you can barely turn around without breaking laws that carry hefty fines or jail time, every day. In this article, she tells us how to live the outlaw life while holding on to our morality.

8 The raging torrent — respect it, even when you play By Scott Stoddard

Whether it's flash flood or a local stream, moving water can kill, and does, hundreds of times a year. Scott Stoddard tells you how to make yourself safe as well as what to do and what not to do should you ever have to try to rescue someone from raging water.



8

Energy Works

62 Finalizing a hydro-electric installation By Michael Hackleman

In this, the fourth and final installment of a do-it-yourself hydro installation, Michael Hackleman describes the completion of the actual installation of the unit at Motherland outside Willits, California.

55 Powering medical equipment during a utility blackout By Michael Hackleman

A power blackout can be deadly to someone whose life depends on electrically powered medical equipment. In this article Michael Hackleman describes a simple and low-cost source of electric power that employs a battery pack and inverter that will take over the instant the lights go out.



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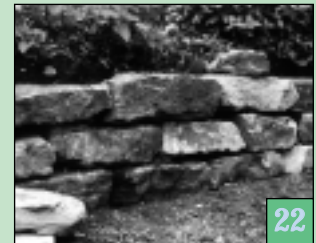
Americana

36 Retiring a flag By Don Fallick

Building and tools

40 Build your own log home in the woods By Jackie Clay

This is the first of a two-part series on how to build your own log home. Jackie Clay explains how to draw up your own floor plans, the tools you will need, where you may find logs cheap—or even free, how to “peel” them, and which “notches” will serve you the best during construction.



22

22 Build a stone wall By Charles A. Sanders

Charles Sanders instructs us on how to split stones with simple tools, and how to use the fruits of your labor to build your own stone wall.

80 Build a small A-frame using pallets By Clay Sawyer



80

Country Living

25 Oh, no! Not lentils again! By Habeeb Salloum

Habeeb Salloum reminisces on how, during the Great Depression, his family of recently-arrived Syrian immigrants hid the fact that they ate the lowly lentil. Today, lentils are a mainstay of Canadian agriculture and Salloum trumpets the health benefits of the food that sustained his family during those hard years.



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97 Last word: How to blow up an anthill By H. Elton Harris

Recipes

77 Some unusual jellies for your sweet tooth By Charles Sanders

Publisher's Note

19,500 *American Survival Guide* subscribers join the *BHM* family

A big welcome to former *American Survival Guide* (*Self Reliance Journal*) readers. I too was a fan of that magazine and I was sorry to see it close its doors. However, I am delighted to fulfill your remaining subscriptions to *ASG* with copies of *Backwoods Home Magazine*. I think you'll like *BHM*. Like *ASG* we are strong advocates of 2nd Amendment rights and limited government. We have one of the best gun writers in the country in Massad Ayoob, and one of the best Constitutional writers in the country in John Silveira. And beginning with this issue, we have Claire Wolfe, the renowned author of *101 Things To Do 'til the Revolution* and *Don't Shoot the Bastards (Yet)*.

We'll fulfill the remaining issues of *ASG* subscriptions for up to six issues. If you only have one or two issues remaining on your *ASG* subscription, you'll only get one or two issues of *BHM*. We paid Y Visionary, the parent company of the former *ASG*, one dollar for the privilege of fulfilling *ASG* subscriptions, but the liability for *BHM* will total approximately \$60,000, which includes the cost of printing and mailing *BHM* issues to *ASG* subscribers. We're hoping to recover that cost when (fingers crossed) *ASG* subscribers renew with *BHM*.

At any rate, please give us a try. You join 19,000 *BHM* subscribers, 25,000 *BHM* newsstand buyers, and 88,000 *BHM* website (www.backwoodshome.com) readers who enjoy the magazine. The free premiums in the ad on page 3 make the present time a particularly good time to subscribe to *BHM* or to renew an existing subscription.

And one final personal word. I believe that part of the reason *ASG* folded was because the magazine responded to pressure and attempted to go politically correct. It began downplaying gun articles, stopped criticizing government, and even changed its name to *Self Reliance Journal*. That won't happen with *BHM* because I own the magazine. I am an unabashed patriot and freedom fighter. To judge for yourself, you can read all my columns of the past 12 years at our website, www.backwoodshome.com.

Claire Wolfe/Scott Stoddard

This issue introduces two new *BHM* writers: Scott Stoddard and Claire Wolfe. Scott Stoddard is the former senior field editor of *American Survival Guide*, and his first article for us, which appears on page 8, was to have appeared in the next issue of *ASG*.

Claire Wolfe is the popular activist author and former Internet columnist for WorldNetDaily.com, which is one of the best alternative news sites on the Internet. She got

burnt out on activism a year and a half ago and dropped out of sight. We found her and hired her. With this issue, she inaugurates a regular column called *Living the Outlaw Life*. She'll also contribute a monthly column to our website, www.backwoodshome.com.

On page 74 of this issue, we've reviewed Claire's three popular books.



Kansas Wind profile

While I'm yapping on and on about politics, activists, and the like, I'd like to direct your attention to the Kansas Wind Power profile on page 75 of this issue. Since 95% of the sellers of alternative energy devices are liberal environmentalists who directly appeal to a person's concern for the environment to sell their products, I thought I'd profile a patriot who sells these products and whose only appeal is that the products work and make you more independent.

So I'll make an additional appeal for him. If you're interested in alternative energy products, buy them from McBroom's Kansas Wind Power and the other energy advertisers who advertise with *Backwoods Home Magazine*—**because they support your values**.

Most alternative energy companies boycott *BHM* because of our support of gun rights and our conservative/libertarian politics. Bob McBroom supports gun rights, limited government, and lower taxes. In short, he shares the values of most of *BHM*'s readers, while most of the rest of his industry shares the values of socialists and gun grabbers. Just as environmentalists and bigger government types support the socialists who dominate the alternative energy industry, why don't you support the alternative energy industry's maverick, Kansas Wind Power. I sure will.

Five freebies

Great free stuff this issue. The ad on page 3 lists five freebies that are tied to a new subscription or renewal. There's a valuable freebie for each year of your subscription or renewal, up to five years. Some of the freebies include CD-ROMs with articles by Mas Ayoob and John Silveira. Δ

My view

Something unsaid about Timothy McVeigh's execution

There's something unsaid about the Timothy McVeigh execution. Many of us can feel it but are afraid to express it for fear of being labeled a Timothy McVeigh sympathizer, or for fear of being charged with condoning the murder of 168 innocent people, including 19 children, even for fear of being targeted by our government as terrorists ourselves.

What is unsaid can be inferred from the absence of Internet e-mail or newspaper snail mail condemning McVeigh. In fact, it is the absence of much discussion at all about him. Sure, mass media reporters talk about him, and our government does, but ordinary people don't.

When our federal government caused the deaths of 76 people at Waco, Texas, April 19, 1993, exactly two years before McVeigh struck, the Internet and local newspapers were aflood with heated chatter about how horrible and unjust our government was. And when the government acquitted its agents of all wrongdoing, and convicted the surviving Branch Davidians of minor offenses but sentenced them to 30 and 40-year prison terms anyway, there was outrage once more. You could not download your e-mail, surf the web, or read your local newspaper without being inundated with the outrage.

But for McVeigh's death on closed-circuit TV in the first federal execution in 38 years, there is relative silence from ordinary people, both on the Internet and in the local newspaper. Very little e-mail or letters to the editor, very little discussion pro or con. Why is that? We can't quite put our finger on it, can we, or we dare not express the horror in our heart at the moment, and the implications for freedom in this country.

Let's review what many of us feel:

- We accept the fact that Timothy McVeigh is a murderer and we sympathize with the victims' families. But we also understand that our government's agents killed 76 people at Waco, including 19 children, many of whom died agonizing deaths vomiting their stomachs out from the CS gas grenades lobbed into the building. We sympathize with those victims' families also.

- We accept the fact that Timothy McVeigh should pay with his life, but we cannot accept the fact that our

government's agents got off scott free for Waco, and some were even promoted in its aftermath.

- We cannot accept the fact that the mainstream media remembers the victims of Oklahoma City, but is silent about the victims of Waco. You'd think no one died at Waco, or that there were no dead children there, or that there is no connection between the two events.

- We are outraged by the fact that McVeigh showed no remorse for the deaths of the 19 children at the Murrah Building, but we are also outraged that our government showed no remorse for the deaths of the 19 children at Waco.

- And no, we do not buy the government and mass media line that the Waco victims chose their end by their lack of cooperation with the FBI agents, BATF agents, and the tanks that besieged their home. They were nutty members of a religious cult? So what! Since when is that a crime?

Our government created McVeigh by its actions at Waco, just as it creates terrorists around the world by its "police" actions in various parts of the globe. Is it any wonder that one of these created terrorists, one among the millions of people who were outraged by Waco, felt unable to gain justice through the normal legal channels, and sought revenge by trying to get at the BATF agents housed on an upper floor of the Murrah Building?

Blowing up the Murrah Building was a horrible act by McVeigh, for sure, but that is what terrorists do. Look around the world at what the Arabs have done in Israel, or what they did here in the U.S., in New York, in 1993, at the World Trade Center. We view them as criminals, but they view themselves as justice-seekers.

Terrorism is a terrible thing, whether it's committed deliberately by a government against its citizens, or by an individual who strikes out in a blind rage.

When the anniversary of Waco and the Murrah Building arrived April 19, I mourned all the victims, both those of our government and those of Timothy McVeigh. And with McVeigh's execution, I am saddened that his is to be the only justice delivered.

McVeigh's execution is a major turning point for America. We now all see the double standard in action, in all its horrific nakedness: the lone terrorist dies, while the government terrorists go free. We may be rid of McVeigh, but we understand that far more powerful terrorists still lurk among us.

— Dave Duffy

The raging torrent— respect it, even when you play

By Scott Stoddard

Years ago, while learning to sluice gold from a swollen mountain stream in southern California, I saw something that immediately sickened my stomach. The limp body of a young woman, face down, was floating rapidly downstream.

I ran along shore, trying to find a safe place to attempt rescue, but the water was too fast and deep, and it was freezing cold. Without a lifejacket, my own survival would be ques-

tionable. I finally gave up running, as the terrain made it impossible for me to keep up with the unconscious girl.

Luckily, another gold seeker, dressed in a wetsuit and dredging the river bottom, was about a half mile below us. He spotted the girl, pulled her out, and was able to administer first aid. Within minutes a helicopter landed and she was rushed to a nearby hospital where she fully recovered.

I didn't know it at the time, but nearly half of all drownings related to

swiftwater incidents are would-be rescuers. The statistics include good Samaritans like myself, as well as emergency personnel who may lack proper swiftwater rescue training and equipment, but feel compelled to "do something."

I now live in Colorado near a river that is extremely popular among kayakers, whitewater rafters, and local kids who like to go tubing and swimming. Sadly, each year the river claims lives. The Arkansas River is the most heavily rafted river in North



America, with over 62 rafting outfitters in the valley it runs through. A total of 656,223 people participated in some sort of river activity in 1999. Because of the sheer numbers of people involved, drownings occur each summer, and most are preventable.

A case last year illustrates how treacherous swiftwater can be, even in relatively calm waters. A brother and sister team were kayaking a stretch of river that runs through town. This section rarely gets above a Class I or II in difficulty (the easiest). For some reason, the girl got out of her kayak and began wading across the river. She suddenly lost her footing and went down. As she disappeared under the water, her brother frantically tried to find her and help. At that moment, she was already drowning. The family called search and rescue and the girl's body was eventually found, trapped underwater by a strainer. When her foot became lodged between an underwater tree branch and the river bottom, the force of the water pulled her under and she became trapped without the ability to surface for air.

Flash flood danger –

The force of moving water is very deceptive. It's hard to tell by looking at it how deep a flooded area is, or how strong the current can be. A flooded road that does not "look that bad" may have sufficient force to sweep a vehicle quickly downstream. The majority of deaths in flash floods occur when motorists enter unblocked but flooded roadways, or drive around safety barriers, enter a flooded area, and get swept away.

For people who love the outdoors, water is a magnet. For young children and pets, swift flowing water holds a mesmerizing effect. Statistics show that children 14 years and under are most likely to drown in wading pools, bathtubs, buckets, toilets, spas, hot tubs and swimming pools. Kids naturally like to explore, and when they



Two members of a local search and rescue unit practice CPR.

find themselves too close to the edge of a flood-swollen river, stream, arroyo, or cement-lined flood control channel, tragedy usually strikes.

If you see someone fall into swiftwater, never enter the water to attempt a swim rescue. Do not grab a raft or boat and go after them either. You, too, will more than likely become a victim.

Throw the victim flotation: a car seat or a large, closed ice chest will work. Dial emergency and ask for swiftwater rescue teams to respond. Never tie a rope around your waist

and enter fast flowing water. While this may result in a "lucky save," more often than not the force of the water will pull you down, pin you there, and kill you. Furthermore, it will be nearly impossible for even the strongest person to pull you (and the victim) safely back to shore.

In flash flood country such as the desert southwest, motorists should be aware of potential hazards, even on sunny, cloud-free days. Although there may be no rain in your area, flash floods, mudslides, and debris flows resulting from storms upstream



Getting stuck on a rock is aggravating, but better than getting thrown out of the boat.

can be unleashed with little warning and quickly overtake you downstream.

Swiftwater can be very dangerous, even when depths are minimal. A 46,000-pound, fully loaded cement truck was swept down the Los Angeles River in less than two feet of water! Eighty percent of all fatalities in swiftwater are the result of drivers ignoring warning signs and entering clearly dangerous flooded roads or low water crossings.

Never drive into a flooded area, especially if the water is moving quickly. If your vehicle stalls in rapidly rising water and you can safely exit and jump to dry ground, do so immediately. Do not stay with your car. However, if the water is coming up too fast and is flowing very swiftly, or if you are too far out, do not try to swim out or wade over to dry ground. Six inches of fast-flowing water can knock you off your feet. Climb to the roof of your vehicle and call an emergency number if you have a cellular phone, or cry for help.

Nearly one-third of flooded roads and bridges are structurally unsound. You may not make it across safely no



A good kayaker plans his route well in advance.

matter what kind of vehicle you are driving. Heavy military transport vehicles have been swept downstream in just two feet of water.

If you plan on camping in areas prone to flash flood, avoid pitching your tent in a dry wash. Choose higher ground and check weather forecasts frequently. Never try to outrun an oncoming flash flood down a canyon, arroyo, or cement-lined flood control channel. If you hear a sudden,

loud sound upstream, exit your vehicle, leave your campsite, and seek higher ground immediately. You may have no warning by authorities and only seconds to evacuate to higher ground. Flash floods also occur at night, so bring a flashlight and other emergency supplies when you evacuate.

Whitewater survival —

Paddlers on whitewater rivers need to take serious precaution to avoid tragedy. The right protective gear includes a Coast Guard approved personal flotation device (also known as a PFD or life vest), helmet, drysuit or wetsuit depending on water temperature, and rescue gear. Rescue kits should include a throw line (70 feet of 3/8ths inch line in a throw bag), carabiners, two prusik loops (to set up a hauling system), nylon tubular webbing (for anchoring and making harnesses), river knife, small folding saw, and a whistle.

In an emergency situation, paddlers will sometimes be thrown from their boat. Swimming is the quickest form of self-rescue and may even be more safe than wading. If you capsize in big water, “defensive swimming” will be necessary. Large rapids and strong currents are too powerful to fight —



A “swimmer” can be pulled back into the raft by grabbing the life vest and falling backwards.

even if you are a powerful swimmer. The objective is to ride out the river, conserving energy until an opportunity for self-rescue arises.

If you are rafting whitewater with a professional guide, they will tell you exactly what to do if you fall out of the boat. If you find yourself in very fast water, self-protection is a must. Face downstream and float with your legs bent in a bike-pedaling position. Arch your back and try to stay high on the surface. To look forward, don't sit up — this pushes your butt deeper into the water. Instead, tuck your chin against your chest and look ahead. Don't let the current get you sideways to the flow. This avoids tumbling in the shallows.

You can drown in big water even while wearing a life jacket. Save your strength and make the most of your breathing opportunities. Focus on swimming away from the most dangerous hazards and on getting the air you need. Steep ledges form big holes where hydraulic forces can catch a person and hold them in a powerful upstream current. A legs-straight, feet-first approach can lead to dangerous entrapment. Your best bet is to bend your legs when encountering large holes and tuck into a ball. Although you may hit rocks, the current at the bottom is actually going downstream and you should eventually pop out without getting sucked back into the hole.

As you continue to float down a section of rapids, anticipate calmer waters where you can attempt "aggressive swimming" toward a safe shore or protective eddy. Aggressive swimming in heavy whitewater takes the form of short, powerful bursts. To cut across the current, roll onto your belly and swim hard upstream, angling toward your goal. This is called a "body ferry." Paddling across a river's current is hard enough in a boat. But it's slow, tiring work for a swimmer, so make sure you have the energy before making the attempt.

Allow plenty of distance and time to make the move. Even if you can't entirely swim to safety, using the body ferry may be necessary to position yourself on a safer part of the river to avoid nasty rocks or strainers.

Strainers are obstacles through which water flows, but paddlers can't. Fallen trees, logjams, and manmade debris can form strainers that are highly dangerous. Victims can be caught in unseen traps underwater and pinned with tremendous force. Most strainer victims are found in a feet-up, head down position, suggesting that hitting the strainer feet first caused the entrapment.

Modern wisdom teaches to do all that's possible to avoid a strainer, but if collision is inevitable, get on your belly and aggressively swim head first toward the strainer. When you make contact, start climbing over the top immediately, before the oncoming water has time to pile up behind you against your body. Grab on to whatever you can and fight hard to stay up. If you can pull your pelvis clear of the water, you've saved yourself.

Wading in a fast-moving river is sometimes necessary for self-rescue, but can be very risky. River bottoms and midstream rocks are unbelievably slippery. It takes total concentration and looking exactly where you are stepping to avoid a fall. Foot entrap-

ment is a huge concern. Entrapment usually occurs when a swimmer tries to stand up in fast current and blindly thrusts a foot into the riverbed. Once the victim finds his leg caught in a crack between two boulders, there usually isn't time to remove it. The current pushes him down, holds him under, and he drowns.

Avoid foot entrapment by maintaining balance and control while wading. If the current is too strong, keep swimming. Once the water slows, you can attempt to wade again. Take each step carefully, without lunging or scrambling. If your foot slips into a crevice, and you are not being pushed around by the river, you can usually remove it.

Wading with a paddle or tree branch provides three-point stability. Shuffle your feet side to side and maintain a constant two-point contact with the riverbed at all times.

A group working together can wade into water much deeper than a single person can. Team members not only support each other strength-wise, but by standing together they create small eddies that give their mates protection from the onrushing current.

If paddling a river is a "must" on your list of activities this summer, plan well, gear up, and think safety. Never take chances when it comes to fast-moving water! Δ

Additional information and resources

American Whitewater Affiliation (AWA), PO Box 85, Phonecia, NY 12646; (914) 688-5569.

This organization promotes river safety nationwide, and works on conservation and access issues.

National Association for Search and Rescue (NASAR),

PO Box 3709, Fairfax, VA 22038; (703) 352-1349. Their Basic Water Rescue Preparedness curriculum introduces nonboater rescuers to water safety.

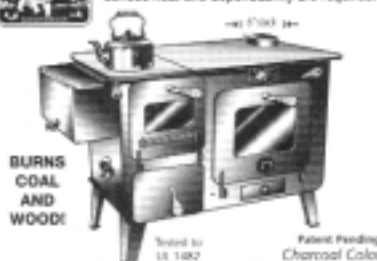
National Organization for River Sports, Box 6847, Colorado Springs, CO 80904; (719) 579-8759. Represents private whitewater boaters on access and safety issues.

Rescue III, PO Box 519, Elk Grove, CA 95759; (800) 457-3728. This organization caters to professional rescue personnel and river outfitters. The Swiftwater Rescue Technician (SRT 1) course is taught more than 300 times each year.

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Ayoob on Firearms:

The rationale of the automatic rifle

By Massad Ayoob

There are those who would ban private citizens' ownership of semiautomatic rifles. After 27 years of carrying a badge, the author profoundly disagrees.

If there is any place you need state-of-the-art defensive firearms today, it is the Republic of South Africa. Yet it has been some time since private citi-

zens there have been allowed to own a semiautomatic rifle in a caliber larger than .22 rimfire, unless they were in the military reserve and the weapon was government-issue. The ANC government, the unabashedly communist-based African National Congress, has recently passed sweeping laws that will restrict law-abiding citizens to ownership of only three or four firearms.

I first went to South Africa with my oldest daughter when she was ten years old. It was the time of apartheid, and under that rule, because of our Arabic blood, she and I were considered "colored." No problem. She was allowed to be out and about with her .38 caliber revolver, so long as I was there to supervise, and I was authorized to carry my .44 Magnum concealed. They had no problem with my Springfield Armory M-21 semiautomatic sniper rifle, so long as I used it as a single-shot (no magazine) while actually hunting game. It was a time when any South African—Black, White, or Colored under the three-stripe rainbow of apartheid—could legally carry a gun more easily than a



Captain Ayoob is shown in the mid-90s with the weapons carried in each of his department's patrol cars: semiautomatic 12-gauge shotgun and semiautomatic .223 rifle. Each officer on that department is also issued a .45 caliber semiautomatic pistol. He sees no reason to prevent law-abiding citizens from owning the same weaponry. (Photo courtesy Petersen Publishing Company.)

citizen of any color in Washington, DC, or seven of the fifty United States even today. The crime rate in the cities was about like that of New York City at the time. No problem; if I and the kid both have guns we know how to use, we'll take our chances. We did. We were safe.

Today, with a crime rate so high the ANC won't publicize it, the danger is several times greater than the worst city in the United States. I will no longer bring one of my children there. Has restriction on firearms ownership reduced crime and danger? No, quite the reverse.

The same has been true in Great Britain and Australia. Both followed similar patterns. First, semiautomatic rifles were banned. Then other guns. Then handguns were banned completely (in England) or further restricted to a Draconian degree (Australia). In both countries there is at least still a free press, which reports that in both cases violent crime and armed crime have risen rather than fallen since the restrictions. It is clear that powerful government forces in the RSA, the UK, and Australia intend to finish what they've started with a complete disarmament of their law-abiding citizenry.

The United States has something those nations did not: a *Constitution*, and a *Bill of Rights* which contained that controversial *Second Amendment*. Though the anti-Constitution, anti-civil rights crowd would have the public believe that this merely empowers the National Guard, their argument has leaked like a sieve even among their own kind in the last decade. During that period, the *Second Amendment* has been heavily discussed in the law journals by the greatest scholars of judicial principle, and has been found in virtually every case to speak to an individual citizen's right, not that of the states and the military reserve.



Police officers are shown qualifying with their department issue Ruger Mini-14 .223 rifles. Is there any reason they're unfit to own such firearms after they retire from law enforcement?

One doesn't need to be a rocket scientist or a legal scholar to figure it out. Every other Amendment in the *Bill of Rights* (which goes part and parcel with the *Constitution* and the application of Constitutional Law) speaks to the rights of each and every individual citizen. Did the Framers accidentally slip up and transpose the *Second Amendment* here when they intended to put it in something about states' rights? Not bloody likely.

In the application of law, there is also an important little thing called "obvious legislative intent." It means that we have to analyze what was in the minds of those who made the law, and what their ultimate purpose was. In the time of the writing of the *Bill of Rights*, the gunfire of the American Revolution was still ringing in the ears of those who so carefully crafted the document. A "National Guard" of the period would, by definition, have been Tories loyal to King George. Somehow, Logic 101 tells us, it is not terribly likely that these were the forces the Framers intended to empower when they so deliberately and explicitly created the *Bill of Rights* and its *Second Amendment*.

The "militia" of which the *Second Amendment* speaks, today's archaeologists of law almost unanimously agreed, was the enfranchised individual members of the society who were of a suitable age to fight in military battle. Yes, at the time it meant white males. Extrapolated to the egalitarian society today's Americans know and love, it means every law-abiding adult of any color or gender who is competent to fight. Just as an honest interpretation of the *Second Amendment* passes the other tests and allows female as well as male, gay as well as straight, all colors and all religions, it passes the "agism" barrier. Otherwise, at the age of 45 or so, it could be said that the right to possess weapons ceases, since you're too old for conscription into the militia.

When judges analyze a law's applicability, they go to the caselaw, to cases that are on point—relevant—that have already been decided by other jurisdictions. When you discuss the militia today on the planet earth, some of the strongest caselaw is embodied by the experience of Switzerland. The Swiss have been at peace longer than any other people on



Those who are inimical to the civil rights of gun owners would ban private citizens' ownership of fine rifles like this match-grade Springfield Armory M1A, shown with Trijicon Accupoint scope.

Earth, primarily because virtually every adult male (and any adult female who wants to join the effort) is a member of the militia and issued a real assault rifle.

The rifle the Swiss government issues to its citizens is a true machine gun. Picture a match-accurate M-16 rifle with a target grade trigger and a selector switch that goes from safe to semiautomatic to three-shot burst to full automatic, and you have the Sturmgewehr-90, which may be the most advanced assault rifle on earth. There's one in almost every Swiss home, yet mass murders in public are unknown in that country. The murder rate in Switzerland is a fraction of that in the lowest-crime states in the US, despite the ubiquitous presence of machine guns and ammunition.

When their time comes to leave the militia, aging members have the option of keeping their rifles. A great many do. The Swiss army, with only a few thousand full time career members, see the retired militia people who are still armed as one more resource that keeps their country safe from war.

Barely more than half a century ago, the Nazi war machine considered invading Switzerland. It was the sort of nightmare that would make a field marshal of an army of conquest wake up screaming in the middle of the night. Every home a sniper's nest? Mountain roads and bridges all mined, ready to be blown up and made impassable within 24 hours of an invasion? A populace unworried about embargo because every home had a year's supply of food, not to mention a significant supply of ammunition? And why had the German spies reported that every Swiss village had a 300-meter rifle range, busily used by the citizenry every weekend?

It was Invader Motel. "They check in, but they don't check out." Why did field marshals who could not dissuade Adolf Hitler from invading Russia in winter manage to convince him that there was no future in attacking tiny Switzerland? Because some things are so obvious that even raving madmen can understand them.

At the time, the Japanese Empire certainly understood it as it drafted

plans to invade the mainland United States. In 1960, Robert Menard was a Commander aboard the USS Constellation when he was part of a meeting between United States Navy personnel and their counterparts in the Japanese Defense Forces. Fifteen years had passed since VJ day, most of those at the meeting were WWII veterans, and men who had fought each other to the death at sea were now comrades in battle who could confide in one another.

Someone at the table asked a Japanese admiral why, with the Pacific Fleet devastated at Pearl Harbor and the mainland US forces in what Japan had to know was a pathetic state of unreadiness, Japan had not simply invaded the West Coast.

Menard would never forget the crafty look on the Japanese commander's face as he frankly answered the question. You are right, he told the Americans. We did indeed know much about your preparedness. We knew that probably every second home in your country contained firearms. We knew that your country actually had state championships for private citizens shooting military rifles. We were not fools to set foot in such quicksand.

Tradition

The 20th Century saw a tradition develop in which American citizens not only shot NRA Rifle Matches with the guns of their nation's military, but used them for hunting. The bolt action rifle replaced the lever action after one generation came back from the Spanish-American War acclimated to the Krag, and another returned from the Great War that they'd fought with the Springfield. When WWII ended, a generation of Americans had learned that they could trust their life to the semiautomatic Garand, and the popularity of semiautomatic hunting and target rifles soared. Not until the Vietnam conflict did a generation of

Americans feel a need to own an AR-15.

Now, for the first time, the US Military had issued a true assault rifle—a “selective fire” weapon that could become a “machine gun” with a flick of a lever—to its rank and file troops. More than half a century before, the National Firearms Act had limited the ownership of fully automatic weapons, machine guns, so strictly that the general public thought their private ownership was banned. Actually, all that was required to own one was an investigation by the Government to prove that the applicant was, no pun intended, the highest caliber of trustworthy American citizen, and a hefty licensing fee. Some states, however, had banned their ownership at a state law level.

This did not trouble the general citizenry. The AR-15 sold to the public simply fired one shot at a time, like their issue M-16 set on semiautomatic, and it sufficed to remind them of the time when they fought for their country. To remind them they had fought for a country that trusted them and their fellow citizens.

Today's perspective

Fast-forward to the present. We live in a time when those who believe they were born to rule others and should be able to command them without input from those they rule, put forth emotional and flowery arguments as to why they should disarm the American people. They always seem to cite support from “the local police.”

They never mention that many if not most of the uniformed police officers who stood behind Bill Clinton when, as President, he signed the Brady Bill and the Crime Bill into law, were ordered to be there for the “photo op.” They do not mention that the high-profile police chiefs who publicly support gun bans are appointed officials who must hew to

the lines the appointing politicians feed them to speak, or be demoted to the rank of captain, the highest rank protected by Civil Service regulations.

Nor do they mention that virtually every poll of rank and file police indicates overwhelmingly that the street cops on the ground oppose further “gun control” measures aimed at law-abiding private citizens. And they never mention that, for the last several years, police have been trading in their “riot shotguns” en masse for semiautomatic rifles like the AR-15.

America's police do not fear guns. They are an armed society themselves. What they fear are criminals with guns. They have learned through hard reality that it is criminals, not guns, that need to be controlled.

Those who have stood in the front lines against armed criminals know that the operative term is criminal, not armed. An Illinois cop who has arrested criminals for 25 years resents the fact that the moment he turns in his badge or star, he will be forbidden to carry a gun with which to protect himself and his family from those he has been sending to prison for a quarter of a century, who might think “Cape Fear” was a training film. A New Jersey cop resents the fact that when he retires, he will no longer be trusted with an AR-15 rifle like the one in his patrol car that protected him and his citizens from the deadliest danger.

In 2003, the “Crime Law” that banned ownership of certain semiautomatic firearms and of magazines that held more than 10 cartridges will “sunset.” There is time now to make it clear to elected representatives that such regulations should die a natural death, indeed, should be interred forever with a stake in their heart and a clove of garlic in their mouth so they don't rise up again to interfere with decent citizens of a free country.

The time to decide is coming. The choice is the English and Australian model, or the Swiss model. The choice is simple, the choice is stark, and the choice will be made by those who understand the issues and care to become involved.

(Massad Ayoob has spent slightly more than half his life, 27 years, as a sworn police officer. He has served for the last 11 years as a captain, the highest rank he expects to attain, in a municipal police department. He was a law-abiding armed citizen before he pinned on a badge and swore an oath to die if necessary in defense of those he was entrusted to protect (and in defense of the United States Constitution), and expects to remain one when he turns in his shield. Next issue, this essay continues with more “close-to-home” arguments for why private citizens should be allowed to own the type of arms in question.) Δ

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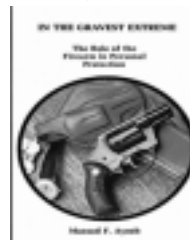
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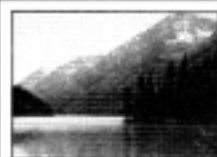
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Living the outlaw life:

Freeing your inner outlaw *by Claire Wolfe*

(This begins a regular series by Claire Wolfe. — Editor)

To be truly free, you will be an Outlaw.

I don't mean criminal — although you are probably that, also. I mean a person who thinks "outside the law." When you are an Outlaw, your body (just like everybody else's) may be subject to the dictates of bureaucrats, armed enforcers and various elected fixers, controllers, connivers, pork-barrellers, socializers, corporatizers, fear-mongers, cigar-sexers, bribe-takers, old-boy-networkers and global influence peddlers.

But when you are an Outlaw, your heart and mind (unlike most everybody else's) are your own.

What exactly does that mean, though, in this over-lawed, over-ruled, over-executive-ordered world?

Let's go back for a moment to the statement that you're already a criminal. I've said it before and it always offends somebody: "YOU may be a criminal, Wolfe. But I'M a law-abiding citizen. Don't paint me with your black brush."

Well, sorry. You may not already be an Outlaw. But definitely you are already a criminal. You can't help but be.

