

THE NATURAL RESOURCE • MAY/JUNE 1990 • \$2.50

# Sierra

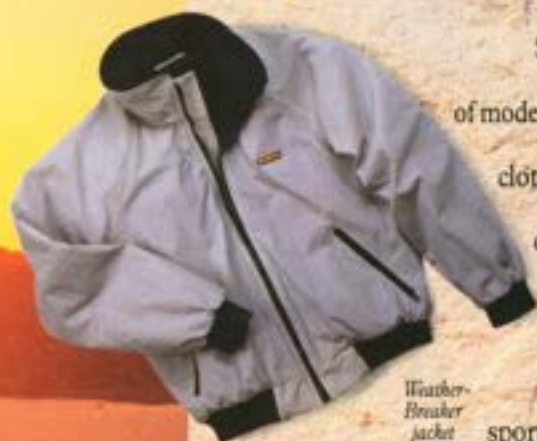








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# Sierra

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Photo by Larry Ulrich.

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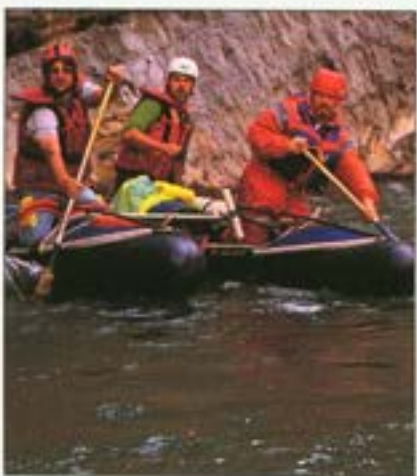
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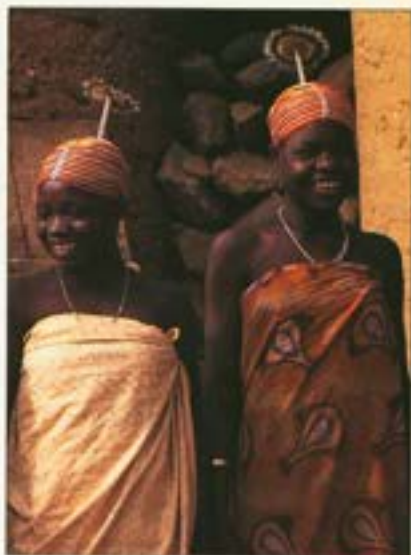
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## HOPE'S REWARD

Even as we derive a heightened sense of hope from the interest surrounding Earth Day—an interest pegged solidly to escalating concern over the myriad problems that confront us—it's difficult not to view April 22 (still a month away as this is written) as an Environmental Christmas in the making.

All but the brightest-eyed of children soon begin to view December 25 and its attendant goodwill and cheer as slightly sad, simply because those sentiments are in such short supply the rest of the year. Just as it's not enough to pick one day out of 365 to practice charity and generosity of spirit, it surely won't be enough to single out one day in April to be kind to Mother Earth.

When you read these words, Earth Day 1990 will be behind you—by at least a week, maybe more. Does it still resonate in the columns of your local newspaper? Do happy-talking TV anchors still simmer over grammar-school recycling projects and the Kiwanis' tree-planting campaign? If so, terrific: Long may they promote those worthy undertakings, and all the others we'll need to nurture if we're to keep ourselves afloat in the years ahead.

But suppose Earth Day turns out to be little more than the disposable news hook and marketing opportunity we're already seeing signs of weeks before the event. What do we do next? How can we channel the energy that decadal anniversaries tend to generate (be they of rock festivals or assassinations), but that dissipates once the Great Day is done? Does anyone know a foolproof way to transmute concern over our mutual survival into effective action? What will move us to redefine our concept of self-interest—let alone defend the interests of other life forms—when so many of us refuse even to acknowledge the dangers or our own complicity in them?

Perhaps these cynical ruminations are ill-founded. Perhaps the implications of our precarious condition have penetrated so deeply into the collective consciousness that a critical mass has at last been reached—one that will not only unify us against further wanton destruction, but whose energy will percolate upward to the politicians, industrialists, and other power brokers whose attention must be focused now—because their decisions, even if they're the right and proper ones, we may yet find have come too late.

All of which brings us, not terribly neatly, to the notion of optimism. We know from recent history that those who maintain a sense of hope, of spiritual if not material empowerment, often survive longer than those who give in to despair. Ask Elie Wiesel; ask Nelson Mandela. Sometimes they even gain their freedom, and call it hope's reward. The freedom we seek is the freedom from fear of the world we've made together, and that we continue to destroy even as we lament its destruction.

Earth Day, the Environmental Christmas, is every day. From all of us to all of you, best wishes of the season.

Jonathan F. King  
Editor-in-Chief

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## LETTERS

### CRAZY, OR WHAT?

*Sierra* is incredibly beautiful. The articles are all very worthy. But almost all the articles I read leave me feeling hopeless, depressed.

I've thought a lot about reasons why *Reader's Digest* has been such an enduring success. I think the bottom line is that it informs, entertains, and makes people feel better.

I would suggest that your editorial staff consult a psychologist to give you insight into ways to achieve your goals without the perpetual gloom-and-doom cloud.

I write this as a person who has done her bit for Planet Earth for many years. I will continue for the sake of my children and grandchildren. I have made a conscious decision, however, to choose to hope—to consider my cup half full, rather than half empty.

Renee Sutton  
Phoenix, Arizona

*Having long ago noted the hovering cloud you mention, we try to balance hard, often depressing news about environmental problems with more inspirational efforts—our hope being to communicate the ineffable joy and wonder to be found in the natural world. If you still think our balancing act tilts too far toward apocalypse, try starting this issue with the meditations of four lyrical naturalists ("Knowing Their Places," page 62). From there flip back to Richard Bangs' tale of a thrill-seeker's conversion to the environmental cause ("Rapid Changes," page 56). These contributions might well elevate the contents of your cup closer to the high-water mark.*

### NOT A GLOWING REVIEW

Carol Polsgrove's review of Catherine Caufield's *Multiple Exposures* ("Books," March/April) quotes, without disagreement, the author's complaint that our radiation standards are based not "on scientific certainty, but on judgment, hunches and compromise."

Author and reviewer here seem curi-

ously unaware of what science is all about, and on how the risk assessment process is obliged to work. I am sorry to have to disabuse Caufield: There is no absolute truth in science. And when we must extrapolate from small numbers of exposed individuals to general populations, or from experimental animals to man, or from the test tube to the living organism, there are multiple uncertainties that can only be resolved by using the best judgment of which we are capable.

I must wistfully agree with Caufield, however, that certainty would surely simplify the world.

E. C. Foulkes  
Institute of Environmental Health  
University of Cincinnati Medical Center  
Cincinnati, Ohio

### WILD'S ENTHUSIASM

I'm disappointed that Peter Wild is so taken with John Haines' *The Stars, the Snow, the Fire* ("Books," March/April). While Haines' descriptions of the natural world are all very poetic, his indiscriminate urge to trap and kill what he finds there puts him into the same category as the dirt bikers and others who must rape wild places for their personal amusement. A leghold trap may be poetic to Haines and even to Wild, but it isn't to whomever happens to be caught in it.

The natural world has troubles enough without the literati out there playing hunter-gatherer. For every reader of *Sierra* who has lived (as I have) for long periods in wild places without killing the wildlife, I have a piece of advice: Buy some other book.

Elizabeth M. Thomas  
Peterborough, New Hampshire

I believe that Peter Wild has missed the crux of Bill McKibben's *The End of Nature* ("Books," January/February). First, though the evidence McKibben assembles is depressingly strong in support of global change *already* in motion, he points out that what we do





Cheddar Cheese



Peanut Butter



Raspberry Jam



Strawberry



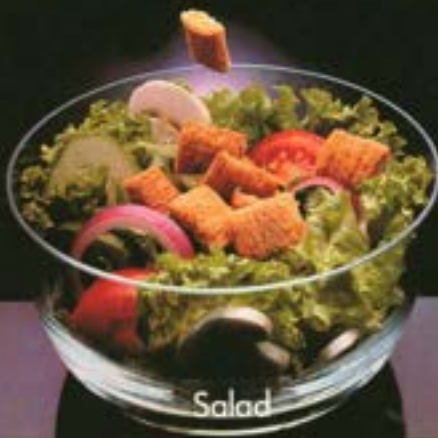
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now and in the immediate future can at least mitigate the effects in the physical world.

It is in considering the spiritual or psychological effects on humankind that McKibben veers closest to despair. He argues that we now have two pathways from which to choose: increased human control of the Earth, or turning away from these practices. Technological control—vast plantings of genetically engineered trees, or domed urban environments—may allow us and some other living things to survive, perhaps even in some comfort. But the fundamental role of "Nature" in the human psyche or spirit will have been destroyed.

McKibben does offer the hope that we may choose the other path and, worldwide, stop our disastrous indulgence in support of luxury and numbers. This is a remote hope, to be sure. But we can try—to save not only Earth but our souls, too.

Regina McAskill  
Austin, Texas

### FORESTS AND FLUES

Your answer to a question about whether natural firewood burns cleaner than artificial firelogs ("Q&A," March/April) was misguided. The assumption seems to be that firelogs breed themselves in the back room of the grocery store.

Artificial logs use sawdust from large-scale sawmills as well as paraffin, a by-product of oil production. The logs are then manufactured in a process that involves a fair amount of energy. They are packaged in cartons (that normally are discarded) and transported a considerable distance by truck before you see them on the shelves. The energy used to manufacture these logs, and the resulting pollution, probably exceed that resulting from their use.

While the utilization of the by-products of commercial timber and petroleum production is admirable, please don't restrict your pollution calculations to the fireplace flue. Pollution is pollution, and the fact that modern distribution systems enable us to "transport" some of it from the place

where it comes out of a chimney back to some rural community where the forests are clearcut and the artificial logs are manufactured hardly makes them a clean product.

Tom Clyde  
Woodland, Utah

### ALL CHEMICALS AREN'T BAD

Dwight Holing's overview of biologically based pest control ("Looking for Mr. Goodbug," January/February) contains a few common misconceptions. First, integrated pest management strives to minimize the use of pesticides through the use of resistant crop plants, cultural techniques, and the use of naturally occurring "goodbugs." But in those cases where no reasonable alternatives exist, environmentally benign pesticides (such as chloropicrin and methyl bromide) are the weapons of choice. Also, the National Research Council does not state that farmers can farm without chemicals or that production levels can remain the same without them. The report is sprinkled liberally with qualifiers.

A. Ann Sorensen, Assistant Director  
Natural and Environmental Resources  
American Farm Bureau Federation  
Park Ridge, Illinois

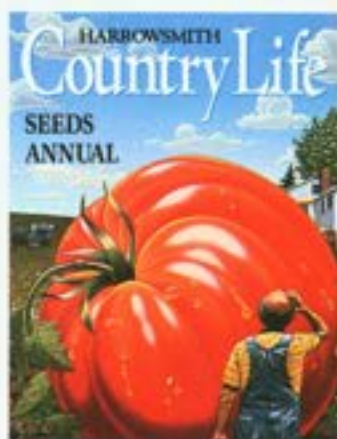
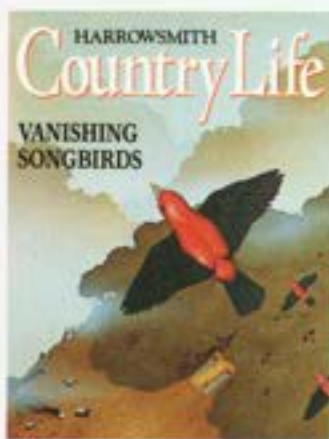
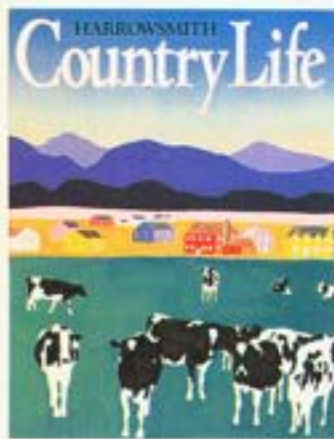
### GREEN FILM GUIDE

I was astonished not to find *Gorillas in the Mist* in Daniel Conner's personal pantheon of films with ecological themes ("Afield," March/April). The 1988 drama, directed by Michael Apted, probably did more to publicize the plight of the mountain gorillas of East Africa, and to save them, than any other efforts since the work of Dian Fossey (portrayed in the film by Sigourney Weaver).

To round out my honor roll of ten, I would offer: *The Mission* (1986; dir. Roland Joffe); *Where the River Runs Black* (1986; dir. Christopher Cain); *The Day of the Dolphin* (1973; dir. Mike Nichols); *Testament* (1983; dir. Lynne Littman); *The Quiet Earth* (1985; dir. Geoffrey Murphy); *Where the Green Ants Dream* (1984; dir. Werner Herzog); *Deliverance* (1972; dir. John



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Boorman); *The Mosquito Coast* (1986; dir. Peter Weir), and *Iceman* (1986; dir. Fred Schepisi).

Steven G. Kellman  
Professor of Comparative Literature  
University of Texas  
San Antonio, Texas

Conner originally enumerated a baker's dozen of his favorite eco-films—including *Gorillas in the Mist*. His list was whittled down because of space considerations.

As additions to Conner's list, I'd like to nominate *Silent Running* (1972; dir. Douglas Trumbull), a chilling, all-too-personal meditation on the possibility of destroying our genetic pool, and *Walkabout* (1971; dir. Nicolas Roeg), a twisted fall-from-the-garden tale.

Jonathan Schorsch  
New York, New York

Wildlife biologists and naturalists have condemned Conner's top nominee, *Never Cry Wolf*, for its misinformation. This piece of celluloid trash is entertainment unrelated to reality. Other entries in his potpourri of films are equally misguided.

You have a membership to serve that is more sophisticated than this trash suggests. It appears that the contributors to *Outside* magazine have invaded Sierra.

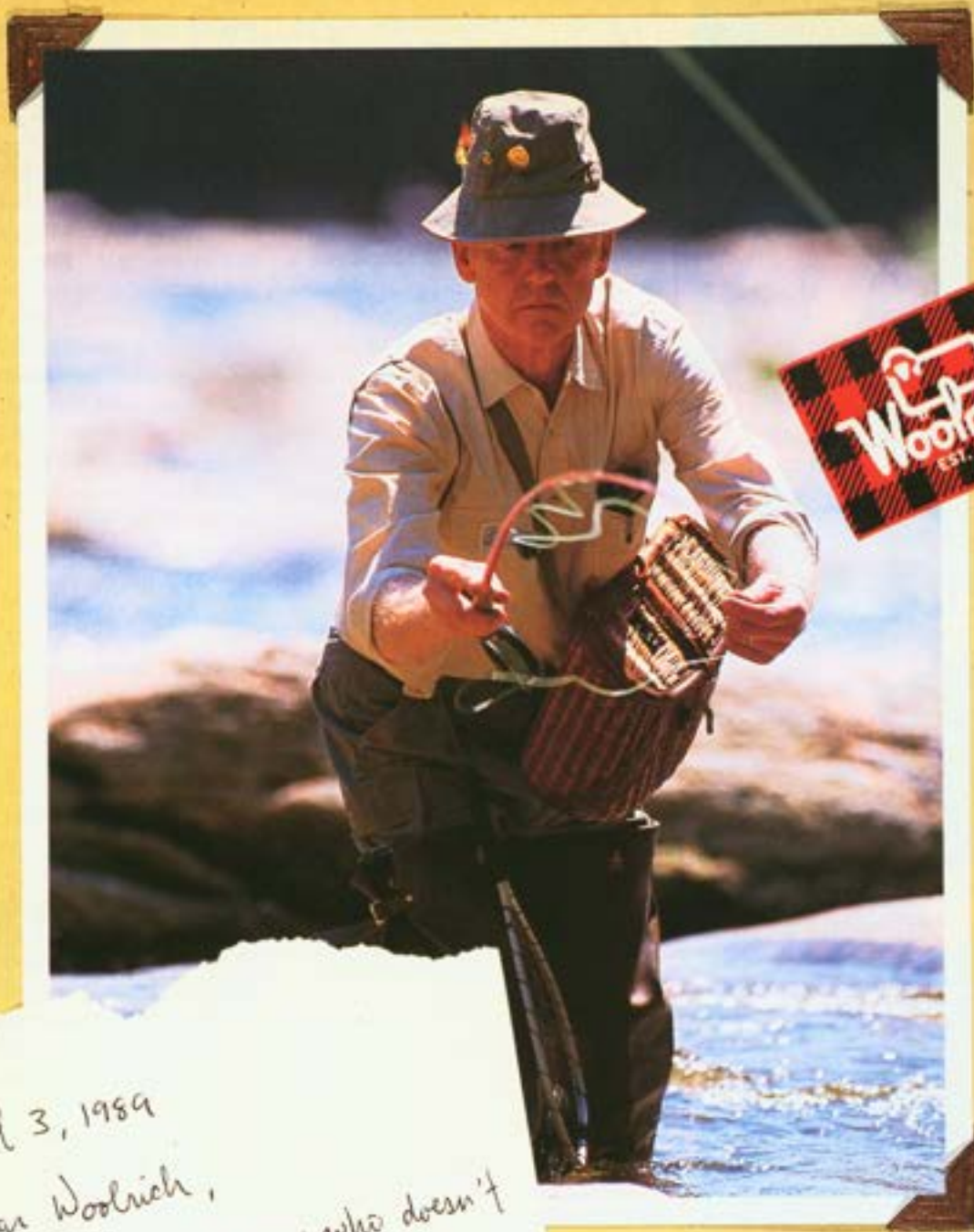
E. M. Risse  
Fairfax, Virginia

*We have a deal with Outside: They don't do movie Top Tens, and we don't cover dogsled races.*

The inclusion of *Bambi* in your roundup will surprise many scholars who have devoted their careers to studying wildfire ecology. In that scientific community the film is considered a classic of anti-environmental propaganda.

In *Bambi* a forest fire, menacing as only Disney's animators could make it, destroys harmony in the animal community by sending fauna fleeing in terror. Fire is portrayed as evil, unnatural, and anti-environmental. In fact, hundreds of scientific papers doc-





April 3, 1989

Dear Woolrich,

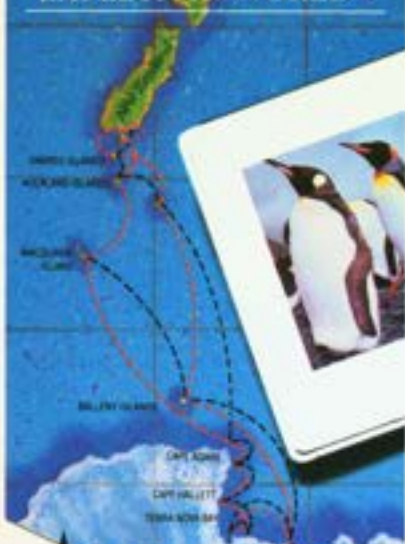
I'm the kind of guy who doesn't sit still, I'm always out doing something. I like Woolrich clothing because it wears for years. I count on it for comfort, no matter what I do outdoors.

Howard Ceyer  
Bethlehem, PA

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ument that much of the western U.S. has been ecologically dependent on periodic wildfires for millennia. Without it, ecological diversity declines. All evidence suggests that real animals in real forests are comfortable with fires, and usually treat them nonchalantly.

I've spent much of the last year studying media coverage of the fires, and have concluded that *Bambi* was a major source of anti-environmental media bias in newspaper and TV reports. While it may be a classic of American popular culture, *Bambi* hardly deserves endorsement as a "film with an ecological theme" or as a motion picture in which "animals are portrayed in terms of their own unique characteristics."

