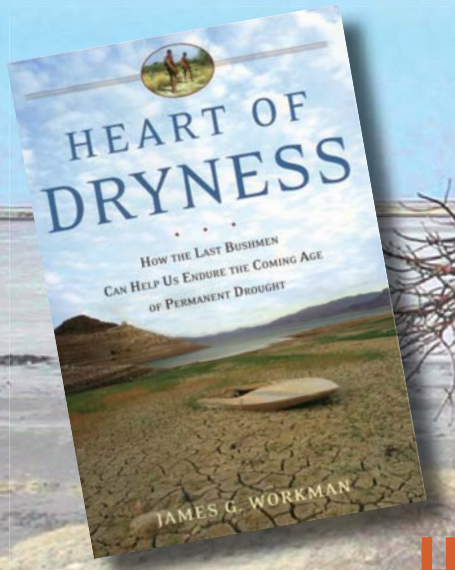
JAMES G. "JAMIE" WORKMAN AND ELIZABETH V. "LIZ" GARDENER



How the Kalahari Bushmen Can Help Us Solve Our Water Crisis

Workman

Gardener

James G. "Jamie" Workman, author of the award-winning book,* Heart of Dryness: How The Last Bushmen Can Help Us Endure The Coming Age of Permanent Drought, *talks with Elizabeth V. "Liz" Gardener, suburban conservation coordinator for Denver Water and AWWA member since 1986.

Jamie, your website and book jacket list many of your appearances, writings, and speeches, but it doesn't appear that you've had the opportunity to talk with the largest group of water professionals in the world—the American Water Works Association—at least, not until now. For the benefit of JOURNAL *readers who have not yet heard of you, I'm going to begin by quoting portions of your résumé. Then we'll get into some of the questions that naturally arise from having read your book and from having heard you speak.*

An honors graduate in history from Yale, Workman is a journalist, speaker, entrepreneur, and consultant to statesmen ranging from Interior Secretary Bruce Babbitt to Nelson Mandela and to institutions ranging from Bechtel and USAID to the World Water Council and World Conservation Union. In Africa and Asia, Workman helped forge the landmark report of the World Commission on Dams, led desert research safaris, and advised businesses, aid agencies, and conservation organizations on water resources. Based on his seven-year study of indigenous coping mechanisms in the Kalahari, Workman wrote the critically acclaimed and award-winning *Heart of Dryness: How the Last Bushmen Can Help Us Endure the Coming Age of Permanent Drought*. When he was blacklisted from Botswana [for his role as a journalist who once filed regular reports on Botswana's siege of Bushman lands], he returned to the [United States] to translate, replicate, and scale up the Bushmen's social innovation in partnership with utilities to let end users own, save, and trade equitable and ecological shares in water and energy efficiency.

Female Bushmen (left) provide 90% of the band's water requirements through 150 species of wild roots, tubers, fruits, melons, berries and rhizomes—arguably harvesting the most efficient and nutritious "crop per drop" on earth. Reflecting the longevity and adaptability of their traditions, Bushmen rock art (right) still can be seen, and is among the oldest on earth.

What inspired you to write this book?

Books on the water crisis often fall into ideological rants or focus on disembodied statistics, case studies, and policy responses inadequate to the problem. My goal was to break free from the pack by telling a story. I unlocked water's fault lines through the microcosm of unlikely protagonists: the last free indigenous people in southern Africa and, more specifically, a matriarch with the almost unpronounceable name of Qoroxloo (Chlora-cluve) Duxee (Dew-klee). These Bushmen have been thriving for thirty thousand years in a dry landscape without depending on a utility to provide their water. That's the point. By stepping out of the natural monopoly of water and comparing the Bushmen's decisions, techniques, and strategies with our own, the contrast is as instructive as the story is riveting.

How did you choose the title?

Beyond a shameless literary reference to Africa in [Joseph] Conrad's masterpiece *Heart of Darkness*, my title identifies a place—the arid core of the Kalahari, the farthest place from any river. It then evokes the empty soul of those who use water as a weapon to control the weak. Finally, it reveals the desiccated heart of the heroine, Qoroxloo, who made the ultimate sacrifice during her long, defiant refusal to surrender.

How did you become interested in the topic of water?