In *The Tyranny of Good Intentions*, Paul Craig Roberts and Lawrence M. Stratton write:

"The U.S. Code, which contains all federal statutes, occupies 56,009 single-spaced pages. Its 47 volumes take up nine feet of shelf space. An annotated version, which attempts to bring order out of chaos, is three feet long and has 230 hardcover volumes and 36 paperback supplements.

Administrative lawmaking under statutes fill up the 207-volume Code of Federal Regulations, which spans 21 feet of shelf space and contains more than 134,488 pages of regulatory law. ... Federal law is further augmented by more than 2,756 volumes of judicial precedent, taking up 160 yards of law library shelving."

And you're certain you're not breaking one of those laws?

During the Clinton years alone, as James Bovard noted in *Feeling Your Pain*, "Federal agencies issued more than 25,000 new regulations—criminalizing everything from reliable toilets to snuff advertisements on race cars." And Bovard wrote that before Clinton's final year in office, when the federal government issued more than 100,000 pages of new regulations.

That's just federal. Let's not even mention the states.

Still think you're not a criminal?

Really. So you've never: "forgot-ten" to report a little extra income on your 1040, built an addition on your house without a permit, driven without a seatbelt (the Supreme Court says cops can throw you in jail for that), given a glass of dinner wine to your 17-year-old, smoked a joint, disconnected a pollution control device on your car, cut a friend's hair without a license, installed an "outlaw" toilet, carried a pocket knife with a blade longer-than-legal (bet you don't even know what length is legal, do you?), been in a room where friends were talking about doing something illegal (conspiracy!), put a dollar in a football pool, patronized a prostitute, taken a tax deduction you really

weren't "entitled" to, lied to a bureaucrat, "willfully" failed to file, built a pipe-bomb just to watch it go boom, carried money with traces of cocaine on it (like some 82 percent of the paper money in circulation today), put prescription medicine into one of those little daily dispenser containers, given one of your own prescription pills to a sick friend (search Title 21 of the U.S. Code and just see if you can figure out exactly what you can and can't do with that itty-bitty bottle of Zoloft or Prozac you depend on to help you survive this modern madness), owned chemicals that might be used in bomb making (like the bleach and ammonia bottles under your kitchen sink), transposed the digits of your Social Security Number on a government form, or driven in a car with someone who might have been transporting contraband. Ever?

Remember, these days you can be convicted of "conspiracy" for crimes you don't even know about, or for buying legal items that might be used for illegal causes. Some acquaintance gets in trouble and needs to snitch on a friend to get his own sentence reduced — and you're toast.

You can even be convicted of violating laws that don't exist — as plenty of "tax criminals" have been. Ask the IRS for copies of the laws you're allegedly breaking and they'll respond with legalistic gobbledegook. I have a friend who once testified as an expert witness in a tax case. Her expertise? Grammar. On the stand, she diagrammed a mega-monster sentence from the tax code and proved the alleged regulation couldn't be obeyed — because it literally had no

meaning in the English language. Still, people get arrested for disobeying it.

Those are just a few of the ways individuals can get in trouble. Heaven forbid you should own a business and try to get through the day without committing a crime. For example, while Your Father in Washington still permits you, you lucky little person, to disconnect the crazy-making doodad that goes bingidy-bing-bing when you leave your car keys in the ignition and open the door, it's a federal crime for your car dealer to disconnect it at your request. Like, whose car do they think it is, anyway? Well, actually, it's not a federal crime to disconnect only the part that goes bingidy-bing-bing when you open the door and leave your key in the ignition, but it is a federal crime to disconnect the part that goes bingidy-bing-bing when you unhook your seatbelt and leave your key in the ignition, which is all part of the same system but a different set of wires from the other one. (Are you following this? There won't be a test, but there could be a hefty fine later.) Oh yeah, by the way, before you unhook the thing yourself, you'd better check your state law. You wouldn't want the state-o-crats' SWAT team swooping down on you when you're armed only with a pair of wirecutters.

Bottom line. You are no longer a law-abiding citizen. There are too many laws to abide. And it doesn't matter whether they call 'em laws, rules, regulations, or something else altogether. You break them every day.

With laws like these, who even wants to be a law-abiding citizen? When you put yourself at the service of rules and diktats of this nature, you put your life in thrall to the kind of people who make them. Even if you're a member of the infamous Snopes clan, you're bound to be better at figuring out how to live your own life than people who sit around all day cooking up stuff like this and

figuring out how severely to punish you if you don't obey.

In the science fiction novel *Pallas*, one of L. Neil Smith's characters says, "People—pardon me, journalists and politicians—have often accused me of believing that I'm above the law. And yet, who isn't? ... The law is created by demonstrable criminals, enforced by demonstrable criminals, interpreted by demonstrable criminals, all for demonstrably criminal purposes. Of course I'm above the law. And so are you."

Amen, bruthah Neil.

So why not enjoy being above the law? Why not embrace it? Why not do it with panache? Flair? Savoir faire? Pride and shining resolution? Why not, in short, free your Inner Outlaw?

For this is what divides the Outlaw—D.B. Cooper, Bonnie and Clyde, Robin Hood, the Scarlet Pimpernel, Zorro—from the mere criminal—the creep who steals your CD player or the furniture out of the White House. Or the person who breaks the same old everyday laws you do, but breaks them in a sniveling, sneaking, guilt-ridden way, rather than with a jaunty shrug.

Attitude. Attitude. Attitude.

Don't let me give you the wrong idea. You don't have to start holding up IRS offices and distributing the proceeds to starving taxpayers to be an Outlaw. Whatever crimes you're already committing will do. The essence of free Outlawry is the way you live in the face of growing tyranny—the Outlaw way you think. Even when it's the government that's committing the real crimes, being an Outlaw comes in handy.

Some examples:

You go into a doctor's office a year from now and they tell you, "Sorry, Comrade. Thanks to federal privacy protection, you can no longer get medical care unless you accept a unique identifying number and 'consent' to have your medical records

shared with anyone the government wants to see them." The good little citizen, sick, vulnerable, overwhelmed and puzzled, submits. The Outlaw? The Outlaw has already prepared for this and, depending on the kind of Outlaw he is, has options. Maybe he meekly submits, also—using one of his five pre-built identities. Maybe he knows an Outlaw doctor who trades services for cash. Maybe he makes such a stink threatening to bring a civil rights suit that the doctor decides she'd rather risk the wrath of U.S. Health and Human Services than the wrath of a mad patient who knows his rights (and a good lawyer).

You're driving along minding your own business when you find yourself in the middle of a checkpoint. Who knows what they're trolling for today? Drugs, booze, seatbelt crimes—or perhaps just "Your papers, please" (an insurance checkpoint). A cop comes to your window and although his words say "please" and "may we?" his tone says, Cross me, muhfu, and you'll be on your face in the gravel with my knee jabbing a hole in your kidney. "Where are you going?" he asks. "Where are you traveling from? What's that in the back seat? Who helped you load your pickup? Do you mind if we search your vehicle?" The good little citizen, once again, submits. The Outlaw, once again, has options. That might mean anything from playing dumb and innocent ("I'm sorry, officer, are you sure it's okay for you to do this? My high school civics teacher told me they absolutely couldn't do things like this in America. You seem like a nice young man and I'd hate to see you get in trouble.") to calmly refusing any consent to search to covertly making note of all officers' badge numbers, names, and descriptions for possible later use. (You know, like maybe sending them a copy of the Constitution.)

The Outlaw doesn't always emerge victorious from encounters with authority. Bonnie, Clyde, and John Dillinger ended up with their bullet-riddled bodies on public display, after all. You really might end up with your face in the gravel and your nether portions in a world of hurt if the nice officer is having a Justin Volpe moment and thinks you're Abner Louima. Refuse to allow a random search of your vehicle, for instance and, as Boston T. Party describes in *You and the Police*, a drug dog and handler may be brought to the scene. The handler strokes a baggie of marijuana in his pocket then touches the trunk of your car. The dog goes wild and voila!—instant “probable cause.” (Or the dog simply sniffs you, and the almost inevitable traces of cocaine on your federal reserve notes lead to a shake-down and the forfeiture of all the cash you're carrying.)

Government ruthlessness is a giant purple rhinoceros standing in the path between you and the free enjoyment of Outlawry. It's a rabid rhino. With a cyanide-tipped horn. It's rutting season and it thinks you're competition. It's got a thorn in its little hoofie. In general, it's having a really, really, really bad day.

Yes, resistance to arbitrary power is dangerous. Let's nobody kid herself about that. But resistance is not futile.

In most cases, being an Outlaw doesn't mean attracting attention to yourself. It simply means living, as much as possible, as you wish. More important, it means having the mindset needed to live that way in a world of adversity. More often than confronting, it means ignoring or evading insane and excessive rules. When confrontation is necessary, it means having the knowledge, preparation, and—once again—attitude to help you get through the situation without either passively submitting or going unproductively postal.

In practice, that means something different for every Outlaw. But in

every case, it means you have an attitude of self ownership (or, if you prefer, of belonging to God), not being the natural subject, and easy target, of any bureaucrat or badge-bearer who wishes to push you around.

It means recognizing the pathetic state of law and justice around you, and recognizing its dangers—but resolving to live your life more like a free American than a Stalinist peasant, regardless. It means living by your own highest moral and ethical choices, rather than trying to tippy-toe around every persnicketing regulation in every obscure book in every cubbyhole governmental office.

It means remembering that this is still our America. Not theirs.

It means remembering that you are still a human being with potential beyond anything those who want to put us all into tight little categories and boxes—and prison cells!—could ever conceive.

It means knowing every day that, despite the chains and travails of too much government, and their very real threats to your security, your heart and mind remain free.

It means you belong to yourself. That you think for yourself. That you have higher values than any do-gooder, lobbyist, congressthing, corrupt cop, or midnight raider will ever give you credit for.

But that's okay. Because it's not their approval you're looking for. Freedom is what you're looking for. And you're only going to find that by being determined to live it.

Gandhi said it: “We must be the change we wish to see.”

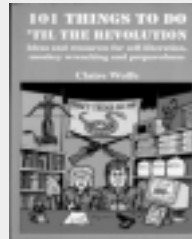
Amen to you, too, bruthah Mohandas, fellow Outlaw. Δ

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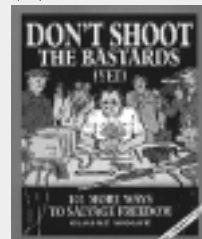
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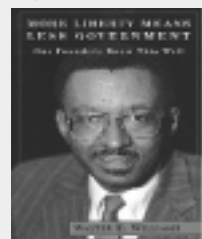
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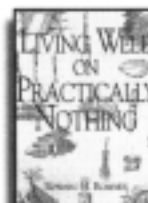
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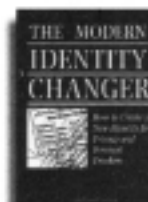
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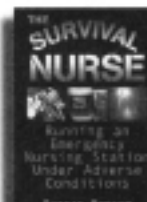
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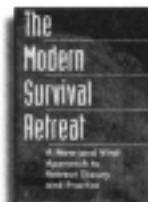
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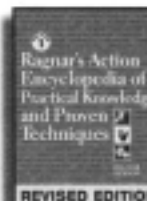
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BUILD A STONE WALL

Charles A. Sanders

The natural beauty of a stone wall has been romanticized in poem and picture for hundreds of years. There is a soothing permanence that can be seen in a well-built stone wall. I have built a couple of simple stone walls over the years and thought I'd share what I have learned about the process of building and working with stone.

Our area is very rocky, and a few folks make pretty decent money just "harvesting" and selling fieldstone. They work up and down the streams and creeks in the area, hauling load after load of heavy stone out in old pickup trucks. The "crick rock," as it is often called, is sold by the ton to a local dealer who then sells it all over the state and region. Most of it eventually ends up as a part of fireplace mantles in high-dollar homes, veneer on exterior walls, lining walkways, and so on.

Recently, we had a planting bed that needed to be rebuilt. The bed had initially been made of old railroad crossties, but over the years the wooden pieces had finally begun to do some serious rotting. I decided to replace the wood with a fieldstone wall, made of stone from right around home.

Once I had gathered the stone at the construction site, I decided that I would have to cut or split a few of the pieces to make the puzzle fit together. Cutting stone versus splitting stone can perhaps best be compared to cutting wood versus splitting wood. When cutting, you are going across the grain; when splitting, you are going with the grain.

Cutting or splitting a stone will give you a piece that will fit better into a

given spot. It will also, and not unimportantly, give you a stone that is much easier to handle. I'll admit, I haven't tried this on Rocky Mountain granite or Vermont marble, but the method works really well on good old southern Indiana sandstone. I used a common hand sledgehammer and an old hatchet that I had in the toolshed.

eventually become the stone. Pick out a good line that goes along with the shape of stone you need. You may have to look over a few rocks to get the one needed for a particular spot. Don't worry, you will use the misfits later. I've found that nearly every stone ends up in a spot that seemed made just for it.



Staggered joints will result in a more solid and longer lasting wall.

I used the hatchet as a sort of wedge, struck by the hand sledge to create breaks in the stone where I wanted them—approximately. Oh yes, always use some good eye protection when cutting or splitting stone.

Let's get started. Pick out a nice sized rock and roll it to where you can work on it. First, look at the stone. Size it up. Walk around it, turn it over and look at the way the structure "flows." Many stones have a sort of grain that runs along their length. I guess it is the result of the eons of compression of the material that

Once you have picked out the stone, be sure it is on a flat, solid surface. Cutting a stone is done in baby steps. That is to say, using the small sledge and the hatchet, start at one side of the rock and first lightly score a line along the cut you intend to make. Next, place the hatchet near one end of the line and begin solidly tapping it with the hammer. Go back and forth along the scored line, moving from end to end, all along the stone. Keep it up. Eventually, you will worry the stone to pieces. Keep tapping, all along the line. Soon, you will begin

to see a hairline crack develop and feel the hatchet stick as it begins to wedge into the forming crack.

The way I figure, it works like this: The light, but solid taps of the hammer on the hatchet send structure-crumbling shock waves through the stone, beginning at the point of contact. By using the light taps of the hammer, you are in more control of the eventual fissure and break than if you really pound away on the stone.

Try to resist the temptation to start whacking harder on the hammer. You will only end up with a jagged break going somewhere other than where you wanted it. Trust me on this. In fact, it's a good idea to have a few practice stones to mess up, but I believe you'll be surprised at how easy this method works. Note too that the structure of the stones themselves may differ. Even in the same general area, a different stone can look, feel, and work up differently.

Take a look at the photographs below. In the one, you can see the rel-

atively clean cut, with no flaking. It's a nice break with two usable pieces. The other photo shows a decent break, but it is jagged on the end. You can also see some shards of stone and some flaking. All of these pieces were quite usable and found a place in the wall, but they do illustrate the differences in breaks that can result.

These stones can be split just about as easily as they can be cut, perhaps even more easily. If you turn one of these rocks up on their sides, you can usually see the flow or "grain" along the length of the rock. To split such a stone, just locate the point where you wish to begin and start tap, tap, tapping along the grain, just as you did when cutting the stone. Soon, you will see the hairline crack begin to form and soon the stone will cleave into two pieces, much like a split piece of firewood.

I chose to put the wall together without using any mortar. This method is referred to as drystacking.

Now, when it comes to drystacking the wall, I have found a few simple things to watch for. First, lay a course of stone as level as you can. It will make the rest of the wall much easier to construct if the foundation is level. Make these stones as large and as uniform as you can. Next, stagger the joints of the stones as much as possible. As you can see in the photograph on the opposite page, I have staggered the stones to give almost a laid-brick look. This simply ties everything together better and will result in a sturdier and longer lasting wall. Use rocks as large as you can handle. Since gravity and friction hold a dry-stacked wall together, larger stones will simply stay in place better than smaller ones. The smaller stones can be used to fill gaps or provide some leveling.

I hope you enjoy working with stone. Building with materials right off the home place can be especially satisfying. Building something that lasts is just as satisfying. Δ



Left: This photo shows the two simple tools needed for cutting a stone. You can see the relatively clean cut with little or no flaking. Right: This photo shows a more jagged break. This can be caused by the physical makeup of the stone or by rushing and hitting the stone too hard.



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Oh, no!

Not lentils again!

By Habeeb Salloum

Exhausted from working in the fields, my father and I sat down to eat our daily meal. That day, the south Saskatchewan heat had been especially aggravating as we summer-fallowed the land. Now with the dust washed from my face and hands, I felt relaxed and hungry. As we sat down around the table, my mother, a gourmet cook, brought out a steaming pot of stew.

The aroma filling the air was mouth-watering. I lifted the lid, "What are we having this evening?" My mother smiled, "*Yakhnat `adas* (lentil stew). Eat! It's a healthy-tasty dish."

"Oh! no! Not lentils again! We just had a lentil salad yesterday." I was angry. It seemed to me in these Depression years that our diet consisted, in the main, of lentils.

During the 1930s, on the western Canadian prairies, this ancient pulse was not known to the vast majority of our fellow farmers. However, the ancestors of my parents in Syria had cultivated this tasty legume, one of the world's oldest foods, for untold centuries. When our family immigrated to Canada they had brought their love for lentils with them. Hence, every year it was the mainstay of our hand-watered garden. In the dry soil of the prairies, this hardy plant, which

had adapted to the arid conditions of the Middle East, grew and thrived. None of our fellow farmers were familiar with lentils and we, like the other Arab immigrants, kept the knowledge of cultivating lentils well hidden. Being foreigners with inferiority complexes, we ate our delicious lentil dishes hidden in our home, safe from the prying eyes of our neighbors.

Now, when I look back to these years, I think to myself how foolish we had been. Instead of acquainting others with this ancient healthy food, we were ashamed to mention its very name. In fact, as children, my siblings and myself thought that our parents were forcing us to eat inferior food.

All this has changed in the last few decades. In the late 1970s, I visited my sister's family who were farmers in Saltcoats, near Yorkton. To my astonishment, I found that lentils had become one of the major crops in Saskatchewan, and many people were talking about this legume as a health food. It was then that I realized how unwise I was in my youthful years.

Today, Canada is one of the world's top lentil-producing countries with most of the crops grown in Saskatchewan. Even though India produces half of the world's supply, most of its production is consumed locally. Canada is the second largest

exporter of this pulse, only exceeded by Turkey. It is apparent that the country has come a long way from when we ate our lentil dishes in secret.

Little did I know in those years that the fare which my mother cooked from lentils was, perhaps, one of the reasons why our family members rarely had to see a doctor. They are low-fat, containing about 116 calories in half a cup of cooked lentils. Highly nutritious, this legume is chock-full of minerals, like folic acid, iron magnesium, phosphorus, potassium, and rich in calcium, carbohydrates, vitamin B6, and especially protein.

Lentils have one of the highest protein contents of any vegetable, containing more protein than an equal amount of meat. To get the full punch of this protein content and create a complete and tasty vegetarian meal, lentils should be combined with a grain like rice or bulgur.

In addition to their nutritional value, lentils are recommended for anemia, emaciation, hemorrhoids, low blood pressure, and ulcerated digestive tracts. A boon to diabetics, they assist the body in controlling blood sugar and insulin levels. However, they have one drawback, tending to produce gas—an irritant which can be somewhat relieved by adding turmeric as an ingredient in the cooked dishes.

Lentil and meat stew - Yakhnat `adas Serves 8

- 4 Tbsp. butter
- ½ lb. beef, cut into ½-inch cubes
- 2 medium size onions, chopped
- 4 cloves garlic, crushed
- 1 small hot pepper, finely chopped
- 1 cup lentils, rinsed
- 5 cups water
- 4 medium potatoes, peeled and diced into ¾-inch cubes
- 4 medium tomatoes, chopped
- 1½ tsp. salt
- 1 tsp. cumin
- ½ tsp. pepper
- ½ tsp. turmeric

Melt butter in a saucepan; sauté beef for 5 minutes. Add onions, garlic, and hot pepper; stir-fry for another 10 minutes. Add remaining ingredients, then cook over medium heat until meat and lentils are well-done, adding more water if necessary. Serve hot with cooked rice.

about 35 minutes to cook. The red type, sometimes sold as Egyptian lentils, are usually retailed with the outer skin removed and split. They become ready for the table much more quickly than the other varieties. Unlike many other pulses, all types of lentils do not require soaking, but if placed in water for a few hours, they take half the time to cook.

They are delicious when cooked by themselves or with almost any grain, meat, or vegetable. In salads, soups, stews, and as a vegetable side dish, they are delightful. With their meaty flavor and healthful qualities, lentils make any dish in which they are an ingredient appetizing and nourishing. Without doubt, they must have contributed greatly to the health of our family during the Depression years. This lentil dish, from a repertoire of hundreds, will open the door for the uninitiated into one of the most ancient foods in the world. Δ

Cheap and wholesome, lentils are climbing the social ladder in North America, appearing more regularly on the household's menu. It is possible that in the foreseeable future, they will become one of the basic foods in the Western Hemisphere. Should this happen, then many will understand the Biblical story of how Esau sold his birthright to his twin brother Jacob for a bowl of pottage made from this legume.

Lentils come mainly in three types: brown, green, and red. They are one of the simplest foods to prepare, the green and brown types taking only

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Finding wilderness property, pickles, growing potatoes in boxes, ginger beer, homemade tortillas, kale soup, hanging

I have spent thousands of dollars and wasted 20 years of my life running around looking for wilderness areas. North Carolina, South Carolina, Illinois, Minnesota & Mississippi, so far. I need some help to pinpoint an area that would be the best place for homesteading. I found those states too civilized but maybe I was wrong to count them out.

Desperate to live my dream I had when I was 18 and now I'm 39. I have had so much stress moving around and still hearing planes, seeing people, etc.

Carol Anderson
canderson@ie.com

I really sympathize with you a whole lot, Carol. I see myself at 54 where you are at 39. We have lived in very remote areas, but we long for wilderness, and it is so very hard to find in today's world. Even in Alaska's interior, you still find people and hear planes in the bush. That's why we tried to go to the Canadian Rockies in British Columbia. (See *BHM*'s September/October 2000 issue for the whole gruesome story.) So I consider myself an *expert* on finding wilderness.

So, for a start, you've got to ask yourself how "wilderness" do you want? If you don't have heavy livestock and can really live self-reliantly, with very few trips to town, you can pick up remote Alaskan interior smaller pieces of fly-in only land for less than \$30,000. These are usually on lakes or rivers, part of state sales, i.e. subdivisions. But very few people

live on their land because the only way in and out is via float plane.

We found one such property and were very seriously considering it. Our horses were the reason we decided against it, as the only way we could get them in was riding them 30 miles on winter ice and snow from a small town to the homestead. Then there was hay—at \$5 or more a bale, and we would need 20 tons to overwinter them. Not to mention hauling it so far via snowmachine. So we faced reality. We could not have horses there. But we are horsemen, having had horses for a lifetime.

We got a quote from an air service in Fairbanks for a fly-in, drop us off, fly back and pick us up in a week to look at the land. The cost was \$800. So you see, you wouldn't be able to get "out" very often unless you have more money than we do. Also a small float plane can seldom carry over 500 pounds of gear, and only a small plane could land on our ½-mile lake. Without the horses, we could have done it; we get along with "light," and are used to snowmobiling for miles in the winter. But so very few people are happy that isolated. Cabin fever is a standard Alaskan joke.

Remember that wilderness is just that because it has no public access or very poor or seasonal access. Where there are decent roads, there is no wilderness.

Okay, maybe your wilderness is less "wild?" Sometimes even being able to "get out" via ATV or 4x4 truck makes the difference. There are some places in Alaska that are wilder-



Jackie Clay

ness, but you can still access the highway via a vehicle. The problem here is that many are in more "built up subdivisions, where some people do live year-around.

As most Alaskan land is either state, federal, or tribal, much of the privately owned land is state sales—larger tracts that have been subdivided for sales.

You can sometimes luck out and find someone's old homestead that is remote and isolated for sale. But such private Alaskan land is not cheap.

There are a few wilderness pieces of land scattered through southwestern Montana. These are patented mining claims, usually in the mountains, and are sometimes surrounded by Forest Service land. Unfortunately the government and rich investors have bought up much of the "nicest" land. But there still are a few out there. With our horses again, we need more than 20 acres, which is the "average" size of these claims.

If you only have one (or no) horses, this would not be a problem. These claims typically are on a small stream, usually in fairly high country. You have to be careful, as some are really polluted from mining and some are all rocky, steep mountainside—

totally unavailable for any type of homesteading.

Remember that the mountains in Montana are rough to homestead (it can snow 12 months out of the year), but it can be done. We are doing it.

There is some good wilderness in northeastern Minnesota. This is where we plan on moving when we sell here, on our quest for wilderness. I lived in northeastern Minnesota for 17 years and explored much wilderness, including the Boundary Waters Canoe Area Wilderness (BWCAW), during that time.

This wilderness area is an hour or more north of Duluth and runs clear to the Canadian border. A big chunk is Federal land—Superior National Forest and the BWCAW mentioned above. But there is private land, isolated in among state and federally-owned land.

I guarantee this wilderness is as “wild” as much of Alaska. But it is about as cold and snowy, too. Now, I lived in Minnesota, so I really don’t care about the cold and snow. But it’s a whole different ballgame than, say Mississippi and the Carolinas.

Expect minus 35°—sometimes lower temperatures—every winter. And expect snow, lots of it, from October until May. It doesn’t melt and go away in midwinter; it just stacks up until the dreaded (yet longed for) breakup. Then MUD MUD MUD.

In the spring and summer, the mosquitoes are as infamous as in Alaska. (Some call ‘em the state bird.)

But, like I said, I got used to the drawbacks and have grown to appreciate them. After all, it’s what has kept that area wilderness. If it was all perfect, it would be wall-to-wall with people because of the gorgeous scenery, rivers, lakes, and wildlife.

There is also some pretty remote land in the Dakotas, Nebraska, Idaho, and, I’ve heard, northern Maine. Check state maps. If you see roads, you won’t find wilderness. And if

there’s a major city within 100 miles, it won’t be there, either. I know of no true wilderness in the states (except Minnesota) in which you’ve lived.

The problem with living in a wilderness area is that one must have some type of income. It will not be wilderness if you can commute to work. Others have the same idea, and there goes the wilderness. Luckily I write for a living. I can do it anywhere. There are few “jobs” as flexible, but there are a few.

You can homestead nearly anywhere, although some areas are challenging. (I’d skip permafrost areas in Alaska.) But the easier it is to homestead, the less wild a place will be. That’s why we’ve always been in challenging areas, I guess.

I hope you find your dream. It’s out there somewhere. But avoid “government land” & “homestead land” scams like the plague.

A few helps may be:

Remote Property, Inc., P.O. Box 10-3195, Anchorage, AK 99510-3195. Web: www.alaska.net/~remote, \$3 per year for a color sales flyer.

Robert Fox Realty, 815 Sixth Ave, Fairbanks, AK 99701. Web: www.alaska-land.com.

Vicki Wenz at Cobblestone Realty, P.O. Box 365, Grand Marais, MN 55604. Web: www.CobblestoneRealty.com

Rural Property Bulletin, P.O. Box 608, Valentine, NE 69201. Web: www.ruralproperty.net, Sample copy \$3.

Montana Land Magazine, 1-800-347-0898, Web: www.montanaland-magazine.com, \$20 a year, published quarterly.

I am looking for a recipe for refrigerator pickles. They have vinegar, sugar, mustard seed? They aren’t canned. Can you help?

Lori Allaman Hanken
lhanken@pivotalsystems.com

Sure, Lori. There are all kinds of refrigerator pickle recipes. Here are a couple for you to try.

Fresh cucumber delight

3 qts. sliced cucumbers
¼ oz. mustard seed
½ lb. non-iodized salt
½ oz. celery seed
9 pints water
½ oz. black pepper
1 lb. brown sugar
1 qt. vinegar

Slice fresh medium-small cukes into thin slices. Place immediately into a solution of ½ pound of salt and 9 pints of water. Let stand overnight. Next morning, drain, pack into jars, and cover with a cold, sweet liquid made up from the remaining ingredients. Seal tightly and store in the refrigerator. This recipe makes 3 quarts.

Lazy housewife pickles

4 qts. small cucumbers
1 cup dry mustard
1 cup sugar
1 cup salt
1 gal. vinegar

Wash the cucumbers, then pack them in glass jars. Mix the mustard, sugar, and salt together, then add the vinegar slowly, stirring well. Pour this over the pickles and seal the jars. Let the jars stand for at least a week in the refrigerator before using. The brine is not heated. Makes 4 quarts.

We live in a mobile home on leased land and we cannot plant a garden or have a compost pile. I got the book Squarefoot Gardening by Mel Bartholomew. One section talks about gardening in boxes made of 1x6s with bottoms and raised off the ground. This sounds great for our situation, but my questions to you are:

Can I grow potatoes in these boxes? Are all purchased bags of compost that you get at the garden store

organic? I'm real new at gardening and have been a subscriber for about a year.

Kim Howe, Toms River, NJ

Mel's book is real encouraging to folks like you with limited garden space. If you make your boxes for potatoes 18 inches deep, they'll do fine for potatoes.

This will allow you to plant the seed potato on 14 inches of soil, then hill the plant up (cover it gently with soil) twice, as it grows. This will give you many more potatoes than if you simply plant the seed potato and let it grow.

One interesting method is to use a barrel or garbage can with a few drainage holes in the bottom. Fill it to 14 inches with good compost or soil and plant your seed potato. As it grows, add more soil, keeping it covered as it grows.

Pretty soon, the plant will be at the top of the container and will mature. Keep it well cared for and when it finally matures and the vine dies down, you can dump out a whole lot of big potatoes from just one seed potato. (I've even heard of some folks using heavy duty plastic garbage bags with this method.)

Remember that you can grow *up* in containers. With indeterminate tomatoes, cucumbers, beans, vining squash, and even melons, etc., you can encourage (by gently tying vines) the plants to climb high trellises made of sticks, strings, or even chicken wire or livestock fencing. (One tomato plant, planted in a five-gallon bucket on a sunny porch, can be trellised to grow 10 feet high and produce a bushel of tomatoes.)

I have been trying to find a good tortilla recipe and instructions for handmade tortillas. Could you tell me how to do it? I really hate that all my cookbooks and on-line recipes start with "go to the store and buy them."

Steve Strong
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I'd love to teach you how to make tortillas. In fact, we'll do both flour tortillas and corn, as they are two very different flat breads that do much to expand your meal menus. Both are *very* easy to make and only take a few minutes. Besides, home-made tortillas are much better (surprise!) than store-bought. We even take it a step further and make our own masas (wheat and corn flour) from homegrown grains. (See previous columns in *BHM*.)

Corn tortillas

2 cups masa harina de maize (corn flour, *not* cornmeal)
1 cup (more or less) water

In a medium-sized bowl, mix enough water into the masa harina to make a very stiff dough. Add water slowly, mixing well with a fork. The dough will seem a bit dry, but will form a ball easily when worked by hand. You don't want any dry flour left, but don't want a wet dough. Let the dough rest for 10 minutes.

Dampen your hands and pinch off a large walnut sized ball, and work it into a ball. Repeat with the rest of the dough.

Using either a tortilla press, lined on both pads with waxed paper, or plastic, or a pie plate and cutting board with waxed paper on the board

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and under the pie plate, sandwich a slightly flattened ball of dough between waxed paper and press flat. I've found that when using the tortilla press you need to turn the pressed tortilla around a half turn and press again to get a uniform thickness.

Some folks cut each tortilla into a perfect circle, using a bowl as a cook-

ie cutter. But I don't mind irregular edges on the tortillas and dispense with the extra work.

Use a griddle or cast iron frying pan with *no* grease and heat it to a medium heat. Gently bake each tortilla about 30 seconds until edges seem dry, then gently turn and bake until it puffs slightly. Store in covered dish and use soon. This recipe makes a dozen tortillas.

To make taco shells, heat ¼-inch of grease in heavy frying pan. Fry each baked tortilla until limp. With tongs, gently fold tortilla in half and continue frying, holding the edges apart. Cook 1½ minutes longer, turning once, until crisp. Drain on a paper towel.