Conrad Smith  
School of Journalism  
Ohio State University  
Columbus, Ohio

### HIS ATTITUDE AND OURS

I would agree with David Clayton's letter regarding ads for four-wheel-drive vehicles in *Sierra* (January/February) if he were talking about the latest Caterpillar bulldozer or Husqvarna chainsaw. His attitude is so typical of the hate-mongering perpetuated by some segments of the environmental movement. This attitude gets in the way of getting problems solved.

I also resent your attitude, in responding to his complaint, that *Sierra* Club members are the only people capable of using a 4WD truck carefully.

David Lotz  
White House, Tennessee

### RECYCLED PAPER

As a national environmental leader, the *Sierra* Club should take more responsibility in the realm of recycling. Several magazines that deal primarily with waste issues have already changed to recycled paper, either glossy or not.

*Recycling Today* has just switched to recycled paper after a year of investigation. They now use a grade of paper that contains between 50 and 60 percent waste paper and as much as 15 percent post-consumer waste. Editor Arnie Rosenberg reported in the Feb-

ruary 15, 1990, issue that the costs of switching to recycled paper "are not insignificant: The paper is twice the cost of our old stock, and its weight will increase our postage by 20 percent. But the ethic of recycling, we believe, is important to practice, not to just espouse. As the industry's leading publication, we feel it is important to lead by example." Can *Sierra* do less?

As a member of the board of directors of the National Recycling Coalition, I feel it incumbent upon me to encourage participation in, and understanding of, recycling at all levels. As a member of the *Sierra* Club I feel it incumbent upon me to encourage increased environmental sensitivity on the part of the organization. I request, therefore, that you accept the responsibility to begin the process of converting to the use of recycled paper.

Florence Thompson  
Bloomsburg, Pennsylvania

*Reader Thompson's measured recommendation reflects her understanding that the conversion to a partially recycled coated paper stock (such as Recycling Today now uses) must be the result of a careful process of investigation and testing, not a hasty gesture made in the interests of symbolism. Editor Rosenberg points to the huge increases in paper and postage costs such a move entails; we are estimating those now, even as we solicit samples of recycled paper, consider the quality of color reproduction they afford, and investigate their "runnability" on high-speed presses.*

*Questions of definition must also be asked: Can the Sierra Club be content with paper that is made from far less than 100-percent recycled materials, particularly if the recycled portion is pre- rather than post-consumer waste? Such is the case with paper being touted as "recycled" by a number of suppliers and their customers, even though large quantities of virgin fiber continue to be used while only an insignificant reduction in solid wastes is achieved.*

*This topic will be explored in greater depth in our next issue. Beyond that, we pledge to keep our readers aware of the Sierra Club's progress toward its goal of maximizing its use of recycled—and recyclable—materials.*



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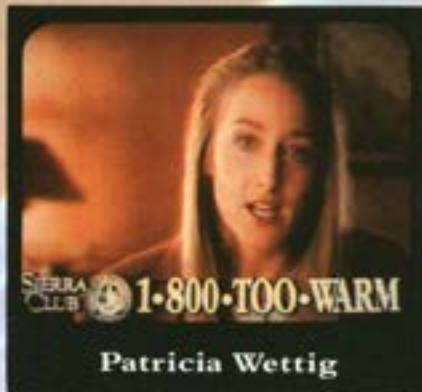


## Red-Hot Information

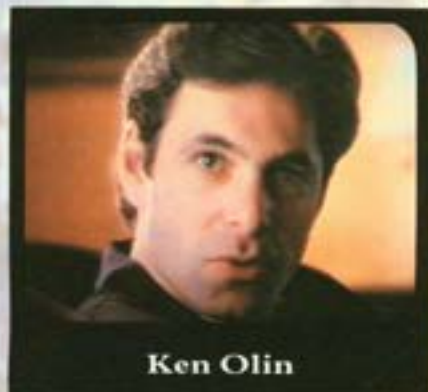
**E**ven casual followers of *thirtysomething* know that the characters have a lot on their minds. So it comes as small surprise to see one of those familiar faces on the tube, wearing an expression of high anxiety.

But, say, the 800 number is new, isn't it?

Stepping out of character for 30 seconds at a time, *thirtysomething* stars Patricia Wettig and Ken Olin—along with William Shatner (*Star Trek*), Lloyd Bridges (*Sea Hunt*), Daniel Travanti (*Hill Street Blues*), John Ritter (*Three's Company*), Bruce Boxleitner (*Scarecrow & Mrs.*



Patricia Wettig



Ken Olin

*King*), and Jill Eikenberry (*L.A. Law*)—are speaking plainly and directly about drastic climate change in a series of public service announcements taped for the Sierra Club earlier this year.

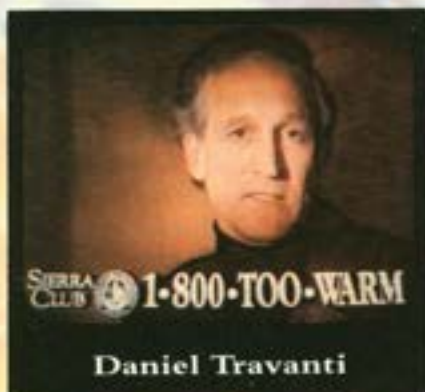
The PSAs were provided to broadcast and cable stations on April 16 as the kickoff of the Club's national campaign to educate the public about the perils of global warming. (More than 500

stations have requested the tapes so far; call your local broadcaster and ask 'em to roll a couple.) The toll-free number (1-800-TOO-WARM) is for callers who would like to receive a what-you-can-do brochure, "21 Ways to Help Stop Global Warming by the 21st Century."

"Our member research found that basic information is the biggest single need right now



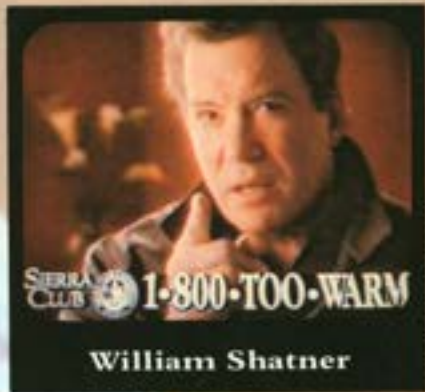




Daniel Travanti



Jill Eikenberry



William Shatner

CRISTINA TACCONE PHOTOS

among people who are concerned about climate change but don't know how severe the threat really is, or what they can do about it," says Joanne Hurley, the Sierra Club's public affairs director. "Education is the first step



toward building confidence that a solution can be found."

Most investigators now agree that several interrelated atmospheric inputs and reactions (among them global deforestation and fossil-fuel burning) have probably already led to an average increase in temperature of about 1 degree Fahrenheit. They're virtually convinced that these changes will cause numerous and varied environmental problems on a planetary scale—ranging from increased skin-cancer rates to rising sea levels—

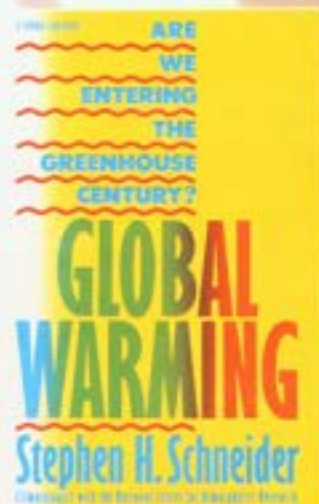
if left unchecked. Yet the threat hasn't rallied the citizenry to lend its considerable weight toward finding a solution.

The Sierra Club informational campaign is designed to move that process along with the urgency normally felt as one's feet approach the flame. Along with producing the "21 Ways" brochure and the "Sierra Club Sourcebook" (a list of useful readings sent to each 800-number caller), the Club devoted the heart of *Sierra's* July/August 1989 issue to the theme, while Sierra Club Books published the title that heads up everybody's global-warming syllabus, Stephen Schneider's *Global Warming: Are We Entering the Greenhouse Century?*

Other materials available from the Sierra Club Office of Public Affairs (730 Polk St., San Francisco, CA 94109) include an informational poster (\$5, or \$4.50 for Club members), a four-page conservation campaign briefing that includes "how you can help" activist information (\$1/\$.50), and the relevant Sierra Club policy statements on global warming and stratospheric ozone depletion (\$.50/\$.25).

This is the opening salvo in a major long-term campaign. The Sierra Club has been focusing on

climate change for some time, establishing passage of an undiluted Clean Air Act as a national priority and charging its Global Warming Campaign Steering Committee with helping to coordinate the efforts of



local, state, and federal-level activists. The campaign's next phase centers on the Club's Global Warming Local Action Kit, a key component of which is a resolution drafted by the committee that environmentalists can use in their communities to focus the attention of local decision-makers and the public alike on this vital issue . . . all part of the process of getting folks heated up and ready to act.

—reported by Edith Pepper

EARTH PHOTO: NASA/PETER ARNOLO, INC.



## THAT'S WHAT FRONDS ARE FOR

**A**t 4 a.m., small teams of wet-suited sea-vegetable harvesters can be seen wading through frigid low tides off the Northern California coast, trimming the fronds off sea palm and bullwhip kelp. These hardy folk are helping to satisfy a health-conscious public's growing demand for edible seaweeds that can be added to soups, brewed as herbal teas, or used—more familiarly to many—as sushi wrappers.

As many as ten species of edible seaweed are found along the coast of Mendocino County, along with the few small companies that collect, dry, package, and sell them. These entrepreneurs have yet to rake in much cash



SEAN SPRAGUE

with their *kombu*; for now the emphasis is on sales through mail order and health-food stores.

"Seaweed is the healing food for our era of pollution," says Eleanor Lewallen, who operates the Mendocino Sea Vegetable Co. with husband John from their home in Navarro. Sea vegetables are rich

in vitamins, possess numerous essential trace elements absent from processed foods and those grown in demineralized soils, and even—in the case of kelp—contain algin, which, Lewallen says, appear to help remove heavy metals and radiation from the bodies of test animals.

These potential benefits

would be enough to give oat bran a run for its marketing dollar if not for what Lewallen calls "cultural nausea"—a reluctance on the part of the American consumer to chow down on foodstuffs that happen to grow in sea



BOB EWANS/PETER ARNOLD, INC.

water rather than in dirt.

"We have an unusually clean coastline here," she notes, although as founder of the Ocean Protection Coalition, which is opposed to offshore oil drilling, she's concerned about



## JUST PLUG IT INTO THAT CHERRY TOMATO OVER THERE

**U**ntil there's a videocassette of *The Little Mermaid* that injects healing ozone into the stratosphere with each playing, it's hard to conceive of an eco-innovation more relevant to the 1990s than the power-generating salad bar.

The University of Maine's prototype system combines salad-bar scraps with cattle manure, then processes the mélange in a biogas-generating "digester tank" at the university's dairy farm. Thus do organic materials that might combine with nastier refuse in a landfill and leach into groundwater

instead help run a generator that produces more than \$8,000 worth of power a year.

"Americans are going to have to face up to the fact that food wastes must be separated from other trash in order to be managed effectively," says George Criner, who heads the research team that devised this new twist on a well-known waste-treatment process called anaerobic digestion. Criner thinks the potential reduction in solid waste can be of even more immediate benefit than the generation of electrical power. (Organic wastes

RICHARD STUTTING



the future. Oil development could play havoc with the inventory, some items of which, like sea palms, are unique to the West Coast's nutrient-rich waters. Indian tribes in Nevada used to send runners to the coast in annual harvesting pilgrimages, according to Betsy Holliday of the Ocean Harvest Sea Vegetable Co. Her small firm specializes in *wakame*, sweet *kombu*, and silky sea palm—foods at least as interesting to pronounce as to eat.

For more information on edible seaweed, send an SASE to Mendocino Sea Vegetable Co., Box 372, Navarro, CA 95463, or to Ocean Harvest Sea Vegetable Co., P.O. Box 1719, Mendocino, CA 95460.

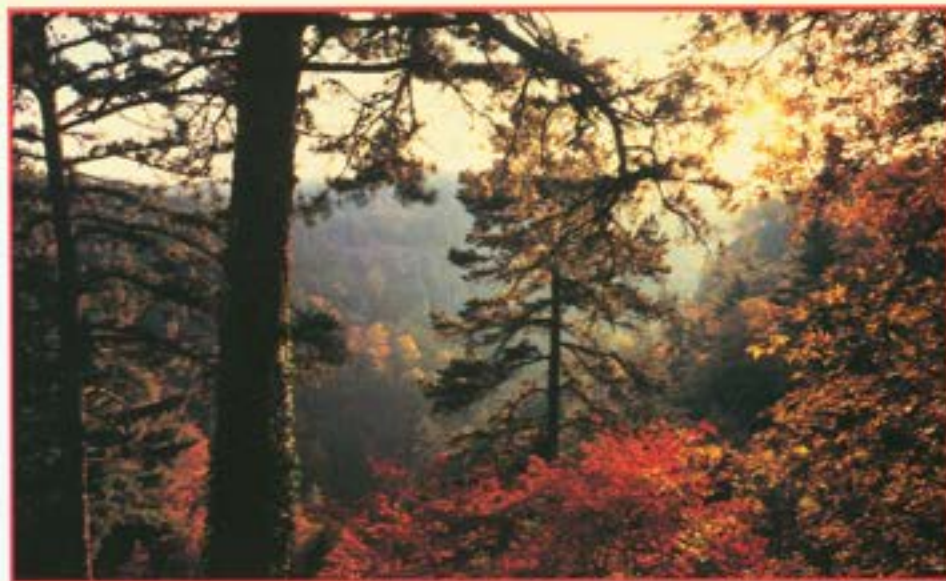
—Edith Pepper

make up 15 percent of the nation's total trash.)

Still, other aspects of this proto-technology seem equally attractive: Not only may home entertainment systems eventually run 24 hours a day on wilted iceberg lettuce—manifestly an inexhaustible natural resource—but a by-product of the power-production process is a potent, relatively odorless fertilizer that Criner claims strengthens the soil as it improves yield.

Now if he could just figure out a way to create old-growth forests out of stale Bac-o-Bits. . .

—W.B. Travis



## PIONEERS ON A PARALLEL PATH

**F**orest planner Benton Mackaye (1879-1976) had a vision: a continuous trail along the crest of the Appalachian Mountains, between Springer Mountain in southern Georgia and Maine's Mt. Katahdin.

For many years now, his dream—the Appalachian Trail—has been reality. But congestion and overuse of the trail are realities too. That's why many hikers hope a planned 250-mile loop trail winding through some of the finest wilderness in the Southeast will spell relief for the overburdened AT, which for much of its course the new trail was designed to parallel high along the western ridge of the Appalachians.

The first section of the Benton Mackaye Trail, already completed, lies entirely within the state of Georgia; it ends abruptly at the Tennessee line, where further construction awaits authorization by national-

forest managers.

Work on the new loop trail began a decade ago, when an all-volunteer crew from Atlanta ranging from

(BMTA). "This project truly appealed to people's pioneer instincts."

The next stage calls for extension of the trail through national-forest



preschoolers to 83-year-olds logged more than 13,500 hours on Saturday work outings.

Although the Forest Service provided some tools and took charge of technical tasks like bridge-building, "we supplied the labor and the effort," says Edwin Dale, former president of the Benton Mackaye Trail Association

lands in Tennessee and North Carolina, to connect eventually with the Appalachian Trail on the eastern side of Great Smoky Mountains National Park.

For detailed topographic maps of the existing trail segment and information about how you can help, contact the BMTA at P.O. Box 53271, Atlanta, GA 30355. —Edith Pepper

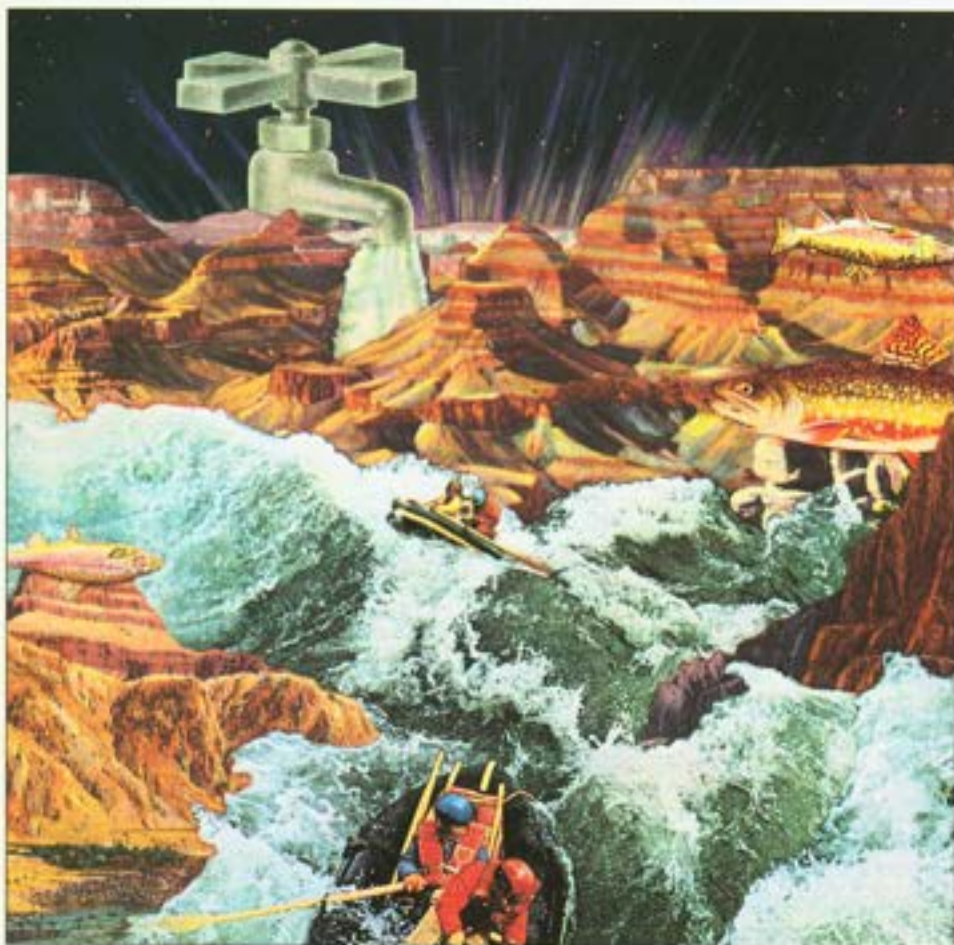
DAVID WILSON/ALB TOSCA

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## A Wild, Swinging River

*Twenty-seven years after its floodgates clanged shut, the dam that drowned Glen Canyon continues to alter the Colorado.*



James R. Udall

**D**OWNSTREAM FROM Glen Canyon Dam, the Colorado River no longer resembles a torrent of mud churned with blood. Because the sand once transported by the river—65 million tons of it per year—is now trapped in Lake Powell, the Colorado has become jade-green and, as unlikely as it may seem, one of the best trout fisheries in the West.

Before the dam, the riverbanks

were nearly barren, pruned by annual spring floods. Today more uniform flows nourish a jungle of coyote willow and tamarisk. The permanent vegetation has allowed many birds, including the rare willow flycatcher, to gain a new toehold in the canyon; at least ten species of birds now have population densities five times greater than before.

On the negative side of the biological ledger, changes in river temperature and the aquatic food base have wiped out four species of native warm-

water fish downstream from the dam in Grand Canyon National Park. And the canyon's beaches, like the sand in an hourglass, are disappearing grain by grain, minute by minute as silt-starved waters released by the dam scour the river corridor.

Because the beaches and their cloak of vegetation form the cornerstone of this riparian oasis, biologists worry about their loss, as do commercial river runners, who take 15,000 rafters on the spectacular 277-mile journey through the rugged canyon each year.

"Many of the good things that happen on a river trip happen on beaches," says longtime Colorado boatman Gaylord Staveley, whose father-in-law, Norm Nevills, pioneered commercial river running in the canyon four decades ago. "You can't make camp without them. You can't sleep on the rocks. You can't sleep standing against a tree."

