The Poetry of Power

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IN THE SCRUBBY WOODS at the town limits of Peterborough, New Hampshire, there's a deep trench carved in the forest floor. Climb into it and you'll notice stone facing; this is no old streambed. Follow it downstream, paralleling the raucous Nubanusit Brook, until it ends at a crumbling stone wall. Toward the top of the wall is a hole, four feet in diameter: the mouth of a giant pipe. Scale the wall and you'll see the pipe snaking through the woods, half-submerged in the forest loam, until it empties into another, deeper channel. The last section of the pipe, the part where the water rushed down through the blades of a turbine, then into that final channel to rejoin the brook, is missing. What remains, in leafy mounds, is the detritus of industry: scrap metal, wires, still-shiny porcelain insulators. Tug on a half-buried light socket and you might pull a copper filigree lamp sconce out of the dirt. I did. I held it up in the shadows and felt as if I'd yanked up a ghost, the ghost of light. I knew what this ruin was. I'd seen it on old maps: the Peterborough municipal hydroelectric plant, once used to generate 165 horsepower—about 123 kilowatts—that lit the streets and buildings of "Our Town."

If this plant were put back in operation, even in its 1907 condition, it would produce enough power for about a hundred homes. But it won't be, and following the sluiceway upstream, I came to the reason: a demolished dam. It's a sight that would please many environmentalists. Standing there, clutching my light sconce, I had to wonder if maybe it shouldn't.

IT WOULDN'T PLEASE VERNE. Verne Tower is aptly named, a Martello man: white Stetson, black jeans, work boots built like tanks. His millipede mustache is in danger of being upstaged by his caterpillar eyebrows. He lives in western Massachusetts, where he has farmed or built things his entire life.

Verne is one of those paradoxical men New England mints, the kind with black-rimmed fingernails and graceful hands, a man equally likely to rebuild your truck engine and to say, "I heard a great story on NPR." Cutting stone is his line today; his low workshop is flanked by redoubts of marble, awaiting appointments with his saw.

"There is no free ride," he also says.

Sometime in the mid-'80s, a man named Paul Eckhoff contacted Verne. Paul had bought a crumbling dam and paper mill on the Kinderhook River just across the New York state line. He was in the process of restoring it to make hydropower, and he needed a good craftsman to do some steelwork. Verne went out to Chittenden Falls to take a look. "I'll help you out for a couple of weeks," he told Paul. He continued helping for twenty years.

When it came to hydroelectricity, Paul and Verne were autodidacts. They figured out how to restore one of the powerhouse's main turbines. Then they designed and built another powerhouse for the opposite side of the river. Verne became the plant supervisor, and he and Paul became good friends.

Verne went on to get involved in restoring a dozen or so hydro sites in New England. He built a historic Shaker turbine from archival drawings. He constructed an old-fashioned overshot water wheel. He fabricated control panels from metal lockers and powerhouses from scrap steel. He donned scuba gear to search for a turbine blade that had spun off into the Kinderhook and buried itself in gravel.

Another thing Verne likes to say: "It's not rocket science."

One sunny summer day, I drive with Verne to Valatie, New York. The Hudson River valley town is postcard perfect. At its center, a glassy millpond froths over a dam about three feet high, then races in multiple streams down another twenty feet of rocky waterfall. To one side, a concrete sluiceway diverts some of the water into the basement of a white clapboard house: the powerhouse. Verne helped rehabilitate this hydroelectric plant, and he's showing me around.

"This is cute," I say.

"Oh, it's adorable," agrees Verne.

The powerhouse is locked with a padlock. The combination is written on the siding. Inside, the generator sounds like a sewing machine. It's painted green with red trim. The powerhouse consists of four small rooms stacked on top of each other. On top, there's a small apartment for the caretaker. The room we enter holds the generator and controls. The next room down contains the penstock, arching its neck to deliver water to the room below, which is the waterbox, a concrete cube filled with water and a spinning turbine. We can't go in the waterbox, but we climb a ladder down to a deck outside it. The turbine hums behind the wall. Below us, draft tubes empty noisily into the tailrace, a sylvan channel that reconnects with the river. Above us, power lines take 110 kilowatts of power to the surrounding homes, lighting around a hundred of them.