To soften tortillas to fill, heat 2 Tbsp. grease in a small frying pan. Holding a baked tortilla with tongs, dip each one in oil till limp. Drain on paper towel. Repeat, adding oil, when necessary. Fill.

Hint: I often add spices, such as chili powders, garlic, and onion to the masa harina before adding the water for different flavors. We like them this way.

Flour tortillas

2 cups flour 1 tsp. salt 1 tsp. baking powder 1 Tbsp. shortening ½ to ¾ cups quite warm water

In a medium mixing bowl, stir together the dry ingredients. Cut in the shortening well. Add warm water until the mixture forms a medium dough. Add more water, if needed, but don't let it get to a sticky dough. It needs to be able to be handled well. Let rest for 15 minutes; it rises some.

Divide the dough in half, then in halves again, eventually forming 12 pieces. On a lightly floured surface, roll each into a ball, then roll out into a 7-inch round. Again, some folks trim them into a perfect circle. We

prefer the appearance of irregular tortillas; they have character.

I pat each tortilla a bit with my hands and lay it on an ungreased griddle over a medium heat. Bake about 1½ minutes on each side, until lightly speckled brown. Hold hot under clean tea towel; serve or fill.

I hope you'll enjoy these tortillas as much as we do.

I am a Peace Corps volunteer working in Africa. One of the things we are trying to teach is local food preservation. We teach solar vegetable drying and canning jams and chutneys by putting the hot foods directly into sterilized jars. (Out here, professional and pressure canning devices are unavailable.) However, I am having trouble finding a recipe for preserving pumpkin that can be used in this environment. Do you know of any recipes that don't require a pressure canner? Also do you have any advice on jerking meats using a solar dryer? (Humidity is not a problem out here).

Zachary Maichuk
U.S. Peace Corps, Africa

One of my favorite ways of preserving pumpkin fits in well with your food dehydration program. I simply peel the pumpkin slices, removing the strings and seeds, then cut slices about ¼ inch thick and lay them out on the dehydrator screen or tray. They dry nicely in about a day, in the sun, having been turned once.

The slices can be easily rehydrated in hot water, broth, or milk and cooked up. Or you can grind the dry slices, then rehydrate to use as a smoother pumpkin in recipes such as puddings, pies, or mashed pumpkin. The only way you are able to can pumpkin safely without a pressure canner is putting it up as pumpkin preserves or butter. The method is in a previous *BHM Ask Jackie* column.

Have you canned tomatoes? They and other fruits can be canned, using a simple hot water bath. This is any

container that will hold enough boiling water to completely cover the jars with an inch of rolling-boiling water. The container needs to have something (rack, wire or even folded cloth) on the bottom to keep the jar bottoms off the *very* hot container bottom.

Any jerky recipe will work well in a solar dryer. Tips are: use tender cuts, remove all fat and bone, and slice diagonally or you will have tougher jerky. Slice the meat thick. For taste we like to marinate it several hours in a spice, vinegar, brown sugar mixture first, but this is optional. Keep insects away from the drying meat, using either a thin cloth or even smoke. Turn the meat strips halfway through drying process for even drying. For long-term preservation, the jerky must be quite hard. Soft jerky sold in stores is convenient to eat but will go moldy or rancid fairly quickly, and should be refrigerated. This is probably not an option in your neck of the woods.

My wife and I are looking into buying a recreation property and have found that it is much cheaper to buy in eastern Washington than western Washington, where we live. The only thing is my wife doesn't really like it over there because it is so dry. So I got to thinking and I decided the answer is to build a water tower. Can you tell me how to find the plans for one? Thanks.

Scott Christiani, Everett, WA

I really don't think a water tower will help the problem. Now if you said, "My wife and I really love it over there in eastern Washington, but we need a way to store water and have water pressure without much energy spent," we'd discuss the water tower idea further. Could you reach a happy medium on the property? Say buy less land in eastern Washington or come farther, into Idaho, where it's greener? I've been in eastern Washington and it is, well, pretty darned dry.

When we went down to northern New Mexico to help out my parents, we thought we'd be okay in such a remote area, and having a good well for plenty of water. Not so. We all missed *green* and, even with watering the garden and lawn, we northerners just plain missed it.

I hope you can both find land that each of you truly loves.

I received the first five anthology books. I skimmed them all quickly and read the first one cover to cover. I was hoping that you had an article on making vinegar, not just flavoring vinegars with herbs. I did find a paragraph that says vinegar is made like sourdough or yogurt; use a little of the old to make a fresh batch. I need more instructions than that. Also, can white distilled vinegar be made at home? And from what?

D. J. Clark, Adrian, MI

Vinegar is fairly easy to make at home. The trick is getting the acidity right. As far as taste, it matters little. But for pickling, you need vinegar with a 5% or 6% acidity.

White distilled vinegar is made by distillation of alcoholic spirits from corn, rye and barley malt. It begins with mashing of the grains and adding water. Yeast is added, causing fermentation, which changes the sugars into alcohol.

The alcohol is extracted by boiling the mash. The alcohol vaporizes and the vapor is forced into cool water, in which it condenses. Oxygen transforms the alcohol into vinegar. To make distilled vinegar, one must be able to first make alcohol, an art in itself.

Apple cider vinegar is much easier. Simply open a jug of fresh cider, pour off a pint and add a little "mother" (the whitish clump of bacteria that forms on the surface of natural vinegar) from a previous batch. Then let it set at about 70 degrees for about a month. Sniff the jug, then taste a bit. You'll know when it's done. To use it

in pickling, you must test the acidity, as vinegar needs to be at 5-6% acidity. You can get an acid testing kit through wine-makers companies.

You can keep saving the "mother," from one batch to the next, much as you save a favorite sourdough starter.

You can also make vinegar from peaches, grapes, or most any fruit by first making pure juice, much as cider is made from ground and pressed apples, then fermenting it.

Prior to our move to the USA about 20 years ago, we were ardent drinkers of ginger beer. At one time, we actually made our own. However during our move we lost the recipe.

Can you find a brewing recipe for me?

Harland Zipprich

It just so happens that I have an old recipe in my files for making ginger beer. And I'll be happy to share it with you.

Ginger beer

4 oz. dried ginger root
1 gal. water
Juice from 1 med lemon
1 packet active dry yeast
½ lb. sugar

Pound or grind the ginger root, then boil it in ½ gallon of water for 20 minutes. Remove and set aside. Mix lemon juice and packet of dry yeast in a cup of warm water and add to the ginger root water. Pour in remaining water and let mixture sit for 24 hours. Strain out the root bits and stir in the sugar well. Bottle in sterilized glass bottles and place in refrigerator. Don't store at room temperature or bottles may explode. Makes ten 12-ounce bottles.

I'm not sure if you have any information or might even have already covered this but I have not found addresses for getting information for buying land like you did over the Internet. Information I mean from

Arizona, Utah, which are the areas I am most interested in first. How do I go about finding these people in the remote areas. Can you help?

Judy Edens, JudyEdens@aol.com

Well Judy, check out the web site for *Rural Property Bulletin* for your first question. I'd advise closely checking out a state map of each state you're interested in. Then either write, call, or e-mail the Chambers of Commerce in the areas that seem to interest you the most. Ask for the names of local realtors who handle remote properties. Then contact them and ask what remote properties that fit your needs (be specific) they have available in your price range.

Be especially sure to check out available water in Arizona and Utah, as many remote privately owned areas are in very arid areas where the water table is down a thousand feet or more. One can not hope to live without dependable and relatively cheap water.

Regarding your reader's question in issue 68 on pomegranate jelly: I've done it for several years and after the first batch didn't jell, I contacted the Certo people, who suggested doubling the pectin to 2 packages instead of one. Also I add 2 Tbsp. fresh lemon juice to the mix.

Incidentally, pomegranates benefit from frost before harvesting. My kids in high school commented when we first harvested and processed them, "You mean there really is something to do with them besides throwing them at other kids?"

Mary Fuller, Datil, NM

Thanks, Mary, for your tips on pomegranate jelly. We all appreciate it.

I was just reading an article you wrote on seed saving and would be happy if I was able to find the Hopi Pale Grey Squash. I, too, save seeds

but do not have these. Can you tell me where I can get some seeds?

Bernadette, Bernadette@pa.net

I'd send you some, but I accidentally crossed mine with a giant pumpkin and am in the process of weeding out the pumpkin strain. (About 1 "squash" on two vines looks like an orange pumpkin.) Oh well, they taste good, and in a few years I'll have 'em back pretty pure. I only save seeds from squash that look like Hopi Pale Greys. One interesting note is that many Native American varieties are freely crossed. Varieties become "pure" when it is the only kind grown in quite a distance. That's why many Indian vegetables are so varied and pretty. (Yellow and orange muskmelons, red and yellow watermelons, and different sizes, colors, and shapes of squash from the same vines.)

We really do love the Hopi Pale Grey Squash, as it is such a good keeper, lasting more than all winter, when simply stored under the bed. And it tastes fruity and sweet, not stringy at all. It makes great "pumpkin" pies too.

You can find seeds through Abundant Life Seed Foundation, P.O. Box 772, Port Townsend, WA 98368. They have a great catalog of open pollinated vegetables, herbs, and more.

Jackie, here is my recipe for kale soup. If you try it, I'm sure you and your family will love it. In the meantime, can you tell me how to can it?

Kale soup

pork bones to make stock (optional)

3 quarts water (or other stock—vegetable stocks go great in this)

2 lbs. chourico, sliced into ½" pieces (other types of sausage, such as linguisa, kielbasa, etc, work too, but I like chourico best)

1 large red onion, chopped

6-8 medium red potatoes, unpeeled, and cut into 1-1½" cubes

¼ cup parsley, chopped

8 cloves garlic

1½-2 lbs. kale, stems and all, cut into manageable bite-size pieces—use the real curly type of kale, not decorative. (1 bunch of kale is about ½ lb.)

2 15 oz. cans kidney beans, drained

2 15 oz. cans diced tomatoes, with the liquid

2 bay leaves

1 tsp. Italian seasoning

1 tsp. red pepper flakes

fresh ground black pepper, to taste (I start out with about ½ tsp.)

Put pork bones in the water and simmer for about an hour. Remove and discard the bones and add more water to the stock to make three quarts of liquid. (If you don't make the stock, just start with the 3 qts. water or other stock.) Add all the other ingredients to the stock (or water) and bring to a boil. Turn the heat down to a slow boil until the potatoes and kale stems are tender, about 25-30 minutes.

This is one of those soups that, if it's possible, should be made a day ahead and, when it's done, put into the refrigerator overnight and served reheated the next day, as all of the flavors will have married by then.

John Silveira, Brookings, OR

I'll tell you how to can it. And I'll bet you'll like it as well as day-old, as the flavors will really blend well during storage, after processing.

First, make your stock, as usual. Remove the bones and then add all ingredients but the potatoes and kale. Simmer briefly, then add the kale. Simmer again, just until the kale is limp—no longer. Add the potatoes and mix. Dip out the soup, being careful to get a good mix of ingredients in each jar, and fill quart jars to

within 1 inch of the top. Wipe the rim with a damp cloth. Place previously boiled new lids on jars and screw rings down on them tightly, but without undue force. Place jars in warmed canner. (The canner will have an inch of water under the inner basket.)

Tighten the lid, leaving the exhaust petcocks open. Turn on heat and wait until steam has exhausted well. The steam should exit the petcocks in a strong, vigorous, steady stream, not little spurts. When this is happening, shut petcocks and wait for the pressure to build up.

As you are relatively close to sea level, you will be processing your soup at 10 pounds pressure. And you will hold it at 10 pounds for 90 minutes. (Remember to adjust the pressure accordingly, should you can this soup above 1,000 ft altitude above sea level.)

After 90 minutes, turn off heat and allow pressure to return to zero. Then, carefully open the petcocks to release any remaining steam. Open the canner lid, letting the steam rise away from your face. Then remove the jars with a jar lifter and place on a dry, folded towel to cool out of any drafts. When they are cool, you may wash them in warm, soapy water and remove the rings. Your kale soup is ready to store till you need it some wintery day.

We butchered a beef and took it to the butcher where he let it hang 23 days. Now the hamburger tastes bad. Could it be that it was hung too long and the fat got a foul taste?

Diane Grover, cdgrover@lcpz.net

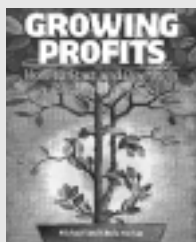
I just had a good discussion about your problem with our butcher, Steve, at the Cascade Meat Market.

Steve's been in the packing business for years and is like a surgeon with his meat. None better. We never let our meat hang longer than 14 days, but Steve says that under good, regulated, cold locker conditions, 21 days is okay. But any less than ideal

conditions and 23 days would be just too long. If there is any outside rancid fat that is not removed, leaving even a small piece of it to be ground in with the lean meat when making hamburger can ruin the taste of the whole batch. While the hamburger would still be "edible" if cooked well, you will probably have to season it very well to eat it. This is why Third World countries eat so much highly seasoned meat; it covers the slightly "bad" taste in nearly spoiled meat, which occurs because of lack of refrigeration.

Another source of nasty tasting hamburger is freezer burn. You didn't say how old your hamburger was. If it is over a year old, regardless of how well wrapped, it will develop freezer burn and be pretty disgusting to eat. This is one reason I can most of our meat. Δ

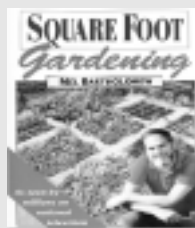
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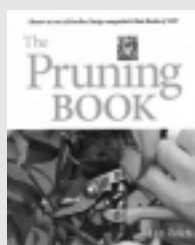
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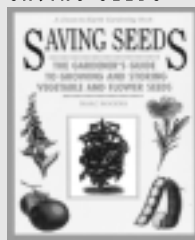


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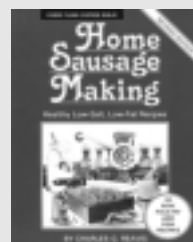
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THE IRREVERENT JOKE PAGE

(Believing it is important for people to be able to laugh at themselves, this is a continuing feature in *Backwoods Home Magazine*. We invite readers to submit any jokes you'd like to share to *BHM*, P.O. Box 712, Gold Beach, OR 97444. There is no payment for jokes used.)

A little girl was talking to her teacher about whales. The teacher said it was physically impossible for a whale to swallow a human because even though they were a very large mammal their throat was very small.

The little girl stated that Jonah was swallowed by a whale.

The teacher reiterated that a whale could not swallow a human; it was impossible.

The little girl said, "When I get to heaven I will ask Jonah."

The teacher asked, "What if Jonah went to hell?"

The little girl replied, "Then you ask him."

Man to friend: "Both of my marriages were disasters. My first wife left me. My second one didn't."

BUMPER SNICKERS

i don't have a big ego, i'm way too cool for that

**I live in my own little world,
but it's ok, they know me here.**

The closest I ever got to a 4.0 in high school was my blood alcohol content.

Isn't having a smoking section in a restaurant like having a peeing section in a swimming pool?

Shopping tip: you can get shoes for 85 cents at bowling alleys.

Q: What do you throw to a drowning lawyer?

A: His partners.

Did you hear about the terrorists who took a whole courtroom full of lawyers hostage?
They threatened to release one every hour until their demands were met.

Coach Bobby Ross had put together the perfect Detroit Lions team. The only thing he was missing was a good quarterback. He had scouted all the colleges, and even the high schools, but he couldn't find a ringer quarterback who could ensure a Super Bowl win.

Then one night, while watching CNN, he saw a war-zone scene in Bosnia. In one corner of the background, he spotted a young Bosnian soldier with a truly incredible arm. He threw a hand grenade straight into a 15th-story window 200 yards away -- ka-boom!

"I've got to get this guy!" Ross said to himself. "He has the perfect arm!"

So, he brings him to the States and teaches him the great game of football, and the Detroit Lions go on to win the Super Bowl for the first time in history.

The young Bosnian is lionized as the Great Hero of football, and when Ross asks him what he wants, all the young man wants to do is to call his mother. "Mom," he says into the phone, "I just won the Super Bowl."

"I don't want to talk to you," the old woman says. "You deserted us. You are not my son."

"I don't think you understand, Mother!" the young man pleads. "I just won the greatest sporting event in the world. I'm here among thousands of my adoring fans."

"No, let me tell you," the mother retorts. "At this very moment, there are gunshots all around us. The neighborhood is a pile of rubble. Your two brothers were beaten within an inch of their lives last week, and this week your sister was kidnapped in broad daylight."

The old lady pauses, and then tearfully says "...I'll never forgive you for making us move to Detroit."

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Retiring a flag



By Don Fallick
“*D* is done....
Gone the sun....”

The melancholy bugle notes of “Taps” rang in my ears as the fire leapt skyward. The Scouts and their families stood in frozen silence as the words echoed in my mind.

My wife and I have always been involved with youth, as teachers, as 4-H leaders, and most recently, as

Scouters. For the past three years, Barbara has been the Cub Master of Pack 3524. One of the hardest parts of her job is coming up with fresh ideas for each monthly pack meeting. Last June, she asked me for an idea, and I remembered the time at Boy Scout camp, years ago, when I attended a retirement ceremony for a worn-out American flag. It touched me so deeply that now, forty years later, I can still close my eyes and relive it, in full color, stereo sound, and all other senses.

“Let’s retire a flag!” I said. My enthusiasm was contagious. We invited the boys, their families, and members of the community to help us retire a flag, on the last Thursday in July. The pack meeting would consist of a potluck dinner, a few awards, then the ceremony.

“Well,” she quipped, “at least it’s a simple plan.” We little suspected how wrong she was! The first difficulty was finding a flag to retire. It wouldn’t do to burn up a perfectly serviceable flag, and worn-out ones are not as easy to find as you might

think. After striking out at the school district, the Post Office, and the local National Guard post, we finally found one, almost “in the family.” One of our Scout Committee members works for a large food distributor. The flag they fly at their corporate headquarters had worn out, and had sat, wadded up in a box, for a couple of years, waiting for someone to figure out how to dispose of it properly. The only problem was, it was as big as a cargo parachute! After consulting with Scouters all over the state, we found some who assured us that it would not violate flag etiquette to fold it double or quadruple, or even more, before retiring it.

“From the lake,
from the hill,
from the sky...”

The most difficult part was finding a bugler to play “Taps.” You would think that just about every kid who ever picked up a trumpet could do it, but none in the community was willing to stand up all by himself and play. The local high school band had trumpet players, but school was out, and they were gone on vacation. So was the band teacher. We called the National Guard again, the Veterans administration, even the local Civil War Fife and Drum Corps. Again, we found the solution “in the family.” Our Webelos Den leader knew of a bugler who played for military funerals. Naturally, “Taps” was his most popular number. Sgt. Culpepper had never seen a flag retirement, and offered to donate his services out of patriotism, and perhaps, out of curiosity. He agreed to come in full, dress uniform.

We held the pack meeting at a local park, where there was a fire pit large enough for our “council fire.” The day of the pack meeting dawned cold and rainy. I rushed to get a pile of dry pine delivered to the park and under

tarps before it could get wet. As meeting time approached, things began to get tense. *All* of the Cub Scouts showed up, with friends and families. Even community members with no connection to Scouting came.

The pot luck was a huge success, but I didn’t get to enjoy it. I spent the whole time building a fire that I hoped would be rain proof, instructing our den leaders in the duties of the “color guard,” and supervising Cub Scouts, parents, and leaders in folding a 60-foot flag in eighths without letting it touch the ground—or almost without touching it!

“All is well,
safely rest...”

But it all came together at the last minute. The rain stopped, just as Barbara finished handing out the awards and chose a Cub to give the closing prayer. The Cubs and “civilians” arranged themselves in a semi-circle around the fire pit, and I began to speak.

“This flag is old and worn, and needs to be retired. You noticed the big rips in the edges when we folded it. Because a flag is not supposed to touch the ground, it would be disrespectful to bury it or throw it out with the garbage. So tonight we will dispose of it properly by burning it, allowing the smoke and ashes to ascend to Heaven. The flag is the symbol of our country, and in honoring it this way, we honor those men and women who gave their lives that we might be free.

“If you are in uniform, please give the proper salute on command. If you are not in uniform, or are not a Scout, simply place your hand over your heart. Whichever form of salute you use, please hold it until you hear the command, ‘Two!’

“Sgt. Culpepper will play a tune called ‘Taps’ on the bugle. It is played

at every Army base at the end of the day to signal the time when the soldiers may go to their rest. It is also played at military funerals when a soldier’s spirit is sent to its eternal rest. This flag ceremony is like a funeral for the flag, which served faithfully and is now going to its eternal rest.

“‘Taps’ has words. We will not sing them, but I will tell you what they are, so you can think about them while the music is playing.” I repeated the words, and we began.

“Scouts, attention! Salute the flag!”

“Color guard, present the flag!”

Holding the flag horizontally, the color guard carried it over the fire and held it there until it burst into flame. At that instant, the trumpet began to sound, and the color guard members tossed the corners of the flag into the flames, stepped back, and saluted too. Sgt. Culpepper stretched out the music, holding each note as long as possible. We all stood rigid as statues, lost in our own thoughts, until the last note died away.

“Two!”

“God is nigh!”

“Scouts, dismissed!”

This is usually the signal for our Cub Scouts, aged eight to eleven, to erupt into boyish shouts and impromptu games of tag, but a strange silence reigned. Even the baby brothers and sisters were quiet. As the moms began putting away the food and getting ready to drive their kids home, the young boys gathered around the council fire, unwilling to leave, or even talk loudly, until the last shreds of the flag had burned to ashes.

Surely, it must have been the smoke that caused all of our eyes to water with unshed tears. Δ

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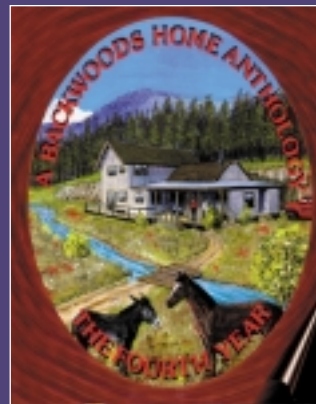
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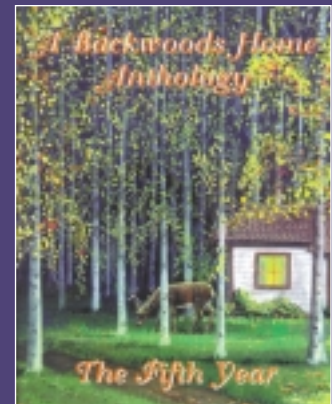
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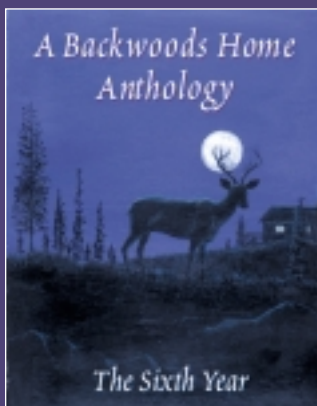
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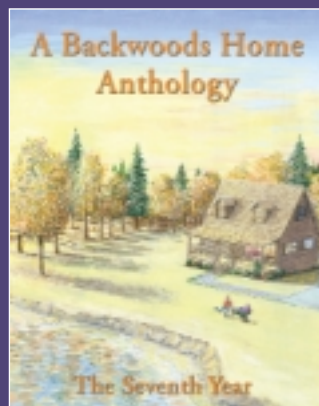
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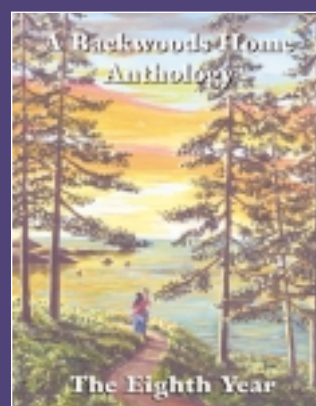
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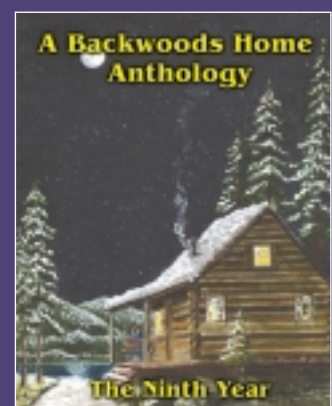
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Build your own log home in the woods

(This is the first part of a three-part series. The second part will teach you how to build windows and doors and how to put in the first story floor, the third part will teach you how to build rafters and joists for the second floor and roof, and how to heat it.)

By Jackie Clay

Nearly all of us have at least a faint dream: a cozy log home nestled on the edge of the woods, a bit of fragrant smoke drifting upward from the stone chimney. And isn't that us, sitting in a rustic rocker on the wide, shaded front porch? My, doesn't the garden look good with its wide rows, lush and green in the morning sun? We aren't dashing off to a job in the rat race to support an artificial lifestyle. We've finally got it right and are nearly self-reliant, with time for our family and ourselves.

And that log home is a symbol of the Dream. Built with our own hands, it allows us a home without an all-engulfing, life-long mortgage. I believe that a log home is not only an economical way for a family with modest, realistic means to have a wonderful home, but it can set them down the path toward true self-reliance.

A log home is strong, naturally insulated with walls of thick, solid wood. Well-built, it lets no drafts enter the comfortable rooms. And, well cared for, it can last hundreds of years, something "modern" stick-built homes, costing many thousands of hard-earned dollars, can never hope to achieve.

Floor plans

When we first began to look at floor plans for a modest log home, we were disheartened. Most all of them were either *huge*, being over 2,000 square feet (too hard for us to build our-

selves, or afford) or they were designed for "modern" living, not our self-reliant lifestyle (they had two or three bathrooms but no large pantry, the kitchen was designed for "entertaining" not cutting up an elk or moose carcass, and there was a huge great room with a ceiling up there about 30 feet—there goes our wood stove heat, without a ceiling fan—and we can't afford the luxury of a square foot of wasted space).

So I began drawing up plans myself. And I drew many, many plans, each that would work in certain circumstances, depending on where we ended up. But all are buildable by two adults and a youngster. All are practical, with a backwoods lifestyle in mind. All can be added onto as time and money allow. And all are simple, yet beautiful, protecting both the logs they were built from and the folks dwelling comfortably inside.

With a log home, you can start with a modest rectangle and add on in a

year or two, as you haul in more logs and save more money. Or you can start early and by working hard all summer and fall, be moved in by fall. The reason for this short building time is the simplicity and size of these floor plans. Here are two for you to judge for yourself. Remember, as with anything, home floor plans are highly personal, and you will probably change one or more things in them to suit your needs and tastes.

One tip: keep your initial building a rectangle, unless you have quite a bit of time to build. In this way, you only have four corners to work with. An L shaped home has six corners and a "+" shaped home has twelve.

One exception to this tip is when you have ready access only to relatively short logs of minimal taper.



This log cabin was a shared project of the author's son, Bill, and his friends. It was a good first log building project.

Sometimes a person must build with what they have.

Also, designing a home with few gables and a simple roofline will make the building go quicker and more easy for a first time log builder.

If you have the time, think of building a small structure from logs before you actually tackle the house. This may be an outhouse, a child's playhouse, or a chicken coop. The main thing is that you gain valuable experience working with logs before you actually tackle building your home. My first building of logs was a 12-foot by 22-foot chicken coop. My son, Bill, and his friends built a nice sized hunting cabin before he started on his three-bedroom log home. The experience and confidence you gain on a smaller project can't be beat.

For us, just having a log home is not good enough; we want it to be the heart of a self-reliant homestead. So we looked for a site for the new home with a vision of gardens, orchard, barn, chicken coop, outbuildings and fences in mind. Where would the horses pasture? Is the garden area expandable and relatively productive-looking? What about water for us all?

We, like most folks, love a pretty view. But we don't sacrifice ease of living for a pretty view. We know folks who have built on a high, rock point in the mountains, overlooking miles of tremendous view. But they couldn't get water after drilling over 500 feet (at \$20 a foot, for a hole). They couldn't use a septic system and were highly disappointed with composting toilets, using no electricity. A garden was nearly impossible, a productive *large* garden totally impossible. They could not even build a barn or a fence for their livestock because the ground was solid rock.

It was a pretty view, but the homestead was useless.

We like a site on the side of a gentle slope, looking out onto a meadow or other wild view. We are survivalists without camo and knife blades



Bill Spaulding, Jackie's son, working on peeling his house logs

clenched in our teeth, with the souls of a poet. We love foggy mornings, watching the elk and deer drift in and out of the trees like ghosts. Watching storms come and go brings drama to everyday life. But we also know we need to make a living for ourselves.

Likewise, examine your ground for signs of excessive dampness. While it is not impossible to build in a wet area, you cannot keep a log home from rotting if the ground around it is continually damp. Also avoid siting the home in a hollow that will fill with snow in the winter or where winter snow will blow and drift around it.

Never site your new home in a steep draw or narrow creek bottom where flooding or excessive run-off could be a problem.

A log home in the deep woods is pretty and comforting, but if you must do excessive clearing to have a productive garden, pasture for your livestock, a few outbuildings, you might choose again, putting your new home on the edge of the forest, instead. Another thought—more old log homes have been lost to rotting of the roof, caused by years of pine needles

and leaves lying on the roof, than forest fires or wind storms combined.

So when choosing your home site, look carefully about you. It can be one of the most important things you do.

Sources of logs

Ideally (as far as the Dream goes), the logs can come from your own land. In reality, it doesn't take a woods full of logs to build a decent sized log home. If you have a few acres of woods on your land, you just might have a home growing right there in front of your eyes.

Although very large diameter logs make a stunning home, very few people have the capability to handle logs weighing up to a ton apiece. True, one can rent a crane, but these huge logs are a challenge and a danger, and unless you have lots of experience building with logs, plus the mechanical help, you might be better sticking with logs under 12 inches in diameter.

While any species of tree *can* be used to build a log home, the most commonly used are lodge pole pine, cedar, white or red pine, spruce, and



Many hands make light work. Bill and friends at his peeling party.

Douglas fir. The reason for this is these trees are relatively rot-resistant (although any wood can, and will, rot without protection), are tall and straight, with little taper, from butt to top, and reasonably lightweight.

Oak is used as a log home building material, as was chestnut and even walnut and hickory. But these woods are heavy to handle.

I've even seen some nice homes built from poplar. The key to using poplar, however, is to be absolutely sure that the wood is protected from moisture. This needs to be done by ensuring that there are at least three feet of roof overhang on all sides, that the sill log is at least 24" from the ground, that there is adequate draining *away* from the house, and that the logs are periodically treated with a sealant.

If you just don't have any buildable logs on your land, don't give up. There are lots of other options. First of all, ask around at your neighbors to see if you can buy logs from their wood lot. Many times you can pick up very reasonably priced logs in this way. Just make your contract in writ-

ing and take care of their land as you would your own.

Another source of very inexpensive logs is the National Forest or State Forest land nearby. Usually you can buy a stand of logs quite reasonably. We have done this for firewood, fencing, and house logs. As this land is usually farther from your home site, you will have to arrange for transportation. If you haul the logs out to an accessible site, you can usually get

a logger to load and haul a semi-load to your building site.

Often overlooked are used electric and telephone poles. Check with the utility companies in the area. Many times they have nice, seasoned logs (with no bark!) for low cost. You may have to buy a dozen or so poles at a time, but you can stockpile them ahead of your actual building date. An added "plus" is that the companies will often haul a load to your site for a little extra fee.