While some erosion is inevitable as long as Glen Canyon Dam remains standing, conservation organizations

contend that daily fluctuations in the amount of water the U.S. Bureau of Reclamation releases through the dam are hastening the beaches' disappearance. Each weekday the Bureau sends two surges through giant turbines in the bowels of the dam. Timed to satisfy peak power demands in distant cities in the West, these "tides" quadruple the volume of water in the Colorado. At night and on weekends, when demand is low, the river is almost turned off.

The Bureau's releases, which cause



the river to rise and fall as much as 13 feet each day, have had "substantial adverse effects on downstream resources," according to a 1988 report by the Department of the Interior. The report goes on to say that such wild swings increase fishing accidents on the river; endanger the humpback chub, a rare fish; destroy prehistoric ruins; hasten beach erosion; strand trout and expose their spawning beds; and disrupt whitewater trips.

"These radical fluctuations have turned the Colorado into a river from the Twilight Zone," says Sierra Club activist Dan Dagget. "Shore-nesting birds like Canada geese have abandoned the canyon. And the chubs, which once were so numerous they could be scooped up with bare hands, now survive in only a few threatened backwaters." Trout numbers are kept high by stocking the river and its tributaries with hatchery fish.

The impacts on raft trips are also dramatic. "At very low water levels, some rapids are impassable for certain types of rafts," says veteran boatman Nels Niemi, while exposed rocks make other rapids, like Horn Creek, very dangerous.

"Beaches that appear to be good campsites can become submerged overnight," the Interior Department report notes. "Conversely, boats moored during high water can be found the next morning stranded on rocks. . . . [Rafters] sometimes have to move boats several times during the night."

Last May, Illinois attorney Mary Schlott rafted the Colorado, and later wrote a letter about the experience to *Sierra*. "On some mornings we had to get up at 5:30 to run with the water, while on others we sat in camp until 10:30 waiting for the river to rise," she said. "When I hear that the pattern of electrical use in Las Vegas is more important than protecting the Grand Canyon, I get so mad I could hit somebody."

River runners, anglers, and conservationists have long argued that an environmental impact statement is needed for Glen Canyon Dam. The

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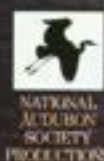
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Bureau of Reclamation has countered, however, that because the dam was completed in 1963, it does not need to comply with the 1969 National Environmental Policy Act's EIS requirements. This stalemate was broken last summer when Interior Secretary Manuel Lujan bowed to public outcry and pressure from the U.S. Fish and Wildlife Service, the National Park Service, and the Arizona congressional delegation and ordered an EIS.

This document "is an essential first step, and one we hope will lead to managing the dam differently," says Rob Smith, the Sierra Club's associate Southwest regional representative. "But it could just be a whitewash." Smith cites the Bureau of Reclamation's decision to limit the research period to 14 months as one indication that the agency may prepare a quick-and-dirty report.

"In that time it will be impossible to gather all the data necessary to analyze management alternatives," says Duncan Patton, a senior scientist working on the technical studies that will serve as the basis for the EIS.

If a decision is made to operate Glen Canyon Dam differently, the facility could still produce as much electricity each year as it does now, but because the river would no longer be jerked up and down each day like a yo-yo, less of that electricity could be sold at a premium for use during peak hours. And while the million customers who receive electricity from the dam wouldn't experience shortages—the Southwest has a power glut—they might see a small rate increase as utilities purchase "peaking power" from more expensive sources.

What would it cost to manage the dam with a gentler hand? According to the Western Area Power Administration, the federal agency that markets Glen Canyon's power, providing steadier water releases would reduce annual dam revenues by about \$5 million. A rate increase to offset those losses would raise the cost of dam power from 1 cent to 1.075 cents per kilowatt-hour—still inexpensive considering that the average price U.S.







consumers pay for electricity is 6.23 cents per kilowatt-hour.

When conservationists argue for better management of Glen Canyon Dam, a topic they hope Congress will address in hearings this year, they are pointing out that irregular flows are only one of many problems that are now besetting Grand Canyon National Park. Many of these threats—including beach erosion, air pollution, noisy sorties by sightseeing aircraft, and nearby uranium mining—could not have developed without the blessing of federal agencies.

"Man can only mar" the Grand Canyon, said Theodore Roosevelt. But surely he never expected the federal government to take a leading role.

**JAMES R. UDALL** is a river runner and freelance writer based in Carbondale, Colorado. Readers who would like to be on the Sierra Club's Grand Canyon mailing list should write to the Southwest Office of the Sierra Club, 1240 Pine St., Boulder, CO 80302.

## From the Grimestoppers' Notebook

*Backed by stiffer laws and scrupulous legwork, prosecutors are putting the squeeze on polluters.*

Jane Easter Bahls

**W**HEN AN ASHLAND OIL tank split open outside Pittsburgh on the frigid afternoon of January 2, 1988, a 30-foot tidal wave of 4 million gallons of diesel oil surged across a parking lot, over a dike, and into storm drains. For days a slick a hundred miles long fouled the Monongahela and Ohio rivers, contaminating the water supplies of 750,000 people in four states.

Although Ashland Oil executives assumed full responsibility for the spill and launched an aggressive cleanup effort, the U.S. Department of Justice charged the company with criminal violation of the Clean Water Act and the Rivers and Harbors Act. The com-

pany pleaded no contest and was handed a \$2.25-million fine.

Ashland Oil got off easy. Now that the Environmental Crimes Section of the Department of Justice has sharply increased prosecution of companies and individuals who violate environmental laws, those found responsible have sometimes gone to jail. When Nabisco Brands pleaded guilty to numerous violations of the Clean Water Act in federal court in 1986, one of its plant managers was sentenced to a year in prison.

In 1989 federal prosecutors obtained a total of 107 guilty pleas and convictions for environmental crimes, a 70-percent increase over the year before. Together these resulted in 37 years of

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jail time for corporate officers, as well as \$13 million in criminal fines.

Until the passage in the 1970s of laws permitting criminal penalties for environmental offenses, a "crime against nature" was treated as a civil offense, with the maximum punishment usually a slap on the wallet. By filing criminal charges, prosecutors open the way to punishment of individual offenders.

It's only recently, however, that the number of convictions has begun to grow significantly. Things picked up in 1982, when the Justice Department's special section was established and the Environmental Protection Agency started beefing up its technical staff with criminal investigators. "They were cops who could sift through documents and detect which ones were being used to conceal crimes," explains Judson Starr, a Washington, D.C., attorney who headed the Environmental Crimes Section for six years. As they gained experience, he says, federal prosecu-

tors learned how to convince juries that some polluters were not hapless victims, but criminals.

Department of Justice spokesperson Amy Casner credits two additional factors: an influx of government funds for environmental prosecution, and stiffer penalties for environmental law-breakers. Congress is currently debating H.R. 3641, the Environmental Crimes Act of 1989, which strengthens penalties for violations of federal pollution laws, with especially severe consequences for knowingly endangering human life.

In some cities, federal and local officials have joined forces. Government agencies in Los Angeles work together as a "strike force" that investigates reports of violations, compiles a single report, and recommends action to the city or county attorney. "We've gotten a number of jail terms for corporate officers," says Vincent Sato, deputy city attorney.

Los Angeles District Attorney Ira Reiner says the threat of "doing time"

is a more effective deterrent than fines, which polluters regard as "just a cost of doing business. The only thing that will get their attention," he says, "is hearing the jail door slam."

How do prosecutors decide whom in a company to go after? "If the evidence goes all the way up the ladder, we go all the way up the ladder," Casner says. It's no secret, though, that they also consider the effects of criminal indictments on other companies. "While the environment may not care whether it's being violated by a mom-and-pop operation or by Dow Chemical, you get a lot more bang for your buck if you target the big guys," Starr says.

Prosecutors no longer reserve criminal charges for cases of deliberate wrongdoing. Environmental laws often carry a standard of "strict liability," meaning that whoever caused the problem is responsible, regardless of intent. In the Ashland Oil case, technical investigations showed that the rupture was caused by metal fatigue

									
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originating with a dime-size flaw in the steel, not by an intentionally malicious act. "We had four million gallons of oil in the tank that we wanted to sell," the company's vice-president for Corporate Communications, Dan Lacy, says in Ashland's defense. "There's a big incentive not to spill that on the ground." Then again, the company had failed to complete certain tests and obtain a necessary permit before filling the tank.

Starr says environmental prosecution has had a significant impact on how companies do business. "There was a time when it was better not to know what was going on in your company, but ignorance is no longer an excuse. It may be what does you in." Corporate environmental-compliance departments that never got much attention are now enjoying larger budgets and additional staff. The attitude in industry has become, "We're not going to mess around with this any more," Starr says.

"There's no question that you re-view your procedures and operating practices," concurs Havar Nordberg, president of Houston-based Baytank, Inc., which handles ocean transportation of liquid chemicals. Baytank, along with three of its employees (including an executive vice-president), was convicted in 1988 of dumping pollutants into a basin leading to the Gulf of Mexico. A judge later overturned the verdicts against the employees, but upheld Baytank's criminal conviction, assessing a \$50,000 fine and imposing a five-year community-service plan on the company. Now Baytank is more watchful. "No one in his right mind would sit back and say it won't happen again," Nordberg says.

Despite his experience, Nordberg favors criminal prosecution of polluters. "We live in a society where a lot of people will [damage the environment] for a quick buck," he says. "I don't think the government can fulfill its responsibility to the public without criminal sanctions."

At the same time, Nordberg favors a clearer distinction between offenses





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that belong in the civil system and those that belong in the criminal system. In Baytank's case, he says, the chemical solution that spilled qualified as hazardous waste in the shipping industry, but not in manufacturing, and was therefore subject to rules of differing severity. "The problem is to define what exactly applies to your facility," he says.

Ashland Vice-President Lacy expresses concern over the effect the strict liability standard may have on how companies respond to a spill. Ashland was praised by the EPA, the media, and the state lieutenant governor for its speedy cleanup efforts after its tank ruptured—but suppose, Lacy says, that Company A threw all its resources into an effective cleanup, while in a similar situation Company B stalled, squabbled about responsibility, and ended up causing a great deal of damage. "If the two companies are punished equally, what kind of message does that send?" he asks. "Why do all that if you're going to get

a criminal charge [no matter what]?"

The Justice Department's Casner says that prosecutors *do* consider a polluting company's response: "We wouldn't go so far as to say that if you break the law by accident we won't charge you, but we do take it into account."

Still, she insists, "We have a responsibility to prosecute environmen-

tal crimes to the fullest extent possible." In February the agency indicted Exxon Corporation on five criminal counts for the Exxon Valdez oil spill, despite the \$2 billion the company spent trying to clean up Prince William Sound.

JANE EASTER BAHLS is a writer in Missoula, Montana.

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#### CLEAN WATER

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## *The Dirty Deep*

*The nation's waterways are pollution sinks—where poisons stay out of sight, but not out of circulation.*

**Beth Millemann**

**I**MAGINE THAT you haven't washed your bathtub in six months. You turn on the tap, anticipating a cleansing bath. But as the clean water swirls around the tub, it dislodges half a year's worth of scum and turns muddy brown. Looking into your tub, you realize something that

many federal bureaucrats, a number of port authorities, and more than a few members of Congress still have not: Water can't be clean if its container is filthy.

Many of the containers that hold America's fresh and salt water—bays, harbors, lakes, and riverbeds—are lined with toxic grime. When water

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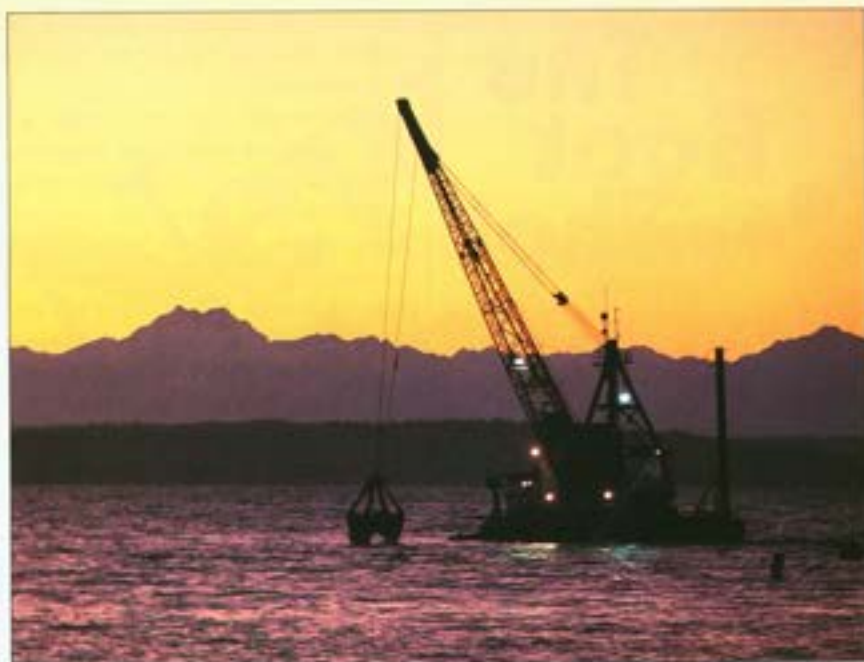
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flows over, or rests on, these contaminated muds—or as they are dredged for navigation—pollutants such as DDT, PCBs, and heavy metals are released. These toxins are eaten by swimming or mud-burrowing organisms that are in turn consumed by fish and their predators, including humans. Deformed birds, contaminated shellfish, cancerous fish, and threats to human health are the result of this toxic food chain.

Although there's no comprehensive inventory, a 1987 EPA study showed that nearly every major U.S. harbor and body of water likely suffers from sediment contamination. In the Great Lakes alone, 41 severely polluted sites have been identified. The news from the saltwater coasts is equally grim: Exposure to underwater sediments is directly responsible for diseased and toxic fish in such places as Washington's Puget Sound, Santa Monica Bay in California, and New Bedford Harbor in Massachusetts.

In such underwater wastelands, sed-



*Dredging for a pipeline in Puget Sound stirs up old pollution problems.*

iments have soaked up pollutants from landfills, sewage plants, and other sources. "Underwater sediments are the last stop for everything from pes-

ticides sprayed on fields to heavy metals released into the air," says Brett Hulsey, associate Midwest representative of the Sierra Club. "Lake beds

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and bay bottoms eventually catch almost everything that we put into the environment."

If sediments are toxic when left alone, they are even more dangerous when stirred up by dredging equipment, releasing toxins like a sponge being squeezed. Some of the most contaminated sites in the country are those that must be cleared of silt regularly to facilitate shipping and commerce: New York's Hudson/Raritan estuary; the Boston, San Diego, Los Angeles, and Seattle harbors; and the Indiana Harbor and Canal in Lake Michigan. To keep such areas navigable, the U.S. Army Corps of Engineers annually dredges 350 million cubic yards of sediment from the bottom of the nation's waterways—enough to encircle the Earth with a cubic yard of muck eight times.

Once the dredging is done, another challenge looms: how to dispose of the spoils. The Corps throws sediments judged safe on riverbanks or wetlands—or dumps them into the ocean at the rate of 45 million cubic yards a year. Because no federal standards exist for sediment toxicity, the Corps uses its own tests, with EPA oversight, to determine which sediments are too dangerous to dump. It places these wastes in upland sites or in Combined Disposal Facilities (CDFs), holding ponds bordered by the shore and encircled by walls of fill.

At best, CDFs are a short-term fix to the disposal problem, according to Glenda Daniel, executive director of the four-state Lake Michigan Federation. "The CDFs are rarely fenced or covered or even marked by warning signs," she says. "In Chicago, for instance, children swim and anglers fish in a CDF adjacent to a public park."

Despite the magnitude of the sediments problem, no national program directly addresses underwater contamination. The EPA has no national criteria that restrict pollution of underwater sediments or that trigger cleanup and protection—nor any fund to pay for such measures. Existing environmental laws place some restrictions on dredging and dumping, but

the Corps makes its own decisions on which sediments are too toxic to dump.

To send a clear message for change, a coalition of more than 225 labor union, fishing, sporting, citizen, health, and environmental groups, including the Sierra Club, has drafted what it calls a Citizen Charter on Contaminated Sediments. The document calls on Congress to establish and adequately fund a national sediments program aimed at aggressively controlling new underwater pollution and cleaning up the old. The charter also calls for an end to open-water disposal of contaminated sediments.

Some Corps and port officials argue that such a program would effectively stop ocean dumping of dredge materials—and might therefore result in undredged harbors too clogged with silt to navigate.

Reformers say the public need not choose between the unpleasant extremes of polluted oceans and silted harbors. New decontamination technologies being applied to Great Lakes sediments look promising, they say. Microbes and fungi have been used to decontaminate some sediments, and chemical and electrical methods have been successful elsewhere.

At press time in April, charter backers were focusing on action in Congress, working to strengthen the sediment provisions in Senate Majority Leader George Mitchell's (D-Maine) coastal pollution legislation, S.1178, and waiting for sediment legislation being drafted by Representative Henry Nowak (D-N.Y.) to emerge in the House.

As Congress deliberates, the list of underwater wastelands continues to grow, taunting a regulatory system that ignores their existence. But Congress and some members of the public have at least been warned: There is no safe harbor. ■

BETH MILLEMANN is executive director of the Coast Alliance, a Washington, D.C.-based coalition of coastal activists, and author of *And Two If by Sea: Fighting the Attack on America's Coasts*.



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## IN DEPTH

INTERNATIONAL

*"The only future for my children is to die younger than I do." In Czechoslovakia the winds of change mix with some of the deadliest air in Europe.*

## A New Dawn in Bohemia?

Rob Waters

**A**T FIRST GLANCE the forests of northern Bohemia look hauntingly beautiful. Rows of pine trees glisten with thick coats of snow, punctuated by long clearings of blinding white. But a closer look reveals snow-covered toothpicks barren of branches and leaves, surrounded, beneath the snow in the clearings, by the carcasses of thousands of others.

Bundled up against the bitter cold, environmental researcher Eva Janeckova scoops a handful of snow into a bag for testing. She tells me she is worried about her daughters: One suffers from allergies and asthma, the other from heart disease. Such problems are not unusual here. Dr. Jiri Kunes, an allergy specialist in the Bohemian city of Most, says high rates of cancer, cardiac disease, and respiratory ailments resulting from the polluted atmosphere and tainted food supply have led to a life expectancy 10 years lower than the national average. "The environment here is killing people," he says.

The city of Most sits some 50 miles northwest of Prague at the center of northern Bohemia's sprawling industrial heartland, an area rich in brown coal that boasts two dozen power stations, a massive World War II-era petrochemical plant, and numerous foundries and steel mills. There are, in fact, two Mosts: the vast wasteland of barren earth and coal tailings that was once a city of 50,000 people, and the sterile, uniform city of gray cement buildings rising up next to it. When

brown coal was discovered beneath the old city's surface 25 years ago, Most was razed and its inhabitants relocated to the new city next door. Only a few of the old buildings were spared. One of them, a centuries-old church, was moved to the new Most, where it sits now, locked and unused, its basement flooded with water.

What is striking about Most and the surrounding region is the almost total lack of color. There is no blue in the sky, no yellow from the invisible sun; only unending variations of gray from the smoke and steam that spew out of smokestacks and cooling towers and quickly disappear into the thick soup of the atmosphere.

This area, where Czechoslovakia, Poland, and East Germany meet, was once the industrial engine that drove the Warsaw Pact. It is the place where Moscow planners decided 40 years ago to forge the steel, mine the coal, and distill the chemicals that would build a brave new world of industrial socialism. Instead, four decades of unrestrained production have poisoned the air, fouled the water, and contaminated the soil, creating an environment so ravaged it will take decades more to bring it back to health.