As a boy growing up in California, my life was shaped by drought—a force larger than my family or government could handle. Most crises like floods, fires, and earthquakes pull our state together; water scarcity drove us apart. Later as a journalist I followed the money, and as you trace economic power to its source, you discover how water infuses our bloodstream, our food, our electricity, our politics. In 1994 US Interior Secretary Bruce Babbitt hired me as a writer to help prepare remarks and position resource policies. I was excited by sexier, more charismatic issues like endangered species, wildland fires, salmon, national parks, and wildlife refuges, but quickly discovered that all these issues trace back to increasingly scarce water. Soon I was hooked; I grew obsessed with the removal of old, obsolete dams, and I came to realize the fate of civilization turns decisively on who controls the universal currency of the twenty-first century.

The cultural divide between the Bushmen and more developed societies seems so vast. How can we bridge that divide to learn from the Bushmen?

I won't glamorize Bushmen or urge us to imitate them. This isn't a romantic or New Age book. But their code of conduct works so well, as ours continues to founder, that I question who is really "backward." Our so-called "more developed societies" irrigate deserts, collapse atop depleted aquifers, amputate currents, blend urine and feces with tap water, kill salmon runs with dams, and evaporate more water than we consume. Because of such profligate waste—this according to such "green hippie radicals" as McKinsey, Nestle, World Economic Forum, or Goldman Sachs—we're

now hitting a wall, a limit to growth—a forty percent global deficit. Well, Bushmen hit a wall thirty thousand years ago and still produce a surplus. Their proven strategies point us toward a softer, alternative approach, and they do so with laughter and dance.

Why do you differentiate between sustainable and resilient?

In a sustainable world, a handful of centralized wise men and women look at past precedent and use graphs to chart a framework system that makes top-down water decisions on behalf of all. But today precedent is gone, blown out the window with the death of stationarity. Models are not just useless, they're dangerous. The center cannot hold, and to keep things from falling apart, our sustainable economy must become resilient. Resilience means the average person has the responsibility and autonomy to become an integrated water management professional, facing risks and rewards for his or her own water use decisions.

Considering all of the uncertainties of the future, what are you suggesting that North American water utilities should be preparing to handle?

In our Great Recession, Ben Bernanke grabs headlines. But the average water utility manager must quietly overcome far more heroic challenges each day. After all, the Federal Reserve looks at inflation, trade deficits, and consumer confidence and prints up a few billion more dollars to tinker with interest rates. But you can't print water. Rate increases require unanimous buy-in from hostile customers who are, essentially, a utility's boss. Now we confront unprecedented population growth, evaporation rates, precipitation patterns, runoff and flows, urbanization, heat waves, floods, droughts, hurricanes, saline intrusion, dynamic competition, and growing affluence, which further ratchet up demand. Our seventy-five thousand aging dams were built decades ago for a certain hydrograph, which no longer exists. In order to absorb potential flood risk you must empty reservoirs right when you need storage most. Aquifer recharge and conjunctive use of groundwater hold potential, if you can roll back seepage pollution. Reverse osmosis diverts anemic rivers somewhere else to cool the prodigious energy that desalination requires. In the recession, people demand lower rates, and if you promote conservation and efficiency, you're killing your revenue base. No wonder one retiring utility manager in the Colorado River basin looked at the future and saw "Armageddon."

There is a lot of talk about our water footprint. What do you see as the virtual impact of our water footprint on public policy?

In the rare event that end users consider how much water they use, they think only of their sink, shower, toilet, and, if you're lucky, their lawn. They don't think of the two hundred fifty gallons they ate for breakfast, or the thousand gallons in their denim jeans. The water to produce our goods and services—from corn flakes and corn ethanol to microchips to megawatts—is embedded or "virtual" water. What we use is our "water footprint." Both offer useful tools in economic or trade policy to visualize our impact. But to bring real change beyond an intellectual parlor game, that water needs scarcity value. Right now, it doesn't have it. Families and firms don't pay for water; they pay to recover the cost of its provision. Few policy-makers know that, but it explains why water costs less in Arizona than in Wisconsin (where pipes freeze and need expensive parts and labor). We waste what is free. It's easy for me to say our problem is that water's too cheap. But you'll never hear an elected official say that in public because doing so would be political suicide.

Many years ago, I read a quote from Eric Hofer, "In times of change the learners will inherit the earth, while the knowers will find themselves beautifully equipped to deal with a world that no longer exists." What do you think of his idea?