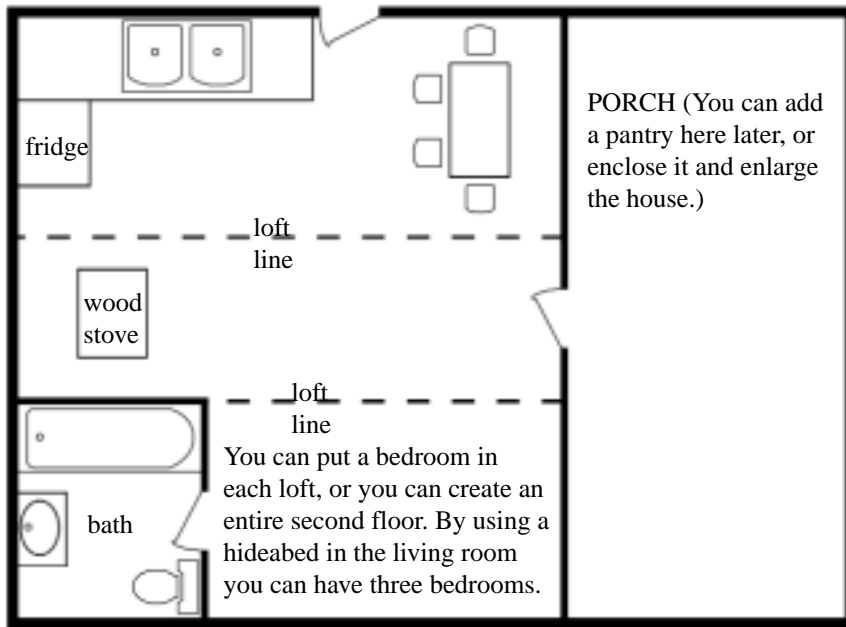
Should all of these options be unworkable, you can buy logs, unmilled and uncut, from a local logger. These logs will cost more than "do-it-yourself" logs, but will still be reasonably priced.

No local logger selling house logs? Well there still is a log dealer who cuts, mills logs to shape, and sells logs only (no turn-key construction). One such dealer is Beaver Log Homes (Rick Garland), P.O. Box 236, Beloit, WI 53512-0236 (608) 365-6879. Web: beaverloghomes.net.

As a last resort, or if you are really pushed for time, you can buy a pre-cut kit home and still do-it-yourself, saving a great deal of money over a ready-built home. Check some of the log building magazines for dealers in



A small project, like the author's log chicken coop, will give you much experience and confidence before building your log home.



This is the floor plan of a basic economy log home like the one the author's son, Bill, built. It includes two loft bedrooms, though the entire second floor could have been made into one large bedroom. And by using a hide-a-bed, the living room can also be used as an extra bedroom.

your general area. Although some far-away companies offer "free" hauling, I don't know of any trucker who will haul a thousand or more miles for "free." They just add the hauling cost into the package. How stupid do they think folks are?

Where will you live while you are building?

This is an important question. I've seen a lot of people living under truly miserable conditions while trying to build the log home of their dreams. So miserable, in fact, that many of those dream homes never got finished and relationships ended in divorce.

Living under a blue plastic tarp, in a camping tent, or in a van are not adequate to house a family during log building. After all, even a small home takes *at least* a spring-summer-fall building season to complete to the comfortable stage. It's true that it can be done quicker. I've seen three experienced men with two teams of horses cut standing dead logs and complete-

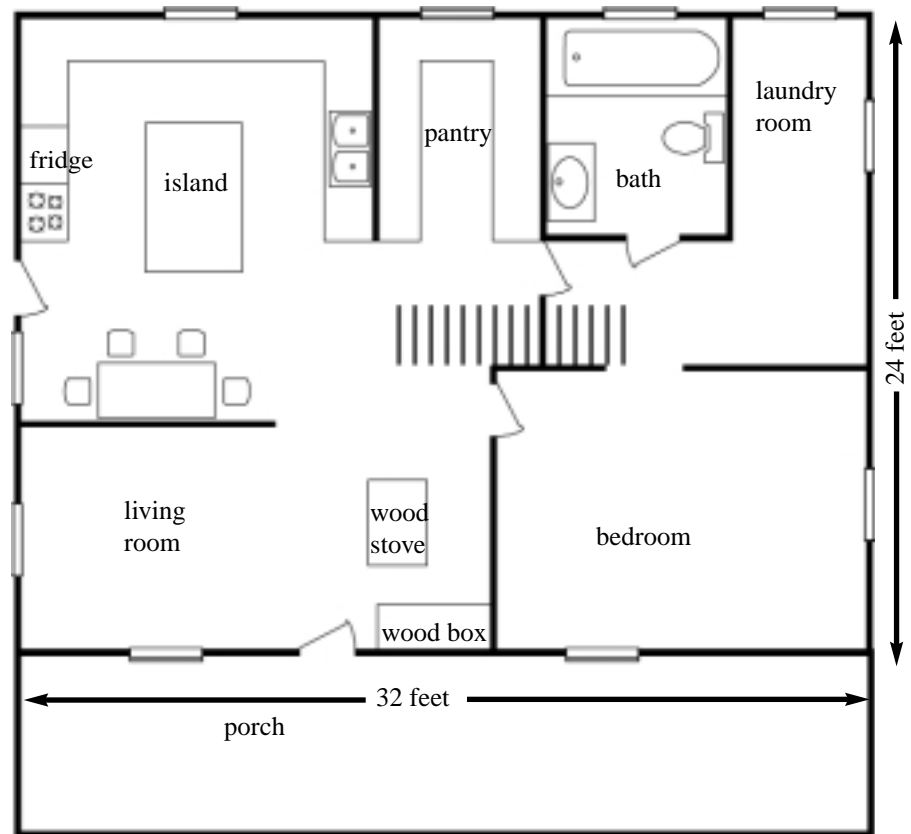
ly dry in a modest sized home in a week's time. But let's look at reality.

These logs were standing dead, near the building site. Therefore they did not have to be stripped of their bark. These logs were also seasoned and lightweight.

Those men were also seasoned log builders, each working with the other like a well-oiled machine. This is not the norm.

My oldest son, Bill, is just finishing up a log home that has taken him over two years' work. He had a full time job, outside of the home, working on the home after hours and on week ends. This is a large home, and it is turning out wonderfully. But folks can't live under a tarp while constructing a home that takes over a year.

By using "seconds," Bill quickly put up a cheap, but very nice looking, two-car garage on a cement slab near



This is the future Clay log home. It will have a full second floor with two bedrooms and one office.

his home site. It wasn't just a garage, but a temporary home and storage shelter for his tools and supplies. One half is a studio apartment, complete with a shower and toilet. It is finished nicely and is cozy, right down to the wildlife wallpaper border around the living room area.

Bill also had his well drilled and installed his septic system, both plumbed to the garage/apartment *and* to the nearby house site, with capped off stubs available when he began finishing the plumbing in the house. All the time, he knew he had water and a septic system available. I know people who finished the house first, then could not find a decent vein of water under a thousand feet in that location...and their septic location was in solid rock. This mistake cost them thousands and thousands of dollars developing alternative solutions.

Bill's forethought has paid big dividends and he and his new wife, Kelly, are living comfortably as he works to complete the finishing touches on the house. It is far from a blue tarp strung between trees, especially when it rains for days or winter comes early.

Another possibility is buying a fixer-upper camping trailer. We have just done that, with an eye toward building a log home on a remote homestead in Minnesota (where Bill lives). Costing less than \$800, we'll have a comfortable 26-foot by 8-foot trailer, complete with kitchen, *bed*, shower and tub, office for my work, dining area, and personal storage. There's even a propane refrigerator to make our camping extra comfortable.

Like Bill's garage, we will remain dry and comfortable while we build. Coupled with our other tiny camper (10-footer) and a mountain wall tent for tool storage, we'll have our own safari camp in the north woods. Both trailers also have propane furnaces and lights.

Commuting from home or a rental in town will work, but you'll quickly find that you are spending more time

driving back and forth than you are building. When you live on site, you'll have lots of extra time to run out and lay a log in the early morning or after dinner—time you won't have if you are living miles from the building site.

Getting logs out of the woods

We'll assume you *are* fortunate enough to have logs for your home available on your land or very close by. We won't get into chain saws and cutting trees down, for lack of space. If you've never cut trees down or used a chain saw, read at least one good book which covers this skill, then practice on a few smaller trees. Smaller trees are not as apt to kill you as large ones.

Once you've cut a tree down, limbed it and measured out the length you need (remember to measure *at least* four feet longer than your wall to allow for notching and trimming), you will have to get it home.

It's easiest to cut and haul these logs during the winter. But this is a fine art; you don't want to be out in waist deep snow cutting house logs. The reason that winter is best is that the snow on the ground helps skid the logs and also keeps the logs clean. During the other seasons, the logs will pick up lots of dirt and gravel, making working with them miserable.

I've hauled logs out of the woods with both tractor (and 4x4 pickup) and horses. I can say, without a doubt, horses work best. Horses require less room to maneuver, have intelligence, which a vehicle does not, and are much easier on the environment. You can pick up much information on logging with horses (and oxen) in *Rural Heritage* magazine, 281 Dean Ridge Lane, Gainesboro, TN 38562-5039. Web: www.ruralheritage.com. Also available from the *Rural Heritage* book store are books

on using horses in harness to help the novice.

Of course it takes more than reading a book to make a beginner a horseman. But there are a lot of horsemen out there who could and would teach you. And maybe you are already a horseman, but have simply not used your horses to haul logs.

Whether using horse or tractor, go slow. **Never** hook a log high on a tractor and charge out of the woods. A very good friend of mine, experienced on tractors and in the woods, took a little log for granted, doing just that. The log caught on a stump, tipped the tractor in a flash and made me attend a funeral, trying to comfort his widow and eight year-old son.

Peeling logs

No matter what kind of logs you use, chances are you will have to peel the bark off them. This is the most miserable job in all of log building—tedious and slow. Plain old *hard* work, no matter how you go about it.

You will need a tool to help you in this. An ax will not work. There are two basic tools—the drawknife and the peeling spud. If you are going to buy a drawknife for this job, look for the longest one you can find. It'll save you time and effort. The peeling spud is basically a narrow, short spade on a hardwood handle.

When using a drawknife, the easiest way is to straddle the log and pull toward yourself. Use care and you'll bleed less. Of course, to be safest, one should use knee protection and loggers chaps. But when the summer is hot a person often slips in the safety department.

A peeling spud is used by walking next to the log, shoving the spud down under the bark, taking it off in long strips.

Your choice of tools will depend on your preference and the type of log you are peeling. Try both, if you can, before buying a tool.



There are a variety of notches that can be used in building your log home.

Try to get all your logs peeled while they are still green, if possible, because the bark will slip off much easier than if it is hardened to a seasoned log.

One suggestion is to have a “peeling” party, sort of a house raising party. My son, Bill, did this, enlisting a number of friends who brought their own drawknives. They worked hard and had a good time. A lot of logs got peeled that day and the whole gang downed many pounds of brats (bratwurst).

Cutting notches

The heart of log cabin building is in the notches used to join the corners. Although there are many types of corners used, you will probably choose one of the following for ease of construction:

Saddle notch corners are the most commonly used in building log cabins. With the saddle notch, a cup is cut in the bottom of a log, which fits snugly down onto the other log of the corner. This holds both of the logs in place with no spikes necessary.

The weight of the logs hold everything firmly in place.

To measure this notch, simply lay up the log, in place, over the one below at right angles, and scribe the cut line on the upper log. You can find a scribe or notch gauge at any log building supply house.

This type of notch is very easy to learn to cut with a chainsaw. I like to make one saw cut in the center of the notch, almost to the bottom, then parallel cuts, again almost to the line. When this is done, work the chain saw back and forth on a diagonal, then side to side, cleaning out the notch. **Safety tip: wear safety glasses, because chips do fly.** This neatly rounds and cuts out your saddle notch with very little refitting.

The **V and A notch** (or **self-tightening notch**) combination is similar to the saddle notch, but in this notch the bottom log is also trimmed to fit. This log is cut with an A or inverted V. The top log is notched out in a fairly sharp V, which fits down on the lower log. As settling occurs (and ALL log buildings settle), this joint gets tighter and tighter, effectively closing off air leaks and places where

Tools needed for building your log house

Chainsaw
Carpenter's saw
Level
Measuring tape
Square
Drawknife
Single-bitted ax
Hand ax
Cant hook
Dividers or Notching gauge
Log chain
Log tongs or heavy ice tongs
Hand sledge
Claw hammer
12 V or greater cordless drill & wood bits
Circular saw
Chalk line

moisture could gather. Like the saddle notch, the V and A notch holds the building square and secure, despite winds and years of snow loads.

The one drawback to this notching system is that it does take a bit longer to cut, as both top and bottom logs are notched at each corner. My son, Bill, used this joining system. It is not only very secure, but looks great as well.

The V and A notch can be cut with a saw and hand ax or saw and broad wood chisel.

The **dovetail notch** is very strong and tight, as well as beautiful. But it is quite labor-intensive unless you have experience or plenty of time.

As you get to the point of cutting notches, keep in mind that you should **never** cut more than half way through any one log. Cutting further weakens the log and the entire cabin.

In addition to these notches, I like to use the Swedish cope method of log joinery, which cuts a V or a cup the entire length of the top log. A strip of sphagnum moss is laid over the bottom log, an inch deep, and the top log is settled down on top. This makes a truly air-tight joint. Caution: use raw sphagnum moss from the swamp, never taking great truckloads from the same area. Bagged sphagnum moss is milled and dried—not insulating material.

Lacking sphagnum moss, you may use fiberglass insulation. Don't let it hang below the edges of the top log as it is **UGLY!** Rag tag bits of this insulation are very hard to clean up satisfactorily.

I do not mention the “**butt and pass**” method of log corners, as I don't feel that this is a good joinery system; the logs do not lock upon each other, only butt against each other and overlap, alternately.

Remember, you will be alternating butt and top ends of the logs as you get ready to lay up logs. This will keep your home level as you build.

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Next issue I will be talking about actual construction tips. Until then, you might want to check out a few books and mags on log home building. *Muir's Original Log Home Guide* and *Log Home Living* are available at most newsstands. The

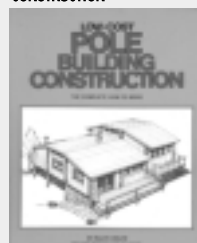
following books will be of interest to you:

Alaska Log Building Construction Guide by Michael Musick

Notches of All Kinds and Building with Logs by B. Allan Mackie

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288 pgs; 4½ x 7¼" ppbk. \$15.95 BU21

THE HOMESTEAD BUILDER



This practical classic is filled with handy advice on the best ways to plan and construct dwellings in any location, using wood, earth, and gravel. Includes no-nonsense instructions on erecting log cabins, slab houses, farm houses, and many others, as well as outdoor ovens, cellars, gates, furniture, and more.
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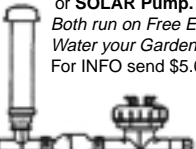
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THE COMING AMERICAN DICTATORSHIP

PART V

How “emergency powers” and Executive Orders have turned America into a dictatorship in limbo

By John Silveira

(This is a continuation of the fourth installment of a multi-part series on the erosion of our constitutional government. The first four parts are posted at: www.backwoodshome.com, the *BHM* website.)

A few hours earlier in the day Dave, Mac, and I were here at the office discussing *Executive Orders* as issued by various Presidents. The conversation was cut short when Mac, who had been leading the discussion, fell asleep in the stuffed chair we keep here. Dave, of course, is Dave Duffy, the fellow who publishes this magazine, and Mac is O.E. MacDougal, our poker playing friend from southern California.

Now that Mac was sleeping, Dave and I were taking care of business. It was almost 2:00 in the afternoon when, suddenly, there was a stirring followed by a low moan. I raised myself out of my seat and looked over my monitor. I saw Mac, his eyes still closed, trying to shift his position in the stuffed chair. His eyes opened a little, but just for a moment. Then they closed again.

“Oh,” he said as he managed to shift his body a little. I settled back into my seat and figured he’d gone back to sleep.

I looked across the office at Dave who had a clear view of him. Dave was still watching him.

“Are you awake?” Dave asked.

“Yes, unfortunately I am,” I heard Mac say and I rolled my chair to my right so I could see him around the monitor.

“In certain Third World countries,” Mac said, “they use chairs like this to extract confessions. How can it have

been so comfortable when I fell asleep a little while ago, and now I feel like I’m on the rack.”

“It’s hard to move around in that chair,” Dave said, “and you become uncomfortable because you’re stuck in just one position.”

“I know,” Mac said. “But why did I have to find it out the hard way.”

“What about Kennedy?” Dave asked.

Mac raised an eyebrow. “What about him?” he asked.

“Before you went to sleep, you said Roosevelt signed the most infamous *Executive Order* until John Kennedy took office. What *Order* did he sign?”

“I also said we have to talk about Truman first. To understand how Kennedy’s *Orders*—there was more than one—and the ones issued by subsequent Presidents have become a danger to us, you’ve got to understand what led up to them. You also have to understand what makes an *Executive Order* illegal and what constitutes a legal one. If you understand this you may also realize how we can effect a solution to this part of the potential dictatorship problem we now face in this country.”

“Then where do we start?” Dave asked. “Do we have to go all the way back to George Washington again?”

“No, we just go back to Woodrow Wilson, fast-forward to Franklin Delano Roosevelt, then go on to Harry Truman.”

“Okay, explain how Wilson figures into this stuff,” Dave said.

Mac stood up and walked around the office as he stretched. Then he returned to the chair and flopped back into it.



John Silveira

Wilson’s war powers

He began, “First, you’ve got to know that prior to our involvement in World War I, Wilson managed to steer through Congress a law called the *Trading with the Enemy Act* of 1917. The law must have seemed like a good idea at the time given that the biggest war civilization had seen, up to that point, was raging in Europe and it looked as though Wilson thought we should be in it.

“That act allowed the federal government to control certain commercial and monetary transactions within the borders of the United States. It was written to affect only those who would be defined or designated as enemies of the United States in time of war, and it pertained only to activities wholly involving transactions with those enemies. The act didn’t pertain to ordinary American citizens, like you or me.

“Second, as I had said earlier this morning, Wilson was the first President to declare a national emergency and the first to bypass Congress and create government

agencies without consulting with Congress, through the use of *Executive Orders*.

"He also used his considerable powers to suppress free speech and had people who spoke out about how his Administration had involved us in the war thrown into jail.

"But, what's important to what we're discussing is that the war ended—we won, by the way—and, when his Administration ended, Congress repealed most of the laws by which he had assumed the power of a potentate. But one of the laws not repealed was the *Trading with the Enemy Act*. There

didn't seem to be any reason to repeal it. It didn't involve the American people, just those foreigners defined as enemies."

"Why did they have to repeal the other laws?" I asked.

"Not everyone was happy with the way Wilson had assumed almost dictatorial power during the war. Charles Evans Hughes, who at one time or another was an Associate Justice of the Supreme Court, Secretary of State, and finally the Chief Justice of the Supreme Court, wondered whether our constitutional form of government, having been suspended and subverted by the unconstitutional war powers acts Wilson had employed, could survive another 'emergency' of any kind.

"But not a lot of people listened to what Hughes, as well as many others, had to say concerning Wilson's abuse of the power of the presidency, because no emergency appeared to be on the horizon. It seemed as though all Wilson's wartime legislation was in the past and the United States entered the Roaring 20s and, other than a short post-war recession, a period of peace

and financial prosperity ensued. It was, in fact, the most prosperous decade the U.S. had had in its history, up to that time."

"What were people like Hughes worried about?" Dave asked.

"Their concern was that not only do laws that create war powers go on and on, but like every other bureaucratic organization, the bureaucracies set up to administer the emergency powers don't go away and bureaucrats have to exercise their powers to justify their existence. Still, it seemed

Article I, Section 9

...The Privilege of the Writ of Habeas Corpus shall not be suspended, *unless when in Cases of Rebellion or Invasion the public Safety may require it...*

as though all was well with the United States.

The Depression begins

"Then, in 1929, the United States was shaken when the stock market crashed and this country, along with the rest of the world, slipped into the Great Depression.

"Herbert Hoover, the President at the beginning of the Depression, spent most of his Administration tinkering with the economy, hoping to end it, but he got nowhere. The Depression deepened and there seemed to be no way out of it. More

Amendment V

No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, *except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger;...*

and more people were put out of work until 25 percent of the American work force was unemployed. Then, in 1932, Franklin Delano Roosevelt was elected and a curious thing happened.

"As I had said earlier today, in the inaugural address he delivered for his first term, FDR first praised the legislative-executive balance of power

our government enjoys, but in the next breath threatened to ignore it, darkly hinting that he would assume dictatorial powers if Congress opposed the course of action he was about to take. The programs he was proposing to end the Depression were a surprise to the American people, including Congress, because they were contrary to the policies he'd promised he'd institute during his campaign for office. And what's funny is that his campaign promises would probably have ended the

Depression had he carried them out. But he took another route. He introduced socialistic

solutions, and instead of the Depression ending, it hung on for another eight years until, thanks to World War II, we went into a wartime economy."

"But Roosevelt has always been credited with ending the Great Depression," I said.

"I know. You said that earlier today. But, as I pointed out, Roosevelt didn't end the Depression. He never served even one minute in office over anything but either a depressed economy or a wartime economy."

"So, what course of action did he take?" Dave asked.

"Upon taking office, Roosevelt decided to manage the entire economy. He closed the banks, made the personal possession of gold illegal, and began creating

agencies to regulate all aspects of the economy. He acted without the consent of Congress and claimed his power stemmed from Wilson's *Trading with the Enemy Act* of 1917. This was the very same Act Wilson had created, before World War I, to seize German businesses."

"But you said that that act didn't pertain to the American people," Dave said.

"Roosevelt knew that. So, a few days after his inauguration, he convened Congress and, by a voice vote, the *Trading with the Enemy Act* of 1917 was amended to his satisfaction and the offending provisions were revised."

"Meaning...? Dave asked expectantly.

"That now, in accordance with the *Act*, during any emergency declared by the President, the *Trading with the Enemy Act* could be invoked, that he could create policy without consulting Congress, and that foreign powers weren't the only people subject to the *Act*. American citizens were, too."

"You're saying that Roosevelt now made it so that everyone fell under the jurisdiction of what was essentially a war powers act and that it applied to anything he deemed an emergency, not just war?" Dave asked.

"Yes, any emergency, and everybody was subject to it."

"And the Depression was an emergency," Dave said.

Mac nodded. "Remember," he said, "because it's important: with this new law, Roosevelt was able to declare emergencies and no longer had to consult with Congress when enacting his policies."

I nodded. Dave just waited for him to continue.

"Now," Mac said, "we can talk about Harry Truman and you'll see what came to make the difference between a legal and an illegal *Executive Order*."

"Truman, like FDR, used *Executive Orders* to advance his policies. Among other things that he attempted to do with them was to seize private property. Specifically, he attempted to nationalize the railroads in order to settle a strike. However, at this point the Supreme Court stepped in and ruled against that *Order*. Their reason for voiding the *Order*, the Court

The following is a list of *Executive Orders* signed by John Kennedy and is accompanied by a summary of what the EO says. Issued at the height of the Cold War, each contains the event of war as one of the reasons under which it could be activated. But each is also carefully worded so that the EO can take effect for any emergency declared by any President, and without the consent of either the people, the Congress, or the Courts. Each is written in accordance with the *War Powers Act*, but war is not a necessary condition for enacting them.

EO 10990; gives the government, (and since 1976, FEMA) the power to takeover all modes of transportation, control of highways, seaports etc.

EO 10995; allows the takeover of the communications media. (This means, of course, that even if Tom Brokaw, Time Magazine, or the L.A. Times wants to question any takeover, if one happens, such questioning can be declared illegal. Why the media doesn't question this is beyond me.)

EO 10997; provides for the takeover of all electric, power, petroleum, gas, fuels, and minerals regardless of whether they are publicly or privately owned..

EO 10998; provides for the takeover of food resources and farms including farm equipment.

EO 11000; provides for mobilization of all civilians into work brigades under the government's supervision.

EO 11001; provides for government takeover of all health, education, and welfare functions, both public and private.

EO 11002; designates the Postmaster General to operate a national registration of all persons.

EO 11003; provides for the government to takeover all airports and aircraft.

EO 11004; provides for the Housing and Finance Authority to relocate communities, designate areas to be abandoned, and establish new locations for populations.

EO 11005; provides for the government to take over railroads, inland waterways, and public storage facilities.

Many of these EOs have been amended since they were first issued to make them broader or more encompassing, and some have been consolidated with other EOs. None, however, have been abandoned and none have been rewritten to narrow their scope or limit when they can be invoked.

ruled, was that Truman had thrown the supposed system of checks and balances out of whack. They said he had overstepped his bounds by trying to create laws—namely, nationalizing an industry—when in fact, it is Congress' job to create laws.

"Now, they didn't rule that *Executive Orders* in general are illegal, because they're not. They just ruled that this one was not. What they said was that for an *Executive Order* to be valid it must either stem from the *Constitution* itself or from an act of Congress. And Truman hadn't based his takeover of the railroads on either the *Constitution* or on a law passed by Congress.

"Part of the ruling also stated that the President's job is to see that laws are faithfully executed, further refuting that he is the source of those laws or the lawmaker, himself.

"Now, along with remembering the *Trading with the Enemy Act*, you've got to remember what constitutes a legal *Executive Order*, because that's going to have an impact on what comes later."

"Because the *Trading with the Enemy Act* is now an act of Congress," Dave said. "And if a President bases his *Orders* on acts of Congress, which includes the *Trading with the Enemy Act*, then they're legal."

Mac tossed his hands in the air. "That's exactly right," he said. "*Executive Orders*, issued under any emergency declared by the President are now legal if they use the amended version of the *Trading with the Enemy Act* as their bases.

"For the remainder of his presidency, Truman issued plenty of *Executive Orders*, as has been the wont of all

20th century Presidents. And when Eisenhower sat in the White House, he too issued plenty of *Executive Orders*.

Kennedy's EOs

"Where it gets interesting is with the presidency of John Kennedy. During his short tenure in the White House, the United States and the Soviet Union began the arms race in earnest. In a few years each country had literally thousands of nuclear bombs pointed at the other and the threat of nuclear war seemed very real.

"The question arose: how would we survive as a society if a nuclear war started? How would such a war be conducted? Unlike World War II where battles could be fought over days and movements of troops and supplies could be conducted over months, the nuclear war that would be World War III would require lightning-fast decisions.

"To deal with this problem, Kennedy went on an *Executive Order* writing spree the likes of which this country never before saw. The *Orders* he wrote granted him, and subsequent Presidents, dictatorial powers, but not just in the event of a nuclear war. He also included any other emergency declared by the President. Go look on a government website and see what *Orders* he put in place. They're available for anyone to read. And those *Orders*, or their amended later versions, are still on the books."

"What do they cover?" I asked.

"They cover a multitude of things, from government control of transportation to communications. They include control of power, food, health—virtually every aspect of our lives. And, as I said, they don't say 'only in the case of a nuclear war.' And though the intent may have been honorable, the potential for abuse is considerable. And during any of these

crises, the *Constitution* is up in the air.

"Naturally, none of these *Orders* were voted on by Congress or by the electorate."

"But wouldn't *Executive Orders* that suspend the *Constitution* be ruled unconstitutional?" Dave asked.

"Suspension of the *Constitution* is allowed by the *Constitution*."

"You're kidding," Dave said.

I almost fell out of my chair.

"No, I'm not.

Article I, Section 9 of the *Constitution* and the *5th Amendment* both state that we cannot be arrested, tried, or convicted, *unless* we're in the middle of a rebellion, being invaded, or for other reasons of *public safety*. In other words, the *Constitution* could be suspended but only in the event of dire emergency. What 20th century politicians have done is create the concept of perpetual emergency. Under any ongoing emergency we have in this country, the government can do anything it wants and the *Constitution* has only been in effect at the pleasure of the President since 1933."

"Why doesn't Congress or the Supreme Court just call an end to the emergency powers?"

"They can't. Part of the Act of 1933 said the emergency was in effect until the President declared it was over. Counting Roosevelt as the first, we've had 12 successive Presidents, none of



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whom have seen fit to end the emergency and, therefore, all of them can issue *Executive Orders* that would seem contrary to the *Constitution*. Furthermore, the *Constitution* has been null and void any time any President has declared emergency powers since March 9, 1933. That's almost 70 years if anyone is doing the math."

"Then Kennedy's *Orders*..." Dave began.

"...and those in the same vein that have been passed by other Presidents..." Mac interrupted.

"...would appear to be a *real* threat," Dave said. "Do you think they would ever really be used for anything other than our survival during an all-out war?"

"The answer to your question is that no one knows. But it was by allowing one man to aggrandize so much awesome power that the Germans gave themselves Hitler. At some future

date we may be faced with the same kind of leader—and then again, we may not. We're not mandating a Hitler, but why a country that was founded on individual freedoms would want to clear the way for one is beyond me."

"Have any Presidents issued any similar *Orders* since Kennedy issued his?" Dave asked.

"The *Executive Orders* that sit silently, waiting for a President to declare the ultimate emergency, have been amended and consolidated and most have now come under the purview of FEMA, the Federal Emergency Management Agency. FEMA itself was created by *Executive Order* by Jimmy Carter, though similar, weaker, agencies existed before it, including Nixon's Federal Emergency Preparedness Agency, the forerunner of FEMA.

"Since Kennedy, Presidents have enhanced FEMA's powers so that during any emergency declared by the President it has the power to take control of all transportation; take over all electric, power, petroleum, gas, fuels, and mining; take over radio and television; take over food production including farms; mobilize any and all civilians into work brigades to be supervised by the government; take over health, education, and welfare; order the registration of all persons in the United States; and to relocate communities and any population groups as directed.

"None of this has been authorized, approved, or directed by Congress. The American people neither provide nor are they even allowed to provide input. There is no public debate.

"And last, it has the power to suspend the *Constitution*, if it deems it necessary."

"It's hard to believe this could happen," Dave said.

Mac said, "If there is a dictatorship imposed, the *Constitution* will not be amended. It will remain in place, but it will be void because of the ongoing

'national emergency' that will never end. Our *Constitution* will continue to be a showcase to the world, a demonstration of how men can govern themselves if they want to protect their rights. But it will not be in force. It will be dead.

"And that brings us to where we are today," Mac said. "Maybe it will never be acted upon. Perhaps, for the first time in history, as far as I know, the mechanisms for tyranny will be set in place but never be acted upon.

"Though the American people believe they have a constitutional democratic republic, what we really have are a mass of laws waiting silently for some President, for whatever the reason, to legally pull the trigger that will suspend the *Constitution* and legally make the man in the White House the only law of the land."

"But no President since FDR has threatened to act as dictator," I said.

"Just a few years ago," Mac said, "when the Republican controlled Congress and President Clinton were at loggerheads over some piece of legislation, Clinton hinted that, if the Congress didn't come around he would bypass them and enact the laws he wanted through *Executive Orders*. The media loved this threat to the Republicans, but none of them pointed out that Congress is supposed to be expressing the will of the people and enacting the laws of the land and that, if Clinton can bypass the Congress, he was, in fact, acting as dictator.

"Now, as it turned out, he didn't carry out his threat, but his message was clear: by simply declaring an emergency the President can enact any laws he wants and democracy, the Congress, the people, and the *Constitution* including the *Bill of Rights* be damned.

"Now, it may be that no President will ever act as a dictator, but why do we want to make that kind of power available?

"I believe, if most people were asked if they wanted this much power vested in any President, they'd say no. Yet the Congress, the people, and in particular, the mass media have ignored them and let it happen. We now have a dictatorship waiting to *legally* happen. We have a dictatorship in limbo. Maybe it will never happen. But letting these *Orders* stand is the equivalent of leaving a loaded gun on the kitchen table with a houseful of kids. Why would you do that, even if you felt like you could trust *most* of them?"

"Why doesn't the Congress or the Supreme Court just end these emergencies themselves?" I asked.

"They can't. The original emergency powers Roosevelt assumed as President are still in effect. In September of 1976 Congress considered, then failed, to end them. It wasn't that they refused to, they simply found out that they couldn't. By law, ending the emergency requires that the President declare that the emergency is over. No President since Roosevelt has felt compelled to do so.

"In fact, under the current law, any emergency declared by the President under the *Trading with the Enemy Act* continues until he himself declares it is over.

"The truth is that the overwhelming majority of people in the United States have lived under this quasi-dictatorship we now have in this country. They don't know any different. They think this is the way the country is supposed to be run. They don't realize that any time the President wants, he can declare an emergency and ignore the *Constitution*."