The environment here may be the worst in all of Europe, rivaled only by areas in East Germany. The burning of brown coal in the power stations emits great quantities of sulphur dioxide, which has been measured here at 3,000 micrograms per cubic meter of air—a level 50 times greater than the recommended maximum set by the World Health Organization. The re-



sult—acid rain—has destroyed some 120,000 acres of northern Bohemia's forests in the past 30 years.

This situation is replicated, usually on a somewhat smaller scale, throughout the country. According to Josef Vavrousek, an environmentalist and activist with Civic Forum (the citizens group that helped bring down the Communist regime), more than 70 percent of Czechoslovakia's forests are badly damaged or dying, while 50 percent of the water supply is unsuitable for drinking. In agricultural regions the soil and groundwater have been devastated by massive amounts of herbicides and pesticides.

In Prague, where many homes still burn coal for heat, the air is nearly as bad as the air in Most. The breast milk of nursing women in the nation's capital was found to contain high concentrations of the heavy metal cadmium, a respiratory poison used in numerous industrial processes. Cadmium causes kidney damage, emphysema, and arteriosclerosis in adults, but is found only in low concentrations in healthy infants.

"The ecological situation in Czechoslovakia is, in a word, disastrous," says Dr. Bedrich Moldan, the Czech Republic's new environment minister. "It is nothing short of a catastrophe." The question now is whether the country's peaceful political revolution, which brought hope and pride to millions, can save the environment.

A few months earlier, no government official would have dared make a statement like Moldan's. Under the repressive rule of Czechoslovakia's Communist Party, environmental information was strictly controlled, and allergist Kunes was prevented from releasing his research to the public. Editors were hauled before the party's Central Committee if their papers did more than hint at the true state of the environment.

One journalist who pushed the limits of government control was Josef

# WASHINGTON'S *Wild Rivers* THE UNFINISHED WORK

by Tim McNulty; Photography by Pat O'Hara

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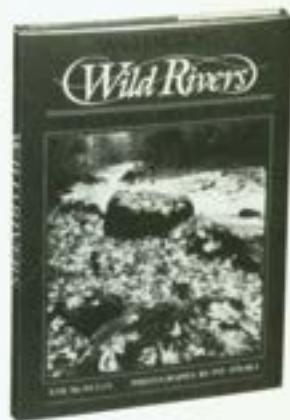
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Velek, a veteran environmental reporter for the popular weekly *Mladý Svět* (Young World). A skilled investigator working at one of Prague's feistiest papers, Velek, through his stories on environmental problems in the early 1970s, helped inspire the formation of the Brontosaurus Movement, a national

view. "They were not eating food grown in Czechoslovakia; they had special farms and imported food every day. All the food for the Mafia was checked in a special laboratory." High-ranking party members could buy food in special stores available only to them, while workers in the mines and

Soldat has been working at the plant for eight years. He offers an example of the priority given to output. When the atmosphere in Most goes into inversion—as it does frequently—the air becomes stagnant and pollutants hang over the town like a thick plague. At such times ChemoPetrol is supposed

to cut its production of electricity, but in fact, says Soldat, "they just pretend production has decreased. They write a report that production has been reduced, and after 30 minutes they increase it again to full power."

During inversion, he says, there's no sun in the sky for three or four days. "You can't see the sky at all—it's just total fog. You can't open the window, and you have to watch your children—they always have the flu."

Soldat himself suffers sore throats; other workers complain of headaches, asthma, respiratory problems, and depression. Milan Necas, an eight-year veteran of the plant's research department, says the situation left him feeling helpless: "I see the conditions in which my family is living. I see that the environment is shortening our lives, and I often feel that the only future for my children is to die younger than I do."

**T**he ChemoPetrol plant is a massive complex of smokestacks and cooling towers, brick buildings and a never-ending series of pipes dripping chemical icicles into the frigid air. Signs mounted on yellow pipes warn of danger from hazardous chemicals. The sour stench hanging over the entire region is at its most undiluted here, served up in a variety of noxious aromas.

Known officially as the Chemical



WILLIAM CONE

group dedicated to nature protection. More recently he blew the whistle on a covert plan to import toxic wastes from the United States. The scheme, drafted under the old regime, was derailed when Velek leaked it on national TV last December.

"The party Mafia knew quite well the true condition of the environment," Velek said in a recent inter-

view. "They were not eating food grown in Czechoslovakia; they had special farms and imported food every day. All the food for the Mafia was checked in a special laboratory." High-ranking party members could buy food in special stores available only to them, while workers in the mines and

plants were not told that *their* food was unsafe. The health of the labor force was apparently not a consideration for the nation's economic managers. "The priority was production at all costs," says Miloslav Soldat, an engineer at ChemoPetrol, a giant chemical and oil works located just outside Most. A tall, bulky 32-year-old whose long brown hair frames a boyish face,



*As we go on and on, studying this old, old life  
in the light of the life beating warmly about us,  
we enrich and lengthen our own.*

—JOHN MUIR

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Works of Czechoslovak-Soviet Friendship, ChemoPetrol has facilities ranging from a high-tech, two-year-old hydro-cracking unit used to produce high-octane gasoline, to two 50-year-old power stations that generate electricity from coal. These were built by the Nazis in the late 1930s, when the

plant was founded as the Herman Göring Works to produce fuel for the war machine. Constructed partly by prisoners of war, the facility was heavily damaged by Allied bombing in 1945. But like the smoke that surrounds the plant, ChemoPetrol rose again in the hands of the Czechoslovak govern-

ment that took it over after the war, a "gift" from the Soviet Union. ChemoPetrol now processes 5 million tons of crude oil a year in addition to 450,000 tons of ethylene, most of it used in the manufacture of plastics.

I visited ChemoPetrol in early January, some six weeks after the beginning of the revolution and just days after the inauguration of President Vaclav Havel. At the administration building I was ushered in to meet with Managing Director Josef Sadilek, a great bear of a man dressed in a gray suit and flanked by several translators and aides. Sitting quietly at the middle of a long conference table was a slender man wearing a sweatshirt that bore the red-blue-and-white button of Civic Forum.

Sadilek, who has worked at the plant for 37 years, gave a long discourse on its annualized production capacity, newly introduced technologies, and excellent health and safety record, while Anthony Pokorny, the man with the button, rolled his eyes and grimaced. After the briefing, Pokorny led me downstairs to what he called the "free land," the new offices of the workers' Civic Forum chapter.

The small office was buzzing with activity. A jovial retiree tended the constantly ringing phone while a woman typed up requests for rehabilitation of workers previously punished by plant management. Sitting under a poster of a smiling Vaclav Havel, Pokorny explained how the workers organized.

On November 24, 1989, just seven days after students held the dramatic demonstration in Prague that began the country's whirlwind of change, the ChemoPetrol workers, dormant and repressed for so many years, joined the revolution. A thousand plant workers took part in a 15-minute general strike organized by an ad hoc committee that bypassed the government-controlled trade union and proceeded to press demands on the plant's management.

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In short order the workers' committee ousted the party and the party-controlled People's Militia from their roles at the plant, earned the right to publish bulletins and use loudspeakers for announcements, and took over the Communist Party's basement office. Operating under the banner of Civic Forum, by early January they had signed up 4,000 of the plant's 11,000 workers, established 24 shop-level branches, and were moving to take over the structure of the old trade union, which faded away after it refused to support the strike.

Now plant engineers whose ideas were previously ignored are developing proposals to modernize and improve the plant's obsolete and ecologically disastrous production techniques. "We want to make this plant safe—to totally change it," says Pokorny. "The old production units, which are not suitable, have to be closed. Everything must be created from new; it must be totally expert and professional."

Clearly, such solutions will not be painless. Whole sections of the plant may have to close, and layoffs there and at the nearby coalfields are inevitable. But it also seems clear that solutions will be pursued, because for the first time Czechoslovakia has a government that is making the environment a top priority. In a New Year's speech delivered a few days after taking office, President Havel called Czechoslovakia's environment "the most contaminated in Europe," and environmental ministries have been created in both the Czech and Slovak republics to address the crisis.

Czech environment minister Moldan, a respected environmental scientist, says his most important tasks will be increasing public awareness of the issues and bringing about major reductions in energy consumption—and he believes that achieving both goals depends on restructuring the national economy. Soon he and other



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new officials will be faced with major decisions on projects planned or already begun by the old regime.

These include a coke plant, a hydroelectric dam planned for the Hungarian border, and—most controversial of all—the Temelin nuclear power plant, where two of four planned reactors were constructed before work was suspended last year. Environmental activists, supported by Austrian Greenpeace, hope to stop the plant in its tracks, while some government leaders see it as an alternative to continued reliance on coal. Moldan predicts a compromise in which the two completed reactors will go on-line and the other reactors will be shelved.

Even in the face of such controversies and the nation's bleak ecological history, environmentalists here remain guardedly optimistic, if only because of the euphoria that has greeted the country's massive political changes. They point out that environmental concerns helped fuel the "tender revolution," and they maintain that ecological change is impossible without political change.

"I am optimistic because I believe that the first prerequisite for really solving our ecological problems is true democracy," says Moldan. "Without public participation—without an educated and engaged public—you cannot do anything."

Sitting in her living room, Eva Janeckova watches a videotape showing demonstrators in Prague being beaten by club-wielding policemen. Filmed by members of the old regime's secret police, the tape has become a video hit and a symbol of change. "I think things will now follow in a better direction," Janeckova says, staring at the television. "We believe in our government now. But if the new government doesn't take care of the environmental problems, it, too, will fall." ■

ROB WATERS is a freelance writer based in San Francisco.



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# VALDEZ

# REFLECTIONS

THE BLACK REMAINS OF NORTH AMERICA'S LARGEST OIL SPILL CONTINUE TO PLAGUE ALASKANS—AS DOES THE KNOWLEDGE THAT SUCH A CATASTROPHE COULD EASILY HAPPEN AGAIN.

Along the shoreline, snow begins to melt where the sun strikes it at midday. Eagles soar on the wind. Flocks of gulls fly low along the green, white-capped waves. Soon the great migrations of birds and whales will begin, and salmon will search for their spawning streams.

One year after the wreck of the *Exxon Valdez*, Prince William Sound is certainly not dead. But the Sound and the Alaska coast southwest to Kodiak and Katmai are not as wild and teeming with life as they once were. Winter storms lashed the sea cliffs, yet oil still clings to the rocks in sheltered coves and covers patches of water with a bright iridescent sheen. Along hundreds of miles of shoreline, oil is buried in the sand.

Exxon officials insist the nearly 11 million gallons of oil spilled on March 24, 1989, did not create an ecological crisis. Indeed, on the spectrum of toxicity, oil is far from society's most destructive pollutant, and the planet's air and water systems do have recuperative powers. The seas will continue to clean the shores. Barring further oil spills or other adversity, the bird, otter, and other ani-

mal populations of the Sound will likely return to their pre-spill numbers. Biologists estimate that some species may recover in 20 to 70 years—a way of saying that no one really knows how long it will take—but all agree that no species has been wiped out forever. An ecological disaster? Exxon asks. Where's the evidence?

Studies will continue on the impact of the spill on everything from whales to bald eagles to microorganisms, and the results will spur controversies in and out of court for decades. Years from now, we may have a more precise accounting. But even preliminary data indicate that the *Exxon Valdez* spill was the single most devastating and costly such event ever.

One thousand sixteen dead otters were retrieved, making this spill the most catastrophic in history for marine mammals. No one knows how many other otters and sea creatures died. An undetermined number of seals and whales also perished in the vicinity of the spill, but their deaths may never be linked conclusively to the oil.

The official count of the U.S. Fish and Wildlife

BY ART DAVIDSON



Service stood at 36,460 dead marine birds, but scientists believe that this number represents only 10 to 30 percent of the total—that 100,000 to 350,000 birds might have died. By comparison, the next-highest bird mortalities were the estimated 30,000 from the *Torrey Canyon* spill off the coast of England and the 20,000 from the *Amoco Cadiz* spill off the coast of France.

The *Exxon Valdez* also set a record for dead eagles. One hundred fifty-one adult bald eagles were found dead—but again, no one knows how many actually died. In the most heavily oiled areas, 83 percent of the eagle nests failed to produce young in 1989.

By these measures alone, then, the Exxon spill was highly destructive. But these numbers represent only the most obvious losses. The oil also affected clams, mussels, urchins, fish, and other life in the intertidal areas. Furthermore, an ecological disaster is defined not just in terms of fatalities, but also in terms of complex interrelationships among a vast array of organisms. The jarring impact of the oil upset the balance among species and set off chain reactions whose ultimate effects may not be detectable for many years. Finally, the ecological reshuffling caused by the spill was not a series of isolated, localized events: Many species, particularly migrating birds and whales, face other sources of pollution, other encroachments on their habitats, other threats to their existence. For these animals, the ecological crisis is ongoing.

The social impacts of the spill are even more difficult to quantify. How do you measure, for instance, the heightened sense of vulnerability of people near the tanker operations? Their world has been forever changed by the oil industry. Native Alaskans depend upon the resources of the sea; hunting and fishing are essential to their survival and cultural identity. Now they know that another enormous swath of oil could sweep through their lives at any time.

There is another loss that is nonquantifiable, almost inexpressible: The south-central coast of Alaska remains beautiful, but it will never again be pristine. No one will be able to return to a favorite cove or fjord, in memory or in person, without sensing the oil buried in the sand.

WITH DESTRUCTIVENESS AND LOSS established as the context, another thorny question arises: What is the extent of Exxon's responsibility for the spill?

An Anchorage-based federal grand jury has accused the company of criminal behavior, but judging Exxon's performance will be no easy matter, partly because so many people were involved in so many different arenas. Yes, the captain of the *Valdez* had a well-known drinking problem. Yes, crew fatigue and policy violations could have played a part. Yes, the Coast Guard was negligent in its vessel-tracking responsibilities. Yes, the state of

Alaska's laissez-faire attitude toward tanker operations fostered neglect. Still, the inescapable fact remains that the chain of command traces up to the company's decision-makers. In both practical and moral terms, Exxon is responsible for the grounding of its tanker.

As for the corporation's response to these events, although it was unprepared for a spill of this magnitude, Exxon reacted faster than any government agency and marshaled enormous resources to fight the oil. Removing 40 million gallons of it from the stricken tanker was a major accomplishment. Moreover, Exxon mounted its response amid the confusion of state and federal officials trying to determine their roles and responsibilities and the extent of their authority.

Also to its credit, Exxon promptly established a claims process, which no law required. In one year the company spent close to \$2 billion as a result of the *Exxon Valdez* wreck, making this the most costly oil spill in history by more than a billion dollars. With profits of \$5.3 billion in 1988, Exxon is one of the few companies in the world capable of actually paying the costs of such a spill, which could reach \$4 billion by the time all the claims and legal fees are factored in.

Yet, for all its efforts, Exxon recovered less than 15 percent of the spilled oil. Regardless of all the attempts to divert, contain, disperse, and recover it, the massive slick inexorably ran its course.



THE FACT THAT EXXON did respond vigorously makes the wreck of the *Exxon Valdez* a highly instructive case study. The words of the man who was the company's shipping president at the time, Frank Larossi, are telling. "I won't say that there weren't details that couldn't have been done better," he said in an interview. "But I've seen EPA and Coast Guard reports that basically give us a B-plus or better on most of the response work. It's just that it was totally inadequate relative to the magnitude of the spill.

"I'd say the lesson to society is that a spill like this can happen," he continued. "No matter how low the probability, the potential is still there. Another lesson is in the inadequacy of current technology. What we have is just not good enough."

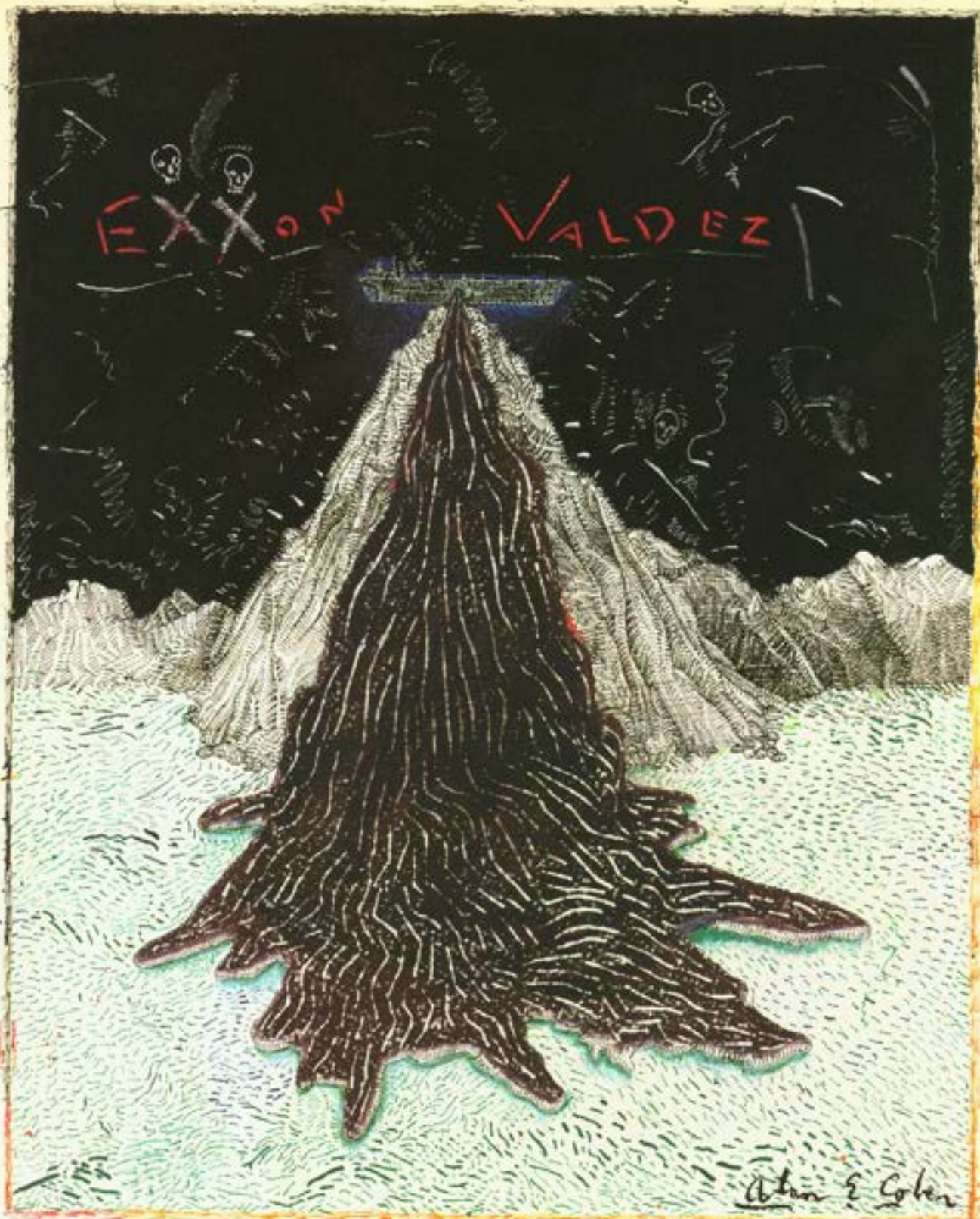
Exxon played out a lesson in futility that the whole world needed to learn: No amount of money spent or personnel deployed can control a large oil spill. Part of the problem is lack of preparedness. "The industry has neither the equipment nor the response personnel in place and ready to deal with catastrophic tanker spills," according to an American Petroleum Institute report issued three months after the *Exxon Valdez* ran aground. The report acknowledged that the industry was not prepared





• PAINTING BY SUE COE •





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to deal with a spill of 9 million gallons or more "anywhere along the coastal U.S."