LIKE SO MANY HYRDO SITES IN THE NORTHEAST, Valatie's power plant used to be a textile mill. Most mid-sized New England towns were once mill towns. Peterborough, New Hampshire, was. The history of Peterborough's ruined power plant is a history, in miniature, of America's electricity industry. Peterborough's dam was built in 1853 to impound water for the local sawmill's water wheel. When the area ran out of trees, the sawmill closed. In 1887, the private Peterborough Electric Light, Power and Heat Company refitted the mill to generate hydroelectricity. The town bought the plant in 1902. This was typical; many towns considered electricity, like water, to be a public resource. The pages of the *Peterborough Transcript* document the town's pride in its power plant. A plant manager's resignation, a new dynamo, smokestack repairs: all were front-page news. So were dry spells; people were expected to conserve when the Nubanusit ran low. "We trust we will all again do our bit," opined the *Transcript* in February 1918, when the town was experiencing a cold-weather water shortage. Conservation wasn't restricted to hydropower. The same cold snap led to a coal shortage too, and the federal Fuel Administrator instituted a program mandating "Heatless Mondays."

Heatless Mondays ended when the war did. But Peterborough's low-water alerts and other more regional calls for conservation ended when power stopped being made locally.

As the market grew, power generation and distribution were increasingly done by larger companies at fewer sites. A small town like Peterborough could afford to buy a small hydro facility, but building a coal-fired power plant, or a huge hydroelectric dam, required more capital. Transmitting power over greater distances required complicated infrastructure. In short, power was best handled by the powerful. Samuel Insull, an early electricity magnate, called it a "natural monopoly." In 1912, Peterborough's power plant was sold to the larger Keene Gas and Electric, which linked it to power plants in nearby Dublin and Keene. Throughout the 1920s, the nation's small electric companies were rolled up into larger and larger monopolies. Eventually, in response to public outcry, the monopolies became utilities—some public, some private—but all highly regulated. The utilities saw economies of scale in operating a few huge power plants, rather than numerous small ones, especially since oil and coal, the main fuels for the large plants, were plentiful and cheap. They acquired small hydro sites and began shutting them down. Peterborough's hydro plant was switched off in 1926, just two years after Keene Gas and Electric was absorbed into a new statewide utility, the Public Service Company of New Hampshire, owned by Samuel Insull. With large power plants and a growing transmission network, PSNH had plenty of power to sell without small plants. In fact, a year after closing Peterborough's plant, the company announced a rate reduction to encourage greater electricity use. Within five years, residential consumption had nearly doubled.

Small hydro plants were decommissioned throughout the '40s and '50s. Without upkeep, they decayed and crumbled. Many, like Peterborough's, were forgotten.

They were remembered in the late '70s. On the heels of the OPEC oil embargo, President Carter's administration devised incentives to encourage renewable energy development. The Public Utility Regulatory Policies Act of 1978 required utilities to buy power at market rates from small producers. Hydrologists got excited and went around looking for promising sites. That's when Paul Eckhoff bought Chittenden Falls. There were many others. In 1980, John McPhee profiled small hydro developers, including Eckhoff, in *The New Yorker*. That same year, the New England River Basins Commission listed eighty-two hundred sites where still-existing or former dams could produce significant amounts of electricity. Two Peterborough sites were redeveloped in the early '80s, but not the old city plant. Its dam had already been destroyed.

Few things are as beautiful as falling water. That beauty has been making power for thousands of years—first mechanically, with waterwheels, and then electrically, with turbines and generators. *Generator*, from the Latin *generare*, to produce, is a misleading word. No device can produce energy; it must convert it from something else. The burning of coal converts millions of years' worth of stored sunlight into heat. A hydroelectric plant converts the kinetic energy of falling water into electricity.

The process is simple. A sluiceway diverts water from a river into a downward-slanting tube called a penstock with a turbine at the bottom. The distance the water falls is called the site's "head." The water spins the turbine, which in turn spins a magnet centered in a conductor made from tightly wound wires. This produces an electrical current. That current travels out of the powerhouse on wires and joins the electrical grid. The water exits the turbine through draft tubes and rejoins the river via the tailrace.