"So we could fall into a dictatorship of endless emergencies," Dave said.

"Yes. In his novel, *Nineteen Eighty-four*, George Orwell describes how the main character, Winston Smith, realizes that the country he lives in is under a perpetual dictatorship because there is a perpetual state of emergency, a perpetual state of war.

"That's where America seems to be headed today."

"Why don't people know this?" I asked.

"It's not something that's taught in high school civics, and I've sat in on political science classes in college and, as far as I can tell, it's never mentioned there."

"Why aren't newscasters talking about it?" I asked.

"Why would they? Television newscasters aren't journalists; they're celebrities who read what's put in front of them. And the few journalists who do point it out suffer ad hominem attacks in which their character is attacked and the issue itself is ignored."

The solution

"Is there a solution?" Dave asked.

"Of course there is," Mac said. "In fact, of all the things that make a dictatorship possible in this country, this is the one that could be most readily solved. But I don't think it's going to happen."

"What's the solution?" Dave asked.

"The first step would be to start making government by emergency a campaign issue in the next presidential election, and every presidential election until this government by emergency edicts is abolished. Make it a litmus test for the presidency.

"Of course, before it can become a campaign issue, the major media outlets are going to have to inform the public. I don't think it's going to happen."

"Why?" Dave asked.

"Because most of them are unaware of it, and as the media is largely liberal, government by decree was initiated by one of their own and they're not going to want to undo anything promulgated by one of their own.

"But a 30-minute segment on *60 Minutes* and cover articles by *Time*, *Newsweek*, and other large circulation newsmagazines would go miles toward exposing to the American

public that we are no longer truly a democratic constitutional republic."

"The second step would be for Congress to repeal Title 12 USC 95(a) and 95(b). These are the amendments to the *Trading with the Enemy Act* by which Congress vested so much power in the President.

"The third thing we should do is take past *Executive Orders* that have been vaguely written so they cover virtually anything the President deems to be an emergency, and specify the emergencies those *Executive Orders* can cover and place a time limit for which they can be in effect. The way Kennedy's *Executive Orders* were sold to the public—what public that actually listened—was that they were needed in the event of nuclear war. So limit them to nuclear war. Would that be too difficult?"

"And if the the *Executive Order* is required for an emergency, it should be an emergency with a sunset date or with the words, 'until Congress can convene to consider the matter,' or some other such phrase?"

"Is that it on the dangers of *Executive Orders*?" Dave asked.

"We could go on, but this more or less sums the dangers up."

"You said you thought there were dangers from the creation of the new professional Army we now have."

"Except it isn't so new anymore," Mac said.

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"What do you have to say about that?" I asked. "I think the concept of a professional Army is great."

Mac got out of the chair again. "I can't talk about this stuff on an empty stomach. Let's get out of here and find some lunch."

"All you do is sleep and eat," Dave said.

"Is that a problem?" Mac asked as we walked out the door. Δ

In future issues they will discuss how the government will eventually control the Internet, how the conversion of the military from a "citizen army" to a professional army is a danger to us all, and, though we don't like to admit it, why the United States is, in reality, now a fascist country.

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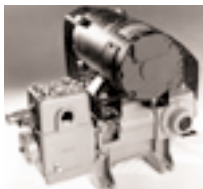


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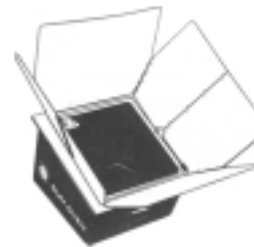
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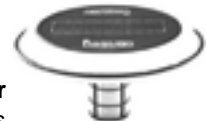
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Powering medical equipment during a utility blackout

By Michael Hackleman

Most people consider blackouts a nuisance. However, for some folks, a blackout can be paralyzing or even deadly, particularly if a critical piece of medical equipment lacks electricity. A standby generator is not always a good or practical undertaking, particularly for folks living in the city, an apartment building, or retirement home. For these applications, a small battery pack and inverter interconnected with the utility grid offers a low-profile and cost-effective measure against the impact of a blackout. Designed and installed correctly, it is kept in constant readiness and ready to go to work immediately (even instantaneously) when grid power goes off.

The process of designing such a system is within the capacity of anyone who wishes to tackle it and can do some simple math. To illustrate the process, I'll relate the experience of a recent consulting job.

The initial contact

"I saw an article online that you wrote entitled 'What if the electricity goes off?' (BHM, Jan-Feb'99, and BHM web page). I have two friends who are dependent on medical equipment for their basic needs. We've already had a couple of blackouts where they had problems associated with the loss of this equipment. Because they live in a condominium development, solar, wind, and hydro adaptation and additions are not allowed. Generators also represent a problem because of their installation, maintenance, fuel, noise, and size limitations. I consid-

ered a UPS (uninterruptible power supply) but was told they run their load continually from the time the power goes out until they are exhausted—even if you're not using it to run anything. To me, this means if the battery stores an hour's worth of energy and the blackout goes two hours, then you won't have energy past the first. I don't want to invest in several really heavy UPS units in order to get 5 hours worth of energy.

So (correct me if I'm wrong), I figured a battery-powered inverter system attached and charged through the circuit breaker box would work best. If I understand correctly, the energy stored this way is not used during a blackout unless you actually run something on it. So, my friends could use it on and off during any length of blackout until they've used up the stored energy. Even an hour's worth of electricity would get them up and down their stairlifts about six times each.

The medical equipment they depend on is as follows:

Handicapped stairlifts (2). One to upstairs bedroom and only bathroom, and one to basement bedroom. Each has a 15A (amp) spike on start-up and 9A running, at 120Vac (60-cycle). These stairlifts are needed for several runs up and down the staircase during a blackout.

Oxygen Concentrator. Make oxygen. It is not life threatening because they can use portable backup tanks and can go short spurts without it. However, it is definitely necessary to have unit back online as quickly as possible. Unit draws 5A at 120Vac. It'd be good if this could run continuously for 2-5 hours (usually length of blackout).

If you have the time or resources, could you suggest someone in my area that could expertly install such a system or help with any other backup plan you might suggest?

Thanks, Lynda S.

Gathering the info

Lynda did a good job of describing the three loads (two stairlifts and an oxygen concentrator). The power consumption of a load is defined by volts, amps, and wattage. Since wattage equals amps multiplied by volts ($W = VA$), you only need two of these values to compute the third. By law, two of these values must be printed on a plate or otherwise detailed somewhere on the unit itself. It may also be found in any product literature or manual.

A critical piece of information was missing in Lynda's initial contact. How long does it take for the stairlifts to go up and down between floors? The analysis of the power consumption of any load essentially involves wattage and time. I immediately e-mailed Lynda and she supplied the information.

"It takes 30 seconds for a stairlift to go up or down."

This was all the information I needed.

The load chart

The first step in finding the overall load on a system is to build a load chart. There's a line for each load—light, appliance, tool, refrigerator, etc.—and columns for various entries (Fig. 1). This arranges all the information in a way that makes it easy to record the values, do the needed math, and add up the results.

Fig. 1 Load Chart

AC Load	Volts	Amps	Watts	kW	Cycle	Freq.	kWh
Stairlift Surge	120	9	1,080	1.08	1(m)/0.017(hr)	1	0.018
	120	15	1,800	1.8	<1 sec	Start-up	
						6 12	0.108 0.216
Oxygen Concentrator	120	5	600	0.60	1 (hr)	Constant	0.60
					5 (hr)	Constant	3.0

A. Load Analysis

Application definition: Provide electricity for routine use of two stairlifts and continuous operation of medical equipment (an oxygen concentrator) for a blackout with a duration of 5 hours.

Stairlifts

Stairlift motor wattage is defined as:

$$\text{Surge}^* = 15\text{A} \times 120\text{V} = 1,800 \text{ watts, or } 1.8\text{kW}$$

$$\text{Run} = 9\text{A} \times 120\text{V} = 1,080 \text{ watts, or } 1.08\text{kW}$$

*The surge rating describes the inrush of current as any motor starts to spin and operates something. The surge lasts for, at most, a few seconds. Surge must be considered for its effect on other loads, the circuit itself ("nuisance" trips of a circuit breaker), and any inverter that must supply this burst of energy.

The stairlift, as the Load Chart reveals, consumes 0.018 kWh for each cycle (go and return) where the frequency of use is:

$$6 \text{ cycles} \quad \text{consumption is} = 0.108\text{kWh}$$

$$12 \text{ cycles} \quad \text{consumption is} = 0.216\text{kWh}$$

Oxygen concentrator

Oxygen concentrator wattage is defined as:

$$\text{Run} = 5\text{A} \times 120\text{V} = 600 \text{ Watts or } 0.6\text{kW}$$

The oxygen concentrator, as the Load Chart reveals, works at a rate of 0.60kW (600W) and, in one hour's time, will consume 0.60kWh. At other rates:

$$3 \text{ hrs} = 1.8 \text{ kWh}$$

$$5 \text{ hrs} = 3.0 \text{ kWh}$$

$$12 \text{ hrs} = 7.2 \text{ kWh}$$

Observations

The stairlifts are big loads that run very briefly. Their wattage, individually or combined, will determine the inverter's maximum wattage rating. The oxygen concentrator is a relatively small load which runs continuously and hogs the energy requirement. Its usage will dictate the size of the battery pack.

Why? Compare the energy consumption of the oxygen concentrator after one hour (0.60kWh) versus the energy consumption of 6 cycles (12 one-way trips) of the stairlift (0.108kWh). The oxygen concentrator has consumed 6 times the energy as a whole day's worth of stairlift use and has four more hours of work to do. This is the classic case of the small-and-long load taking the lion's share of the energy pie over the big-and-short load.

I highly recommend taking the time to build such a chart for two reasons. First, it's a good way to avoid mistakes, since they can't easily hide from view. And, secondly, it's one way to get in touch with how much of the energy pie specific loads consume. For example, small loads that are on for a long time often take a bigger slice out of the available energy than a big load operated briefly, as this particular load analysis will tend to bear out.

The analysis

On the load chart, I listed the two devices—stairlift and oxygen concentrator—and the info Lynda had given me. Some notes:

1. **Wattage** is expressed both in watts and kilowatts. Which one do we use? In idle conversation, probably wattage. In low-voltage (i.e., 12V) systems *without* an inverter, the Ah (Amp-hour) is a good standard. However, in utility-tied systems, the standard of measure is the kWh (kiloWatt-hour), where:

$$\text{kWh} = \text{kiloWatts} \times \text{hours}$$

[Note: Your current utility bill will tell you how many kWh of electricity you used during the last month.]

For the math of the load chart to work correctly, then, we must adopt a standard measure and convert any values to the appropriate expression. Math folks say this helps the terms to cancel out. Teachers say it helps if everyone is on the same page. Since 1kWh equals 1,000W, we can convert any wattage to a kWh value by dividing it by 1000.

For example, the 600W load (oxygen concentrator) is equal to 0.6kW (600 divided by 1000).

2. **Duration** (of the load) is given in both minutes and hours. If the load is operated briefly and this time is defined in minutes, you must convert this value to hours for the math to work correctly.

For example, each stairlift takes 30 seconds to go between floors (up *or* down). Reasoning that the start and stop point of the lifts each day are the same, I've defined a *cycle* of operation as an up and down (go and return) which takes 1 minute (60 seconds).

Now, let's define the cycle duration of this load in hours. Since one hour equals 60 minutes, the 1 minute duration of a stairlift cycle is 0.017 hours (1 divided by 60).

3. If you're making up your own load chart and have listed the wattage and duration (in minutes) of each load of concern, make your *next* task the conversion of these values into kWh and hours.

4. Converting values of wattage and time into kWh and hours is the challenging part of any load chart. When you're done, you are over the hump.

The inverter

An inverter is an electronic device that converts dc electricity—usually from battery pack voltages of 12V, 24V, 48V, etc.—into 60-cycle, 120Vac like that available from the utility grid.

Most of today's inverters are designed to supply their rated wattage continuously and will briefly handle the surge (startup) current when inductive loads such as motors are first started. Nevertheless, it's best to include such information on the load chart since simultaneous startups (rare but possible) of several motor loads may exceed the capacity of a specific inverter to handle such a combined surge. Most inverters have overload protection, shutting down automatically to prevent damage, but the result is a blackout to the loads they supply.

Many models of inverters today are designed to be interconnected with the utility grid. There are many advantages to this marriage. One is

that as long as utility electricity is available, it feeds through the inverter to power the loads directly. In the same mode, it also works as a battery charger to keep the battery pack at full capacity.

When a blackout occurs, the inverter shifts into full operation. Internally, its transfer switch shuts the battery charger off, turns on the inverter, and directs the energy of the battery pack to all ac loads (up to its maximum rating)—all within a fraction of a second.

Another common feature of today's inverters is the sleep/search feature. When this inverter has no loads to power, it puts itself to sleep while activating a search pulse that looks for newly-activated loads. The most efficient search (slow) setting means that you must wait for a fraction of a second before, say, a light comes on when you've thrown the switch. The search pulse has to see this load and wake up the inverter to deliver the juice. The feature is adjustable if you find the wait some-

B. Inverter Analysis

Continuous rating:

A. All loads operating together.

Stairlift 1 + Stairlift 2 + Oxy. Conc. = Total

$$1,080W + 1,080W + 600W = 2,760W$$

B. Lifts *never* operate at the same time.

$$1,080W + 600W = 1,680W$$

Intermittent rating:

Surge is 6A above the continuous run current of 9A for either stairlift. The surge wattage, then, is 720W (6A x 120V) above continuous rating. This is well within the capability of most inverters to handle for many seconds.

Recommendations

1. An inverter rated at 1,800W (or higher) continuous rating will easily handle the load if the stairlifts are *not* used simultaneously.

An inverter with a 2,500W (or higher) rating will be needed if the stairlifts must be able to operate at the *same* time.

2. Motor surge is not an issue with *either* inverter as they are designed to handle this surge. However, make certain the circuit breaker that feeds utility grid power to the inverter is capable of handling 15A continuously (with surge up to 20A) without tripping.

3. Select an inverter with a battery charger feature built in. It is generally more expensive to buy an inverter *and* a good (separate) battery charger. Also, when combined in one unit, there's better overall regulation and less likelihood of overcharge, undercharge, etc.

4. Inverter should have a load-sensing feature so that it remains in standby until any one of these loads comes on.

5. The electrical code wants the inverter tied into the utility main (or sub-panel) through its own breaker. You may be able to use one of the two (i.e., 15A or 20A units) that presently control the stairlifts. More likely, you'll need to upgrade the breaker slot to a 25A or 30A breaker.

Your running load is 9A (one stairlift at a time) plus 5A (oxy conc), so 14A minimum. This will probably pop a 20A breaker with the surge of motor startup. A 30A breaker will handle this easily.

6. The inverter has three sets of terminals: ac in, ac out, and dc in/out (Fig. 2). The utility grid (or a standby generator) is connected to "ac in." The loads connect to "ac out." The battery connects (through a fuse/switch or dc circuit breaker) to the inverter at "dc in/out." The in/out designation refers to inverting vs charging modes, respectively.

how unbearable at a slow search setting.

It's these two features—line-tie and search mode—in the inverter that make this type of backup system so desirable. It's on the job quickly, sleeps to conserve energy, and keeps the battery pack charged and ready to go—all without any knob-fiddling or attention from you.

What loads will the inverter need to handle? Sizing the inverter looks at continuous and intermittent ratings, singular and simultaneous use of important loads, and any motor surges (Sidebar B).

The battery pack

Many people cringe at the thought of investing money in 4 or more batteries to make up a battery pack. Why? I think it's because they think they may have to replace this battery pack as frequently as they do the battery in their car.

Fortunately, this is *not* true. A battery tends to last 2-3 times longer when used in stationary applications. Why? In cars, a battery is exposed to the heat and vibration of engines in

close proximity, road shock, and cold weather. Stock golf cart batteries will last at *least* 5-6 years in an RE system, and ones specifically tailored to RE systems will last ten years and more.

While there are many choices for batteries to use in this application, a good standard to start with is the conventional 6V, 220Ah (amp-hour) lead-acid battery like that used in golf carts. It has a maximum capacity of 1.3kWh (6V x 220A) at an 8-hour discharge rate. This means the battery will deliver 27.5A (220Ah divided by 8 hours) for an 8-hour period. Be careful. The math suggests that this battery will deliver 110A (27.5 times 4) for 2 hours because the product equals 220Ah. It won't. At discharge rates higher than the 8-hour rate, the chemistry is strained and the losses get big fast.

In the industry, then, the capacity of this battery is *adjusted* to a more realistic 0.75 kWh capacity (or lower) *per* battery to account for the higher discharge rate (in this application, a 150-200A rate) and the fact that no battery pack should be dis-

charged completely. By adhering to the recommended 50% depth of discharge, the owner/builder can be ensured of a good, long service life for the battery pack.

How big a battery pack is needed for this system? Let's consider two blackout scenarios: 5 hours and 10 hours (Sidebar C).

The battery pack may be rated at either 12V or 24V. If wired as a 12V pack, two sets of the 6V batteries will be wired in series and then parallel-wired together (Fig. 2). If wired as a 24V pack, all four batteries are wired in series.

Choosing a 24V arrangement generally has the advantage of lower line losses for a given size of wire if there's a big distance between the battery pack and the inverter. There are two advantages in this application for the pack to be wired for 12V instead of 24V. One, it's easier to tap a 12Vdc pack directly for emergency lighting because there are more products available at 12V than 24V. This strategy avoids the use of an inverter for this function. Two, if it is to be increased in capacity (now or later),

C. Battery Pack Analysis

Let's size the battery pack for the indicated loads for a 5-hour and 10-hour blackout.

1. A 5-hour blackout. The stairlift system needs 0.018 for each cycle (up/down). Let's figure 5 cycles, or 0.09kWh (5 x 0.018kWh).

The oxygen concentrator needs 0.6kWh for each hour of use. Let's figure 5 hours of continuous use, or 3.0kWh (5 x 0.6kWh).

The total demand, then, is the stairlift load plus the oxygen concentrator load, or 3.09 kWh (0.09 + 3.0)

At a capacity of 0.75kWh for each 6V, 220Ah battery, four batteries will store 3.0 kWh (4 x 0.75kWh). This

pack capacity is a close match to the *load requirement* of 3.09kWh.

2. A 10-hour blackout. If the load conditions are the same—five additional cycles of the stairlifts and full time operation of the oxygen concentrator—the battery pack needs only to be doubled in size (eight 6V, 220Ah batteries).

Recommendations

1. Avoid a bigger battery bank (\$440) by minimizing operation of the oxygen concentrator during a blackout. Avoid a larger inverter (\$1,000) by never operating the stairlifts together.

2. The electrical code wants a DC disconnect between the batteries and inverter. This is high current at low voltage (12V). It's more than 10

times the current at 120Vac for the same wattage. Only 15A of 120Vac loads will draw 150A of dc current from the 12V battery pack.

3. Electrical code requires automatic *and* manual shutdown of the battery-inverter circuit. So, a big fuse and power switch *or* a dc breaker (works like standard circuit breakers, popping with a big load or shutting off with a pull on the switch) is needed. Fuses are expensive and no fun to change in the dark. However, in this system of *fixed* loads, the fuse/switch idea has merit. A breaker-type DC-disconnect switch is best overall, but a more expensive option.

You'll need miscellaneous connectors and fittings in this installation, i.e., the big cables that run between

a 12V battery pack will take a 50% increase in capacity whereas a 24V pack will need a 100% increase. That's because the 12V pack will need a minimum of 2 more batteries (two 6V batteries wired in series) added in parallel with the first set(s)—a 50% capacity increase. A 24V pack will need a minimum of 4 batteries (series-wired 6V batteries) added in parallel with the first pack of 4—a 100% capacity increase. The point? It's less expensive to add capacity in a 12V pack than a 24V one.

The battery pack and inverter should be next to each other since they're interconnected with a big electrical cable. However, the inverter and battery pack may be located either near the loads or near the sub-panel to which they're presently wired.

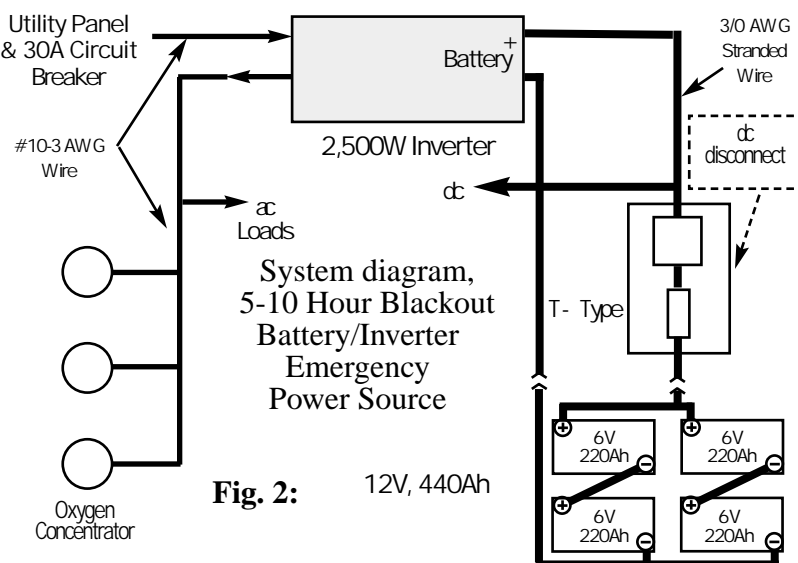
Additional questions

I sent Lynda my findings—load chart, load analysis, the sizing info on inverter and battery pack, and a system block diagram (Fig. 2)—for her review. I had a few questions of my own. Did the users have a way to illuminate their surroundings during a blackout at night or should a few lights be added to the system? Were the stairlifts wired into a sub-panel?

Below, I answer the questions Lynda asked of me in response to what I sent her.

1. How often do we need to replace batteries, parts etc.? What kind of maintenance does this system require? Can we put them on the floor or do they have to be on a shelf? Should they be in a vented, insulated (w/ what?) casing (wood?) or can they stand on their own? Is it safe to have near a bedroom? (The breaker box is on the unfinished side of the basement/bedroom).

You can expect deep-cycle, off-the-shelf golf car batteries (lead-acid) to last at least 5-6 years. For 30% more



money, you can get ones that will last *twice* that long (10-12 years).

Flooded cells will need to have water added periodically (twice a year, or more often). For a little more money, you can get sealed lead-acid or batteries which have virtually no maintenance. These are a better choice for any system where the batteries are located in the house.

An inexpensive way to safely store batteries inside a house is in a plastic tub with a cover (same type of plastic and lids as are used in trashcans) located near an outside wall. These are available from hardware or home improvement centers. If you can't get one big enough for the entire battery pack, get two tubs and place them side by side. Install a fitting at the lowest point in each (bottom or side) that will let you run a drain hose outside. It's also recommended that you add a vent (same as used with clothes dryers) in the side (near top) for carrying off any gases (oxygen and hydrogen) produced during heavy charge or discharge to the outside. Flooded batteries may "spray" out some electrolyte during heavy charge or discharge. If you use the tub-and-drain fixtures I've specified, you can literally hose off the batteries (turn off the breaker switch first)

inside their enclosure, further diluting an already weak electrolyte solution and letting it drain away harmlessly onto the ground outside.

The batteries should be located as close to the inverter as possible because of the big wire (00 or 000) used to interconnect them. It's expensive (\$1-2/ft), so you want a minimum run of it. If both of the stairlifts are connected into the same breaker box, this might be the best location for the batteries. The battery pack and inverter can also be located elsewhere (at a distance from the existing breaker box), i.e., a closet, utility room, or even near the stairlifts. If located outside, the batteries will want to be insulated to protect them against the cold your region (New Hampshire) experiences. Wherever you put them, keep the inverter and battery pack close together.

Plan on a #10-3 (awg) wire set between the utility panel and inverter and between the inverter and the loads. The #10-3 insulated wire has three wires—black (power), white (common), and green (ground)—and can be run inside EMT (electrical metal tubing) or plastic pipe. Or use romex-type wire. This wire will handle the combined load (9A stairlifts,

5A oxygen concentrator, plus lights) with no more than a 5% loss.

By the way, electricians are *not* accustomed to working with batteries and dc systems. Still, even a skillful layperson can do this wiring or direct the installation of this system.

Finally, adding more batteries is not necessarily difficult, or something you have to do right away. That is, put in a 3kW battery pack and check out its operation, then decide if more batteries are dictated or desired. It's easy enough to add them, particularly if you're using tubs.

(Never place batteries directly on concrete. It adversely affects the electrolyte levels between battery cells. Result? Bad chemistry.)

2. *What is needed to add, say, 4 small lights—one in each bedroom, one in the kitchen, and one in the living room?*

The system as designed should be able to handle a lighting load *without* additional battery capacity *if* small, low-wattage, efficient fluorescent (12Vdc or 120Vac) or LED-based (cluster) lamps are used and operated minimally.

Avoid incandescent lights. They typically use 4 times more power than a low-wattage incandescent (light) bulb. The LED cluster lights are 4-10 times more efficient than even fluorescents, thus worth every penny of their cost. The lamps use clusters of red and yellow standard LEDs (light-emitting diodes) to the desired illumination level. More expensive than other lighting systems, they use little power and last forever.

Wires for 120Vac lights can branch off the stairlift wiring, either at the stairlifts or directly from the inverter. Any 12Vdc lights can use romex wire (usually a no-no for dc electricity) since LEDs draw virtually no current.

Fig. 3 Inverters, batteries, connectors, and dc disconnects

I asked Steve Willey at Backwoods Solar, a reputable RE dealer, for quotes on the components—inverters, batteries, dc disconnects, and cables—for this installation.

Inverter The requirement here has the greatest option as to quality and type. Requirements seem to match well with the new ProSine 2000, a 2kW true sine wave unit with 100A charger (built-in), 12V only, \$2,000. ProSine also makes a 2,500W available for 12V (\$909) or 24V (1,000). Trace DR1512 (12V, \$1,029) or DR1524 (24V, \$979) will do it with little margin, whereas DR2412 (12V) and DR24 (24V), each \$1,395, will work with plenty of margin. These are all combined battery charger/transfer switch units (work with line-tie or standby generators).

Battery Pack. As you suggested, 4 Trojan T-105 (golf cart type),

220Ah, 5-6 year lifespan, \$300 total. Or use two L-16HC 395Ah, 10 year lifespan, \$440 total. Generally, we can supply batteries through local Trojan newtwork for customer pick-up, therefore no shipping and tax involved outside of Idaho.

Cables. Between battery pack and inverter, size 4/0, 10 foot length, \$70. Battery interconnect: 2/0 cable. Single (for 10-year pack) is \$6, or 4 (for 5-year pack) are \$16 total.

DC Disconnect/Fuse. Can be a simple in-line fuse, \$69. The class T fuse may be more suitable for this compact system since it's unlikely to ever be blown. Trace DC breaker box, \$329.

All of these components are usually available within two weeks, most within a few days.

(Backwoods Solar, 1395 Rolling Thunder Ridge, Sandpoint, ID 83864. Phone: (208)- 263-4290 Fax (208) 265-4788 Website: www.backwoodssolar.com)

3. *If the inverter must handle 3000 watts, did you mean to recommend a 2000W inverter? (Probably something I don't know, but thought I'd ask.)*

Sorry for the confusion. If the loads are managed somewhat, the cost of the system will be \$1,000 *less* than if the users wish to have the option of running both stairlifts at the *same* time. The difference is in either using a 2,000W (managed) or a 3,000W (unmanaged) inverter—and a dollar per watt price tag.

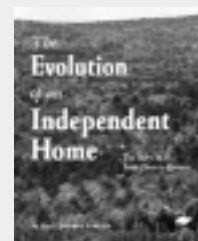
Note that in the final analysis of how this system will perform in a 5-hour blackout that I was generous with the number of stairlift trips. That's because they are such a *small* drain on the batteries due to the brevity of their use. Conversely, these folks could easily stretch their power availability in a prolonged

blackout by minimizing the operation of the oxygen concentrator. It is such a big drain on the system. True, they can *buy* their way into extra reserve with the batteries but conservation is cheap *and* effective if they've enough cylinders charged up to help them manage. It's just one of many strategies.

(Michael Hackleman, P.O. 327, Willits, CA 95490. e-mail: mhackleman@saber.net.) Δ

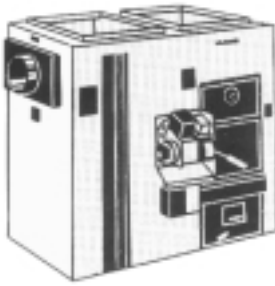


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Finalizing a hydro-electric installation

By Michael Hackleman

Once the snow cleared off the land, I was able to walk the newly-installed pipe track to inspect for damage. The wet, heavy snow had blanketed the area, felling scores of trees or their branches. The temperate climate had permitted an above-ground pipe track for this hydro system, increasing its vulnerability to falling debris or slides. Luckily, all 300 feet of pipe track were unscathed. I was ready to finish the hydro-electric system begun many months ago.

This article will cover the installation of the water diversion system at the culverts (the source of water for the system), electrical connections to the existing RE (renewable energy) system's batteries, fabrication and siting of a basic monitoring system, and first operation of the hydro-electric unit.



1

[This is the fourth in a series of articles on hydropower which details the processes and hardware involved. In Do-it-Yourself Hydro Survey (BHM, Jan/Feb 2001), a site survey established the potential to generate power from the seasonal flow of water in two streams. In Restoring A Hydro Unit (BHM, Mar/Apr 2001), the alternator of a Burkhardt turbine was rebuilt and a simple, practical control unit was fabricated for it. In Installing a Hydro System (BHM, May/Jun 2001), most of the system's components—pipe track, hydro unit, wiring, and sediment barrel—were installed and connected together.

This article reflects the completion of the actual installation at Motherland outside Willits, California.]

2



1. Donna D'Terra and PV system (roof panels to right of stovepipe) will get wintertime help from the hydro unit.

2. Safety belt attached, Michael Hackleman installs the culvert dams.

3. The hydro unit is temporarily sited for a season's use.

3



Water diversion

I left the method to tapping the culvert for the water that would feed the system to the very last. I've been intrigued with this idea for some time. A culvert's job is to collect a flow of runoff and safely pass it under a road. Need a source of water for a hydro system? Why not siphon off most of this water while it's still all gathered together?

There are challenges to tapping a culvert for its water. The water may be accelerated through the culvert. It will vary considerably in flow rate. The water may be transporting debris, sometimes large rocks and tree parts. Somehow the water must be diverted into a pipe while letting the bigger stuff move on.

I'm not afraid of benefitting from the experiences of others. Unfortunately, every hydro installer I knew had *not* tried to tap a culvert as an inlet for a hydro system. Darn, I'd have to figure out everything by myself. I sketched out possible designs. Clearly, I wanted any debris to move on *without* accumulation. At the same time, the water must freely find its way through the diversion pipe to the sediment barrel, through the filter, and into the intake of the pipe track.

I considered and rejected many ideas for tapping the culverts. One was a multi-holed metal pipe running along the floor of the culvert for some distance. Or several of them. Or extending a lip out from the culvert with its lower portion screened to funnel water into a pipe. Or some kind of partition (dam) to block part of the flow. Each had its merits and shortcomings. The fact that a sediment barrel existed in the system—and that it incorporated two stages of filtering for the intake—helped me see that whatever system diverted the water could also initially handle mud, sand, and rocks up to 1 inch in size. For this reason, I elected to fab-



4. Old Hibachi grills were used for the deflection plate in the culvert dam.

ricate what I've come to refer to as a culvert dam.

The culvert dam assembly consists of 4 pieces: the dam plate, the intake tee, the deflection grate, and a weir (Fig. 7). Briefly, the dam plate seats against the inside curve of the culvert and pools the water. The intake tee collects the water and channels it through a pipe that penetrates the dam plate, runs 20-30 feet to the sediment barrel, and shoots the water out across the screened top. The deflection grate is designed to assist large rocks over both the intake tee and the top of the dam plate. A weir is cut into the top of the dam plate to lower the dam height and provide a means of measuring overflow.