Aside from concerns about preparedness, cleanup is also intrinsically difficult. "Even given adequate equipment and personnel," said the API report, "there are any number of variables beyond the control of a response team that can thwart a response to a spill at sea . . . darkness, sea conditions, weather, physical properties of oil, location, logistics and safety considerations." The API report went on to say—much as opponents of the Trans-Alaska Pipeline had said 20 years before—"Nothing can be promised to government or the public except a best effort to respond at sea."

Alaska's Department of Environmental Conservation expressed shock during the *Váldez* cleanup at how little oil was being recovered, but the scant quantities came as no surprise to those who had studied large oil spills. The National Research Council's analysis of spills over the past ten years shows that, "In many cases, mechanical cleanup capabilities may be only on the order of 1,000 barrels [42,000 gallons] per day. . . . Spills much over 1,000 barrels per day have little possibility of being controlled by mechanical means."

Exxon and other oil companies must have known before the wreck of the *Exxon Valdez* that recovery of spilled oil is extremely difficult to achieve. Of his initial reaction to the spill, Jarossi said, "I knew then this was an uncontrollable volume." And Alyeska, the consortium of oil companies that was supposed to act as Alaska's first line of defense against spills, must have known that its contingency plans were based on unrealistic projections. In fact, oil skimmed from the water during the first 72 hours was approximately 1 percent of the oil the group had projected for recovery in that amount of time.

"The plain, fundamental truth is that once oil hits the water it spreads rapidly, and booms and skimmers have tremendous limitations," the International Tanker Owners Pollution Federation's managing director, Ian White, said last fall. Over the past 20 years the group has analyzed more than 200 major oil spills; representatives of Exxon and other oil companies sit on its board.

"Unfortunately, mechanical recovery is in direct opposition to the natural tendency of oil to spread, fragment, and disperse," White said. "The reality, which people don't want to accept, is that there is a very limited chance of recovery. It is rare that as much as 10 percent of the original volume of spilled oil is removed from the sea surface as a result of cleanup operations. . . ."

"The public, particularly in America, has been misled for many years," White continued. "A myth has been perpetuated that a large oil spill is solvable. There is no magic solution or cure. Contingency plans must address this fact fair and square."

**T**HE INESCAPABLE CONCLUSION is that the basic premise supporting oil development on Alaska's North Slope was flawed: There was no safety net guaranteeing effective spill response. Stated simply, environmentally safe oil development and transport were then, and continue to be, impossible. When seeking approval for the Trans-Alaska Pipeline (which delivers North Slope oil to the port of Valdez), the oil companies deceived Congress with assurances of their spill-response capability. If either the state of Alaska or the Department of the Interior had been more attentive and better informed, the industry's false promises might have been revealed. Instead, the government agencies responsible for environmental protection swallowed the industry's arguments whole—both before and after the pipeline was constructed.

I remember attending a private gathering in Anchorage in the early 1970s. At the time, a federal judge's injunction barred issuance of the pipeline permit until potential environmental problems had been studied and alternatives explored. Someone asked then-Secretary of the Interior Rogers C. B. Morton if, as reported in a national news-magazine, he were really going to consider the option of building an overland pipeline across Canada. Morton laughed and told his friends not to worry—the pipeline would be built in Alaska. But to get the injunction lifted, he said, he had to make the judge believe he was studying alternatives.

It was clear from Morton's comment that the Interior Department was willing to deceive a U.S. judge in order to shepherd the oil industry's pipeline plans. Interior's collusion with industry and its willingness to distort the truth surfaced again when the agency announced safety criteria for the pipeline, heralded by Interior officials as stringent environmental safeguards. As Interior Secretary Special Assistant Jack Horton acknowledged in *Oil on Ice* (Sierra Club Books, 1971), "Those standards are designed so the companies will be able to meet them."

It was deception, then, by both industry and government that helped clear the way for the Trans-Alaska Pipeline and tanker system. As the Alaska Oil Spill Commission concluded in a January 1990 report requested by the state's governor, "Public pronouncements by Alyeska and its owners that the company employed the best available technology and committed adequate resources to safety purposes turned out to be false."

In an April 1989 *Alaska Daily News* article, state legislator George Jacko put it in even stronger terms: "After all these years of hearing the oil industry tell us with confidence bordering on arrogance that it could clean up oil spills in even the most extreme marine environments, we're finally seeing more than 10 million gallons of truth



spread across Prince William Sound. The plainest and the blackest truth of all is that the oil companies have lied to Alaskans for years about their ability to clean up oil spills."



**A**N INCIDENT THAT OCCURRED during the building of the Trans-Alaska Pipeline illustrates the willingness of the state to cover up for the oil industry. Gil Zemansky, who was singlehandedly inspecting Alyeska's construction camps for the state Department of Environmental Conservation, reported that raw sewage was gushing into the nearest ponds and streams; the camps were in full swing without the sewage-treatment permits required by law.

Zemansky filed notices of violation, but Alyeska persuaded the state to back off. As Robert Mead reports in *Journeys Down the Line* (Doubleday, 1978), "Alyeska turned its powers of persuasion from the gnat that had been stinging it to the commissioner and the governor himself, and Mr. Zemansky found himself transferred from Fairbanks to Juneau and, soon thereafter, fired. . . . Although little had been done to meet Gil Zemansky's objections, the DEC issued permits that allowed Alyeska to operate its sewage plants."

The state aided industry in other ways too. No one in state government asked Alyeska to prepare a worst-case oil-spill scenario. No one insisted that the consortium prove its equipment capabilities. The Alaska Oil Spill Commission's analysis of the spill concluded that the state had failed in its responsibilities to vouchsafe federal regulation, oversee industry operations, inform the public of risk, and ensure proper response capabilities in case of accident.

Two oil-related fiscal events of 1988 make the point. The state legislature denied the DEC's request for \$252,000 to pay for tanker and terminal inspections, more aggressive enforcement, and review of contingency plans. The same year, the state's annual oil-revenue gift to its citizens was more than \$400 million. Just for living in Alaska, each resident received \$832. With those kinds of benefits, few Alaskans wished to challenge the myth of environmentally safe oil development.

THE DEPARTMENT OF THE INTERIOR's Minerals Management Service has also helped perpetuate the myth. As the lead agency for outer-continental-shelf oil leasing, Minerals Management has the often conflicting responsibilities of selling oil leases and preparing environmental impact statements on lease sites. A key part of the agency's mission is to evaluate oil-spill responses and impacts. One might have expected, then, that its experts would have gone immediately to the site of the *Exxon Valdez* spill—a

real-life situation infinitely more instructive than the computer simulations they rely on. But during the first, critical days of the spill, none of the agency's experts visited Prince William Sound.

One Minerals Management official, who asked not to be identified, tried to explain the agency's inaction: "Our risk-analysis people wanted to go out on the spill—to help and to learn—but word came down from Washington that 'It's in state waters so it's not our concern. Stay away.' When one guy used his vacation time and paid his own way out to the Sound, it became kind of a joke in the office. Initially he was the only one who went out.

"Basically, Minerals Management was more worried about its political posture than the spilled oil," the official said. "We're supposed to be the cutting edge of oil-in-the-environment awareness, but we had to be nice to the oil companies because we didn't want to offend them. It wasn't until about three weeks after the accident that it occurred to someone in our agency that we'd be asked, 'What did you learn from the spill? How did this change your attitude about future oil leases?' This revelation prompted some cover-your-ass maneuvers. We tried to send out analysts, but somehow couldn't make arrangements to charter a plane or a boat. It was only later, during the [beach] cleanup, that some of our people finally spent time in the field."

The Minerals Management official said that staff members who had the expertise to clarify aspects of the spill were directed not to talk about it publicly. "We had a gag order placed on us. When people called our office about the spill, we were supposed to refer them to our public affairs office, which would in turn refer them to Washington, D.C. The Department of the Interior evidently sent down orders to downplay the damage."

Even more consequential is Minerals Management's tendency to downplay the potential damage as it prepares environmental impact statements, the supposedly objective analyses upon which its leasing decisions are made. According to a 1985 report by the U.S. Office of Technology Assessment, "The industry has been most eager to probe . . . the Arctic [National Wildlife Refuge] for possible finds. The Interior Department has been too eager for the past eight years to accommodate it. . . . The agency responsible for leasing should not also be in charge of determining what environmental research is necessary, and of supervising subsequent efforts."

THE EXXON VALDEZ EXPERIENCE suggests several convincing reasons for a national energy policy. The alternative-energy and conservation measures that could be promoted with such national support would reduce dependence on oil, decreasing the frequency of tanker acci-

*Continued on page 96*

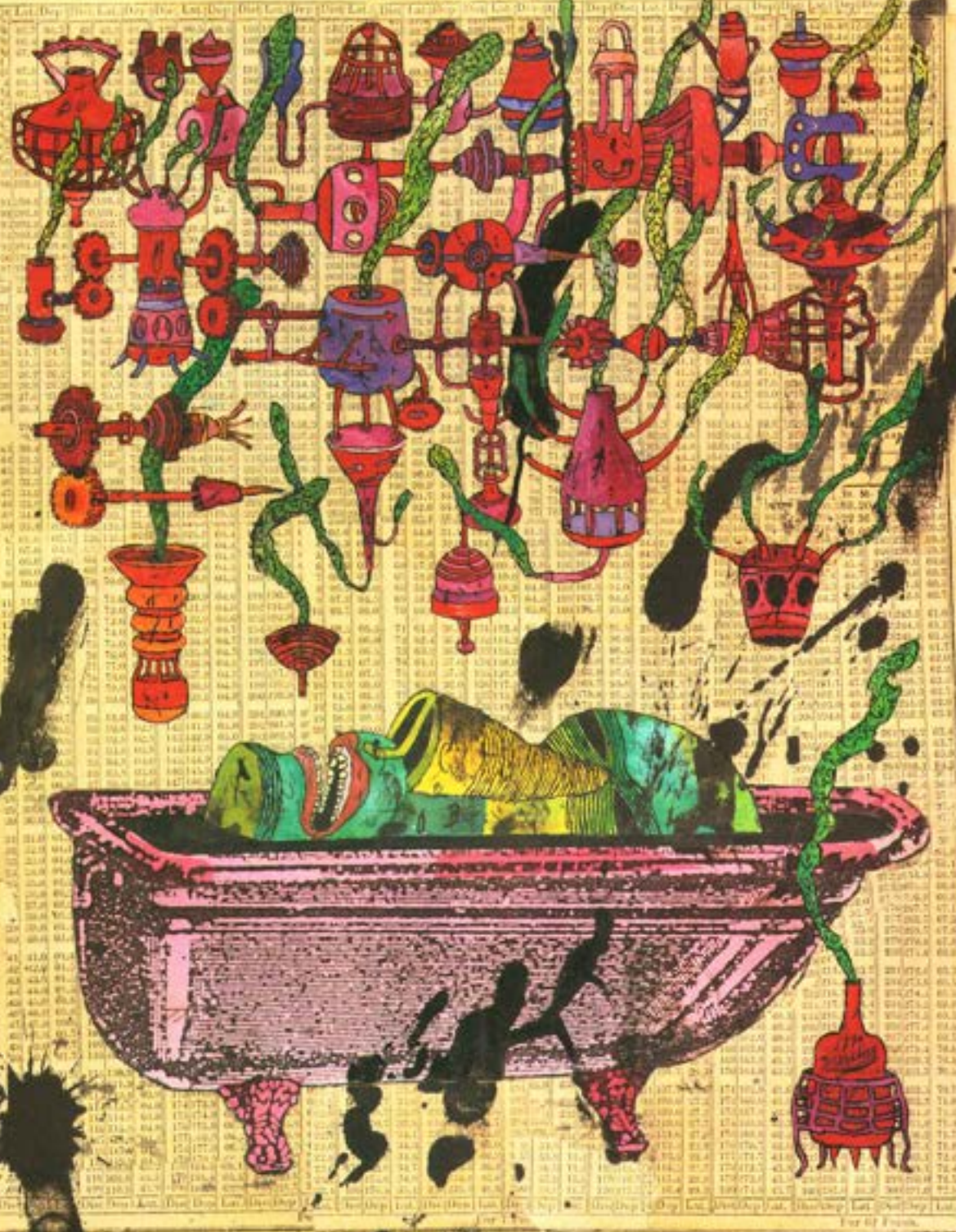


SUICIDE

TABLE I. Difference of Latitude and Departure for 4 Points

NAVIGATION

TABLE I. Difference of Latitude and Departure for 21 Points



• PAINTING BY HENRIK DRESCHER •



# AN ENCOUNTER WITH JOHN MCPHEE

BY JOAN HAMILTON

GIVEN A CHOICE BETWEEN HIKEING AND peeling potatoes, John McPhee would peel potatoes. But paddling? The very thought brings an eager glint to his eyes. Alaska's Salmon, the Delaware, the Allagash, the Yukon, the St. John, the Charley—he knows their waters well. From the time he was a boy admiring a birchbark canoe at summer camp, he's been happiest afloat.

McPhee is also an author. A devoted wordsmith on the staff of *The New Yorker*, he has written dozens of articles and 20 critically acclaimed books on topics ranging from pinball to plate tectonics.

Today McPhee is parked on the New Jersey bank of the Delaware River. At five foot seven, he's a compact man, with a close-cropped gray beard, thinning hair, and glasses. If he's too furrowed and thoughtful at 59 to look like a modern-day voyageur, McPhee is also too amiable and athletic to personify the desk-bound scribe.

We've driven along the sycamore-lined street of McPhee's childhood

**O**N A RAMBLE  
WITH THE WRITER,  
SOME PIECES  
FALL INTO PLACE.







home in Princeton, bounced past thick auburn woodlots and doughty farms, and paused on a hill overlooking the New Jersey coastal plain—a surprisingly rural scene in a state with such a sooty reputation. “Here we are in the most densely populated state in the U.S.,” McPhee says. “It’s astonishing.”

We never really stop, though, until we reach the river. It’s smooth, wide, slow, and full of meaning for McPhee. Having negotiated the rapids and pools upstream with a canoe, he is now in the process of testing them with a fishing rod. His quarry, shad, were scarce when he was growing up, but since the passage of modern pollution laws the river has grown cleaner and the shad have come back. “I can stand in the river and see my feet!” he exults.

McPhee plans to do a piece of writing about the Delaware and its rebounding shad someday—but first he must do some more fishing. “I want to stretch the research out,” he says. “I’m having fun.”

“A PIECE OF WRITING,” A PHRASE McPhee uses repeatedly, can mean anything from a short, unsigned article for *The New Yorker*’s “Talk of the Town” section to a 438-page tome on Alaska. His editors are deferential, imposing no deadlines or restrictions on length, suggesting no topics. As his Princeton English Department colleague William Howarth says, McPhee en-







joys "one of the most liberated jobs in modern journalism."

There's only one hitch: *The New Yorker* doesn't pay its staff writers a salary—only expenses, benefits, and fees for articles the editors want to use. With that as an incentive, and by applying singular diligence and talent, McPhee has become one of the most reliable and respected of the magazine's writers.

His reputation has been built around what Howarth calls "scrupulous nonfiction," fair-minded, meticulously researched products that illuminate a topic from all sides while keeping the author and his opinions in the shadows. McPhee's prose is also artful, full of well-rounded characters and well-told stories. He's a literary journalist, not a fact merchant. "We read his books not so much because we're thirsty for information, but because it's worth tagging along on any literary journey Mr. McPhee feels like taking," wrote *Wall Street Journal* reviewer Steven MacDonald.

"I read McPhee the way I run my eyes and hands over a finely polished piece of cherry or mahogany," Howarth says. "I admire its grain, its strength, its smoothness, and its weight. His sentences have rhythms, color, and surprises, and they carry a snappy, droll sense of humor. Yet his stories are absolutely believable. When I read about his places, I feel I've been there."

As a teenager, McPhee says, he had a feeling he could write long "fact pieces." To test the notion, he began sending articles to *The New Yorker*, "throwing pieces at them like snowballs." While more than a hundred articles crafted in his 20s and early 30s were rejected by his journal of choice, McPhee sold his work to other magazines and to the dramatic television series *Robert Montgomery Presents*. During this period he also wrote the "Show Business" section as a staffer in the high-pressure crucible of *Time*. Although this journalistic testing period was longer than he had planned, in retrospect he has no regrets. "I wouldn't have been trained as well at *The New Yorker*," he says.

Finally, in 1963 *The New Yorker* published "Basketball and Beekeepers," a brief piece that marked a personal turning point for McPhee. Two years later the magazine devoted 50 pages to "A Sense of Where You Are," his portrait of All-American basketball star Bill Bradley, and the 33-year-old McPhee signed on as a staff writer.

**T**O THE DELIGHT OF MANY ENVIRONMENTALISTS, McPhee often investigates subjects that might be discussed, formally or informally, at any of their gatherings. He has profiled conservation patriarch David Brower and edible-plant expert Euell Gibbons. He has written about wildlands close to his home (most notably the Pine Barrens) and river trips farther afield. He has probed such seemingly impenetrable topics as nuclear physics, geologic theory, and the National Energy Act. His most popular book, *Coming Into the Country*, focused on the Alaska land battles of the late 1970s. His most recent book, *The*

*Control of Nature*, examines human efforts to tame natural forces.

Based on this list, one is tempted to call McPhee an environmental writer. Indeed, novelist and essayist Wallace Stegner has dubbed him "our best and liveliest writer about the earth and earth sciences." But he has written equally well about art, sports, cooking, oranges, medicine, the Swiss army, aeronautics, and green beans.

"Ideas are a dime a dozen," he explains. "They just stream by." How does he decide which ones to dive in and pluck? A large share of his topics, McPhee says, are linked to the events of his youth. After a childhood "all wrapped up in sports," it's no wonder he chose to write about Bill Bradley, and later about tennis champions Arthur Ashe and Clark Graebner (*Levels of the Game*). The origins of *The Survival of the Bark Canoe* and several of his other books can be traced to his early experiences at Keewaydin, the Vermont camp where his father worked as a physician each summer. There McPhee learned canoeing and backpacking skills, as well as more important lessons about how to live in and appreciate the out-of-doors. (Once, while giving a college lecture, McPhee was asked what educational institution had had the greatest effect upon his career. The Deerfield Academy and Princeton University graduate immediately replied, "Keewaydin.")

But some of his topics were chosen for other reasons, too; they seem more the products of whim than of bonds with the past. He decided to write *La Place de la Concorde Suisse*, a book about the Swiss army, because two of his four daughters were spending a year in Italy. He developed an interest in Alaska after a canoeing buddy moved there to work as a planner for the National Park Service. One of the most difficult books he ever tackled, a portrait of nuclear physicist Theodore Taylor, was casually suggested to him by a man he met on the tennis court. Two agonizing years of immersion in physics later, McPhee extruded *The Curse of Binding Energy*.

In many ways a methodical man, McPhee seems to revel in these literary leaps of faith. And he's careful to define his work broadly enough to allow him to exercise his whims in the future. "I do sketches of people and the work that they do," he says with calculated vagueness. "Real people and real places."





WHEN I SET UP AN APPOINTMENT TO SPEND A DAY WITH him, McPhee made it clear that he didn't want to sit around talking about himself. He would show me the New Jersey outback. He also had strong ideas about other matters. He didn't want me to present the interview in question-and-answer form, transcribed from a tape. "I'd sound like Casey Stengel," he said. For that matter, he doesn't like tape recorders at all; they're unselective and tend to make reporters lazy. "A lot of nonfiction

researching "A Textbook Place for Bears" (*Table of Contents*). They also have a casual feel and don't get in the way of good conversation. "Riding in the cab of somebody's pickup at night, your scrawls get pretty cryptic," he admits, but even one scribbled word can help him recreate the scene in his mind later.

Physicist Theodore Taylor recalls that McPhee would work from six in the morning until nine-thirty at night when they traveled together in the early '70s, always with an open notebook and sharpened pencil. Taylor would brief him in the morning, and then they'd tour a nuclear facility. At each stage, as he moved from room to room talking with plant personnel, "he would not proceed until he understood what was happening," Taylor says. "I had enormous admiration for his capacity to stay intellectually alert."