Many hydroelectric plants use dams to create reservoirs. Big dams—Glen Canyon, Hoover, Grand Coulee—store water until demand for electricity is high, at which point the engineers who control them release it. These huge structures, called storage dams, have turned rivers like the Columbia, the Colorado, and the Tennessee into strings of elongated, stepping-stone lakes, transforming the landscape and displacing residents both human and wild. The dam the Chinese built at Three Gorges flooded 140 towns and 13 cities, displaced well over a million people, and turned the Yangtze River into a holding tank six hundred kilometers long. When the reservoir was filling up, scientists could detect a wobble in the Earth's rotation. Because these facilities transform river habitats so radically, the power they produce is not considered renewable by the U.S. Department of Energy.

Today, most of the hydroelectric power in the U.S. is produced by a handful of large storage projects. Yet according to the Federal Energy Regulatory Commission, or FERC, the vast majority of the roughly 2,540 hydroelectric facilities generating power in the U.S. are small, "run-of-river" facilities. "Small," according to FERC, is anything less than thirty megawatts, though most are far smaller; "run-of-river" means a power plant that doesn't store water, but operates with available streamflow. The Department of Energy considers run-of-river hydroelectricity to be renewable, and many states have made it eligible for green power incentives. The amount of power these plants contribute to the national grid is small, but it could be bigger.

How much bigger is the subject of a 2004 report for the Department of Energy, prepared by the Idaho National Engineering and Environmental Laboratory. Using topographical maps to assess the nation's undeveloped small hydropower, it catalogued places where rivers could turn in-stream hydrokinetic turbines, or where water could be diverted through penstocks and turbines and returned to the river. Excluding sites that would require new dams and those that were either protected or too remote to be developed, it declared there were about thirty thousand megawatts of potential power to be gained from small hydro in the fifty states. That's about six times the amount of electricity produced by Niagara Falls, or enough to power 30 million homes.

Now, in an age of rising seas and rising oil prices, interest is growing again in small hydro—especially in the Northeast, where many rivers were powering mills a century or more ago. Developers big and small are looking for sites to restore or retrofit. This has some environmentalists worried. That's because the sites with the most power potential often have an impoundment, such as a millpond, to raise the water level upstream of the powerhouse, increasing the head. These impoundments are made with dams. And therein lies the rub.

There's just something about a dam. Dave Brower fought to obstruct them. Edward Abbey dreamed of exploding them. Derrick Jensen dreams of exploding them still. John McPhee wrote that for environmentalists, the Devil's world is ringed with moats of oil and DDT, but its absolute epicenter holds a dam. The treacherous wizard Saruman in *The Lord of the Rings* powers his evil orc factory with a dammed river. "Free the river!" cry the Ents: big explosion, triumph of good. Nothing says eco-warrior like killing a dam.

WILLIAM FAY IS IN THE BUSINESS OF SAVING DAMS. He got involved in small hydro during the late '70s resurgence.

A sort of elder statesman of hydroelectricity, he is a licensed inspector of dams and hydroelectric plants as well as a plant owner. He has two children, Will and Celeste, who are starting out in the business too. They have rehabilitated a small plant in Winchendon, Massachusetts, and on an uncharacteristically gray August day they agree to show it to me.

Will and Celeste share a family resemblance and a tendency to complete each other's sentences. They are sitting on the tailgate of their pickup, swinging their legs, when I arrive. A light rain is falling. Both wear small, wire-rimmed glasses and an intense yet cautious earnestness. Except for their grubby jeans and mud-caked feet, they seem like the kind of young people who might knock on your front door with Bibles, only their gospel is falling water. They have been in the church since childhood.

"It's just what we did," Celeste says.

The younger Fays have a company called French River Land. William Sr. maintains a website for the company that makes small hydro look like the best opportunity for family fun since the invention of Monopoly. It features Will and Celeste rigging I-beams, scrambling around on penstocks, scuba diving in forebays, hoisting fourteen-thousand-pound rotors with cranes, and performing every manner of repair on a variety of lovingly described turbines. *They're the Von Trapp family of hydropower!* I thought when I saw it. I had to meet them.