The dam plate. Both of the 18-inch culverts I would tap had a spiral form to them, like the threads of a screw. This gives the culverts strength *and* slows the water that passes through them. The spiral is coarse (sharper angled) in the middle and finer (more round) toward each end. I wanted my dam to fit down into one of these grooves so it could benefit



5. A flattened and hot soldering tip slices its way through plastic refrigerator shelves that are recycled into dam plates.

6. The grills are fastened to the 2-inch intake tees with plastic ties.



7. The culvert dam for the south culvert is ready to install.



8. Front and rear views of the culvert dams show few differences between the two assemblies.

from the support it got all through its curve against the flow of water. Working from the culvert's end and measuring from the *inside* of the spiral on each side, the diameter was close to 18 inches. Measuring from the *outside* of the spiral on each side, it was about 19.2 inches. A 9.5-inch

radius (half of a 19-inch diameter) of dam curvature, then, allowed for a snug fit and some allowance for a gasket.

While I was tempted to use thin steel plate for the dam, I elected to first try plastic material. Why? With prototypes, it's best to build fast and

modify as needed. Plastic can be worked with simple tools. I searched first my own house and shop for suitable materials to no avail. I had no luck at hardware stores, either. I fared better at a local surplus store, finding two heavy plastic shelves sal-



9. A split rubber hose acts as a gasket for the culvert dam.

10. Holes are drilled for the barrel bolts that secure the diversion dams in the culvert ends.



11. PVC pipe attached to the culvert dam is not glued so that it may be easily removed.



12. With my old tower safety belt secured to a bolt I had added to the northern culvert, I worked hands-free adding the culvert dam.



13. The diversion pipe from the culvert dam can be removed and tied off when not in use.

14. ... or slipped into its fitting to route water to the intake of the hydro system.

15. Water in pipes from the culvert dams shoots across the barrel's brass screen.



vaged from refrigerators that were big enough to work.

I already knew that I did *not* want the dam plate to be very high. Obviously, any *material* captured by the water's flow must pass over the dam plate *or* out through the intake *or* find itself trapped. This debris (rocks, sand, soil, leaves, and bugs) would build up and could block the intake. The lower the dam plate, the more likely any large debris would be flushed over it.

Meanwhile, I also needed to work out a method of securing the dam plate to the inside of the culvert. I wanted it to be easy to remove the culvert dam to release debris accumulated behind it. And—if the plastic dam plate was broken (by big rocks tumbling through the culvert), I would need to replace it with an improved design. Either way, since

the system was capturing seasonal water, it would be cold *and* flowing. This led me to want to anchor the dam plate on both sides near the widest point of the culvert so the anchor hardware was never underwater. The two plastic refrigerator sections were just a little too wide to fit inside the culvert. Checking this fit, I could see that it was possible to retain a lot of the structural integrity of the refrigerator shelves *and* have some strong anchor points IF I used the strongest of the original *edges* of both pieces. Unfortunately, this would result in a high dam, which was somewhat mitigated by cutting a weir shape in the final dam plates.

I was ready to fabricate the dam plate. I used a second circular laundry basket with a 19-inch diameter to actually scribe (mark) the arc onto the dam plate. Rather than use a jig

saw to cut out the dam plate, I again opted to use the soldering iron and *slice* (melt) my way through it, as a melted edge is generally stronger than a cut one. As well, it also eliminated any chance the plastic would shatter as it might with a cutting blade. It took 2-3 minutes to melt my way around the curve.

I tested the fit of this piece in each of the two culverts my next trip out to the site and was satisfied with the result. At the same time, I solidified the anchoring scheme. While the dam plate anchors needed to be strong, I also wanted them easy to remove. I could satisfy both factors by attaching ordinary barrel bolts (for doors or gates) to the top of the dam plate on each side and sliding the bolt through holes drilled in the sides of the culverts. With the dam plates pushed down into one of the

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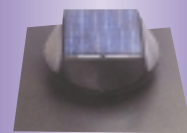
The quality light pipe chosen by NASA & the U.S. COAST GUARD. Superior design & performance.

Both are Easy to install under 2 hrs.
No structural changes required.
Significant energy cost savings.



The Solar Powered

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Cool Your Hot Attic For Free!

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culvert's spiral grooves, it wouldn't be pushed out by the rushing water.

I brought all the parts home with me and purchased the barrel bolts and other hardware. I fashioned the second dam plate with a lower dam height, angled barrel bolts, and a shallower weir. I used the heated soldering gun blade to make the hole for the intake manifold at each culvert dam and to otherwise shape each plastic piece for a strong, good fit.

Intake tee. To increase the amount of water diverted from each culvert, I added a 2-inch tee to the pipe positioned through the culvert dam. Since the sediment barrel had *two* methods of eliminating debris (screen and filter), I added no filter at the intake tee in the culvert dam. Instead, I figured to let anything smaller in size than 1-inch in diameter flow *into* the intake tee and down the pipe to the barrel to be ejected when it hit the brass screen. Hopefully, this would go a long way toward preventing the buildup of rocks, gravel, and sand behind the dam plate over time.

I already knew the outside diameter of 2-inch pipe to be 2.375 inches. I would need to cut or slice (melt) this size of hole at a low point in the dam plate to pass the intake pipe. Since the dam plate actually sits in one of the big spiral grooves, I was able to test fit the dam plate and mark where the pipe should be when the fittings were installed.

Time to make parts. I used the soldering gun to slice out the 2.375-inch hole. I used a large quarter wood file to smooth the ragged edges. Next, I cut a piece of 2-inch pipe just long enough to glue to the inside tee, go through the hole, and end in a 45° elbow, sandwiching the tee and elbow flush against the dam plate. I elected *not* to glue the second PVC connection, relying instead on silicone sealant to keep this assembly

together. To later take it apart, I needed only to cut through the sealant and pull the fittings apart.

So that the 2-inch holes in the intake manifold (tee) would not ingest a rock big enough to jam them, I drilled several holes to pass a 16-penny nail vertically through each side of the tee to form a rough grate. Why a nail? It could be lifted out to release debris and dropped back in—all *without* the need for tools. To facilitate this, I added a rubber grommet to the nail to hold the head of it above the tee for easy removal.

Deflection grate. I was concerned that a large rock carooming through the culvert might shatter the dam plate, crack the intake manifold, or snag. I went in search of a grate that would work like a ramp and deflect any large stuff up and over the dam plate. Since it needed to absorb the impact, I wanted it to be hard. Part or all of a grill like that used in barbeque sets sounded right.

I found nothing I could buy new in a store. In a local Salvation Army store, I was blessed to find two small Hibachi grills with handles that were identical in size. I removed the handles and positioned them over the tee and up to the lip of the culvert plate. I used a plastic tie on each end of the intake tee to secure the grate's cross-piece. This proved strong and nicely adjustable.

Weir. The weir cut in the dam plate was an afterthought. Some kind of cutout in the lip of the dam plate was needed. I wanted the anchor points for this plate high but the overall height of dam should be low so debris would be flushed out at the flow rates the hydro system was designed to handle.

It was at this point that I first thought about making the cutout weir-shaped. A weir is a special fitting shaped to aid in calculating stream flow (depth of flow x width of weir x lookup value in table)

throughout a season, establishing the highest, average, or lowest of flows.

A weir-shaped hole in the dam plate would assist in calculating any overflow of the culvert dams. Eventually, it might be worthwhile to modify the culvert dam (i.e., larger intake tee or more pipe) to direct more water to the sediment barrel where it could be used by the hydro system to generate more wattage.

I used the soldering gun to cut/melt out the 8-inch wide weir and used a big, flat wood file to smooth the edges. I used a marker pen to mark each ½ inch of weir depth (beginning from the bottom of the weir).

Water diversion pipes

I was ready to install the culvert dams. The outflow of the northern culvert was not easily accessible—it exits on a steep, unstable grade—so I first drilled a hole in the top of the culvert near the lip. Here, I used a ¼-inch bolt to secure a fitting to the top to which I was able to attach a clip of my tower-climbing belt. This safety harness enabled me to work hands free while installing the culvert dam. I tested the fit of the plate and drilled the holes for the barrel bolts in the culvert's wall. With each culvert dam in place, I joined the diversion (culvert dam-to-barrel) pipes *without glue* to each culvert dam through the appropriate adapter. I then slid back the barrel bolts and tested the extent to which I could shift, lift, turn, or remove the culvert dam assemblies for periodic cleanout (or replacement) *and* safely re-install them.

Once the culvert dams were in place, I added lengths of 2-inch pipe and fittings until I had the other ends of both pipes sitting on the edge of the screened lid of the sediment barrel. I tied these off with nylon rope to a nearby tree, securing the pipe ends directly over the plastic support framework under the brass screen.

Incidentally, I did not glue every joint in the pipes that led from the culverts to the sediment barrel—including the one right at each culvert dam.

Two reasons. First, I wanted Donna to be able to halt the flow of water to the sediment barrel if, for some reason, she wanted to shut down the hydro system. To do this, she need only jiggle the pipe loose from the culvert dam fittings and tie it off out of the flow. Second, unlike the pipe track, these sections of 2-inch pipe experience only a *flow* of water rather than any pressure. Since they cross steep, unstable terrain and are attached to culvert dams that could blow out in a real deluge, I actually liked the idea that they might fall apart fairly easily if hit by rocks, a mud slide, or sliding and falling tree limbs. These would be easier to reassemble than glued joints which

might cause the pipes to fracture or shatter.

I made sure the diversion pipes were well supported with nylon rope at critical joints.

Electrical connections

In the last article I described the method of finding the size of the main electrical cables, purchased 75 feet of two (black and white) #6 sheathed wires, and routed them under a deck and through a PVC pipe under a footpath to connect the hydro unit with the existing RE system near the battery pack.

I bolted the hydro unit to redwood beams straddling a small creek near the house (its temporary home for one year of service to assess noise abatement). The two #6 wires were looped up and cut to reach the alternator. I crimped and soldered heavy lugs to both #6 power wires, added heat-shrink tubing over the exposed wires, and secured the respective lugs to the alternator's terminals—black at the positive, white at the negative.

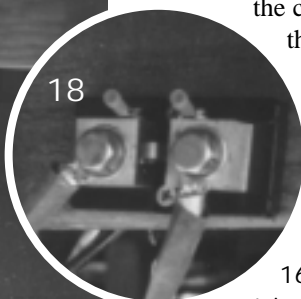
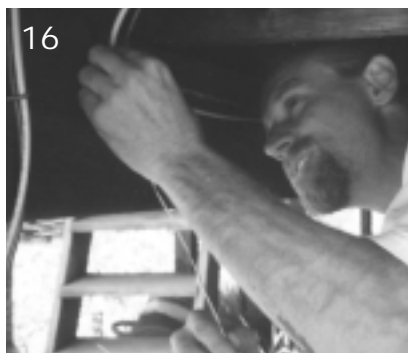
I had already bolted the alternator's control panel to the hydro unit, added terminals to its wires, and connected them to the appropriate terminals on the alternator. The only remaining job was to route the twisted wires (from the remote shunt) to the control panel and screw them down to the terminal strip inside. I added silicone sealant to seal the hole where the wires

exit the box *and* the plastic pipe under the footpath.

At the other end of these wires, I discovered an unused 30A dc breaker in an existing box. Here I would connect the hydro unit's wires to the RE system's wiring. Since this box was large enough to house the shunt, I drilled several holes in its side and bolted down the shunt block inside. I then cut and stripped both of the power cables and secured them to the breaker and common junction inside the box. Since the dc breaker for the PV (solar-electric) modules was adjacent to the one for the hydro unit, I brought their combined output out with a short piece of big cable to which I crimped and soldered a big lug and secured it under the big hex bolt of the shunt. I crimped and soldered a lug to the wire that originally came from the B+ terminal of the battery pack and secured it to the other side of the shunt. The shunt was now inline between both the PV panels and hydro unit and the battery pack.

Next, I connected up *two* pairs of twisted shunt wires under the smaller screws on the side of the shunt body. One pair of wires feed the control unit at the hydro unit to assist with tuning the system. There, a multimeter's leads will plug into the terminals on the control unit, and give accurate current (Sidebar A) readings while the field rheostat is adjusted for highest output. I figured to run the second set of twisted wires into the dining room and attach them to a monitoring station I wanted to add to the system.

By installing the shunt between the battery pack and both the solar array and hydro-electric unit, power from both sources can be monitored. Of course, in the daytime there is a *combined* reading of power from the solar array and the hydroturbine. At night, the power reading reflects the output of the hydro unit alone. At



16. Jim Cassetta strings the power and shunt wires under the deck.

17. The shunt was temporarily installed above the battery bank during initial system tests.

18. A 100A/100mV shunt

any time, breaker switches can be thrown to isolate either system.

Monitoring station

Monitoring equipment in an RE system, even if it only displays volts and amps, is important. This lets you

know things are working (or not), gives you numbers about incoming energy, helps you determine the battery pack's state of charge, assists in forming strategies on how best to use the available energy and storage capacity, and helps troubleshoot problems.

Alas, most multimeters do *not* have functions that can read current. Even expensive ones limit the reading to about 10A. All use internal

shunts which are restricted in size for lack of room. A separate shunt, then, is an inexpensive way to see what's going on, and gives more information than voltage readings in a system will provide alone.

Any shunt is a good investment for the homebuilt RE system—whether solar, wind, hydro, or combinations—but a shunt rated at 100A/100mV is magical. Why? It produces a 100 millivolt (0.1V) reading for each amp that flows through the shunt.

Let me translate that. This shunt (\$20) combined with an inexpensive digital meter (\$25), then, will provide a precise reading. When the decimal point of this value is moved one place (to the right), the value of the reading reflects the actual value of current. For example, a 15A current through the shunt results in a 1.5V reading on the digital meter (which is connected to the shunt's meter terminals). A 50A current yields a 5V reading. Multiplying these readings by 10 (or moving the decimal point one place), then, yields the correct value of current.

[Note: The meter is not actually measuring current from the shunt. It's measuring the *voltage drop* across the shunt. So, the meter's switch is rotated to the **dc volts** position for this task.]

Of course, a large analog meter (like that used in older-style multimeters, with a needle that moves across a face) will provide an accurate way to measure current, too. If there's a 0-10V or 0-100V scale on

Sidebar A: A monitoring station

I wanted a monitoring station for Donna's combined solar and hydro-electric system. To keep it simple, I purchased a pocket multimeter and a plastic project box from the local Radio Shack. From my parts' stock, I pulled out a DPST toggle switch and two (red and black) panel-mounting test points (TPs). I wanted to wire the center terminal of the switch to the TPs so the meter, with its test leads plugged in, could read either system voltage or amperage simply by throwing the switch's toggle one way or the other.

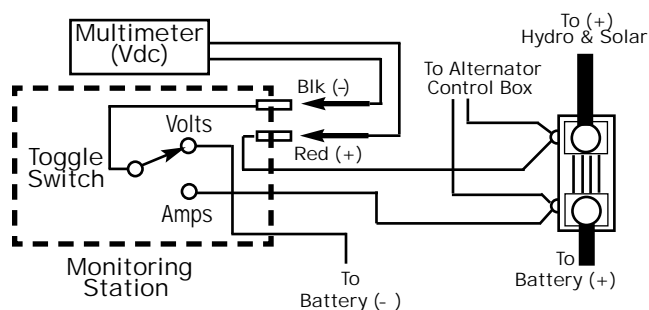
Jim Cassetta (who will soon install his own hydro system and helped me finish this one) drilled the holes in the project box for the toggle switch and TPs. I added small velcro strips to the bottom of the multimeter and the front of the project box so the meter would adhere to the box. This multimeter is designed to hold its own test leads in its lid. I cut a small V in this lid so the wires of the test leads could exit the casing with the lid closed. The test leads then plug into the TPs on the project box, red to red and black to black. This setup permits the owner the option of removing the multimeter from the monitoring station for other duties. Since I had extra velcro strips, I also added several to one of the bowls of the hydro unit itself. This way, the meter could be "stuck" to the bowl for any streamside adjustments of the hydro unit's control box.

Three wires were routed from the nearby battery pack—two from the shunt and one from the negative terminal of the battery—and wired to the switch (Fig. 20). With the toggle in the up position, the meter (plugged into the test terminals) will read battery voltage. With the toggle in the down position, the meter reads across the shunt, displaying a value which, when multiplied by 10, represents the current flowing through the shunt.



19. Velcro strips secure the meter to the project box so it may be used elsewhere. Meter leads plug into test terminals in the box end. A switch (right of meter) selects voltage or current (shunt) readings.

20. Wiring diagram for the monitoring station



the meter, this shunt will give them good functionality.

Instruments that measure and display power also consume power. So, you may not want your display to be on all the time. Digital meters generally use less power than analog meters. That's because LEDs (light-emitting diodes) and LCDs (liquid-crystal displays) consume little power compared with the needle-movement assembly and indicator light needed for nighttime illumination of analog meters. So, it's best to set up the monitoring system so that its display is off when not in use.

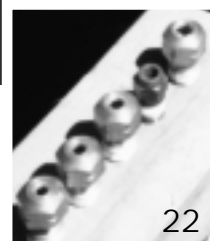
Since most digital multimeters have an auto-ranging feature and are not polarity sensitive, I was tempted to put the shunt inline with the positive battery terminal so Donna could read inverter current, charger current, and the draw of any dc loads, too. However, this additional functionality would interfere with reading the incoming electricity from the solar panels or hydro unit (unless everything was turned off) at any particular moment. This setup might be one that I would use for its troubleshooting capacity, but it wouldn't fit Donna. She concurred. She has lived for 10 years with her PV system (only adding battery water) without *any* instrumentation so even the ability to read volts and amps was a big leap.

With these factors in mind, I designed a simple monitoring station, acquired the parts, and fabricated the unit (Sidebar A and Figs. 19 and 20).

There are many alternatives to this homebuilt monitoring station. One is to spend another \$25 and get two meters. This lets you see both voltage and current simultaneously. For \$150-200, the next best thing is an Ah (Amp-hour) meter. This will show the accumulated charge and discharge of your system's battery pack over time. Effectively, it sums



21. With the bowl removed, nozzle jets may be exchanged.



22. Flows of 5-50 gpm can be handled with these 5 jet sizes.

input and output current with voltage many times each second during operation, and resolves these in a meter reading. Some meters have the ability to simply designate a full pack a 100% value and show percentage of discharge from this value, working like a fuel gauge in a car.

Many of these meters will, at the flip of a switch, show instantaneous voltage or current values or even both in the same display. The price goes up as more features—low-voltage disconnect, alarms, load shunting, etc.—are added in other models. These aren't bells and whistles. They're the eyes and ears of your system, and will help you make good decisions and spot trouble early. At best, it will make you master of your energy-generating system. At least, it provides a solid sense of security when it comes to energy matters.

Hydro unit changes

The flow rate through a Pelton-type hydro unit is controlled by the size of the orifice (jet) in the nozzle

and the system's head (pressure). So, for any specific orifice size, a Pelton-wheel type of hydro-electric system, then, is virtually a fixed-flow device. Large-scale, high-capacity, multi-nozzle hydro units get around this somewhat by offering additional fixed-flow jets that can be valved on or off to take advantage of varying flow.

In the single-nozzle hydro unit I was installing, jet size determines the flow rate. If your water source cannot deliver it, the system will bleed down (slowly drain itself), thereby lowering the pressure and power output to zero. So, once a specific size of jet has been installed, the system is unable to take advantage of any additional water available from the intake source unless a larger jet size is substituted.

How was Donna to know if there was *enough* water available to the system to work for any given size of jet in the turbine's nozzle? At first, this is a trial-and-error process. With the smallest jet installed in the nozzle that was capable of producing power, Donna could simply open the ball valve, excite the alternator (red button on the control box), and see if it worked. If the system didn't bleed down within a few minutes, the hydro unit is getting enough water to work. Subsequently, noting the amount of overflow from the sediment barrel would help assess the possibility of using the next larger size of orifice. Again, if the system doesn't bleed down within a few minutes time, there's sufficient water from the source and the system will operate at that capacity. If bleed-down does occur, the next smaller size of jet should be used. With practice, the process of changing the size of jet in the nozzle—to kick up power generation a notch or back it off—should be a 5-minute job.

To facilitate an easy change of jet in the nozzle of the hydro unit at the

base of the hill, I decided to modify the way the two bowls were attached to each other. The original method used 10 bolts (each with its attendant nut, washer, and lockwasher) around the perimeter. Working with 40 tiny parts—first to remove the bowl and then to re-attach it—was ridiculous. I visited the local hardware store and found allen-head bolts. An allen-head wrench will hang onto its bolt where a flathead or Phillips head

screwdriver won't. I also found some thin metal clips that work like captured nuts, each sliding over the bowl's rim and seating themselves in a hole, thereby eliminating the need for a nut, washer, and lockwasher.

Adding the clip nuts created a small gap between the two bowl halves. Since the bowls are designed primarily to act as spray shields, I knew water would escape through the gap and the spray would wet

everything in close proximity. I rejected using a gasket (too much work), opting instead to use plastic *wire wrap* (like that used in automobiles to sheath multiple wire runs). Wire wrap is split along its length, so it was easy to run it *over* and *around* the rim junction and its bolts with its two ends positioned at the bottom. This effectively captured any water sprayed through the gap and channeled it safely away at the base of the bowls.

Once the wire wrap was in place, I realized that I could also *reduce* the number of bolts holding the bowls together. Sure enough, three worked just fine and shaved a few minutes off the time it took to change the jet.

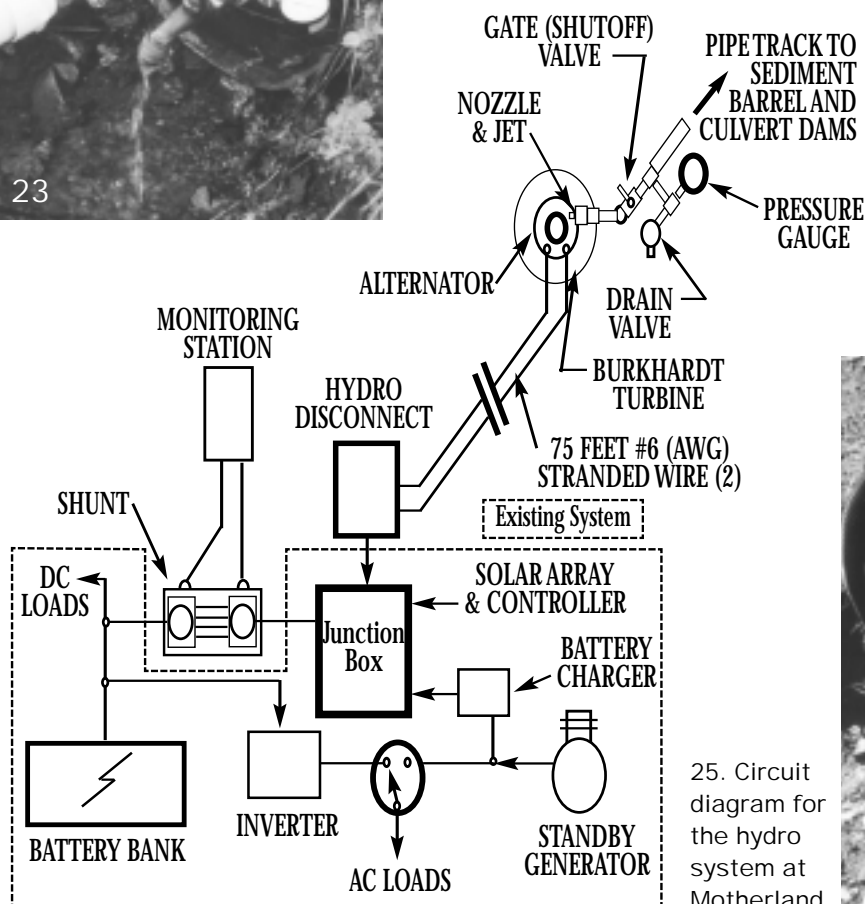
Donna's hydro unit came with one orifice size of jet. While it was approximately the right size for the measured flow and pressure of her system, it would still limit her system to one output. Other sizes of jet were available off-the-shelf but they were expensive. Fortunately, a neighbor who owns a similar hydro unit offered to fabricate jets—three smaller and one larger—for Donna's unit. Her hydro unit will now be able to utilize small *and* large flows from her source of water.



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23. The drain valve, inline ball valve, and pressure gauge are clustered together about 10 feet from the hydro unit.

24. I attached my multimeter to the test points of the control panel for system current. I borrowed the multimeter from Donna's monitoring station to read system voltage.



25. Circuit diagram for the hydro system at Motherland



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Static vs dynamic head

The hose-and-pressure gauge method of estimating head for a hydro-electric system results in a value that represents *static* head, where the water is at a standstill in the pipe. With the lower ball valve closed, the reading on a nearby pressure gauge will reflect this static head. In this system, the pressure gauge read 50 psi.

However, once the gate valve is opened and water starts to flow in the pipe, the pressure reading on the gauge will actually drop. Is this surprising? Turbulence and the resistance offered by the pipe's inner surface and fittings to the flow of water are responsible for this drop. And, the greater the flow of water, the greater the drop in pressure as these losses increase.

[Note: The pressure drop here is analogous to the voltage drop in electrical wires as the flow of current increases. Just as a larger size of electrical wire between the power source and its load will offer less resistance to the flow of electricity through it, a larger diameter of pipe will offer less resistance to the flow of water.]

When the flow of water in the pipe reaches the limit dictated by the size of jet (orifice) in the nozzle assembly, the new (lower) pressure reading reflects the system's *dynamic* head. It is this value that should be used in all calculations of system performance or the owner/operator may be displeased with the actual power the hydro unit produces.

So, in selecting 2-inch PVC pipe over, say, metal pipe of the same size, I had chosen a pipe with a smooth interior wall compared with metal pipe. Of course, the *greater* the pipe diameter, the *less* the difference between static and dynamic head, too. The same motivation kept me from using any 90° fittings in the pipe track and led to my choice of a

Hydro parts & complete units

I asked Steve Willey at Backwoods Solar, a reputable RE dealer, for quotes on hydro parts, alternators, stators, complete units, and sources of more information.

Pelton wheel, polyurethane, by ESD, 4-in pitch diameter, just right for spinning permanent magnet motors or car alternators at 1,000 to 2,000 rpm for up to ½-inch water jets. Shape is a bit flat to be a true pelton action, but works quite well for the price. Has ½-inch center hole and can be drilled for attachment to a hub. \$113

Pelton wheel, bronze, by Harris Hydro, 4-inch pitch diameter, for up to ½-inch nozzle, up to 4 nozzles. Integral hub threaded to screw onto shaft of Delco or 80-A Ford Alternator. \$240.

Turgo wheel, bronze, 4-inch pitch diameter, integral hub threaded to screw onto shaft of Delco or 80A Ford alternator. Takes water jet up to 1-inch, up to 4 nozzles, for generation from much lower head pressure than a pelton of similar size. \$737

Low-cost **Delco alternator**, rebuilt and guaranteed, stock, rated 62A. With pulley and fan removed, units limited to 10A continuous power w/o overheating. (Still, that's 240Ah per day.) \$35. Replace stator with 2V winding for lower rpm operation, usually double output in low power applications. **Replacement stator** upgrades to 24V, or 12V at half the rpm of stock. \$25.

Complete **Harris Hydro Unit**. Alternator, housing, nozzles, field control panel (meter and rheostat). Uses efficient Motorcraft Ford alternator. Custom-configured with windings optimized for your sites' head, water volume, and battery voltage. 1 nozzle (up to 20 gpm), \$820. 2-nozzle (up to 40 gpm), \$925. Four nozzle (up to 80 gpm), \$1,080. (Performance limit about 25A at 12, 24, or 48V.)

Educational small-residential **hydropower video**. Installation and design methods, visits and tours of hydro-powered homes, pipeline and intake solutions, battery diversion charge control, and balance of system used by owners. \$20

(Backwoods Solar, 1395 Rolling Thunder Ridge, Sandpoint, ID 83864. Phone: (208)-263-4290 Fax (208) 265-4788 Website: www.backwoodssolar.com)

low-resistance, large diameter ball valve at the base of the system.

Hydro experts warned me to expect as much as a 30% difference between static and dynamic head for a given size of orifice in the nozzle jet. In this system, then, it would be normal to expect my 50 psi static head to be reduced to a dynamic head of 35 psi (70% of 50 psi). If the pressure reading dipped lower, the hydro unit's capacity to generate power would be better served by installing the next smaller size of jet in the nozzle assembly.

Think about it. Once the pipe track is installed, both the static head (vertical distance separating intake and hydro unit) and the pipe resistance are *fixed* values. Using this one rule of thumb—dynamic head should dip no lower than 70% of the value of static head—an owner/operator can be assured of selecting the right size

of orifice (smaller or larger) for the water (source) in gpm available to the hydro unit.

Fill-and-flush cycles

When we first diverted water from the culverts and filled the sediment barrel, my intent was to flush the debris from the pipe track by opening the ball valve (at the base of the hill). The pipe immediately clogged up with dirt, rocks, and leaves just beyond the ball valve. I ran a reshaped clothes hanger wire through the open valve to break up the clogged material, and it rushed out. This convinced me to run several fill-and-flush cycles, all easily handled by closing and opening the bottom valve.

Next, I let the system fill with water by shutting the valve. While the needle on the pressure gauge climbed, I added the pipe between

Parts and Costs

1. **Site Survey.** 4 hours
2. **Burkhardt Turbine overhaul.**
Parts: bearings, sandblasting (\$18).
Labor: Disassemble, clean, test, tune, assemble. 6 hours
3. **Fabrication.** Sediment barrel, culvert dams, alternator control, monitoring system. Parts: \$75.
Labor: 14 hours
4. **Installation.** Culvert dams, sediment barrel and pad, pipe track, valve-gauge-drain assembly, hydro unit, electrical wiring, monitoring system, and system check. Parts: \$600 (mostly pipe) Labor: 20 hours

the ball valve and hydro unit. Since the hydro unit was fully wired into the RE system, we were ready for a test.

First tests

In our initial site survey, we had established a calculated head (100 feet) from a summation of pressure readings (hose-and-gauge method) that totaled 50 psi. Also, we had measured the flow of the seasonal stream (bucket-and-stopwatch method) at 22 gpm in the middle of winter.

A table exists that describes the flow rate through a full spectrum of nozzle (jet) sizes for many differences values of head. It was a good sign in this installation that the one jet installed in Donna's hydro unit would, at a head of 100 feet, pass 22-25 gallons per minute of flow.

This near perfect match illustrates another point. The two measured components—pressure and flow—at your site may not be fully utilized if the combination falls just short of a specific nozzle size. I can see on my table—Sorry, I don't have permission to print it here—that the jump in flow rates between nozzle sizes, even for the same head, is significant.

Since we did not have full seasonal flow in the streams at Motherland, I

knew my first test run of the hydro system would be brief. That is, with just the original jet size ($\frac{3}{8}$ -inch orifice) and a small flow, I knew I had about a minute before the pipe track would begin to drain. That's because the flow rate, at the calculated 24 gpm, would use up the 22-gallon reserve (water between the intake filter and overflow port) in the sediment barrel in that time.

[Why didn't I use a smaller jet for the first test? They didn't exist. They were made a few weeks later. Even so, I wanted very much to see how much real power the turbine would produce at the design head and flow. That's because I was hearing that Delco alternators were not particularly efficient. So, I first wanted to see what the hydro unit would do "as is" rather than wait until next year.]

My first test of Motherland's system was exhilarating. After hooking up multimeters to read both voltage and current at the hydro unit (Fig. 24), I slowly opened the ball valve.

It is a delightful experience to hear the impeller and alternator spin up for the first time, and watch the water spray out of the system. With the ball valve fully open, I ran over to the control box and punched the red excitation (field) button. The unit immediately slowed down as the alternator began to produce power.

I think I read 16V and 3A before my minute was up. I consider these nonsense ratings since I was fiddling with the rheostat control. Still, the unit had generated a voltage higher than the battery pack (12.6V) with *some* current flowing. So, the unit had produced power. During this time, the pressure reading on the gauge steadied at 40 psi. I was happy that it represented no more than a 20% difference between the static and dynamic head.