McPhee devotes months, rather than days or weeks, to his research, hoping that time and careful observation will bring him the insights that hasty journalism often lacks. In addition to asking questions, he spends less-focused time looking over the shoulders of his subjects. This requires a diplomatic approach. "You can't really tell a guy you're going to spend a year with him when you start out," he says—so you ask if you can tag along on the next outing, then the next, and maybe the next. "I just stay around until people get sick of me."

Geologist David Love, the central character in *Rising From the Plains*, says he never tired of McPhee's company on their numerous Rocky Mountain tours. "He was a delightful person," Love says, "such a gentle interviewer that I found myself telling him things I wouldn't tell my wife."

David Brower remembers how dedicated McPhee was in researching *Encounters With the Archdruid*, which focused on Brower's role as a conservation leader. Wearing boots that gave him blisters, McPhee continued to take notes as he hiked, feeling for the trail with his sore feet. The whole family enjoyed the year McPhee was around, Brower says: "He was the casting director, amusing and assiduous. We all fell in love with him."

"He was a convivial fellow," agrees Sierra Club Alaska Representative Jack Hession, who made a brief appearance in *Coming Into the Country*. "But he was always asking questions and writing in these miniature notebooks."



ANDREW MOORE

material smells of tape," he declared. "Just do a piece of writing."

After that warning, I leave my tape recorder behind on the day of the interview, relying instead on legal pads and ballpoint pens. I can't help wondering how McPhee, a veteran interviewer, would record the events of an important day. He tells me his tools of choice are pencils and 4 × 6-inch notebooks. (He formerly used plain wooden pencils, but has now "escalated" to the mechanical kind.) These implements adapt well to fieldwork; you can run after a black bear and a biologist with them if you have to, as he did

RIDING PAST A NEW JERSEY WOODLOT, WE ADMIRE A FEW auburn and canary-yellow leaves left gleaming in the autumn sun amid an army of slim gray trunks. McPhee rattles off the names: Tulip poplar. Oak. Shagbark hickory. White ash. Sassafras. Juniper. Sycamore. "Isn't this astonishing, this country?" he says again. His zest for rivers obviously extends to trees and leaves. Was it this enthusiasm for the natural world, I ask, that led him to profile David Brower?

Subconsciously, perhaps. But McPhee explains that he initially saw *Encounters With the Archdruid* as an exercise in



literary structure. Profiles were becoming formulaic for him; he'd written cover stories for *Time* on Sophia Loren, Richard Burton, Jackie Gleason, Joan Baez, Mort Sahl, and Barbra Streisand. Then he spun the tales of Bradley and Gibbons and of art historian Thomas Hoving, Deerfield Academy Headmaster Frank Boyden, adventurer Carroll Brewster, Wimbledon grass-grower Robert Twynan, and guidebook writer Temple Fielding for *The New Yorker*. In *Levels of the Game* he tried something different—profiling two people in the same piece.

Next he dreamed up an even more intricate configuration: "A-B-C over D." The idea was to profile one person, D, by showing him or her interacting with three people, A, B, and C. He posted the formula on his wall and wondered. Should it be an architect and three clients? A choreographer and three dancers? A director and three actors?

By now it is after eleven o'clock. With the river overlook and woodlots behind us, McPhee suggests that we drive back to the university. Just as he is beginning to describe *Archdruid's* verbal engineering in more detail, the van rolls into a deserted intersection and dies. McPhee bends over the gearshift, giving it a workout with his wrist. "Oh, God, the car has chosen this time to break down," he says in controlled despair.

Seconds later, his mood lightens. "It's an opportune time, really." As we push the disabled van to the curb, McPhee plots aloud. He'll leave the van unlocked, hide a key in the back, then call a tow service when we get to his office. There is no fuzziness, no faltering. I can easily imagine this take-charge fellow pummeling words, paragraphs, even chapters into submission, determinedly fending off life's distracting minor crises. "Now, where were we?" he asks as we walk briskly toward campus. "Oh, yes, A-B-C over D."

ULTIMATELY, OF COURSE, MCPHEE DECIDED TO TURN A-B-C over D into a study of three pro-development men and David Brower, chosen because he had "the most teeth" of the conservation leaders of the time. At McPhee's bidding, Brower hiked in Washington's Glacier Peak Wilderness with mineral engineer Charles Park, roamed an uninhabited island off the coast of Georgia with resort developer Charles Fraser, and ran the Colorado's rapids with Bureau of Reclamation chief Floyd Dominy. McPhee tagged along, asking questions and scribbling in his miniature notebooks.

Only five months after he first discussed these concocted adventures with Brower, the book's plot boiled over. In May 1969 the Sierra Club Board of Directors asked Brower to resign as executive director, a post he had held since 1952. The book became even more complex than McPhee had planned, an examination of Brower's internal, as well as external, battles.

In his notebook McPhee called Brower's showdown with

the board *The Crucifixion*. He began to see his subject as a religious figure. "He is a visionary," McPhee wrote. "He wants—literally—to save the world. He has been an emotionalist in an age of dangerous reason. He thinks that conservation should be 'an ethic and conscience in everything we do, whatever our field of endeavor'—in a word, a religion."

Although he admires Brower's accomplishments, McPhee was never among the archdruid's many acolytes, and he has remained over the years a communicator first, a nature-lover second, and a closet conservationist at best. When Brower asked him, "Why don't you join the Sierra Club?" McPhee recalls saying, "I don't want to join the Sierra Club. I want to write about the Sierra Club." He depicted the book's major characters "in the round," as *Hill Street Journal* reviewer Edmund Fuller put it, "clashing in concrete situations when factors are complex and decisions hard. Readers must choose."

McPhee's staunch openness to all points of view sometimes frustrates cause-oriented readers—and those who like a little more ego in their authors. When *Outside* magazine columnist David Quammen greedily grabbed a copy of *The Control of Nature*, "eager to learn what McPhee, with his jeweler's eye, had seen and concluded about the battle between mankind and nature," he was disappointed. McPhee "had seen much," the columnist bemoaned in the December 1989 *Outside*, "but refused to conclude anything."

Conclusions are indeed rare in McPhee's work, and where they do occur the author seems embarrassed by them. "I was screaming like Rumpelstiltskin in 'The Keel of Lake Dickey,'" he says of an article in which he voiced polite opposition to a dam on the St. John River in Maine. "A well-written editorial is a good thing—but it's not what I'm out to do." Instead McPhee aims to paint a scene so vivid that readers can experience it on their own terms, and walk away with their own well-informed opinions. "I don't want to look at a topic from just one perspective," he says. "I want to look at the complexities, to come up with a piece of writing in greater dimensions."

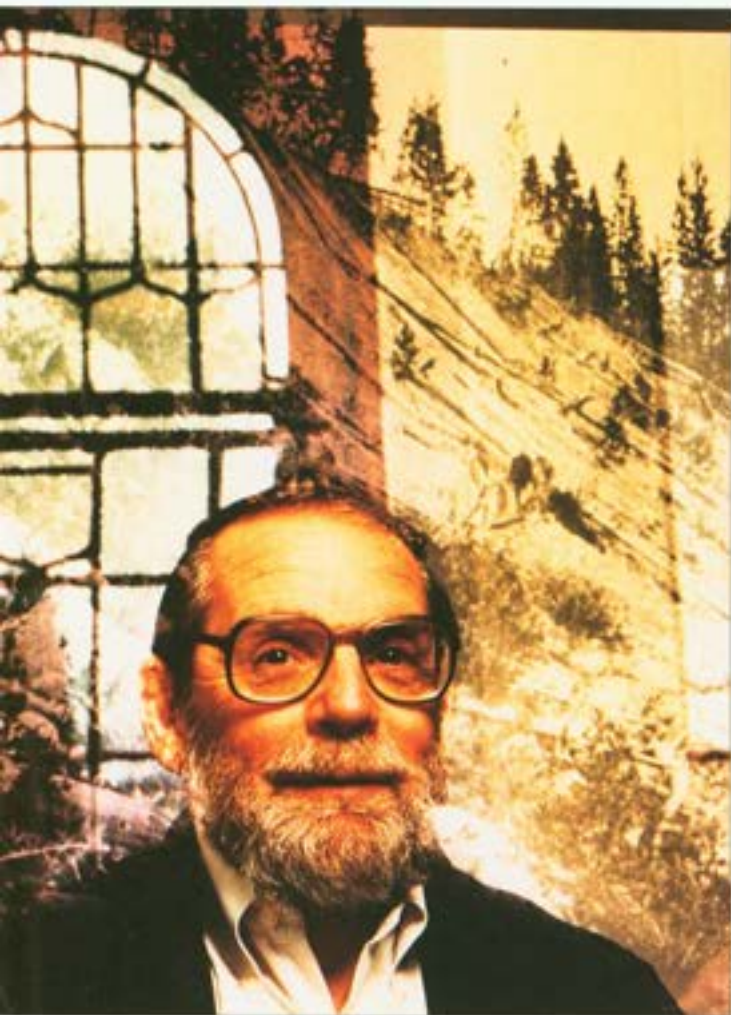
Often complexities can cloud an issue, but McPhee stacks fact upon fact in a way that usually clarifies rather than confuses. In the end, his carefully selected details settle out—





and the choices, while still the reader's to make, become limpid as a mountain stream. At the end of the Glacier Peak episode in *Archdruid*, in which Brower and mineral engineer Park are munching blueberries on Miner's Ridge, McPhee writes:

*Brower's cup was up to its brim, and before he ate any himself he passed them among the rest of us. It was a curious and surpassingly generous gesture, since we were surrounded by bushes that were loaded with berries. We all accepted.*



ANDREW MOORE

*"I just feel sorry for all you people who don't know what the mountains are good for," Brower said.*

*"What are they good for?" I asked.*

*"Berries," said Brower.*

*And Park said, "Copper."*

WITH THE VAN HALF A MILE BEHIND US, WE SHUFFLE through the leaves at Princeton University. McPhee has walked these paths both as a boy and as a student. Now, as a professor, he guides me inside the stone walls of what appears to be an aging castle.

For the past 15 years he has taught a course here, "The Literature of Fact." Two of every three spring semesters, he coaches 16 hand-picked students—a miscellany of majors, both graduate and undergraduate—in the art of telling a compelling nonfiction story.

For half the course, the class explores "the possibilities and limits" of nonfiction writing. The other half is devoted to structure, one of McPhee's favorite topics. Good structure keeps a writer's material from being, as he puts it, "like a bag of meal, cut open and spilled all over the floor." Good structure preoccupies and delights him. Though he doesn't claim to provide answers for other writers, McPhee willingly shares stories of his own struggles with his students, and today with me.

His approach to structure is rigorous and methodical: He first types up his notes on a computer, organizes them according to topic, and writes each topic heading on an index card. Then, over a period of days—or more often weeks—he shuffles and reshuffles the cards until he has built a story in which characters and plot unfold in an orderly but intriguing fashion. "It's an amazing period when the piece tumbles together," he says.

The phase that follows is harder and less rewarding for McPhee. After a story's structure is built, there are no more excuses—the writing process must begin. This is a moment that he hates, and apparently so does his wife, Yolanda. "If I want to make Yolanda mad, I just tell her I'm going to start working at home again," McPhee says. After 20 years of marriage, she apparently wants to spend no more time than absolutely necessary witnessing the grim reality of a writer at work.

What happens when he begins to write? "I feel inadequate," McPhee confides. Even after 20 books? "The last book doesn't write the next one. Sometimes I'm so desperate I'm almost throwing things at the paper."

The result of this verbal assault is an "unwritten, unformed, uneven, awful" first draft. "Then, only after I have lurched, lumbered, and swayed through that, my nervousness and lack of confidence subside." A more cool-headed McPhee then prints out a triple-spaced copy of the draft, reclines on a couch in his office, and puts a pillow under his head. "This is where the real writing happens," he says. One page at a time, he covers the contemptible first draft with a handwritten second draft. "At this point I have something I can deal with. I begin to enjoy it."

When this step is finished, McPhee reads the piece to Yolanda: "I have never published one syllable that was not read aloud." Then he goes back through his work a third, "delicious" time, polishing and looking for opportunities for distinguished wordplay.

How long does all this take? "Oh, Lord," he moans. He spent two years on *The Control of Nature*, five months on research—the fun part—and the remainder on the more

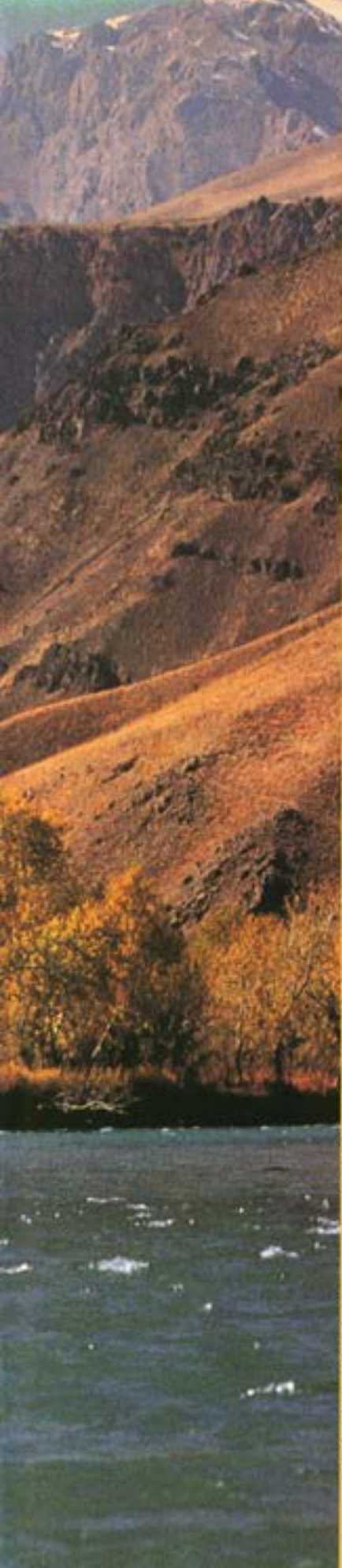
*Continued on page 92*





*The Chatkai River, USSR.*





STEVE BANGS: SOBEK PHOTO FILES (LEFT); DAVID EDWARDS: SOBEK PHOTO FILES

# R A P I D



# C H A T K A L R I V E R S

*Can a thrill-seeker find fulfillment as an eco-ambassador? Afloat in the Soviet Union, an inveterate adventurer considers the question.*



When Soviet Foreign Minister Eduard Shevardnadze and U.S. Secretary of State James Baker got together last September for an arms-control meeting, it wasn't in Helsinki or Malta but in Wyoming's Grand Teton National Park. And when they took a break, they didn't play golf or tennis, they paddled an inflatable boat down the Snake River.

At about the same time, I pulled my raft to shore, wrapped the bowline around a fat poplar, cracked a Lowenbrau and took a long draw. It was a ritual I'd performed many times before in the moment of physical and mental release that comes after a day of adrenaline-pumped whitewater. But that day was different.

I was on the Chatkal River in Soviet Central Asia, and this was no simple rafting expedition but an "eco-adventure," a journey with a purpose, a quest for something more than an expensive thrill. I was part of a mission to reach higher ground, higher consciousness, and world peace—through rafting.

It wasn't long ago that adventure could stand on its own: Mountains were climbed to reach the top, wild rivers run for mental serenity and physical excitement, journeys made to reach point B. There was purity to the pursuit. Adventure was perhaps a selfish undertaking, one that provided heightened self-esteem and a feeling of personal achievement, but it did little to help the planet.

Now all that has changed. Suddenly, ecological and humanitarian causes are au courant, and in today's climate of *glasnost* and global warming there is a heightened sense that we're all in the same raft and will all have to paddle together to get through the century alive.

This is a good and necessary mind-set, but as a

*by Richard Bangs*

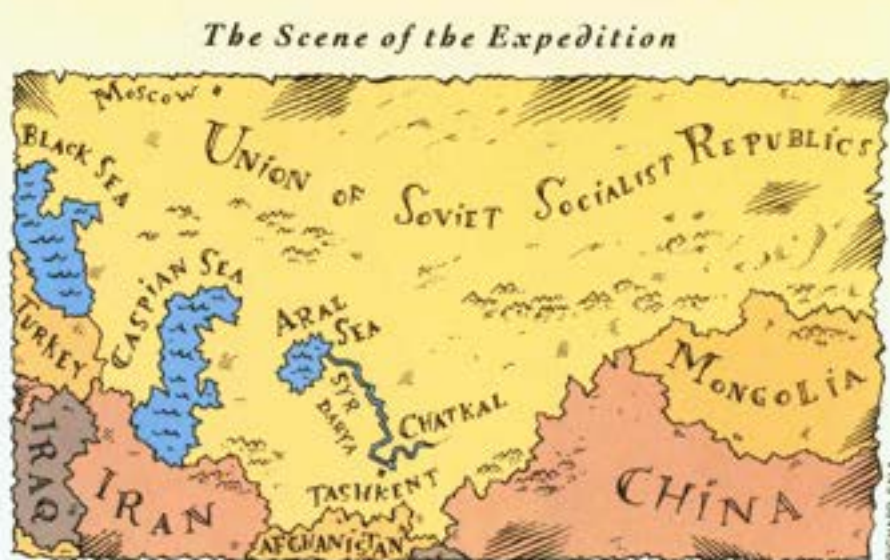
longtime fun-junkie I couldn't help seeing the trend toward conspicuously aligning with causes as a thin carapace covering vainer motives, a marketing technique used to legitimize the hedonism of expeditions, a cognitive agreement that said it's okay to party in



the wilderness, because we're saving the world.

The first joint Soviet-U.S. white-water venture was Project RAFT (Russians and Americans For Teamwork). Started in 1987, the endeavor's original construct was noble and attractive: Take bright young Americans and put them on a raft with their Soviet counterparts. The raft would serve as a sort of petri dish wherein positive super-power relations would germinate. Together the young adults would paddle rapids, overcome natural obstacles, and form the lasting bond that often comes from a shared adventure. Then, 30 years later, when these rafters had attained their respective positions of power, it would be that much harder to push the button, knowing friends were on the receiving end. Project RAFT enjoyed two years of success, sending Americans to Siberia to raft the Katun and other rivers, and Soviets to raft the Colorado through the Grand Canyon.

My own company, Sobek Expeditions, also had permission to conduct adventure tours in the Soviet Union. But it was no longer adequate simply to sell adventure. Project RAFT was a competitor, and Sobek had to go them one better. Thus the Chatkal River



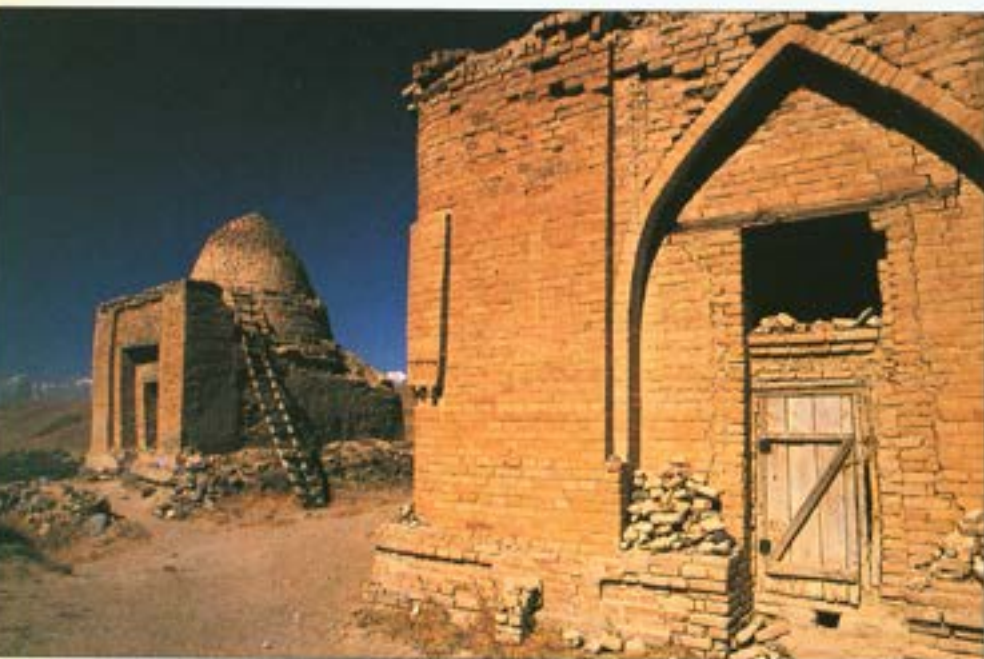
Environmental and Peace Expedition was born, featuring citizen-diplomats from not two but four countries.