Hoffer's right, but the missing catalyst is motivation. Why bother to learn? Why invest time and money to step out of your comfort zone? The public knows it can outsource all decisions to a few "water experts." Why learn to conserve a cheap resource when doing so will result in higher rates to offset the lost revenue, give profligate neighbors a free ride, or punish you when rations kick in? Likewise, at the risk of generalization, centralized "water experts" know their hard science: physics, chemistry, biology, hydrology, or engineering; they know the complexities of tapping, diverting, and managing water. Why learn economics, sociology, game theory, psychology, and the political soft sciences of people? Well, for Bushmen—and increasingly for the layman and expert alike in a thirsty world—our motivation is becoming obvious. We're dry. We've hit the wall of cheap supply. Because we don't know how to allocate the finite and fugitive supplies to infinite numbers of competitive users, we must learn to adapt our demand to the rule of water.

So how do the Bushmen teach us to adapt?

I break down complex strategies to a simple "Seven Habits of Highly Resilient People" that turn resource scarcity into relative abundance. Here are the rules the Bushmen live by:

- **Seek shelter.** Their only enemy is the sun, a death force like a hyena. Where you see a reservoir, Bushmen see a sacrifice to the gods. They trap and secure water in closed, concealed, evaporation-proof storage systems—a strategy that we are only starting to embrace as we unplug dams and recharge aquifers.
- **Consume local.** As Bushmen eat and drink closest to the source, they avoid leaks, spills, pollution, and exposure in transport. Utilities can slash money, energy, and water loss if they reduce imports and encourage community storage or even rainwater harvesting.
- **Diversify supply.** Bushmen obtain eighty percent of their water budget from what's in the ground; they capture the rest from dispersed pockets in the natural infrastructure. Rather than depend on one dam, which may fail, silt up, or evaporate away, utilities offset risk and boost resilience by tapping groundwater recharge, fog, dew, graywater, reuse, or, as a backup, small-scale desalination.
- **Devolve decisions.** Bushmen don't elect or submit to a coercive authority. Decisions emerge laterally through constant but voluntary interaction and trust. Facing finite supplies, utilities can build resilience to the extent that they entrust responsibility outward and reward those who to do more with less.
- **Own shares.** Families and firms may hold the deed to their property, but they can't own water flowing through their pipes. Bushmen can and do respect informal title to water resources.
- **Encourage trade.** Trade is the counterpart to ownership and leads to specialization and cooperation. The frugal or innovative Bushman who reduces individual demand will expand resilience for all.
- **Unlock monopolies.** Shutting off water deliveries, wells, and storage to the Bushmen was a human rights crime, but it also liberated Bushmen from their dependence on an official monopoly. The root of resilience is the liberty to choose, compete, and conserve.

Those last three lessons seem daunting. Can you expand on them as well as why we would want to or how we can translate them here in the United States?

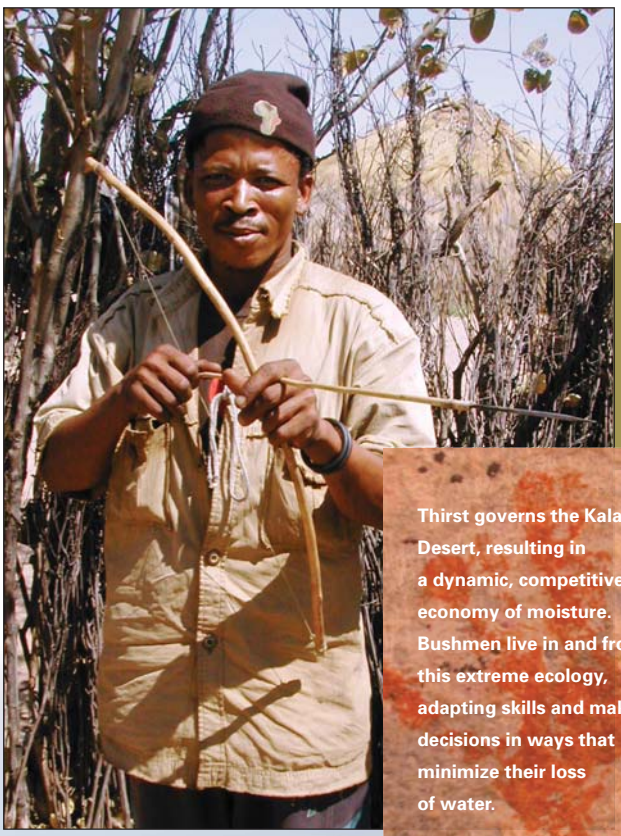
First, secure for all an equal and fair share of water. Bushmen respect informal title to water resources, whether that means water in sip wells, springbok bladders, baobab trees, ostrich eggshell canteens, plastic barrels, or tsama melons. Given the human instinct to care for what you own, it makes sense to entrust metered end users with equal daily shares of the first, say, hundred gallons that flow through their meter. It's their water, after all; utilities hold it in trust. Letting people own some makes it politically expedient to charge steeply for anything above that threshold.