Incidentally, most hydro experts warned me *not* to try to "tune" the system with the lower ball (or gate)

26. Michael and Donna sit with the new hydro-electric system.

valve. It should be open or closed. Any setting in between is resistive, reducing pressure. So, while a partial opening of the valve *may* limit the flow of water to the point that a too-large orifice might *seem* to work, its own resistance will also reduce system pressure. In practice, this scenario will yield less output wattage than a smaller jet working at optimum water flow *and* full dynamic pressure.

In a few minutes, the test was over as the pipe track slowly drained.

Afterthoughts

In the *next* test a week later, I moved the field rheostat too far (alternator control panel) or held the red button down too long, popping a diode (or two) in the alternator. Darn, I hate it when I do that. I plan to replace the diodes with ones rated to handle 100V (peak inverse volts) instead of the standard 50V ones.

Still, this may have been a blessing in disguise. I discovered many things in this project and I'll share three of them with you.

1. For above-ground installations of the pipe track, I'd check out 2-inch polypropylene pipe. It's black, comes in 100-foot coils, is reportedly better in UV (ultraviolet) resistance to sunlight than white PVC pipe, and is less expensive. It's definitely worth checking out.

2. In my first article, I described the power that one could get from a hydro system as expressed in the formula:

$$\text{Power} = \frac{\text{Head} \times \text{Flow}}{9}$$

with power in watts, head in feet, flow in gpm (gallons per minute), and 9 as a conversion factor.



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This suggested that the power this hydro system would produce would be:

$$\text{Watts} = \frac{100 \text{ feet} \times 24 \text{ gpm}}{9} = 267\text{W}$$

Not true! I had overestimated the efficiency of Delco alternators (65%

versus true 35%-45%). This modifies the conversion factor from 9 to 11 in the formula. Instead of rebuilding the original Delco unit, then, I might have opted to find a Motorcraft alternator. Or begun a search for a suitable dc unit (i.e., PM motor working as a generator) with a wattage rating closer to that of the system (more probable now that I've blown a few diodes in the existing alternator.)

3. I had used 2-inch pipe to ensure no real difference between static (measured) head and dynamic (operating) head. Yet I saw a 10 psi drop (from 50 to 40 psi) in the pressure gauge, *reducing* the effective (dynamic) head to as low as 80 feet. I've since discovered that this gauge is meant for air, *not* water. Still, I would think that would affect its longevity rather than its accuracy.

Plugging the *corrected* numbers back into the formula yields a new answer:

$$\text{Watts} = \frac{80 \text{ feet} \times 24 \text{ gpm}}{11} = 174\text{W}$$

Actually, the estimate I *initially* gave Donna was closer to 120W of power. I had wanted to account for (up to) 36W for field current, line losses, and all the other things that crop up. Yet, I was watching the final numbers erode. The site is marginal at best, yet requires an investment (hardware, money, and time) in its careful installation. I feel fortunate that Donna is happy with the installation on all accounts and has one more reason to feel blessed with a prediction of rain.

(Michael Hackleman, P.O. 327, Willits, CA 95490. e-mail: mhackleman@saber.net.

Donna D'Terra teaches and hosts workshops. e-mail: motherland@pacific.net) Δ

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Book reviews: *Think Free to Live Free*, *101 Things to 'Til the Revolution*, *Don't Shoot the Bastards (Yet)*

By Diamond Joe Wolcott

Are you burnt out from trying to save the world? Everybody who "fights for the right" sometimes has that feeling: I'm killing myself; I'm not getting anywhere; and everybody else is just sitting around watching Who Wants to Be a Millionaire. Why am I doing this?

"Think Free and Live Free," Says Claire Wolfe

If you've been there, Claire Wolfe has a book for you. *Think Free to Live Free* (Breakout Productions, 2001) is billed as "A political burnout's guide to life, activism, and everything." This how-to manual is intended for anyone in any political "wing." Activists fighting for the Bill of Rights, human rights, gun rights,

Think Free could also be used by anybody who's burnt out from a job or a bad family situation.

And I do mean "use," not merely read. *Think Free to Live Free* is a large-format book loaded with worksheets (37 of them). Its pages are meant to be filled in with your personal hopes, dreams, angers, frustrations, skills, plans, doodles, and coffee splatters. Wolfe's approach

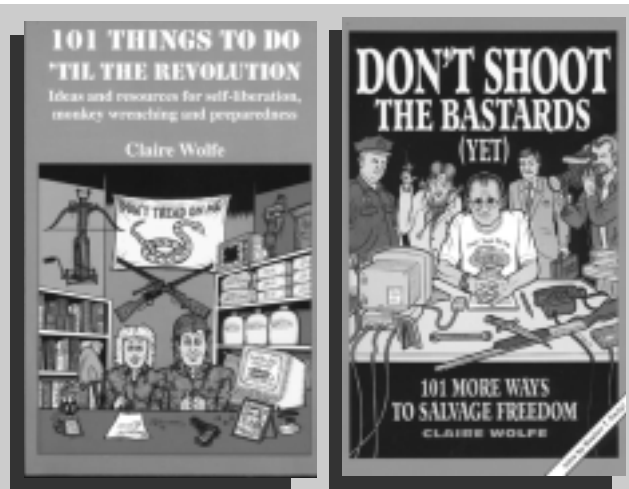
is friendly, humorous, and designed to put you in the driver's seat of your own life change. No know-it-all guru here!

The focus is on lifestyle and how activism fits (or doesn't fit) into the way you want to live. Wolfe takes you through a process of self-analysis that's described by the names of chapters: "The Raw Material of an Activist," "How Can It Feel So Wrong to Be Right?" "Are You Having Fun, Banging Your Head Against that Wall?" "What Are You Best At?" "What Do You Want to Do?" and "Money, Family and Other Immovable Objects."

By the time you've reached the last chapter, "Planning for Action," you'll probably be a lot clearer on what's wearing you down and—more important—what to do about it. You also might have had some fun along the way.

Wolfe writes from personal experience. She's been an activist since age 12. But it wasn't until 1996 that she burst onto the public scene with her

sharp-witted book, *101 Things to Do 'Til the Revolution*. *101 Things* (voted by readers in a Random House/Modern Library poll as the fourth most notable book of the twentieth century) combines irreverent humor with serious pointers on how to free yourself while making life harder for



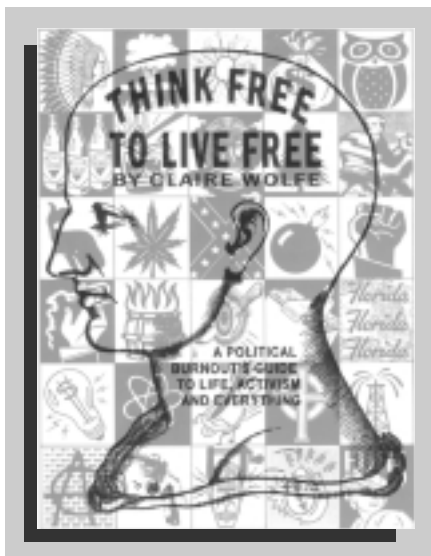
tyrants and snoopy bureaucrats everywhere.

She followed that up with *Don't Shoot the Bastards (Yet)*, packed with another 101 ideas and ruminations, which some reviewers said was even better. Then Wolfe got burned out from being in the public eye, mysteriously disappeared, and only just now reappeared in *Think Free* and on the pages of *Backwoods Home*. This lady lives what she writes.

What better way to get pointers on living free than from someone who is a living example of what she writes about? Think free, live free, be a more effective activist—and enjoy all three of these books.

(After a long absence from the public spotlight, Claire Wolfe is now a regular contributor to *Backwoods Home Magazine*. Her first article appears on page 18 of this issue. She will be featured at the BHM website, www.backwoodshome.com, every month. Her books are available from *Backwoods Home Magazine*. See pages 95-96 to order.)

Δ



property rights, hemp legalization or the welfare of coastal rain-forest could all find renewal and new direction by using this book.

Now I've seen everything! — A patriot selling renewable energy supplies

Bob McBroom, owner of Kansas Wind Power, in Holton, Kansas, sells renewable energy supplies. There should be nothing unusual in that except that, unlike most renewable energy entrepreneurs, McBroom is a conservative. More accurately, he is a libertarian patriot selling what is usually billed as a liberal product—renewable energy.

Politically McBroom leans towards “patriotism and national values.” He believes in smaller government and would like to see a more agrarian form of government along the lines of Thomas Jefferson’s ideals.

He also finds the trend toward globalization and the dissolving of national borders disturbing.

But overall he likes the direction he sees America going in and sees good things happening. He also approves of the advances he sees in technology and the way prices are falling as the latest technologies are developed, particularly in electronics where there is a tendency toward more value at less cost.

What he doesn’t like is the current trend of America’s manufacturing base moving to other countries. He says, “I buy American to support American jobs, though I sometimes buy foreign, but only when there’s no good American alternative available.” He also believes American cars got better when they had to deal with foreign competition.

But he also sees bad things happening, too. He feels the high cost of government is a burden on the people and that our society is becoming more socialistic. He blames this on people’s tendency to want a government answer to all the problems in their lives and their reluctance to depend on themselves. “They don’t

realize these things aren’t free, that somebody has to pay for them.”

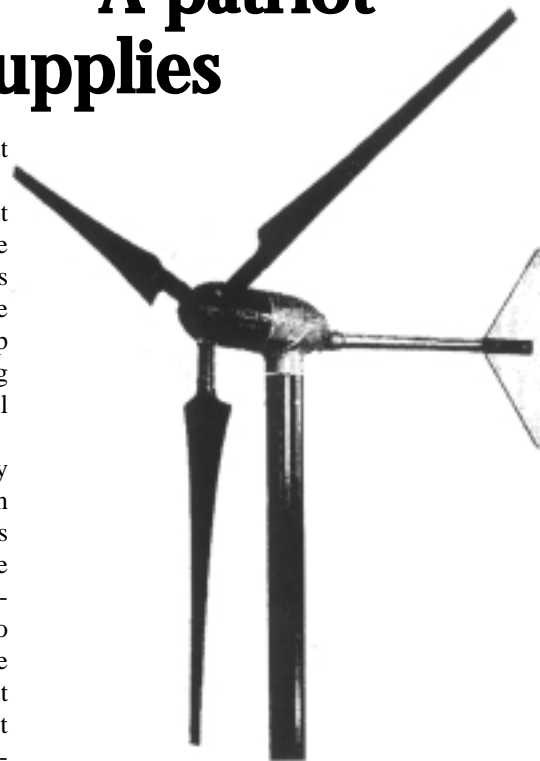
He says, “We’re being taxed at a lot of levels. Forty percent of my phone bill is taxes.” He believes lower taxes would result in people having more money to spend and that would help the economy, because the resulting increased economic activity will automatically generate more taxes.

McBroom sees the solution to many of America’s problems in libertarian principles and usually votes Libertarian. But he says, “I don’t vote parties. A lot of mainstream candidates tend to be the lesser of the two evils. They’re both headed in the same direction, but at different speeds. I don’t like the fact that Bush’s proposed tax cuts are back-loaded with most of the cuts taking place in the distant future. It’s easy to say that you will do some good ‘later on,’ when the truth is that you don’t have much control that much later on.”

On the subject of environmentalism, McBroom says he agrees with conservation and that there is room for improvement in efficiency so we need to use less energy. But he believes we need a good mix of energy—fossil fuels and renewables.

McBroom and his Kansas Wind Power have been in business since 1975. Business is going well, but he is hesitant to expand. When he gets real busy he hires extra help on a temporary basis, but his real desire is to keep his business simple.

McBroom says, “The reason I got into alternative energy is that I wanted my homestead to be self-powered.” He researched water power but liked wind power better. When he started his business he rebuilt and sold old pre-REA wind generators and he helped to install the first utili-



ty-interconnect wind generator in Kansas in 1978. He describes his homestead as five acres. Though he depends on wind, he uses passive solar to heat his water.

McBroom, 51 and unmarried, runs his business out of his home. He says, “My prices are comparable or cheaper than most anyone else.” He stands behind the products he sells and says his customers are very happy. Complaints are rare.

“I treat them like family. I had one customer who offered to fly me to his place so he could meet me.” But he says, “I still like people to buy from local dealers if there is one, particularly heavy items like batteries which are heavy and expensive to ship.”

As a kid, McBroom built and fired model rockets. “Today I like science and I read a lot about astronomy. I have several telescopes and I’m looking to buying a 24-inch reflecting telescope.”

Bob’s ad can be seen on page 54. He can be reached at 785-364-4407. His fax is: 785-364-5123. Δ

1512 ~~1512~~ SELECTED ISSUES of **Backwoods Home Magazine**

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Some unusual jellies for your sweet tooth

Charles A. Sanders

In my mind, one of the simple pleasures in life is hot biscuits, a dab of butter, and a dollop of homemade jelly. Around here any biscuits left after a meal immediately become dessert after being slathered with a spoonful of sweet jam or jelly. Over the past 25 years or so, I have experimented with many good recipes for jams and jellies. I like these simple sweets for several reasons. First, they remind me of the times when my Grandma and my mom would make batches of the sweet fruit spreads. Of course, that is probably where I picked up the “jelly-biscuit” habit as well. Homemade jellies are a good use for the extra fruit that is sure to grow on any productive homestead. Jelly-making is also a good use for any of a wide variety of wild fruits that are found all around our country. Finally, they are easy to make.

With all that in mind, and with a warm jelly-biscuit waiting on me as I write, here are a few unusual jelly recipes that I am certain you will find to your liking.

Elderberry-sumac jelly

The elderberry, with its characteristic heavy clusters of blue-black berries, is actually a member of the honeysuckle family. More commonly known as a fruit for making home-made wine, the buckshot-sized berries also make excellent jelly.

I look for clumps of elderberry bushes growing along field edges, grown up areas, old homesites, and odd spots around my neighborhood. By the way, I don't pick elderberries growing by the roadsides. Although they grow prolifically along the country backroads, I figure both the plants

and the fruit have been bathing in too much automobile exhaust to suit me.

For those readers who are doubting my sanity at using sumac in a food product, rest assured that this is not the white-berried Poison Sumac (*Rhus vernix*). The types of plants required for this jelly are either the common Smooth Sumac (*Rhus glabra*) or Staghorn Sumac (*Rhus typhina*). Either one has the shrubby stems and dozens of dark red seed heads that contain the tart fruit that we will use. To make the jelly, you will need:

2 cups elderberry juice
2 cups sumac juice
5 cups sugar
1 pkg. Sure-Jell (a commercially available jelly-making powder)

Prepare the elderberry juice by putting 2 quarts of elderberries and 2 cups of water in a suitable pot. Heat the mixture and simmer for 10-15 minutes. Mash the softened fruit, stir, and simmer for another 10 minutes. Strain the finished juice through several layers of cheesecloth, or do as I do and use an old pillowcase or tee-shirt.

The sumac juice is prepared in a similar manner. Take a gallon or so of the berry heads and put in a pot. Cover with water. Heat while stirring and mashing the berries. I do not heat this mixture to boiling, rather just enough to help get the most color and flavor from the berry heads. After about 10 minutes, remove from the stove and strain the juice to remove stems, seeds, and as many of the fuzzy little seed hairs as possible.

To make the jelly, heat 2 cups of the elderberry juice and 2 cups of the sumac juice in a large pot. As the mixture begins to boil, add 1 package of Sure-Jell (or other commercially available jelly-making compound) and mix thoroughly. Return the solution to a boil and add, while stirring, the 5 cups of sugar. Allow all this to boil for 3 minutes, stirring all the while to prevent sticking or scorching. After the 3 minutes have elapsed, remove from heat and ladle into sterilized ½-pint jelly jars. Have your lids and rings ready and screw on snugly. Cover the capped jars with a light towel and allow them to self-seal.

Elderberry jelly

This recipe uses the traditional method of cooking down jelly without adding commercially available pectin. When making jelly in this manner, only high pectin fruits may



Smooth Sumac

be used. Acid is also necessary for proper gelling. In this case, the recipe calls for the addition of lemon juice to provide the acid needed.

1 lb. elderberries
½ cup water
1 lb. sugar
juice of 2 lemons

Crush the berries and add the water, heat and simmer. Strain the resulting juice and put back on heat. Add the lemon juice and slowly stir in the sugar. Boil the mixture for 30 to 45 minutes, stirring to keep it from scorching.

When the jelly sets when tested, remove from heat, pour into jars, and seal.

NOTE: The jelly test is performed as follows: dip a spoon into the jelly mixture. Move the spoon away from the steam and heat. Tip the spoon on its side. If the jelly clings together and sort of slides off the spoon in one glob, the jelly is ready.

Corn cob jelly

An unusual, yet very tasty jelly can be made from ordinary corn cobs. Yep, plain ol' corn cobs! This jelly has a beautiful reddish color and passed the ultimate taste test—my kids. A good friend gave me this recipe which I immediately came home and tried.

12-14 red corn cobs
6 cups sugar
2 pkgs. Sure-Jell

Start by gathering a few dozen red corn cobs. Most field corn varieties have red cobs. I'm not sure if the red cobs do anything for the flavor, but they do add the nice red color to the finished jelly. I went out just hours behind the corn picker and gathered up a good supply.

Take a dozen or so of the cobs and break them into thirds. Put the pieces into a large pot and cover with water. It should take about 9-10 cups of water. Cover the pot and boil for 30 minutes. While the cobs are a-cook-

ing, get your jars and lids ready. After that time, drain and strain the liquid through a cloth, such as an old tee shirt. Take 6 cups of the liquid and put back on the heat. Bring to a boil and add 2 packages of Sure-Jell. Next, gradually add 6 cups of sugar. Return the pot to a boil, stirring to prevent sticking or scorching. Boil for 3 minutes. Remove from heat and ladle into the clean and ready jars. Snugly apply the lids, cover the filled jars with a towel and allow them to self-seal. This recipe makes about 5 pints.

Crabapple jelly

Another old-time homestead fruit is the crabapple. These small, tart cousins of the more common varieties of table apples were often grown on the small place for making jelly and preserves. Any extras were usually fed to the family hog. To make this tart and tasty fruit spread, you will need:

3 lbs. crabapples (about 10 cups, cut up)
4 cups water
2 cups sugar
2 Tbsp. lemon juice
1 pkg. Sure-Jell

Add the cut-up crabapples and water to a pot and bring to a boil. Simmer, covered, until the fruit is soft. Put the fruit in a jelly bag or similar cloth bag and allow to drain until you have about 4 cups of juice. Put the juice back on the heat and bring to a boil. Add the Sure-Jell and mix well. Slowly stir in the sugar. Allow to boil for about 15 minutes, stirring constantly to prevent scorching. Remove the mixture from heat and pour into your jars. Attach the lids and allow to seal. Makes about 3 pints.

Pear honey

This tasty fruit spread is something my grandma used to make. It is pretty easy to prepare and is excellent to eat



Simple fixins for corn cob jelly

on hot biscuits. It has a sweet and tasty texture similar to apple butter. This recipe uses the old variety of pears, Keiffers, that are rock hard when picked. They must be placed in a sack or on a table or shelf to ripen before they are used. Many of these vigorous old pear trees are still found on abandoned homesites scattered around the country.

4 cups pears (peeled, sliced, and cored)
½ cup water
4 tsp. sugar
2 tsp. lemon juice
1 cinnamon stick
12 cloves

Mix the pears and water and puree in a food processor or blender. Add the sugar, lemon juice, cinnamon, and cloves. Heat and simmer until thickened as desired. Stir occasionally. Pour the mixture into hot jars and apply the two-piece lids. Cover the jars with a towel and they should self-seal.

These recipes may help you get new ideas for using wild fruits, orchard surplus, and corn cobs in your own kitchen. All of them are very tasty and will surely be a hit with your family. Remember, as you experiment with these and other jelly recipes, that there are many more jelly flavors out there other than grape. Δ

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Build a small A-frame using pallets

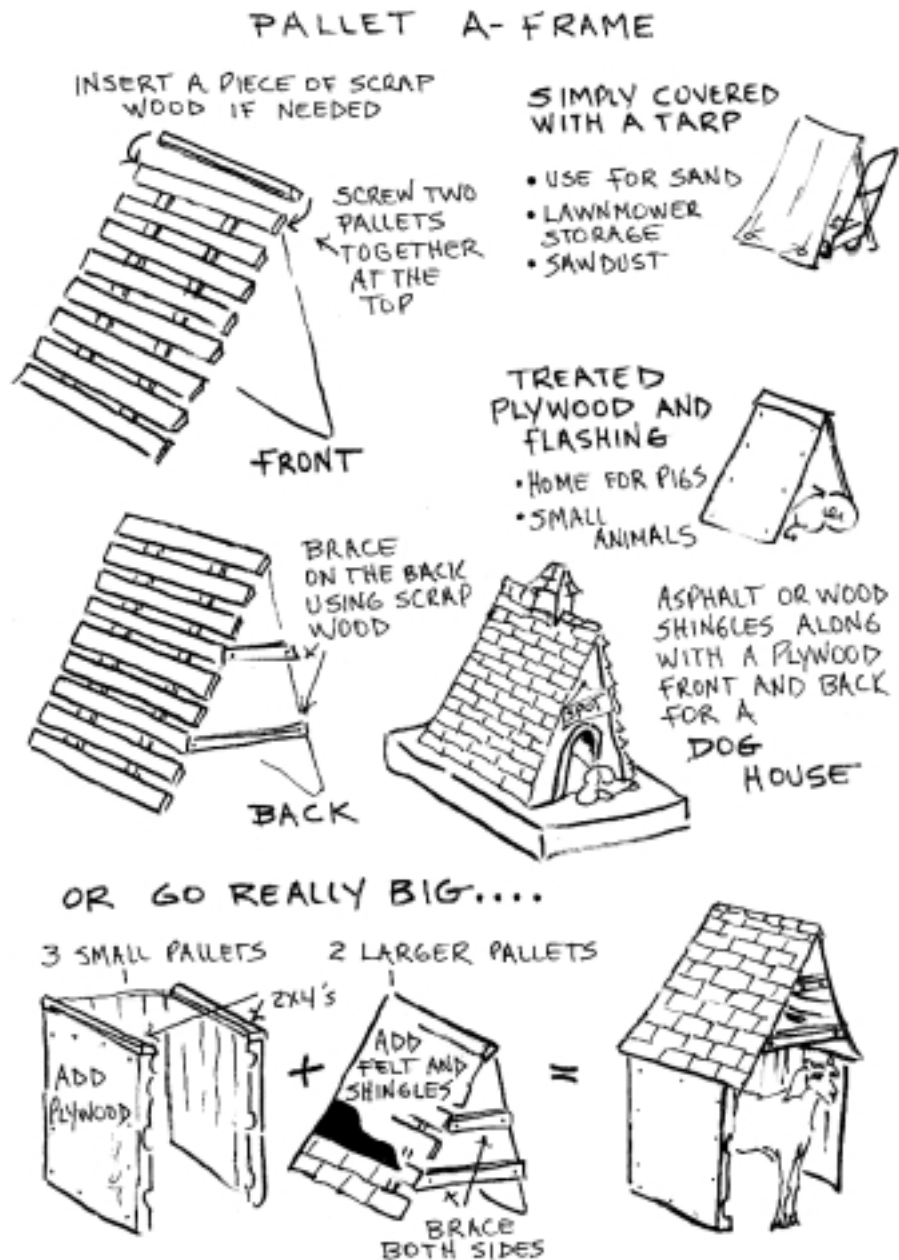
By Clay Sawyer

Pallets can also be used as a primary building element as I'm sure a lot of you already know. I use them for small A-frame structures. Any two pallets the same size, old or new, will work well for this easy project. Equally important is to try to use what you have on hand in addition to the pallets. As a rule my biggest investment on this or any other small project is sheet rock or deck screws. Nothing usable is ever thrown away. For example, empty feed bags filled with sawdust can be stapled inside the A-frame if insulation is needed.

Start by simply leaning two pallets into each other. Depending on the type of pallet used, a center board at the top, such as a 2x2 or 2x4, may be needed for solid support.



This is one of the pallet A-frames the author made for her own farm.



I screw the pallets together at the top, then brace the back with two scrap pieces of wood.

The illustrations indicate the most simple A-frame to the most elaborate.

A cupola on the top of a doghouse adds a great touch. The finished A-frame is only a matter of available materials and your imagination. Δ

Letters

(Dear Readers - Thank you for writing to Backwoods Home Magazine. The opinions and suggestions we receive from our readers are very important to us. We regret that we are no longer able to print or individually respond to every letter received due to the volume. We do read every letter received, and pass them along to the editor or writer concerned. We print a selection from our mail that best represents the views and concerns of our readers.

— The Editors)

American Survival Guide

I understand that the Self Reliance Journal (old American Survival Guide) is kaput. Too bad. I really liked the original format before it went PC. I also understand that your magazine has taken over the subscription list and will be substituting your Backwoods magazine in its place. If this is the case you are to be commended. I recently was told about your magazine and given your website to review. Your magazine is surely what I have been looking for in addition to SRJ and I intended to subscribe to it anyways. Please let me know what is the status of my subscription due to the SRJ fiasco. I am not sure of how much longer my subscription with SRJ would be in effect. If you have that information please let me know. If you are substituting Backwoods Magazine for SRJ I would be more than happy to extend my subscription for an additional two years. I would like to let you know that I was really impressed about what I read on your website and am really looking forward to receiving your fine magazine.

Edward B. Leckey, Franconia, VA
eleckey@erols.com

Received your May/June 2001 issue of BHM and read the notice about Self Reliance Journal. We are subscribers until Nov. 2002 with Self Reliance Journal. Please make sure that our 6 issues are added to our subscription to BHM. At this time we

are paid to July/August 2003, so this will extend us to sometime in 2004.

Now I know why we got so many notices from Self Reliance Journal at the end of 2000. We probably got 10 renewal notices and then one came with a deal we couldn't refuse so we renewed for 2 years.

I do want to tell you how much we enjoy BHM. We have the anthologies 1 through 7 and in a week or so will be sending for #8 and 9. Thank you, thank you for the new low price on them!

Mary Ann Gove, Cottonwood, AZ

Self-Defense Bill, H.R. 31

I read the Last Word in March/April 2001. I agree with you 100%. I have slept more years than I care to remember with a .357. But I know that if some crook or fool breaks in my house he will be killed and the way the laws are today they will prosecute me. The thief, killer, rapist will be portrayed as the best thing on two feet.

A letter I received today from Gun Owners of America explains they are trying to get a self-defense bill H.R. 31 passed. so that if you defend yourself, family, home, you won't have to pay or go to jail. Maybe you could comment on this bill.

George Hettiger, Montrose, PA

H.R. 31 is the Citizens' Self Defense Act of 2001, introduced into the U.S. House of Representatives by Rep. Bartlett (R-MD) January 3, 2001. As of this writing it has 58 cosponsors. H.R. 31 allows law-abiding citizens to obtain firearms for the defense of self, family, and home. It would overrule local and state laws that deny you the right to defend your family when confronted by a violent person, and it allows you to sue zealous anti-gun

prosecutors who try to prosecute you in the aftermath of exercising this right.

This is very important legislation for people who keep guns for self-defense. You can find a complete copy of the bill on the Internet at www.theorator.com/bills107/hr31.html. Gun Owners of America (703-321-8585; also on the web at www.gunowners.org) is leading the charge to get the bill passed. To see if your representative is a cosponsor, go to www.gunowners.org/activism.htm on the Internet. If not, I urge you to contact him or her. — Dave

Claire Wolfe, Jackie, Vin

I had to write and recommend some books I ordered from you. Vin Suprynowicz's Send in the Waco Killers and Claire Wolfe's 101 Things to do 'Til the Revolution and Don't Shoot the Bastards (Yet).

There is absolutely no fluff in Send in the Waco Killers. It will scare you, open your eyes and mind and I hope motivate each one that reads it to begin to understand the loss of our Constitutional rights.

Of course Claire Wolfe and Jackie Clay are my modern day lady pioneering heroes, each from a different perspective of course. Jackie writes it as she and her family live it. Claire writes it in order for all to survive. Both cover the very serious business of providing for and survival of families. I really admire their courage and fortitude...

Anne Dodds, Bedias, TX

Should I go to college

My parents subscribe to your magazine, and enjoy it. Whenever I look at your publication, I always read at least several articles. I would appreciate it if you would take some time to answer the following questions.

I am a fourteen year old home-schooled boy, trying to make a tentative decision on whether or not I should go to college. I am already an

outdoor, freedom-minded individual: no TV, no video games. Putting aside the trouble of money, here are the questions: 1) Will the expense and trouble be worth the knowledge and training that it will give my mind, and any benefit it will give me in applying for a job? 2) Do you think I could do something better with my time? 3) Do you think there is a suitable college for someone who wants to go.

I appreciate any trouble you go to to answer my questions.

William Watner, Gramling, SC

My 18-year-old daughter, Annie, is trying to decide whether or not she wants to go to college. Last summer and this summer she has taken several college courses for credit but has not yet decided whether or not she wants to take the plunge for four years. When she graduated from high school a year ago, she was totally burned out from school that was too boring and confining for her free spirit, so I suggested she take a year off and work for me and learn more in a year than she could learn in four years of college. She did that and soaked up the publishing business. But now I am encouraging her to go to college so she'll have a degree in the bank, just in case she needs it later to get a good-paying job.

But deep down inside me I hope she'll never need that degree, because I don't recommend anyone go to college so they can get a job working for someone else. The only happiness I can imagine is working for yourself. It's the only real security too, as many people getting laid off in the current recession will testify to.

I'm all for education, but you don't need to go to college to get educated. At the age of 57, I take college courses on a regular basis, via audio cassette. My current courses are *The History of the English Language* by Professor Seth Lerer of Stanford University (18 audio cassettes) and *Einstein's Relativity and the*

Quantum Revolution: Modern Physics for Non-Scientists by Professor Richard Wolfson Of Middlebury College (12 audio cassettes). I buy them from The Teaching Company (1-800-TEACH-12). I won't get any credit for the courses, but I don't care about that. I'm just interested in learning things.

But being able to earn a living in the future is a very important consideration for a 14-year-old boy. I'd recommend you go to college just in case you'll need that degree to get a job later, but I'd look for a way to start your own business at the same time. You don't need a prestige college, and you can always get a correspondence degree via the Internet. And for gosh sakes don't get a stupid degree in something like psychology or sociology. If you're going to go to the trouble to go to college, get a degree in something that will give you real knowledge, such as science or how to run a business. — Dave

For Jackie Clay

What delightful articles you produce. I really enjoy all of BHM, but each time I eagerly open it to your articles first. With eight kids and grandchildren, I'm sure it's a lot of work, but very gratifying to live as you do.

I tried canning some very special Polish sausages from a local meat market thanks to your article about canning them. I followed the directions for canning meat in the Kerr canning book, along with your instructions in a previous issue of BHM. The results are just exactly what I wanted...excellent. Ready to can smoked pork hocks!

I have to tell you that in this latest issue, #68, I really enjoyed reading about you and your family. How I would love to live near you. But I am sure you do not have much time for visiting.

Gerraldine,

gisjoberg@virginiamn.com

Our life is a bit hectic, but we always have time to visit. With only one child home now, our youngest son, David, and the grandkids in Minnesota, Wisconsin, and now Rhode Island, I'm not as busy in that department as I once was. With eight kids at home (two homemade, two step-children and the rest adopted), it actually seemed that I was *less* busy. The reason for this is that they helped each other and ME, too. But, of course, every one had his or her special needs to fill. Now my writing keeps me busier than they did.

If you were my neighbor and came to visit, you might have to chat over the back of our cow as I feed or I might put you to cutting green beans with me, but we could enjoy each other's company. That's how it is at a backwoods home.

We love Montana, but are planning to leave for a homestead in the wilderness of extreme northeastern Minnesota. In this way, we will be only a few hours from our children and grandchildren, whom we do miss seeing, AND hope to build a homestead from the woods....an experience we missed out on when we lost our Canadian homestead dream.