My comrades in eco-adventure included two men from Zambia and two from Czechoslovakia. On the American end were five men and two women, one of whom, Jana, had moved to Moscow the previous year. Then there were 12 Soviets on the expedition, eight men and four women. At our get-acquainted breakfast, Chuck had handed out red-and-blue Chums, the popular cloth straps that secure sun-

glasses to fashion-conscious sporting heads. Each Chum had the American flag on one side, the Soviet flag on the other. Even our temples would provide a constant reminder of the trip's high nature.

**O**n the flight to Tashkent, the capital of Uzbekistan and the Soviet Union's fourth-largest city, I see for the first time a map of the Chatkal. Starting in Kirghizia near the Chinese border, the river flows west for about 80 miles before reaching the first of scores of impoundments. Later the river joins with the Pskem; the combined waters are called the Circik, which in turn drains into the Syr Darya, the main feeder to the Aral Sea, but for 18 years now nothing more than a brackish trickle at the mouth of the sea.

In Tashkent we waste no time in transferring our 85 pieces of gear to two screaming-orange Aeroflot helicopters. Within the hour we're airborne on the 90-minute flight to the headwaters of the Chatkal. Below us the colors grow gradually more sober as we whop-whop along into the high-desert mountains and over the rip in the Earth's crust that holds the river itself. We take turns sticking our heads out the round windows like dogs in a speeding car. I look down at a stretch of whitewater that looks impossible even from the air, knowing all the while that aerial views tend to flatten



★ *Not the usual riverside attraction: mosques near the Shiite village of Jange-Bazar.*





★ *The Chatkal ranks as a favorite among Soviet river rats, who, lacking commercial outfitters, have formed dozens of rafting clubs.*

perspective, making obstacles look easier.

We land on a gravel bar on a bend in the river at 4,500 feet and unload the gear. With a whoosh the mechanical monsters are gone. All is quiet save for the hushed rippling of the clear river and a warm breeze whispering through the poplars and brush willows.

Pitching camp on a knoll not far from the water, we start rigging boats. The Americans have three Western rafts that are ready in a couple of hours. The Soviet contraptions, all handmade from spare parts that have been begged, borrowed, or stolen, take the rest of the day to assemble. They are essentially crude inflatable catamarans, two sausages attached to a Tinkertoy frame. The crafts look complicated, flimsy, and unstable, but the Soviets show them off like new cars.

The next morning we're drifting on Soviet waters, something I never imagined I'd do. We're among the first 15 Westerners to boat this river and only among the first hundred to raft anywhere in the Soviet Union. Born in the age of McCarthyism, I was taught that Russians were out to de-

stroy us; at school we would practice ducking under our desks in case of a Soviet-launched thermonuclear attack. Over the next three and a half decades, some things didn't change: President Reagan called this land the Evil Empire. But now here I am, floating and giggling with the Soviets in the next raft. For the moment I drop my cynicism about all this higher-ground stuff and thoroughly enjoy the moment—on a river, far from home, with friends.

**T**he Chatkal River valley looks like something from the Nevada badlands—dry, bleached, sparse, snowcapped. We bounce over a couple of Class I and II rapids and after barely 30 minutes pull over on the southern bank to explore the Shiite village of Jange-Bazar. Because it is a conservative Muslim settlement, Misha instructs us to put on long pants over our shorts before hiking into town.

Two ancient baked-mud mosques on a lilac-colored hill overlook Jange-Bazar. From the top we're treated to a spectacular panoramic view of the Tien Shan mountains and the tur-

quoise ribbon of river twisting through them—all to the soundtrack of rock & roll blasting from a p.a. system down in the village.

Back at the rafts, we lunch on alphabet soup with Cyrillic letters, watermelon with red seeds, crimson pomegranates, sweet grapes, and warm flatbread bought in Jange-Bazar moments before. Soon we're back on the river. Downstream the mountains loom like a great gray tsunami. A black fissure crooks down the middle, the slot through which the hundred-foot-wide river drops.

This is the First Gorge, and suddenly we're in it, hemmed in with the water accelerating. Sergey Kirillov, chief designer of the Soviet gear, is commanding a leaking cataraft, so it seems he may be waterlogged any minute. We in the Western-manufactured boats make smug comments about their superiority of design and function, and wonder if Soviet missiles are as slapped together as the equipment on this trip.

A few minutes into the dark canyon, Chuck calls for the boats to pull over. We moor on the right bank and walk



downstream to see what looks like a river of trapped steam spouting from a broken radiator. The torrent, white as bleached bone, pitches over a three-step, 35-foot falls, impossible to run. We begin the grueling process of disassembling our high-tech rafts and carrying the heavy frames, oars, and rafts over the boulders to a quiet spot at the base of the rapid. The Soviets, meanwhile, simply pick up their ultra-light-weight, homemade catarafts, balance

them above their heads, and walk to the waterfall's end. In 15 minutes they are through with the task and back to help us with ours.

"*Odin, dva, tri.*"

"*Komodzi, karwali, katatu.*"

"*Jedna, dva, tri.*"

"One, two, three."

We take turns counting as we heave the rafts on cue. If the Soviets are self-satisfied in the knowledge that their rafts have outperformed the expensive

lage en route, Aktash, a sheep and farming collective of about a thousand people. Walking into Aktash is like walking into Genghis Khan's encampment: The faces are round, with the Asiatic features of nearby Siberia and Mongolia. In fact, the Aktashians are descended from the Turco-Mongols who invaded the area in the 13th century. Czarist Russia effortlessly annexed the region in the late 19th century, the fur hats conquering the skullcaps. Resentment still runs deep against hegemony, against atheists, and against Communists, but for us it is a friendly place.

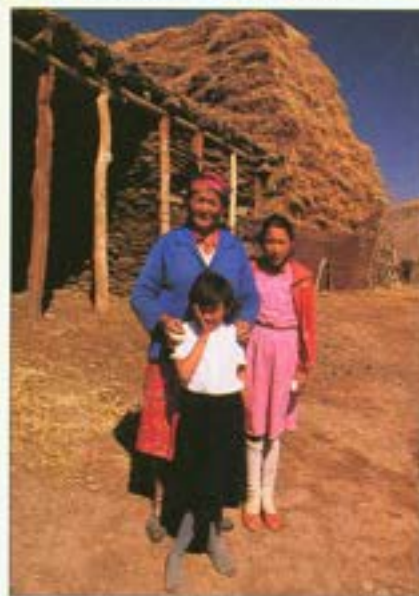
Within minutes of arriving, we are ushered into the dimly lit room of Cherkesh and Tamara, both teachers and new parents. They seat us on the floor around a long table and Tamara serves us a banquet of local delights: bread, apples, dried apricots, hard candy, watermelon, raisins, and green tea poured in half-cup servings so that we will stay and have more—or so we are told.

Tamara hands Jana her baby and takes out a three-stringed instrument called a *homus* and starts to sing love songs. We don't understand a word, but we're touched by her message of passion and romance. As we stand to leave, I look at a colorful map on the wall showing the course of the Chatkal. Cherkesh, noticing my fascination, untacks the map and presents it to me. I reach for my wallet, but he shakes his head vigorously. I have nothing to give him in return—or so I think until I check my pocket. Discovering my old Hohner harmonica, I press it into his hand while bidding goodbye.

That night after dinner Misha lights up several five-inch slabs of Plexiglas he uses as candles. He begins to explain a piece of the philosophy of his rafting partners, that in the Soviet Union a person can be only two of three things: clever, honest, and a member of the Communist Party. If one is a member of the Party and honest, then he is not clever; if he is a member and clever, then he is not honest. And, of course, if someone is clever and honest, then



STEVE GILROY / SOREX PHOTO FILES



STEVE GILROY / SOREX PHOTO FILES

★ *Daily life in the Tien Shan foothills remains relatively unchanged, despite the eco-adventurers who drift through.*

Western models, they don't show it.

That night Sergey announces he's a "party dog" and produces a quart of the 192-proof spirit that also serves as fire starter in rainy weather. "May the troubles in your house be as few as the drops in your glass," Misha toasts, and we all slam back our shots. A competition in cultural jokes begins. The winner comes from Jana:

A Russian finally gets together enough money to buy himself a raft. He goes to Sergey, picks out the one he wants, and asks when it will be delivered. "Ten years," Sergey tells him. "Will that be in the morning or afternoon?" the man asks. "Because the plumber is coming in the morning."

**T**he next day we pull over during the morning float to explore the last vil-





★ Ships that used to ply the waters of the Aral, once the world's fourth-largest lake, are now forsaken, stranded in a sea of salt and sand.

he cannot possibly be a member of the Party.

Day Four brings the first runnable rapids of any size and some new vegetation—cherry and apple trees. At a smoke stop near a yurt fashioned from animal skin I ask Vanja, a certified whitewater instructor, about Soviet rafting. He says the Soviets have been boating whitewater since the late '30s, when loggers and climbers used fold-boats to carry them into remote wilderness regions. It was at about the same time that whitewater rafting was becoming a sport in America, though neither nation knew the other was discovering the same thrills and spills.

Evolution of the sport continued in the two countries in somewhat parallel fashion. In the '60s Soviet rafters began to use discarded Aeroflot survival rafts; meanwhile, I had started boating in the Appalachians using an old Pan Am survival raft. Then, in the '70s, the parallels began to bend. Because many of the better wild rivers in the Soviet Union offered no road access, all gear had to be carried in, and the resourceful began to make the lightweight catarafts by hand. These could be back-packed anywhere and were quicker

and nimbler on the water than the survival rafts.

The new designs grew in popularity and eventually became the standard; now Soviet river runners swear the best of the West just doesn't compare. Soviet river running also differs in that there are no commercial operators, such as dominate stateside rafting. Instead there are scores of rafting clubs throughout the country (30 in Moscow alone) whose members run rivers in their free time. As if to underscore this point, three Soviet rafting groups go floating by while we're sitting at the river's edge.

The next morning I poke my head out of the tent to see what has become the usual sight: Our Russian hosts are scurrying around the kitchen, washing dishes, brewing coffee, and busily preparing another bland, mushy meal for the group. "Dobroy ootra!" Vanja smiles a good-morning at me. None of the other Americans is even awake yet.

I have never seen people work harder than the Russians on this trip: At every juncture they outswear and outperform the otiose capitalists, and they are forever looking out for the interests of others. I share this observation with

Jana, who says it is one of the pluses of a socialist system. The Soviet Union never had a "me" decade; people learn to live and work for the group and put the wants and needs of others ahead of their own. In the microcosmic universe of a wild river canyon, socialism looks pretty good, and I'm inspired to hurry into the kitchen to see if I can help.

Soon after breakfast we're back on the river, and the rapids continue in spades. The mackerel-skyed morning is spent running a long piece called Kishlaksay, then we pull over to scout a continuous two-mile stretch called Pegak. The rapid is so long and complex that Kirby says I should draw a map of the intended route and tape it to the bow. Not a bad idea: With the route fresh in my mind, I sketch it on a piece of notebook paper and tape it to the raft in front of me.

The second wave to wash over us snags my map, yet the run is still good, and in the eddy below we pull over for lunch. Then it's back to the river for a pyrotechnics finale of rapids. For hours they just keep coming—all runnable, all exciting, all wet. It's the best

*Continued on page 98*



# KNOWING THEIR PLACES



When we travel, we often collect destinations as though they were postcards, assembling a registry of places we know we've been *through* but can't really be sure we've been *to*. We need time to watch and wait, perhaps with a companion who knows our destination intimately and can let us in on its secrets. ♦ *Sierra* asked four writers to take us to their favorite natural haunts—places not necessarily knock-your-socks-off awesome, but whose intricacies may emerge only after an investment of time and patience. ♦ Obliging, Gretel Ehrlich sits us down beside a beloved pond in the foothills of Wyoming's Big Horn Range, Janet Lembke shows off a North Carolina backwater that we might otherwise have passed by, John Madson gets our feet wet in the finest swimming hole in the Ozarks, and Sam Wright helps us grasp the immensity of Alaska's Brooks Range. So sit back and let the locals tell you what they know.



## THE POND by Gretel Ehrlich




**T**here is a small lake in the foothills of northern Wyoming with a tiny boat-size island where I go to sit nearly every day. I say "lake" when perhaps it is only a pond. This arid, high-altitude landscape drives me to exaggeration when it comes to water. The lake lies in a narrow south-facing valley hemmed on three sides by mountain flatirons, mounded bentonite foothills, and rock-piled Precambrian peaks, but the view to the south is oceanic: A wide basin spreads out, its winter mists unflooding into drafts of blue.

In the spring I sit behind island willows and wait for the ducks to return: mallards, a few coots, and cinnamon teal. The rueful cry of sandhill cranes stirs me from winter doldrums. They circle and circle, then fly away—not enough wetlands here. Then comes the day when their cry is replaced by the shrill one of killdeer. Snipes pierce gray mud flats with their long bills, and the ululating song of the western meadowlark cuts away the last of the dark days.

From behind my thin screen of willows I watch the





one-night-stand visitors fly in—godwits, avocets, Forster's terns, Baird's sandpipers, and even a rare whooping crane; then the exquisite phalaropes who stay for a month or two.

But that is spring, and it is still winter here. I ski to the island and look: There is no lake, only the three feet of snow that covers the lid of ice under which I can only imagine a body of water. Now whorled and drifted snow is white on white, its wind-hardened designs are reminders of moving water. Late in the afternoon a new moon skates across the sky. The mountains slope up white like fenders. At night the temperature drops to 30 below.

All that moves in the morning is the glitter of frost-fall and the sun's remote southerly arc—a fading smile. Wind chisels snow on the lake into a hard mask, and the island, no bigger than a diving boat, develops a malignant white hump.

February 2. Deep winter has passed.

Somewhere the groundhog casts a shadow, but not here. Clouds fill and refill the sky with something tropical. Pacific air lards an Arctic blast, breaking its hold.

The lake is trackless. Elk climb a shale-finned ridge to get to the winter pasture we left for them. The sky is white, and the ground. There are no boundaries between earth and water. A few gnawed cattails stick out, headless. Solitude has become a reflex. When I look into the snow on the lake, no reflection appears.

Yet there are unseen presences everywhere. Mountain lions lick their paws in red-walled caves above this lake. Overwintering birds—mostly gray-capped rosy finches—crowd the feeder for sunflower seeds. Rattlesnakes, prairie dogs, and marmots are curled in their various burrows and dens, and below hundreds of leopard frogs are dug into the lake bottom.

But the idea of sleeping animals is wrong. Winter dormancy, whether for partial hibernators like the bear or the ones who go under early and emerge late, is a process of maintaining body temperature. If a deep cold takes over, as it did in the winter of 1988, with 41-below nights, an animal will rouse itself and move around to create body warmth.

Night. Sometimes I come to this island to look at the stars. The snow is crusted. Walking over the tops of drifts is like walking on water: I never know when my luck will change and I'll sink through. In the southern sky Orion's belt is pulled tight and bright. From this small island I look beyond the Milky Way and wonder where

the other island universes are and if anything or anyone is looking back at me.

Near the end of winter the surface of the lake changes. Crusted snow is covered with corn snow, and the sharp edges of eddied drifts have softened into what looks like a rubbery gray brain.

The Island of Reil is a name sometimes given to the central lobe of the cerebral hemisphere, deep in the lateral fissure. It is the place where the division between left and right brain occurs, between what Francisco Varela calls the net and the tree.

To separate out thoughts into islands is the peculiar way we humans have of locating ourselves in society and on the planet. We string events into temporal arrangements, like pearls or archipelagoes. While sitting on my island perch I listen to my mind switch from logic to intuition, from the tree to the net, the one unbalancing the other so that dictatorships never stay in power.

Now snow collapses into itself under bright sun. Pairs of ravens fly against the face of the mountain, lifting and falling in unison. A cottonwood tree fills with nine bald eagles. They cock their heads and eye me as I walk by, then look out over the basin as if looking for the arrival of spring. The time between winter and spring is an island of time, a held breath. Below the ruins of snow, ice groans and by afternoon an opening appears—a long oval slit like a barely opened eye.

GRETEL EHRlich is author of *The Solace of Open Spaces* (Viking, 1985) and *Heart Mountain* (Viking, 1988).





## RIVER AT WORLD'S END

by Janet Lembke

**I**f you want to come visit, drive to the end of the world and turn right," says my husband. "Leave your watch and calendar behind."

The river instantly catches the attention of anyone who follows these directions. Flowing a hundred feet from our front door, it may shimmer gently, the surface broken only by leaping fish or an osprey splashing down to seize prey. It may crash over seawalls, uprooting piers and tearing away tons of earth. In any mood it is immense. At our location on its course, twelve miles from the mouth, it stretches five miles from shore to shore, the widest of the country's rivers. This is the lower reach of the Neuse, the more southerly of the two saline and muscular rivers that pour into North Carolina's Pamlico Sound.

Road maps ignore our rural community sprawled on the riverbank, but the area is identified on the nautical chart of the lower Neuse as Great Neck Point, an isolated peninsula inhabited and cherished by people almost as wild as the landscape. A thousand years ago Indians saw much the same maritime forest hugging the shore—sweet gums, pines garlanded with trumpet vines, live oaks and bald cypress wearing streamers of Spanish moss, yaupon holly, myrtles, palmettos. They saw the mixed woods inland—maples, hickories, and Hercules' clubs amid the conifers. Fields interrupt the woods today and bear crops of corn, soybeans, or waist-high weeds. Throughout the peninsula, creeks meander as they always have, guarded by needlerushes and giant cordgrass.

Richness of habitat and a temperate latitude hospitable to northern and southern species afford shelter to more critters than could crowd aboard an ark. Brown pelicans perched on pilings and towhees calling from the hedgerows find equal welcome. White-tailed deer browse at the edge of the soy fields; black bear ramble in the deep woods. Migrating monarch butterflies mingle in season with the ubiquitous swallowtails. Black-and-yellow argiope spiders weave blatant webs while black widows lurk in cinder blocks. Bluefish, carp, shrimp, and blue crabs, cooter turtles and cottonmouths share the river with otters and dolphins. On the luckiest days, bald eagles may soar overhead, newly resurgent after a two-decade absence, summering here where once they nested.

So far, the Point's human population has not competed seriously with the wildlife for living space. Creatures have flourished because they've been left alone, with *anthropos* kept in check by the timber companies that own much of the peninsula and have planted it thickly with loblolly pines. For generations these pines have stood like palisades against urban encroachments. People who have found their way to the Point also flourish, because we, too, have been left alone. Wild animals and wild people may be threatened species, however, now that timber companies have discovered more money in developing waterfront than in growing trees.