Second, encourage trade. Romantics think of them as "proto-Marxists," but Bushmen truck, barter, and exchange water resources, negotiating informally within their transparent network and beyond their bands. A proposed "human right to water"—as a liberal global movement now advocates—is self-defeating unless that water can be defined, owned, and exchanged. Only then is there an incentive to use less rather than more. Those families or firms who save water out of greed for valuable efficiency credits will benefit everyone else by their own self-interest.

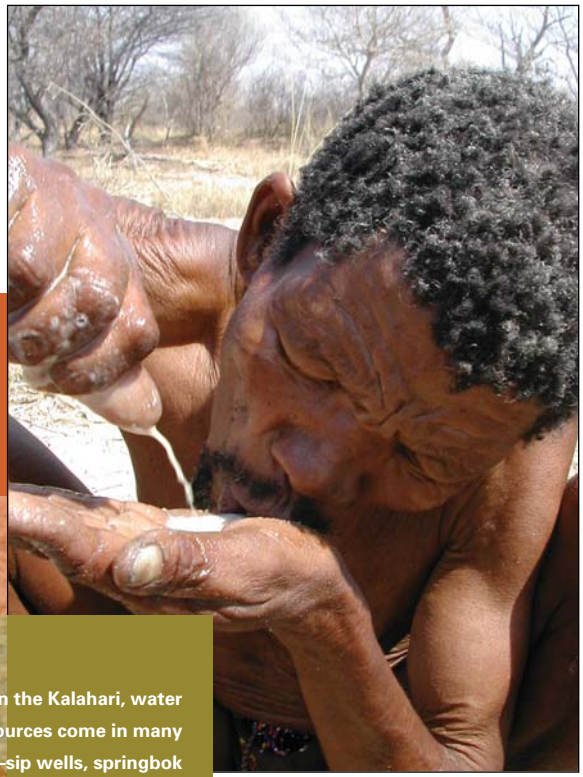
Third, unlock monopolies. In the Kalahari, no species dominates. No chief rules. Interaction is voluntary—and nature abhors a monopoly. Bushmen are freer than the average voter or Fortune 500 CEO in the United States because they do not depend on one central monolithic entity for the very source of their existence. Utilities that loosen the rigid, brittle forces of monopoly can breathe with flux and adapt. They become resilient, gain efficiencies, and negotiate with end users as partners rather than as rivals. As they encourage competition for credits they will create a more loyal, integrated, and efficient "smart water grid."

What you've learned from the Bushmen seems to point to several obstacles for water managers to overcome. Would you address each of these obstacles individually?

Sure. The first is ownership of water. I thoroughly enjoyed a recent symposium given by Bruce Babbitt,



Thirst governs the Kalahari Desert, resulting in a dynamic, competitive economy of moisture. Bushmen live in and from this extreme ecology, adapting skills and making decisions in ways that minimize their loss of water.



In the Kalahari, water resources come in many forms—sip wells, springbok bladders, baobab trees, ostrich eggshell canteens, plastic barrels, tsama melons, or tubers (shown above).

Peter Gleick, and Sheila Olmstead, whom I count—whether they like the association or not—as my mentors. I agree with their views . . . up to a point. They say "ownership doesn't matter" to get past stale ideological debate over "investor-owned utilities" versus "public utilities" because both have successes and failures. That's true. Yet both are also absolute natural monopolies that discourage choice, competition, and incentives to conserve. That must change, and in our Internet age, it can. I guarantee that like all of us, Peter invests more time, energy, and care in his own used car than he does in any shiny new airport rental. Likewise, we would treat one hundred gallons of water we "own" better than ten thousand gallons of the rent-controlled wet stuff we flush down the toilet and spray on driveways. Sure, raising prices will encourage efficiency, but when I catch up with my former boss, I will tease him mercilessly by asking why he didn't impose unilateral price increases on water when he was the governor of Arizona, the Secretary of the Interior, or a candidate for president.