As we contemplate their small powerhouse, Will and Celeste seem eager to explain the rigors of their vocation. They have to find sites and acquire them. They have to invest capital, sweat equity, and time into getting a site up and running. Then there's the permitting process. "It takes between a year and two years and at least $60,000 to get your FERC license," Will tells me. Will and Celeste are luckier than most. Having grown up in the hydro community, they have friends who are architects, environmental engineers, electrical contractors. They trade favors.

Celeste recently got her degree in civil engineering from Worcester Polytechnic Institute, and Will is in his final year in the same program. The Winchendon plant is their first solo rehabilitation project. The ninety-kilowatt dam and its powerhouse are located on a nine-acre brown puddle called Tannery Pond. William Sr. bought the site in the early '90s and never got around to restoring it. He let Will and Celeste take over. They did it by hand and on a shoestring: repaired the leaky dam, installed a rebuilt turbine, and debugged the controls. The whole project took three years. Their first month in operation, they made ninety-three dollars.

"This project makes $30,000 a year, gross," Will says.

"We don't usually make any money," adds Celeste.

The Fays visit the plant often. They do all the repairs and upgrades themselves. They pull dead deer and beavers off their intakes, along with tires, cans, and pieces of furniture. Winchendon is a depressed former mill town, and the Fays have had two powerhouse break-ins; the first stripped them of every inch of copper wire in the place, and the second relieved them of $25,000 worth of tools. The Winchendon police got the tools back. Recently, someone tried to get in with an axe, but the metal door held firm.

"Hydro is so fun," Will says. He's not being sarcastic.

The Fays walk me out onto their dam, showing me the gates they built above the intakes so they could drain the plant for maintenance without draining the pond. We visit the spillway and gaze at the bypass reach—the part of the river that doesn't go through the turbines. According to their license, the Fays have to send a minimum of six cubic feet of water per second through their bypass reach whenever there's enough water to do so. The plant has a float system that monitors pond level and turns the turbine off and on to keep them in compliance. It's off now, but not for lack of water. They've turned it off so we can talk without the noise. They ask if I want them to turn it back on. I do.

Will climbs the upended pallet they use as a ladder to the powerhouse. He flips a switch, and the turbine groans awake. Within a minute, it's whirring like a wet jet engine. From the underside of the cement-block building, water splashes into the tailrace. Will comes to the door of the powerhouse. "It's on," he says. "It's making electricity. It's actually sending it out into the grid." He pauses, a slight smile on his face, like someone hearing distant music.

"It's cool," he says at last. "It feels good."

PRESIDENT CARTER'S TAX INCENTIVES for renewables didn't survive the '80s. Oil got cheap again, and the utilities decided to shed their contracts with small power producers. Once again, they bought up small hydro plants, this time solely to shut them down. They would scuttle the penstocks, or fill the intakes with cement. They would destroy the dams.

They were aided by environmentalists.

A flurry of new regulations—wildlife protection, the Clean Water Act, wetlands conservation measures—made operating a dam increasingly onerous.

"Hydro can, if it's not done right, be . . ." Celeste gropes for the word.

"Detrimental," Will says.

One thing that can be detrimental is a significant reduction of water in the bypass reach. Whether it's a few feet or a few miles long, the bypass reach is what keeps the river alive. If too much water is diverted through the powerhouse, river hydrology will change and habitat can be devastated. The river can also be negatively affected if the water re-entering it from the tailrace is warmed, de-oxygenated, or stripped of its sediment. The licensing of hydro plants by the Federal Energy Regulatory Commission is meant to minimize these impacts. FERC requires license applicants to communicate with state and federal natural resource agencies and water quality agencies, as well as local stakeholders such as Indian tribes, conservation groups, and landowners, before even submitting an application. The list of parties who must be consulted varies from state to state, but it's long; the Massachusetts list includes 13 federal agencies and 118 separate state and local groups. These groups are invited to weigh in on the license and what mitigation steps should be mandated. FERC is required to consider both environmental and developmental values in deciding whether to award a license.