— Jackie Clay

Energy commentary

Greetings from SPARTA behind enemy lines in the socialist republic of California (more specifically the Humboldt soviet). I have just concluded reading My View in issue 69 of 2001 in BHM. You are absolutely right. Those of us who actually walk the walk and not just talk the talk do not need to buy into a cult with regard to alternative energy. We live on 120 acres overlooking the Klamath River and are served by NO public utilities of any kind. We formerly lived aboard a cruising 34' sailboat mostly in the Caribbean. When we chose the site for finally swallowing the anchor we were careful to have a solar suitable area with

adequate water, no visible neighbors and accessibility by 4x4 year around.

We were already familiar with solar and wind power and needed information on their applicability to a shore side environment. We discovered a rag called *Home Power* which contained lots of useful technical data and claimed to promote independent living. **WRONG!** It seemed according to them that the solution to all problems was government action (California style) and subsidies. Having spent some time in Cuba, we knew that idea was something we wanted nothing to do with. It was sort of like dealing with the Dept. of Motor Vehicles every time you went to the grocery store (no ration card, no rice. You know the drill).

We have a satellite internet connection for downloading with DirecPC but have to use a cell phone to upload. They promise a two way system as an upgrade very soon. We envy your Starband system but already deal with Hughes for satellite tv service.

Enjoy your cross country journey and if you swing south on the first day I will open a case of Heineken and give you a tour of SPARTA. By the way, make sure you arrive in Amherst in time to hear the keynote speaker Julia Butterfly Hill. She may even be coaxed into autographing a copy of the sayings of Chairman Mao for you.

Our sailboat's name was Leonidas and the dinghy was called Thermopylae. Ask Mac to explain that bit of esoteria for you.

Allen A. Nightingale
sparta@humboldt1.com

Dave, Dave, Dave, you were in the hills of southern Oregon/northern California for too long. The renewable energy crowd understands their market base just fine. Whereas you assume they should follow the old business maxim of, "The customer is always right", and bite their ideological lips. They, however, have bigger fish to fry. Back in the 1980s their

collectivist business models were encouraged by the adoption of anti-free market policies. Oregon, for example, offered special tax credits for the installation of solar hot water systems. As a result solar hot water businesses sprouted anew thanks to fresh government dollar fertilizer. I have one of these on my roof working today. As they see it they could make renewable energy viable the old fashioned way, i.e., research and development, or the tried and true progressive way through government intervention of free markets. If only they could have elected Al Gore, and controlled both houses of congress their businesses would have taken off. Dave, do you get it yet? If they can get government to subsidize the installation of renewable home energy systems they know that liberals as well as conservatives and libertarians will rush to get in line for the "FREE LUNCH".

P.S. I love everything about BHM, especially your insights and John Silveira's constitutional analysis/commentary.

Mike B., Medford, OR

Regrettably, I'm afraid your analysis of the renewable energy marketing strategy is correct. — Dave

Using BHM excerpts

Great magazine! I look forward to each issue and recommend it to all my clients, friends and family. Many people in our area of northern California live off the grid—me included. Having never lived without electricity, your articles have been extremely helpful in understanding how and why things work like they do.

The articles on the Constitution are very enlightening. I had no idea we had come so far from what the Founding Fathers fought and died for.

What's the possibility of using some of your past articles in my newsletter to my clients? I would appreciate being able to share short excerpts

with off-the-grid "want-a-bies" or those living in remote mountain country property. If so, what's the charge.

Judy Watkins, Weaverville, CA

No charge to use excerpts from BHM articles, so long as you give attribution to BHM, with our phone number and website address: www.backwoodshome.com —Dave

Chuck meets Bubba

All I can say is, it's about damned time somebody put it in writing! In one page John has brilliantly summed up the liberal mindset, i.e., all perpetrators are victims deserving of compassion. There is a term for that attitude but I can't use it because young people read this magazine.

The attitude of the women in the story is proof (if any was necessary) of John Galsworthy's timeless observation, "idealism increases in direct proportion to one's distance from the problem." About 20 years ago I spent a year as a deputy sheriff and I saw enough to forever turn me off of the idea of "rehabilitation," much less compassion. Over the last few years I, like John, have also been the victim of a couple of breakins that were very costly, not only in the monetary value of the things stolen but in terms of my peace of mind and that of my family. Putting it bluntly, we felt violated. It's a feeling that doesn't go away and it made me very distrustful of people and the city where I lived. I eventually moved to a rural county a few hundred miles away where my nearest neighbor is a couple of miles down the road. I won't go so far as to say that trespassers will be shot on sight but I wouldn't advise you to push your luck.

It's my feeling that any judge or magistrate, before he is allowed to sit in judgment of others, should spend one year as a bottom-rung deputy or police officer. Then let's see what kind of justice he dispenses! When I was a deputy I once sat in on the trial of a man who had stolen a car and held up a liquor store. The store

owner was faster on the draw and put one in the guy's shoulder. During the trial the miscreant's attorney pled his client guilty and asked for leniency because his client was a drug addict and thus was operating under "diminished capacity" when he committed the crimes, and that he had "already suffered" by being shot. The judge (who had worked his way through law school as a police officer) held up his hand and said, "Counselor, I realize that you have to represent your client but please refrain from insulting my intelligence!" He then proceeded to hand down a sentence of 25 years at hard labor and admonished the defendant, "Did somebody put a gun to your head and make you take those drugs? No, you knew what you were doing when you took them, and you have to take responsibility for your actions and suffer the consequences." Now, *THAT'S* the kind of judiciary we need!

There's one difference between me and John Silveira, however. He sleeps with a .357 and I sleep with a .45. And probably always will.

Frank Williams
somewhere in the south

Roof trusses and fire

In *Trusses*—low cost marvels to roof over most large spaces, by Martin Harris he writes "But such light steel is far from fireproof; it will soften and collapse because of heat long before wood will ignite and burn enough to lose a comparable amount of strength." This is a serious misunderstanding by Mr. Harris. It appears that he is comparing the relative safety of a wooden truss with a metal one when exposed to fire and the products of combustion.

In almost every case, wooden trusses fail earlier than steel. Not because they burn (as indicated in the article) but because the gusset plate (the metal fastener) heats much quicker than wood, expands and pulls free

from the truss. Because these fasteners are placed at the truss joints, the failure of one gusset plate causes the failure of the entire truss. Because in lightweight construction materials are seldom "over-clocked," a bare minimum are used to complete the job. Plus, to a very great extent, trusses are dependent on one another for mutual support; when you lose one you will shortly lose them all because the remaining portion of a wooden truss goes from being roof load support to added roof load.

The danger from metal is generally during fire extinguishment or soon after a fire. The heated metal trusses expand and push out the retaining clip at the end of the wall during free burning fire. As the metal truss cools and contracts, it slips back past the loosened retaining clip and fails.

For what it's worth, I stand on the roof of a burning house fairly regularly. I don't like trusses at all but I'll take steel over wood any day. Current thought in the fire service is that a roof over wooden gusset plate trusses is safe for around 12 minutes after fire spreads to the area. My personal feeling is that 12 minutes is a generous estimate.

I enjoy your site. A variety of interesting topics.

Bill Doss, asystole@fuse.net

Wild herb tea

Another wonderful and interesting issue in the May/June magazine, as usual. There is an error in the "Foraging for wild teas" article I would like to address. By the time you get this letter your own Jackie Clay will probably have spotted it. I am an avid forager of wild foods. Fireweed and Purple Loose Strife are not the same plant. Fireweed has four petal flowers and the leaves grow alternately up the stem and Purple Loose Strife has six petal flowers and the leaves grow in pairs, one on either side of the stem. I have gathered Fireweed for 28 years and have never

seen it growing in a swamp while Purple Loose Strife does seem to like damp soils. I don't know if Purple Loose Strife is edible. To someone just starting out foraging for wild plants, finding the differences in these two plants, as stated as being one plant, may be discouraging and downright scary for many people are afraid of wild plants to start with. It may end someone's desire to ever gather wild plants to eat.

Anyway, I do love the magazine and look forward to its arrival. Just wish it were a monthly!

Kathryn Venable,
Montgomery Center, VT

Starband

You mentioned your Starband system as your new ISP (Publisher's Note, Issue 69). We installed Starband in January, and are generally very satisfied with it. However, there are some features (or lack thereof) that your readers should know.

First, Starband is still working out some software glitches, including compatibility with Netscape. My new system seemed slower than my land-line, until Tech Support helped me with codes for a manual proxy on Netscape. Now, most of the time, it's not much of a problem, but the system tends to get "hung up," when idle for only a few minutes.

Second, a two-way, "always-on," like the satellite system (like land-line T-1 or ISDN) has a single, permanent ISP address. This poses a vulnerability to "hackers" who send out vicious or annoying little programs to attack and compromise your computer. You can protect your computer with one of several home "firewall" programs, but I found that some did not work well with Starband software. We recently installed a hardware firewall (available for about \$100-\$150), and I think our system is now working (1) like it's supposed to, and (2) like we expect it to.

Although Starband has a "member's forum" on its website, the news-groups have very detailed, very helpful information. We used this as a guide to determine that (1) what we were experiencing wasn't normal, (2) lots of people had the same problems, and (3) there were very good solutions or work-arounds to take care of it.

Overall, I really like Starband (particularly the download speed—wheel!) and Starband is a fairly affordable alternative to land-lines for remote locations. I thought your readers might like to know some of the glitches in the system.

Oh, one more thing—although I really enjoyed Linda Gabris' article about "Foraging for a fine cup of wild herb tea," I would have liked a little more emphasis on pesticide and herbicide contamination. Some of your readers live in more developed areas, where neighbors treat their lawns, municipalities treat public green spaces, and farmers treat their fields. Even if your favorite forage site is not chemically-treated, it can still be exposed to chemicals that drift from nearby (or even not-so-nearby) applications. My sister lives in the city, lives the organic lifestyle (no chemical treatment on her garden or yard), but has a noticeable lack of weeds in her yard due to the drift from her neighbors' lawn treatment. If you are foraging, you should really know owners and whether the owners (and the owners' neighbors) use chemicals, and when those chemicals were last used.

Keep up with the great magazine. I always see something useful, something enlightening, and something entertaining. What more could one ask for?

Miriam E. Robeson
MiriamRobeson@starband.net

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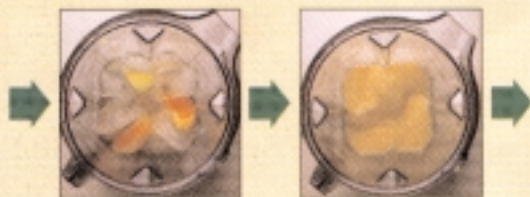
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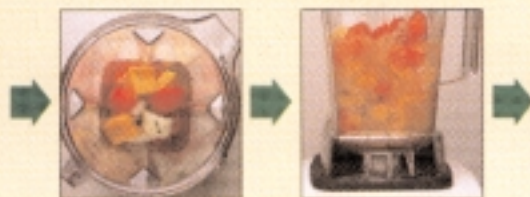


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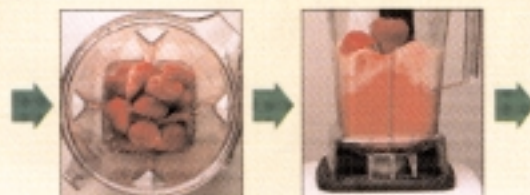
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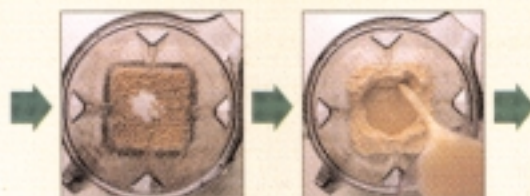
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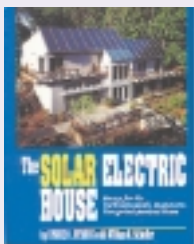
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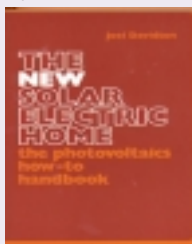
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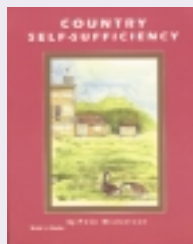
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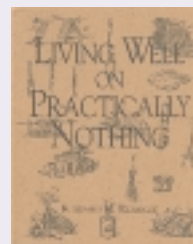
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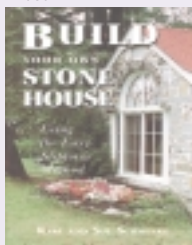
BUILDING WITH STONE



Nothing can rival stone for its beauty and durability. This book educates the novice and inspires the seasoned artisan. A stonebuilder at any level will learn how to evaluate each stone and undertake each step in the procedure with an eye toward aesthetics and useful permanence.

192 pgs; 8½x11" ppbk. \$20.95 BU19

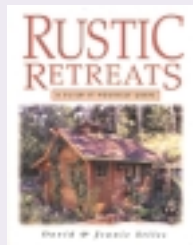
BUILD YOUR OWN STONE HOUSE



The simple and functional beauty of a well-built stone house never seems to go out of style. Nearly twenty years after Karl and Sue Schwenke first constructed their Vermont home, their classic book has been revised, updated, and reissued for a new generation of readers.

164 pgs; 6x9" ppbk. \$15.95 BU13

RUSTIC RETREATS



Campers, anglers, hunters, and nature lovers—the woodland hideaway you've dreamed of is here. From an elegant water gazebo to a traditional tipi, you'll find it in this book. Experienced designers and builders offer illustrated, step-by-step instructions for more than 20 low-cost, sturdy, beautiful outdoor structures.

153 pgs; 8½x11" ppbk. \$22.95 BU15

RENOVATING BARN



Save money, history, and architecture when you renovate or restore your barn, shed, or outbuilding. Learn to square and strengthen the structure, repair the roofing and siding, enlarge and modify the building, install windows, doors, electricity, and plumbing. Also how to evaluate an old structure in light of current building codes.

247 pgs; 8½x11" ppbk. \$27.95 BU25

HEALTHY BONES & JOINTS



This book includes clear explanations of how herbs can be used to help prevent bone and joint diseases, a thorough overview of musculoskeletal conditions, with a wide variety of preventive strategies, and a directory of herbs that are most helpful for the musculoskeletal system—along with preparation instructions and dosage guidelines.

122 pgs; 5½x8½" ppbk. \$15.95 HE18

HEALTHY HEART



The whole-body approach of noted herbal clinician David Hoffmann offers a practical, natural way to prevent heart disease and ease the symptoms of hypertension, congestive heart failure, angina, varicose veins, arteriosclerosis, and other cardiovascular conditions. Discover how herbs can help you live a longer, healthier, more vital life.

122 pgs; 5½x8½" ppbk. \$15.95 HE17

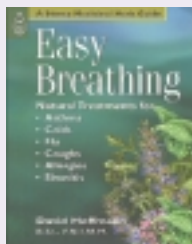
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It's one of the most nutrient-packed foods, and widely used herbal medicines. Now all its latest uses, preparations, and recipes are brought together for the first time. Whether you suffer from arthritis, high cholesterol, or depression—or you want to prevent these and other problems—you'll love dandelions.

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EASY BREATHING



This easy-reference guide offers an overview of common respiratory ailments, with preventive strategies and healing herbal formulas suggested for each condition. The author uses a holistic approach to respiratory care, with a combination of herbal medicines and lifestyle changes.

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HEALTHY DIGESTION



Healthy Digestion is your complete guide to tapping into the power of herbs to maintain a healthy digestive system—with a full directory of useful herbs, preparation instructions and dosage information, and a chapter on simple ways to make your own teas, tinctures, powders, and capsules.

122 pgs; 5½x8½" ppbk. \$15.95 HE20

NATURAL LIQUID SOAPS



Finally, a book on making liquid soaps at home. Using a simple double-boiler technique, you can create inexpensive moisturizing hand soaps, revitalizing shampoos, invigorating shower gels, soothing bubble baths, and much more. And all tailored to your skin type, to your hair's needs, or even to your mood.

134 pgs; 7x10" ppbk. \$21.95 SS37

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BIG BOOK OF COUNTRY LIVING



Originally published in 1922, this work represents years of observation and experience in the wilderness. Learn to distinguish edible plants from poisonous ones, start a fire using a jackknife, build a birdhouse out of a wooden box, tie a variety of essential knots, identify trees, wildflowers, animals, birds, constellations, and much more.

590 pgs; 7x10" ppbk. \$22.95 SS31

PRUNING MADE EASY



Pruning is one of the best things you can do for your plants. Learn when, and how plants should be pruned, artistic pruning techniques used to make topiary, and methods of using and caring for pruning tools and equipment. More than 300 illustrations show proper techniques for pruning of trees, shrubs, bushes, hedges, vines, and flowers.

218 pgs; 8½x11" ppbk. \$22.95 GL8

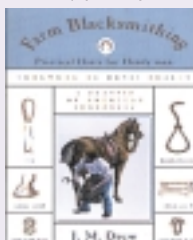
HIVE MANAGEMENT



Long-term success in beekeeping can only be achieved by understanding the lives, behaviour, and motivations of honey bees—the factors which govern the life of each colony. For the practicing beekeeper who needs more information, or for the serious novice who wants to start out right, this book offers sensible advice to help keep your honey bees thriving.

152 pgs; 6x9" ppbk. \$19.95 FP28

FARM BLACKSMITHING



This complete, no-nonsense guide, published originally at the turn of the century, dispenses invaluable tutelage on both the history and craft of this grand tradition. J. M. Drew begins with the basics, including how to set up a blacksmith shop, identify and use various essential tools, and select materials with which to work.

100 pgs; 4½x7¼" ppbk. \$15.95 SS32

THE LAWN & GARDEN OWNER'S MANUAL



You know when it's time to mow the lawn, but do you know when and how to prune the tree that is starting to block the view? Move shrubs that are overcrowded? Liven up an overgrown perennial bed? Fertilize and aerate your lawn? This book will show you how easy lawn and garden care can be.

188 pgs; 8½x11" ppbk. \$24.95 GL65

FOREST GARDENING



Based on the model of a healthy natural woodland, a forest garden incorporates a wide variety of useful plants, including fruit and nut trees, perennial herbs, and vegetables. The principles of "backyard permaculture" can be applied in every temperate zone of North America, helping to transform even a small cottage garden into a diverse and hospitable habitat.

234 pgs; 6x9" ppbk. \$20.95 FP43

SUCCESSFUL SMALL-SCALE FARMING



This book introduces anyone owning (or planning to own) a small farm to the harsh realities and the real potential involved in making a full- or part-time living on the land. Karl Schwenke's clear-eyed approach to the best farming methods covers a wide range of proven techniques and practical advice.

134 pgs; 8½x11" ppbk. \$17.95 FP27

MULCH IT!



Mulch protects the soil, minimizes weeds, contributes to plant health, encourages earthworms, reduces water needs, and cuts down on the gardener's labor. In this book you'll find a complete guide to the relative cost, appearance, insulation value, thickness, weed control, water penetration, moisture retention, and rate of decomposition of more than 50 mulching materials.

123 pgs; 6x9" ppbk. \$14.95 GL68

THE BOOK OF GREEN TEA



Enhance your life with the great versatility and healthful benefits of this tea of the ancients. From bath salts to ice cream, this traditional Asian beverage can be used in dozens of ways to relax the mind, strengthen the body, and soothe the soul.

156 pgs; 7½x7½" ppbk. \$19.95 CR20

SMALL-SCALE LIVESTOCK FARMING



Yes, you can have a prosperous farm and achieve the lifestyle of your dreams—and farming expert Carol Ekarius will show you how. This natural, organic approach to livestock management produces healthier animals, reduces feed and health-care costs, and maximizes your profit.

217 pgs; 8½x11" ppbk. \$21.95 FP12

LANDSCAPING MAKES CENTS



Make sure that the money you spend on your home landscaping adds long-term value to your property. Professional landscaping contractors lead you step by step through the process of planning and building a landscape that fits your needs and preferences and will maximize the return on your investment.

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CIDER



Clear language, illustrations, and instructions lead you through making fresh and delicious sweet and hard ciders—including blended and sparkling ciders, building your own working apple press, enhancing your cooking with cider as an ingredient, choosing the right apple cultivar for the flavor you want, and planning and planting your very own home orchard.

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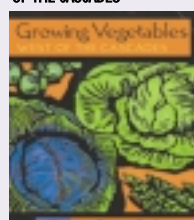
MAKING YOUR SMALL FARM PROFITABLE



Choose the right products, market them effectively, and you too can be a top-earning farmer. Whether buying a new farm or jump-starting an old one, with down-to-earth advice on planning, farming, and marketing you'll make your farm profitable—and find satisfaction doing it.

273 pgs; 6x9" ppbk. \$22.95 SS21

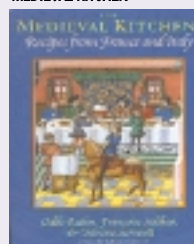
GROWING VEGETABLES WEST OF THE CASCADES



Grace your table year-round with fresh, nutritious vegetables straight from your garden. Includes advice on how to select, cultivate, and harvest plants suited to this region. Whether you grow a few tomato plants or aspire to self-sufficiency, you'll find this bible of Northwest gardening indispensable.

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MEDIEVAL KITCHEN



This book is a delightful work in which historians Redon, Sabban, and Serventi rescue glorious cuisine of the Middle Ages. Medieval gastronomy was superb—a wonderful mélange of flavor, aroma, and color. The recipes are reconstructed from fourteenth- and fifteenth-century sources and carefully adapted for the modern kitchen.

285 pgs; 6½x9½" ppbk. \$21.00 CR37

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Free yourself from the world of rush-hour traffic and office politics with easy-to-digest ideas and techniques for establishing and running your own home office. With authority and wit, Gould covers it all—from setting up your workspace to setting up record-keeping systems. Nearly 50 million Americans work from their homes. Why not you?

171 pgs; 4½x8" ppbk. \$12.95 SS39

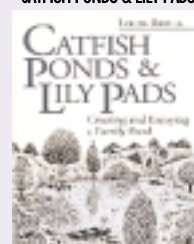
THE VEGETABLE GARDENER'S BIBLE



Wide rows, organic methods, raised beds, and deep soil are the author's method of gardening. Smith says that if he can grow vegetables like these in the tough conditions of northern Vermont, gardeners everywhere, no matter where they live can grow great gardens, too.

309 pgs; 8½x10½" ppbk. \$27.95 GL67

CATFISH PONDS & LILY PADS



Whether it's fishing by moonlight, planting iris and weeping willows, catching crawfish, or supervising an unruly crowd of ducks, Louise Riotte knows how to get the most fun out of a family pond. She shares her experiences in this entertaining book, presented with her trademark mix of facts, anecdotes, lore, and lively humor.

186 pgs; 6x9" ppbk. \$15.95 GL26

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OUTWITTING MICE



Anyone who has had mice invade his or her home knows that nothing is as unnerving as hearing them scurrying behind walls in the middle of the night or finding droppings on the kitchen counter in the morning. But it's trying to get rid of them that can throw any sane person into utter madness.

160 pgs; 5½x8¼" ppbk. \$17.95 SS35

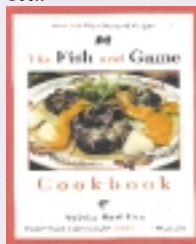
SQUIRREL PROOFING YOUR HOME & GARDEN



The bestselling author of *Deer Proofing Your Yard & Garden* helps homeowners battle one of nature's most wily and persistent creatures—squirrels—with a storehouse of environmentally responsible techniques that really work.

153 pgs; 6x9" ppbk. \$15.95 SS36

THE FISH AND GAME COOKBOOK



A unique cookbook by a former food columnist. Included here are dozens of outstanding recipes, many of which have been neglected by standard cookbooks—venison moussaka, shark tetrazzini, trout with cucumber sauce, broiled goose in mustard sauce, and curried fried squirrel, to name just a few.

272 pgs; 6x9" ppbk. \$17.95 CR33

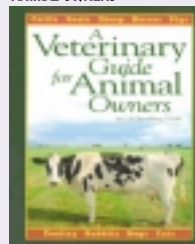
THE PAPERMAKER'S COMPANION



With clear instructions and step-by-step illustrations, expert Helen Hiebert covers every aspect of creating one-of-a-kind papers and using those papers in fun, creative, and beautiful ways. This essential handbook is sure to be one that paper crafters return to again and again.

219 pgs; 8x8" ppbk. \$21.95 SS38

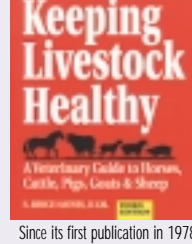
A VETERINARY GUIDE FOR ANIMAL OWNERS



Backwoods Home Magazine's very own Jackie Clay revised and updated this classic on veterinary care. Included are methods to diagnose and treat diseases and injuries in livestock and pets. This is the book to have when you have to treat your own animals or to check before you call the vet. Illustrated.

432 pgs; 8½x5½" hdbk. \$25.95 SS34

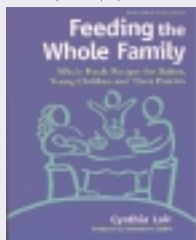
KEEPING LIVESTOCK HEALTHY



Since its first publication in 1978, this handbook has been read by more than 100,000 livestock owners and veterinary students. In this newly updated edition, veterinarian Haynes addresses recent developments in vaccines, artificial insemination, ultrasonography, disease testing, drug treatments, and diseases such as Potomac fever, blue tongue, and BSE.

344 pgs; 6x9" ppbk. \$22.95 FP19

FEEDING THE WHOLE FAMILY



Cynthia Lair is a certified health and nutrition counselor and member of the nutrition faculty at Bastyr University. This is an excellent book for families interested in whole, organic foods. Chapters include starting your baby on whole foods to including vital vegetables in your diet to making wholesome desserts and natural drinks.

282 pgs; 7x10" ppbk. \$21.00 CR36

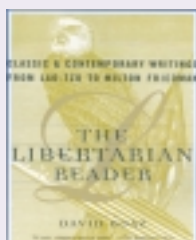
NATURAL BABY CARE



Get your baby and yourself off to a great start—naturally. Herbalist Dodt offers experienced advice on the safest, gentlest products and practices for ensuring good health for your baby. Includes easy instructions on how to select or create safe creams, baths, and shampoos, that promote the health and well-being of mother and child.

156 pgs; 6x9" ppbk. \$15.95 HE1

THE LIBERTARIAN READER



A comprehensive anthology of libertarian thought with readings from the Bible, our Founding Fathers, philosophers, economists, and others explaining why the individual and personal freedom are more important than collectivism and the state. Here is the sensible alternative to the Democrat/Republican monopoly.

458 pgs; 6x9" ppbk. \$20.95 TH3

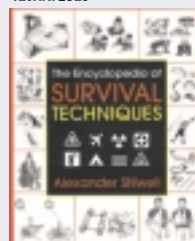
LIBERTARIANISM: A PRIMER



This book traces the history of libertarian thought and provides a concise yet thorough treatment of the subject. The writer discusses why libertarianism is morally just, efficient, and practical, and how it would affect public policy in America by leaving decisions in the hands of the individual, creating a freer and more efficient society.

314 pgs; 6x8½" hdbk. \$26.00 TH5

ENCYCLOPEDIA OF SURVIVAL TECHNIQUES



Included here is everything you need to know about staying alive in the wild. Organized by climate and terrain (desert, sea, arctic, mountain, and jungle), this book is packed with over 200 line drawings that provide step-by-step guidance to mastering survival situations.

192 pgs; 7½x9½" ppbk. \$22.95 SS41

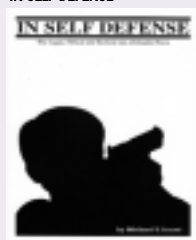
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Our Founding Fathers ordained that jurors had the right to vote "not-guilty" if a law is unjust or unjustly applied. This allows us to hold the government to the principles of the Constitution and prevent oppression. But American courts now systematically deny us this right. Read this book and realize your real power as a juror.

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Keep children safe from unauthorized guns—in their hands or those of others. Discusses gun locks, methods of storage, and safety training. Also includes an introduction to the handgun for the novice. Real world handgun safety, how to shoot, when to fire in self-defense, and gun/ammo/holster choices are discussed.

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The last word

How to blow up an anthill

From early summer after the fourth grade, until late summer after the seventh grade, I lived on my grandmother's farm in New Mexico. She owned forty acres along the San Juan River, three miles from Broomfield, and eleven miles from Farmington.

Every spring, when the weather got hot, we were given one pair of bib overalls each. They were one size too big. No sense buying the right size, because we would outgrow them by fall. The same held for underwear, shirts, shoes, and socks, which we only wore Sunday when we went to church, a requirement when we stayed at grandma's.

When the bib overalls got too dirty we wore them swimming in the river and then just went on with whatever we were doing and they dried as we ran around.

This was back in a time when fireworks were still legal in New Mexico and, on one particular Fourth of July my cousin Raymond and I were each allowed one package of forty with the following warnings: "Don't throw them. They must be placed on the ground and lit. And never take them near the barn."

So we took our firecrackers and as soon as we were out of sight of the house I tried holding one in one hand, lighting it with a match I held in the other, and throwing it before it went off. We soon found out that the fuse, once lit, might burn slowly, go out, or burn up almost instantly. One went off about two inches from my hand.

So we looked for something else to do with them.

We found that if you buried one in a gopher mound, it would throw dirt in the air. Two, firecrackers with fuses twisted together, threw a lot more dirt. Higher too.

As we were doing all this, I was doing the lighting of the fuses, and Raymond was doing the burying. He had had a bad blow on the head when he was a baby and was kind of slow. He would have lit the fuse and left his hand there, so I had to look out for him.

Soon we found that three were as many as we could join together since the fuses were too short for any more.

We also found the anthill.

Now this wasn't just any old anthill. It was one of those that had a hole in the top as big around as your thumb, and the pile of stuff they had hauled up was about 18 inches across. Some of those ants were over half an inch long, with heads like a red BB, and with big hooked pincers.

Just right for blowing up.

Raymond didn't want to do it. He was afraid we'd get bitten if we tried to put the firecrackers into the hole. But I had that one figured out. I got a stick about four feet long and

after we twisted together the fuses on three of the fire crackers, we tossed the bundle onto the anthill close to the hole, and with the stick I pushed it into the hole with the twisted fuses sticking out.

By this time that anthill was in a real frenzy. Ants were rushing back to the hole in little zigzag patterns like they weren't sure where it was. Even where we were standing, two or three feet away, we had to keep moving so they wouldn't crawl on our bare feet.

Raymond kept saying, "No good, no good," over and over, but like I said, he was kind of slow. That knock on the head, you know, slowed him down.

We stood there watching those ants pile up on those firecrackers. They must have been an inch deep. They had found a way to get out of the hole alongside of the firecrackers and were pouring out in a steady stream.

Boy, I never saw so many ants. We could barely see the fuses.

Raymond started edging away again.

"You can't light it," he said, "you'll get bit!"

I grabbed his arm and pulled him back beside me. He came back, not liking it, but if I said so he would give it a try, ants or no ants.

He really trusted my judgment.

Well, like I said, I had it all figured out.

See, when that stick got broken off, it left a split in the end. Well, I just lit one of those big old kitchen matches and stuck it into the split end of the stick. It stuck real solid. Then, it was easy to just reach over all those ants and light those twisted fuses.

It worked! All those fuses lit at once, all three of them, and all three firecrackers went off at once. And boy did those ants get blown up. All of them. I know because we stood right there and watched the whole thing.

I think every ant in that hill was in the air.

And then it rained ants.

Those oversized bib overalls were like funnels. Ants were falling everywhere and those overalls were gathering them up and guiding them right inside. Since there wasn't anything but a skinny brown body in each pair, those ants didn't have anything to hold them back. They just started chewing.

And we started moving.

We ran, swatted, and brushed and cried and shook and wailed and did it all over again. And after we thought we had gotten rid of them one would crawl out of somewhere and bite one of us again.

Raymond didn't get bit as many times as I did. But that was because he was a little farther back than I was, and I think he maybe ran a little before I did. He was like that, kind of slow, that knock on the head, you know, slowed him down.

— H. Elton Harris

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