The second one is connecting water quality, water quantity, climate change, and population growth. Some blame our "water crisis" on climate change, but that just accelerates existing stress points past a tipping point. Others advance a "population bomb" hypothesis, but I suspect the world could support fifteen billion people if we all conserved and innovated efficiently the way the Bushmen do, or three billion people if they all consumed like me and my profligate American family of four. Still others blame pollution, and ever since the Cuyahoga River caught on fire in 1969, America's energies in the water sector have been focused on quality, not quantity. But today, parts of our river beds may be clean and still catch on fire because they're bone dry and covered with dead twigs and leaf litter. All of these compound forces are inextricably linked, and we can't address them one by one. You can't say "the solution to pollution is dilution" when there's no water with which to dilute; you can't "cap and treat" water effluent that is almost entirely urban and agricultural runoff. But you can engage all firms and families to take H2Ownership of our water.

So is H2Ownership of water a human right or a tradable commodity?

In reality, both views are symbiotic. A human right to water works only if it is explicitly defined, exchanged, and owned by us, the citizens. Civic water right exchanges may seem radical, but have deep roots in thirsty landscapes. In arid Chile, Australia, or the western United States, governments endowed farmers with private shares of public currents—usufruct rights now traded to secure water for urban uses and leased by The Nature Conservancy for river health. South Africa distributes public water shares among poor nonwhites as leverage to negotiate co-ownership of private farms. Under aflaj, a 4,500-year-old water rights exchange system, Oman communities secure enough public water to drink or bathe; beyond that, water's value fluctuates by owner's use. Oldest of all, under xaro, Bushmen bands self-regulate their Kalahari economy by informal bartering of water resource goods, services, or information. Under a utility-based H2Ownership system, robust social innovations can be fused with and adapted to Silicon Valley's technological innovations. Here, Web 2.0 social media can allow hundreds of thousands of urban water users to benefit from "click" markets within natural "brick" monopolies via a transparent trading platform.

In the public policy arena, what do the elections of November 2010 offer water managers?

Four words: "You're on your own." Just like Botswana cut off Bushmen's water supply, Washington essentially will cut off support to you. For better or worse, this shifts responsibility and autonomy to your local shoulders. Let's not be naïve. America elected hundreds of state and federal officials who either deny the menace of climate change or the notion that humans have anything to do with its causes and water-stressing consequences; these include melting snowpack, crip-

pling droughts, faster evapotranspiration, sudden flash floods, hotter wildfires, and so on. For the next three years, expect federal and state budgets to cut the meager funds available for repairing and upgrading our crumbling water infrastructure, which has been given a D– by the American Society of Civil Engineers. Is there a silver lining? I think so. Savvy managers at both publicly and investor-owned water utilities should be motivated to look to their end users not as "customers" to please or "voters" to fear but as "shareholders" to vest with new shared responsibility as partners.

In your book, you mention that the Bushmen celebrated often. So how do we in North America blend in spiritual celebration in addition to our fine history of good engineering?

Whether a person is religious or not, water remains the ultimate mystery. Our access to water shapes how we live, where we live, and, in some cases, if we live. There's a reason water provokes such a visceral response. We're primates; we evolved to the rhythms of rivers and seeps. The birth of every city, from Metsiamenong to Manhattan, begins with a secure well. Every aspect of our economy relies on this matrix of life. In the developed world, at some point we lost—or happily surrendered—the labor and love that attached us to water resources. We outsourced water to extraordinary engineering performance at a utility. While we took water for granted, we lost some of the reverence and awe and mystery of water.

There are certainly plenty of problems and challenges, but let's not stop there. Let's talk about your suggested solutions. Given the book's title and focus, is there a problem outside of drought-prone regions?

Hydrologists give drought a narrower technical meaning. As a nonscientist, my book defines drought for the lay reader as the inexorable convergence of booming populations, worsening pollution, rising prosperity, careless waste, distorted economies, and unprecedented climate flux. Augmenting supply is rarely an option outside of conjunctive use; even where rainfall may increase, it comes too fast and furious to store. Whether they are privately or publicly held, North American water utilities operate as "natural monopolies," which limits options when it comes to reducing demand. You can unilaterally impose higher rates or crack down with rations, but both risk political backlash and lost operating revenues. We've been forced between Scylla and Charybdis, until the Bushmen showed us an alternate route.