As is typical, the Fays' FERC license mandates not just minimum flows in the bypass reach, but also fish escapements to let fish get over the dam and trash racks to keep river life (and damaging things like logs or tires) from entering the penstocks, all of which Will and Celeste built themselves. In addition, they voluntarily drilled holes in their draft tubes to re-oxygenate tailrace water.

"We bend over backwards to help the environmentalists, and yet we're still seen by about a third of the people out there as damaging the environment," Celeste says.

Verne Tower voiced a similar frustration. The environmental activists of the '70s, he explained, put in place a lot of regulations that make small hydro difficult to develop today. Those activists were Verne and his friends: "I got involved in this industry because I thought it was a sociologically, environmentally beneficial endeavor, a way to mitigate some of the impact I've had on the world," he told me. "And I've had people just about throwing rocks at me."

THE FOLKS AT AMERICAN RIVERS don't typically throw rocks, but if they did, they would throw them at dams. Formed in 1973, largely to fight big dam projects, American Rivers was originally focused on getting undammed rivers protected under the National Wild and Scenic Rivers Act. Then, in 1997, the Federal Energy Regulatory Commission decided not to relicense a hydroelectric project at Edwards Dam on the Kennebec River in Maine. American Rivers joined a broad coalition of conservation groups that helped plan and engineer the 1999 destruction of the 917-foot-wide dam, launching a new phase in river restoration: dam removal.

Today, annual reports and newsletters from American Rivers include dam-elimination beauty shots: dams being exploded by dynamite, dams being pounded by hydraulic hammers, dams being chewed up by backhoes. Since 1999, the group has offered guidance and technical know-how in the removal of over seven hundred dams. Most have been low-head dams, around five to fifteen feet high. American Rivers calls them "dams that don't make sense."

That phrase implies that some dams do make sense, which gives me a glimmer of hope. Maybe there's some common ground between small hydro enthusiasts and river activists after all. I travel to Washington and meet John Seebach, director of American Rivers's Hydropower Reform Initiative. With conservative hair and wonkish spectacles, John looks less like an eco-warrior than like someone who works a few blocks over, at the Treasury Department. There's a stack of studies on his desk; the pen next to them is red.

I raise the topic of small dams on old millponds, secretly hoping John will offer up his approval for an adorable power plant like Valatie. The opposite turns out to be true. Small dams are John's least favorite kind. “If you’re a utility and you’re trying to get 15 percent of your portfolio from a bunch of five-hundred-kilowatt or even one-megawatt projects, that’s a lot of dams,” he says. He pulls two bar charts up on his computer and toggles between them. They show number and capacity of FERC-licensed projects by size. Big dams are far fewer, but produce the vast majority of the power.

“The footprint of all these little dams adds up and chokes up a watershed,” he says. “A big plant provides a lot more power.” That extra capacity means big plants are more profitable. And more profit means they can afford to mitigate the harm they do to the river with measures like fish hatcheries and smelt barging.

He concedes that, done right, small hydro plants can preserve riparian habitat and provide for fish passage. But for John, “done right” is the hitch. Doing it right requires money, and John just isn’t sure the economics add up. As projects get smaller, their price per kilowatt-hour ramps up. Private producers and communities may like the idea of small hydro, but as costs increase, John worries they’ll be tempted to relax environmental standards. That temptation might only grow as more and more states institute renewable portfolio standards—minimum percentages of power that utilities must generate with renewables.

“It’s been kind of a frustrating thing for us—or for me personally,” he says, “because there aren’t clean lines between people who want to protect the environment and people who don’t. If all you care about is the river, it’s clear. But if you care about other things—power use, global warming—then it’s not a clear answer. I think that’s why I keep coming back to cost.”

Cost is a highly rational way to make decisions. Big dams may not be ideal, but they’re efficient. Small dams do less harm, but their economic benefits may not outweigh the harm they do. One thing this assumes, of course, is that there’s no relationship between our centralized power grid and our profligate use of power. But it isn’t easy to connect the action of running your microwave to the burning of a hunk of coal two counties away. In the era of Big Energy, power has retreated from the public eye.