Could you explain how and why smart meters relate or lead to AquaJust?

There's a lot of hype and healthy skepticism surrounding automated reading or "smart" meter infrastructure. This technology can relay water use data not every other month or week, but every fifteen minutes. The benefits for leak detection and labor reduction are clear. But it is dangerous to remove people from the equation, trying to put the system on two-way autopilot. It also misses the enormous potential value of real-time data: motivating the end user. Although smart meters and smart utilities provide the how, when, and where to an intelligent water utility system, we need a community-based "smart market" platform to offer the why. People will check water use and behavior with strong incentives, such as water credits or ecoshares, that they can accumulate and own like frequent flier miles but earned through conservation.

When I visited South Africa shortly after the new government was starting up, there was a lot of talk about freedom/ownership but not much about responsibility. How do these two values fit together, or do they?

As Aldo Leopold famously warned us, "There are two spiritual dangers of not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace." For Leopold, ownership was a means to an end; it meant understanding the ecological limits and risks in using the precious resources on which humans depend. It also meant taking responsibility to invest in what belongs to you, and enjoying the freedom to improve on it. Today, he'd say that a spiritual danger in not owning a well lies in supposing water comes from that faucet, that toilet tank, that pipe in the wall.

I get it that you are urging us to think differently about the value of water, so would you give an example?

Most of us don't own a well or want to. But we could own shares of and invest in what would essentially be our very own "virtual well" of ecoshares. In fact, ecoshares could underpin a new "blue" economy—an ecosystem and viral community linking users' drip irrigation, lawn sprinklers, and taps back to the institutions, natural reservoirs, and aquifers from which the water came. The less they deplete, the more they earn. If a family consumes its daily allocation of ecoshares, they owe nothing; if they use more, they pay more. But, if like Bushmen they are frugal and efficient and find ways to use less, they can save, bank, accumulate, donate, or sell their ecoshares to more profligate users elsewhere in the same utility. The result is a widespread incentivized race to conserve, an authentic "smart water grid" whose wisdom comes not from technology but rather from competitive people thinking differently about water's scarcity value.

Why focus on urban residential, commercial, and industrial water rather than rural agricultural water, where most water is used?

The short answer: Because that's where the people are. The long answer: In 2010 half the world crossed a tipping point to become more than fifty percent urban. In a few decades that number will be seventy percent. Most economic activity, most value per drop, and most income related to water all take place in cities. Also, most urban connections, unlike rural users, are metered—which means everyone's locked into the same system and we can prevent free riders or the tragedy of the commons. What's more, we can reduce emissions most by cutting urban water use because that's where the water–energy nexus is embedded and intense. Finally, if we can establish a sense of urban H2Ownership in a political majority, the efficiency lessons can be carried over to agricultural allocations as well. After we "climate-proof" our urban economies, we can drought-proof our diets to reduce our footprint from what we eat and wear from food and fiber.

Is water too political? Should it be, given nonpartisan regulatory oversight?

Water isn't a partisan issue, and that's actually a problem. Do an informal survey through a Google search of political races in every district of the United States, and you will discover universal consensus. It does not matter whether the office-seeker was Republican, Democrat, Socialist, John Birch, Green Party, Tea Party, Libertarian, or Peace & Freedom Party. No candidate has stood on a platform in the midst of the Great Recession and vowed: "If elected, I promise to raise the price of your family's water, gas, electricity, and grocery bills." But water should be emphatically political in terms of who controls the taps at what price for which economic interests.

So how do you overcome the political biases and fears of elected officials?

Ironically, the Bushmen's apolitical approach wins support across the ideological spectrum. Conservatives feel that "owning" virtual shares in water can unlock and engage the creative energies of most private individuals working in their own long-term self-interest. Liberals can embrace their democratic impulse to give every American an equal opportunity starting point each day and seize upon this approach's ability to avoid punishing the poor or policing our neighbors over their "watergy" use [i.e., efficient use of water and energy]. Libertarians can rejoice that instead of new laws, policies, taxes, or police pushing reforms from the top down, an online community exchange platform would encourage a competitive yet voluntary culture of conspicuous conservation.

Why can't rate restructuring promote stewardship by each person just as well?

It's a start. But what opportunity sounds more attractive—save money or make money? If we rent water, we can avoid spending as much on our bill each month; if we own ecoshares of water, we can earn money and could get a check in the mail instead. Moreover, as owners we have a stronger long-term incentive to fix leaks or invest in all those showerheads, high-efficiency toilets, WaterSense-approved dishwaters and washing machines, timed sprinklers, rainwater harvesting, tiered gardens, and so on because they will pay higher dividends over time.

What happens if we don't make these changes?

Even if we immediately stop all carbon and greenhouse gas emissions, the world will keep warming. As it does, sudden deluges will alternate with longer, hotter, droughts. Floods let us store less; droughts leave us less to store. These extremes affect irrigation, depleting food supply. The lack of water also cuts energy production, depleting power supply. So climate adaptation literally boils down to water adaptation. There is no civilization better adapted to doing more, with less water, than the Kalahari Bushmen. Right now people are migrating to the very cities—Atlanta, Ga.; San Antonio, Texas; Las Vegas, Nev.; San Diego, Calif.—that are drying up and as a result have shakier bond ratings. Sure, trade in goods with embedded water will help mitigate the crisis, but it won't diminish its vice grip. So the way things stand, the "losers" will be the same they have always been: marginalized poor and aquatic ecosystems. The winners will buy Evian, use air-conditioners, and vacation in New Zealand. For me, and for the Bushmen, the root of resilience is the liberty to choose, and that's why we need a system that lets us voluntarily save, own, and trade shares of water efficiency credits within utilities.

What have you learned/observed since the publication of Heart of Dryness*?*

The most profound shock to me over the past year has been the disturbing new recognition of the extent to which water and energy depend on—and choke—each other. We often think, "Oh, right, hydropower." But it goes way beyond that to involve every decision from the idiocy of irrigating food into biofuels or installing thirsty solar thermal plants in the desert to the nineteen percent of energy burned up by heating, treating, moving, and lifting water around each state. Each day each family

In the Kalahari, Bushmen do not dominate everything around them. As a result they are freer than most humans because they are not dependent on a single entity to support their existence.

requires a ton of water; have you tried lifting or warming up a ton of water? Now multiply that by 100 million homes. Every 24 hours. The flip side is that once we start to think of "energy-efficient toilets" and "water-saving light bulbs" we can put a huge dent in our emissions while building climate adaptation strategies.

What do you wish you had done/written/said differently?

I wish that earlier on I had found a teacher who could have made economic decision-making less . . . dry. It was all rational theory, pure and mathematical, rather than the messy, fun, amoral, and fascinating explanation of our behavioral instincts that it can reveal. But life provides its own correctives. If I hadn't been such a self-righteous young man in a hurry, I might have seen the folly of trying to "rescue" Bushmen where they lived; but then my car broke down in the middle of the Kalahari, a wonderfully humbling experience. If I hadn't been so focused on defensively "conserving wild nature," I might have seen earlier that conservation is really all about proactively harnessing "human nature." Again, that epiphany came through a conversion in the desert. If I had taken a different course, I'd have missed the real-world example of the "diamond–water paradox of value" that confounded Adam Smith—the godfather of economics.

What emerging trends and issues intrigue you right now?

I've begun a second nonfiction narrative book that investigates where, how, and on whom my own individual "water footprint" actually lands. This explores "virtual water" not as an abstract theoretical concept, but as a consequential reality. I think the "human right to water" still hasn't gained the traction that it could. I believe the cell phone is the most powerful, yet untapped, development tool for improving water, sanitation, health, and energy in the poorest parts of the world. Beyond that I'm intrigued by the emerging lessons of evolutionary behavioral psychology, game theory, the watery aspects of the locavore movement [those who prefer to eat locally grown/produced foods] and the "watergy nexus"—carbon footprint of water, and the water footprint of energy.

What do you anticipate doing in response to your interest in these emerging trends/issues?

When I'm not writing or working to pay the rent, my partner and I have invested in several platforms that translate the xaro exchange system of the Bushmen into a Web 2.0 community-based market for the exchange of water and energy efficiency credits. We are working with progressive utilities in a dozen cities to adapt, customize, and scale these competitive platforms in ways that benefit the end user, the natural resource base, the utilities, and the regulatory officials.

—Workman is open to talking with JOURNAL *readers via e-mail about the ideas presented here. He can be contacted at jamesgworkman@gmail.com. Readers are also invited to post comments on Workman's websites at www.heartofdryness.com and/or www.smart-markets.com.*