People who go off the grid learn to re-see it; when you’re making your own watts, turning on a light or a television has a tangible cost. Heatless Mondays become something to consider. Maybe TV-less Tuesdays too. Recently, when avalanches took out transmission towers that brought hydropower to Juneau, Alaska, the city was forced to run on diesel generators. The price of electricity increased from eleven cents a kilowatt-hour to fifty-three. Within weeks, consumption dropped by 30 percent. But it may not have been just about price. The hydropower plant was nearly thirty miles away; the diesel generators were all within the city limits. And they were dirty. By the time the transmission towers were repaired, the generators had pushed Juneau to the limit of its air-quality permit. Power use was suddenly a cause with effects you could see.

On the other hand, people can see a free-running river, and they like it. Augusta, Maine, home to the former Edwards Dam, loves its renewed waterfront, which has even attracted condos and new businesses. In an American Rivers documentary, a developer calls Augusta “the next upscale old-port development.” American Rivers likes to point out that the three and a half megawatts of power lost by removing Edwards Dam could be made up by replacing seventy-five thousand incandescent light bulbs with energy-efficient ones. Sadly, that didn’t happen; since Augusta’s river was freed, electricity consumption in Maine—as in all states—has steadily increased. To help meet the demand, five new natural gas power plants were built in Maine in the three years following the removal of Edwards Dam.

“IT WOULD BE NICE if something happened when you flip a switch, so that you had some idea that you just blew up the top of a mountain to get coal,” says Lori Barg, principal of Community Hydro, a small hydro consulting firm. She founded the Vermont Small Hydro Association, an organization enabling small hydro developers to share information and work together for regulatory change. She also just bought a small hydro site herself—an eighteenth-century milldam.

Lori talks a lot about “distributed power”: generating power at thousands of small sites, in a variety of renewable ways, rather than at huge centralized plants. Such a system would not only favor low-impact, greener power, but it would be less “brittle,” meaning less subject to cascading failures when one big plant goes down. It would reduce transmission losses, too, because the shorter the distance power has to travel, the less is lost in the process.

“We’re losing one or two times as much power as we’re using in the end,” Lori says. “If you want to start looking at the economics, is a kilowatt-hour generated in Boston the same as a kilowatt-hour generated in Peterborough, when you have so many losses along the way? It’s like having a leaky bucket.”

In January 2008, Barg’s Vermont Small Hydro Association ran afoul of American Rivers generally and John Seebach specifically. The association lobbied the Vermont state legislature to pass a bill calling for reforms to small hydro regulations, including a reduction in streamflow requirements for bypass reaches. In short, its members wanted the state to let them take more water out of the river. The default minimum standard they wanted was called “7Q10”: the amount of water in the river during the lowest seven-day period that could be expected every ten years. Conservation groups countered that this was like using the worst smog week of the decade to benchmark clean air for Los Angeles.

Describing this bill to me, John Seebach said, “When you see the small hydro people agitating for lower flow requirements, that tells me that, essentially, developing the project to current environmental standards is going to make it uneconomic.” If the economics don’t make sense, he concluded, development doesn’t. “You don’t kill the environment to try to save it,” he declared.

“I’m an environmentalist,” Lori Barg tells me. “And I guess I think we can walk and chew gum at the same time. I think there’s a way to do low-impact hydroelectric development. The biggest environmental issues have been around fish passage. Do dams block fish passages? Yeah, they do. But not every fishery is an anadromous fishery. There are also environmental problems that you have to look at when you look at dam removal. A lot of dams contain a lot of hazardous waste and sediments.”

Hearing her speak, it occurs to me that in spite of all the numbers zinging back and forth, the differences here are as emotional as they are intellectual. John sees a dam as a noose, choking the river. Lori Barg, like Verne, like the Fays—like me, in fact—actually likes old dams.

There’s a critical question for environmentalists at the heart of the small hydro conundrum: what constitutes the natural state of a landscape? Is it early agricultural pastoral? Is it the landscape the colonists first encountered, much of it already transformed by Native Americans? Or is a landscape only beautiful if it’s completely denuded of all traces of the human hand? Nineteenth-century writers called landscapes reshaped by humans “improved.” A dammed millpond was an improvement on a free-running brook, because it bent the landscape’s beauty to human use. When I mention this to Verne Tower, he nods. “I am of that school myself,” he says.

No one can deny that any dam changes the ecology of a river. Water upstream of a dam is slowed and often warmed. Sediment accumulates, changing the cobbled river bottom into pond muck. Fish populations often shift from cold-water species like trout and salmon to cool-water species like bass, or even warm-water species like largemouth bass, pickerel, and bluegill. Anti-dam activists see this as a problem that should be solved with backhoes and dynamite. Advocates of restoring old hydropower sites argue that these ecological changes can’t be rectified, or that in some cases they shouldn’t—that the newer ecosystem has been around for a couple hundred years and has value of its own, even before you factor in the site’s potential for making clean power.

The one thing everyone seems to agree on is that dams should be evaluated on a case-by-case basis. There’s no one-size-fits-all-dams solution to balancing the need for power with a facility’s ecological effects. Some dams should definitely go. Others might be worth keeping. The question is, how do we calculate worth? Is it pure financial return, or is there some value in reconnecting people to their power?

It’s hard to imagine people putting up with Heatless Mondays from Entergy or Exelon. But Heatless Mondays from the local hydro plant, when they can see for themselves that the river’s running low? That sort of thing worked rather well in the past. Maybe it could work again.

CHITTENDEN FALLS CRASHES down twenty-five feet of vertical rock with six feet of dam on top. Verne Tower takes me to see it: the first hydroelectric site he worked on, the one he helped Paul Eckhoff restore. Four years ago, Paul walked out of his home, slipped on the ice, hit his head, and died ten days later—undone, in the end, by water. Verne grows sad thinking of his friend as we walk around the power plant the two of them built.

The wooden ramp that leads to the powerhouse is painted green with red slats. Inside, two generators are spinning loudly, producing four hundred kilowatts. The floor above the penstock shakes with thudding water. Across the river, a small powerhouse astride a steep penstock is generating another two hundred kilowatts. Verne and I tromp through the grass and a snake slithers over my toe.

Looking at Chittenden Falls is like stacking the deck. The place is gorgeous, both the natural setting and its human improvements. The waterfall is a tall, smooth barrier that would have been an impasse to fish even before the dam. Clearly, the small hydro folks have been showing me their exemplary sites. But at American Rivers, I had asked John Seebach to find me an injurious small hydro installation, one that had completely denuded its bypass reach, or destroyed its river ecology. I wanted to see small hydro at its worst. He promised to come up with one and send it to me. He never did.

Later, I called Fred Ayer, executive director of the Low Impact Hydropower Institute, a nonprofit organization formed—in part by American Rivers—to create standards and certify green hydroelectric facilities. I asked him for the same thing: a power plant that would make me rethink my enthusiasm for small hydro. "That's funny," he said, "John Seebach called the other day asking for the same thing." Fred couldn't think of one either. It would have been easier, he told me, twenty years ago. But today, plants that were dewatering their rivers have, in most cases, been forced to stop. Environmental regulation has worked. That doesn't mean everyone is happy. Though they talk readily about compromise, in their hearts, the opposing camps are as opposed as ever. There are those who speak for the river and those who speak for the dams. I wonder, as I watch Chittenden Falls surging down its smooth face, if emotional deadlock is not exactly where the small hydro debate should stay.

Power use is not merely a function of policy; it has its poetry too. But we have grown deaf to its song. What was once an art—a marvel that connected us to place through the mechanics of wind, water, or sunshine—has been reduced to mere need. And at that point, the only question becomes how to get more. "I've learned this," Verne Tower tells me. "When the public gets the power, unless the price dictates to them how they use it, they are going to squander every bit of it." He's right of course. Price can promote conservation. But so can reconnecting people with the sources of their power.

Silently, we drift out along the sluiceway that channels water to the larger powerhouse's penstocks. Like the paper mill's sluiceway a century ago, it's made of wood. I ask Verne if there were cost or efficiency reasons to build it of wood again. Verne contemplates his handiwork. "We could have fabricated it out of steel," he says. "But it wouldn't have looked as nice."