Meanwhile, isolation works its wonders. Lack of urban services fosters a frontier mentality and makes shore-dwellers fiercely self-reliant. And isolation connects us intimately with sun, wind, earth, and water. We may not be sure of the date, but we know the season and the hour of day. Spanish mackerel are running, crab pots fill overnight, sea nettles sting unwary bathers: midsummer. Striped mullet bulge with roe, canvasback and black scoter begin to raft, migrating veeries feast on tupelo berries: October. Lion's-man jellyfish bob on the waves and yellow-rumped warblers chip in the hedgerows: winter. Returning orchard orioles bugle brisk chow calls while bobolinks, passing through, sing their rinky-tink tunes from greening mimosas: late April. Now the river is warm enough for wading—high time the fishnets were repaired; time, too, that tomatoes, peppers, and speckled butter beans were planted. Sun, moon, and stars infallibly tell us the hour. We set our lives to their cycles, to the seasons revolving like a moving wheel, and to the ever-insistent water.





Since its rise 2 million years ago, the river has been a road, traveled in its depths by marine life, overhead by birds, and on its surface, only a blip of time ago, by humankind. When we tug sea trout from the summer net or glimpse a kittiwake blown upriver from its pelagic haunts by a January storm, when we find shards of Indian pottery in the sand, how easy it is to slip off today, slide into yesterday, and bob up again in the present. The river is a two-way cord that flows between then and now. Shining or raging at world's end, it echoes world's beginnings.

JANET LEMBKE is author of *River Time* (Lyons & Burford, 1989).



## JOHNSON'S SHUT-INS

by John Madson



**I**n southern Missouri's Ozarks, the mountain people say "shut-ins" to describe a certain kind of deep, narrow, closely confined stream course. One such place is the Johnson's Shut-Ins of Reynolds County, where the East Fork of the Black River cuts through the ancient footings of the St. Francis Mountains.

The place is neither remote nor unknown. It's a heavily used state park less than 90 miles from St. Louis. But it includes the finest swimming hole I've ever seen in a lifetime spent collecting fine swimming holes.

The heart of Johnson's Shut-Ins State Park is a wild tumult of bedrock outcroppings that break the East Fork into a thousand parts. The boulders and ledges there are of dark, purplish rhyolite porphyry, fire formed and very hard, some of the oldest exposed rock in North America. Eons of erosion have polished all this, rounding and smoothing any sharp edges.

Upstream the little river is wide and shallow—a clean, clear wading creek for little people. Then it enters the main boulder field and is broken into myriad channels, chutes, waterfalls, and deep tarns. One of the best is a natural tank no more than 15 feet long and little more than half that wide, with a waterfall at the inlet. I dive to the bottom and look up through ten feet of water into the clouds of silver bubbles. I surface, slide over a polished ledge into the next tank, and finally come into a quiet, shallow basin perhaps 40 feet long and nearly as wide.

From there the Black River dances over its bedrock

and gravel for another hundred yards before entering a narrow trough only a few feet wide and knee-deep at its upper end. With face mask and fins, go down this chute; stay near the bottom, clearing your ears as you go. Twenty feet into that chute there will be more than twenty feet of water above you. Out of the green gloom, sheer stone cliffs rise toward the silver sheet of the surface; under some of the deep ledges bass and sunfish cower in a state of shock until evening, when all those huge white frogs will leave.

You surface for air. The trough has led into a long, deep pool. On the right a wall of rock rises 50 feet; in defiance of park rules there are usually teenagers at various points, diving or jumping into the deep water at the foot of the cliff. Now and then someone gets badly racked up, but it takes more than that to squelch the prevailing machismo.

We first saw the place in 1960, when the campground was a patch of brushed-out timber shared with wood ticks and copperheads, and a rough path led a quarter-mile to the Shut-Ins proper. The central part has been tamed since then; today there are manicured campsites, and a paved path leads to a viewing deck above the main Shut-Ins, where easy wooden stairs lead down to the rocks or up the brink of the cliffs.

Pets aren't allowed in that part. A pity: Our black Lab would purely love it down there. But I can think of something better. One of my long-standing fantasies is swimming, sliding, and diving among those rocks with a pair of pet otters just as the sun touches the water on a June morning. Not a coral lagoon in all of Polynesia would be a patch on that.

JOHN MADSON is author of *Where the Sky Began* (Sierra Club Books, 1985) and several other books.



# KOVIASHUVIK

by Sam Wright



**T**he Brooks Range is that craggy cordillera that sweeps east to west across the state of Alaska north of the Arctic Circle. For 22 years I have called it home.

This great blue range is more than geography and seasons. It is a life perspective and a way of seeing that becomes part of one's blood and bones.

Instead of a gentle spring, break-up arrives like an avalanche. Rivers roar. Birds fill valleys with song. Ducks and geese call. Loons laugh on the lakes. Arctic terns and falcons hover over myriad ponds glistening with the iridescent wings of newly hatched insects.

And then it is summer, with plunging waterfalls and hanging green valleys. In the central mountains a white Dall sheep stands motionless on a pinnacle of rock high above turbulent water. Great white clouds billow above mountains until they are dark with rain, sleet, and hail. Lightning ignites fires and smoke drifts up valleys where clouds of mosquitoes hum among the muskeg's cotton-grass sedges. Fireweed is crimson in the foothills, and by mid-June the sun never sets but touches the horizon between sunset and sunrise.

With the first frosts of autumn, mountains sing with orange alder, yellow willow, and golden birches. Antlers flash white as a moose lifts its dripping head from the marsh. A grizzly bear, golden brown in the sun, fattens on blueberries where flocks of ptarmigan share the bounty of cloudberries and scarlet lingonberries.

By October the cold seals rivers and creeks. Stars glitter above crags no one has climbed. There echoes down canyons the howl of wolves at their kill. The aurora twists, turns, and dances across the sky above a now-silent range. The birds have trained their young and

flown south, leaving only Alaskan jays and chickadees to watch the frost flowers form on icy marshes and frozen ponds.

Then comes the silence. Cobalt-blue mountains tower into a turquoise sky where stars appear in mid-afternoon and the only sound is the click of a thousand hooves as a herd of caribou crosses the ice.

In midwinter the range is a prehistoric land, silent and motionless except for the aurora streaming across the sky. The only boundary, it seems, is the stars.

This is *Koviashuvik*, an Eskimo word that can be translated loosely as "place and time of joy in the present moment." To say "Koviashuvik" is to attempt to encompass a mountain range without diminishing it, bringing it into a focus of meaning. Impossible to speak of it except in terms of seasons, for the cycles are always ending and beginning.

Soon after break-up, millions of excited birds arrive. Some, like arctic terns, fly 11,000 miles from Antarctica for courtship and mating. Voices are everywhere. The door of silence has burst open with running water and bird songs. In the swollen creeks, rocks tumble, and my ax is a beat to the harmony of white-crowned sparrows in the willows.

From Koviashuvik an inner call was heard by multitudes of migrating waterfowl. Loons, swans, cranes, plovers, geese, and ducks by the thousands arrive at the place of their year's fulfillment.

No one knows why this range calls so many animals that move with the seasons. Perhaps in a warmer age the animal center of population was here, and its descendants have an urge to return. Perhaps it is because the north has been a place apart. Or perhaps it is for them—as for me—a response to the coun-

try itself, a place where there is a fresh crispness in the air and the sun shines night and day but circles the horizon instead of climbing over the zenith so that light and shadow always have the fresh touch of morning. ■

SAM WRIGHT is author of *Koviashuvik: A Time and Place of Joy* (Sierra Club Books, 1989).





THE  
1990  
SIERRA PHOTO CONTEST



"DRAGONFLY AND BUR REED," DONALD JOHNSTON, FIRST PLACE (COLOR), "WILDLIFE," 1989

Through its annual photo contest, *Sierra*, the national magazine of the Sierra Club, recognizes the contribution that photographers have made toward the protection of our environment. Last year's contest brought in entries from more than 2,000 photographers; we expect another record-breaking year in 1990. The winning photographs will be published in *Sierra's* September/October issue, then displayed at the Sierra Club's headquarters in San Francisco.

#### CATEGORIES:

- *Patterns*: Nature as designer, weaver, or abstract artist.
- *People*: Our species at play, at work, or otherwise in accord with the natural world.
- *Horizons*: Give us your sunsets, your vistas; anywhere heaven meets Earth.
- *International*: Images of nature from beyond the U.S. borders.

#### PRIZES

- Grand Prize: A Nikon N4004S 35mm SLR camera with an AF Zoom-Nikkor 35-70mm f/3.3-4.5 lens and a versatile all-terrain bike, the Sedona, from Giant Bicycle.
- Eight first prizes: Nike's Baltoro High lightweight cross-trainer boots with EVA mid-sole and polyurethane sockliner.
- Eight second prizes: a special-edition folding knife from Buck Knives.



#### SUBMISSIONS

No more than two color transparencies and/or two black-and-white prints may be submitted in any one category (each category will be judged separately for color and black-and-white). Either originals or high-quality duplicates are eligible as color entries, but prizewinners must provide originals for publication. No color prints or color negatives from print film will be considered. Black-and-white entries must be unmounted prints no larger than 11 x 14.



#### ELIGIBILITY

The contest is open to all amateur and professional photographers. Sierra Club staff, their immediate families, and suppliers to *Sierra* (including photographers whose work we have published since 1985) are not eligible. Previously published work, photos pending publication, or photos that have won other contests are not eligible. Void where prohibited.

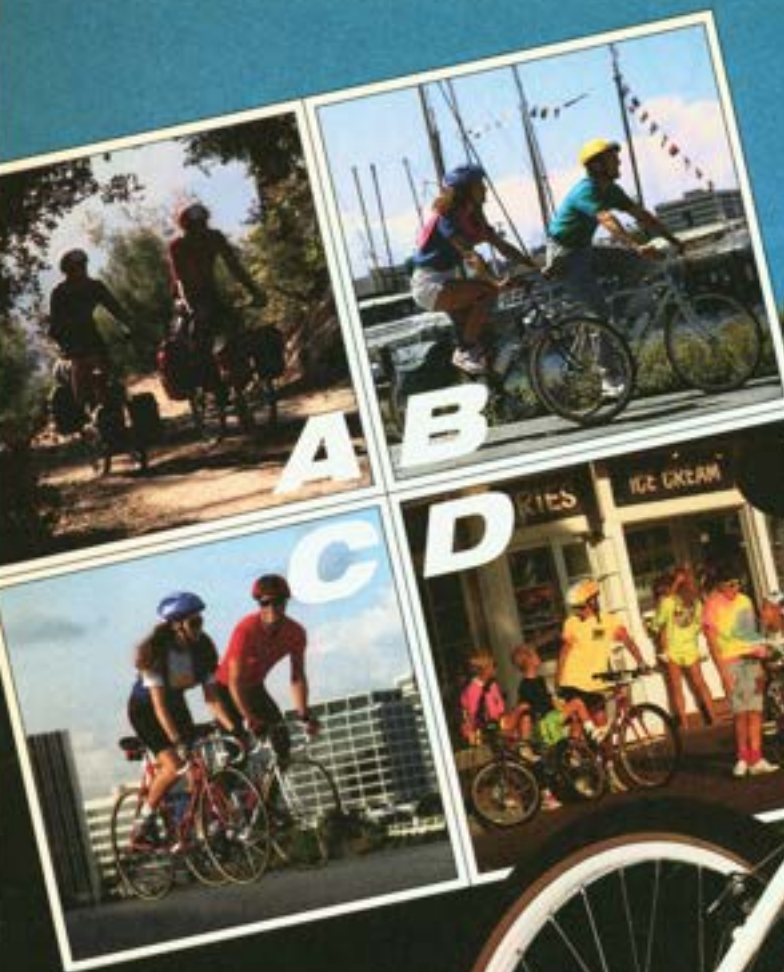


#### HOW TO ENTER

All entries must be accompanied by a *Sierra Magazine Photo Contest Submission Form*. To receive the forms, send \$5 (this serves as your entry fee as well) to *Sierra Photo Contest*, 730 Polk St., San Francisco, CA 94109. No phone calls, please. Entries submitted without the 1990 forms, or with photocopies of the forms, will not be considered. All submissions must be postmarked by midnight, June 1, 1990; we suggest mailing your request for submission materials by May 15, 1990.



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2. Enter as often as you like, but each entry must be mailed separately. Not responsible for lost, late or misdirected mail. All entries must be received by September 1, 1990.

3. Winners will be selected in random drawings from all entries received by Marden-Kane, Inc., an independent judging organization, whose decisions will be final. All prizes will be awarded.

4. Odds of winning are determined by number of entries. Prizes are not transferable. No substitution for prizes.

4. (1) First Prize: 9-Day trip for 2 to Maui, Hawaii, including round-trip coach air transportation, use of 2 Giant bicycles for 6 day bike tour, first and last night accommodations and meals in Kahului, guided six-day bike excursion including a variety of accommodations, all meals, support van and optional side trips, plus 2 Giant bicycles (approx. value: \$6,500.00); (2) Second Prize: Giant Cycling Jersey & Short Sets (approx. retail value: \$52.00); (3) Third Prize: Giant Expandable Family Packs (approx. retail value: \$10.00).

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6. All entries become the property of the sponsor and none will be returned. Winner will be notified by mail. All taxes on prizes are the responsibility of the winner. Winner's name and likeness may be used for promotional purposes without additional compensation. Winner will be required to sign an affidavit of eligibility and release.

7. For name of winner, send stamped, self-addressed envelope to: Magic of Maui Winner, P.O. Box 11405, Chicago, IL 60611.



...and a trip to Maui for two!

Whatever your biking style or needs, you can be sure there's a Giant bike *precisely right* for you. Giant offers a full line of top-performance, top value Mountain bikes (Photo A), including the exciting new ATX series with its advanced, totally integrated oversize system. Or, for a whole new combination of comfort, performance and versatility, there's Giant's unique All-Terrain/Fitness/Sport bikes (Photo B). For the lightweight enthusiast, Giant Racing/Road bicycles (Photo C) offer world-class technology and performance at realistic prices. And, finally, there's the Giant Youth Adventure Series (Photo D), featuring rugged, high-style bikes for boys and girls of all ages.

and abilities. Giant bicycles that have set standards in technology, quality and value all over the world, are available at 1500 Authorized Giant Dealers, nationwide.

And here's your chance to enjoy Giant quality and value first-hand as part of a 9-day, all-expense-paid biking adventure on fabulous Maui, Hawaii's fabled "Valley Island". From lush waterfall-beribboned tropical forests to ruggedly beautiful volcanic landscapes, from bamboo groves to stunning white sand beaches, you'll experience it all as only a cyclist can.

Look what your Giant "Magic of Maui" Sweepstakes Tour includes!

- Round-trip air fare for two to Kahalui on Maui.
- Two Giant bikes for tour use.
- First and last night accommodations and meals in Kahalui.
- A guided six-day "Magic of Maui" biking excursion, including an optional, thrilling 38 mile cruise down Mt. Halaekala and including a variety of accommodations, all meals, support van and optional side trips.

And to top it off!...

- Two brand new Giant bicycles to enjoy at home!
- 25 Second Prizes! — Giant Cycling Jersey & Short Sets.
- 75 Third Prizes! — Giant Expandable Fanny Packs.



## Enter the Giant™ "Magic of Maui" SWEEPSTAKES!

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(Please Print)

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CITY \_\_\_\_\_

STATE \_\_\_\_\_

ZIP \_\_\_\_\_

Please answer the following questions carefully.

1. As a full-line bicycle company, what types of bikes does Giant offer?

Photo A: \_\_\_\_\_

Photo B: \_\_\_\_\_

Photo C: \_\_\_\_\_

Photo D: \_\_\_\_\_

2. The Giant ATX series features: (Choose One)  an advanced totally integrated oversize system.  Carbon Fiber tubing.

Mail this coupon by September 1, 1990 to:

Giant "Magic of Maui" Sweepstakes, P.O. Box 1819MS3, Palatine, IL 60078

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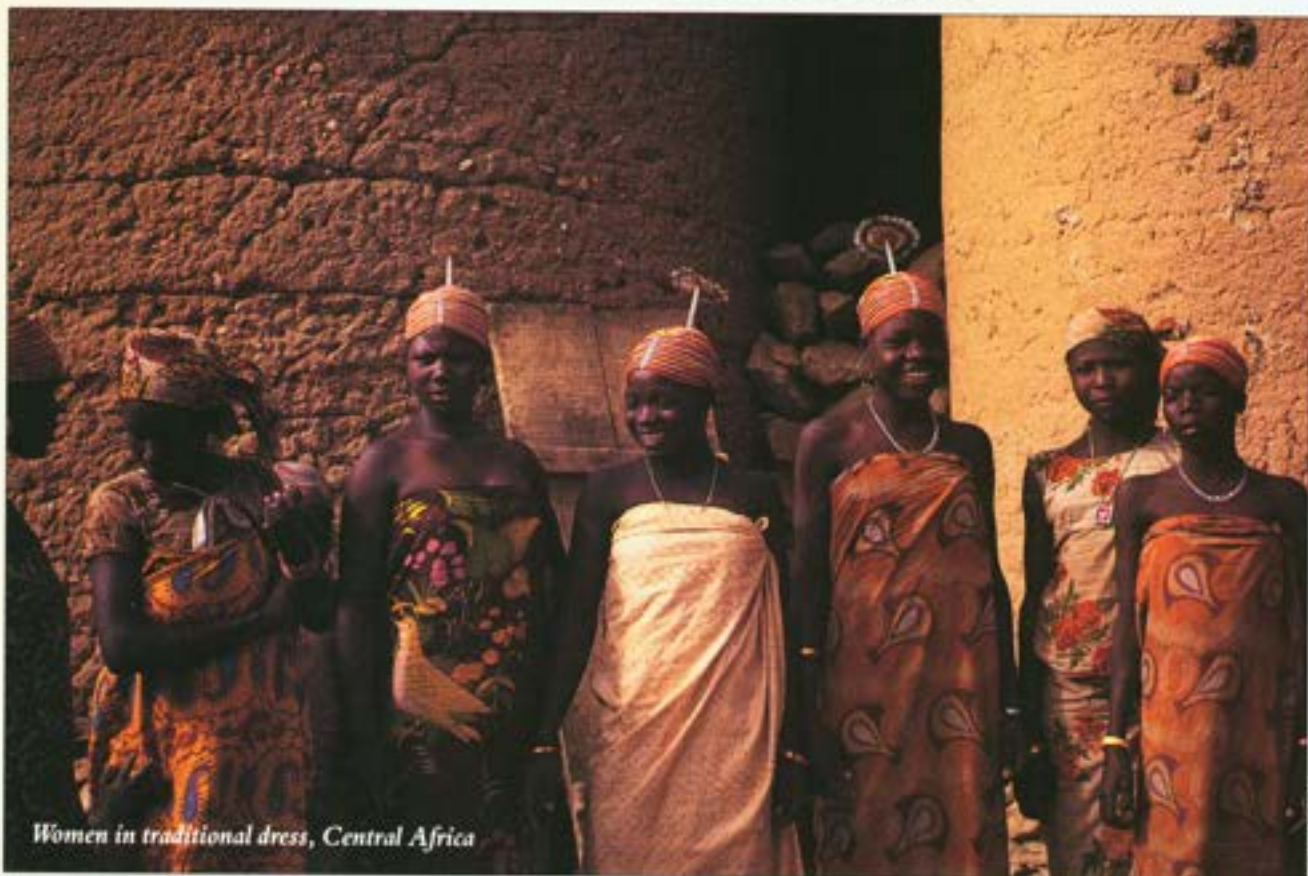
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# OUTINGS

Sierra Club

## 1990-91 FOREIGN OUTINGS



Women in traditional dress, Central Africa

ALEX WOODRUFF

**S**norkel off the coast of a palm-studded Caribbean island in Belize, trek through Nepal's remote Hidden Valley, or hike in the eucalyptus forests of southeastern Australia's Blue Mountains: These opportunities and more await you on Sierra Club Foreign Outings in 1990. Send in the coupon on page 75 for more information on these trips. Please refer to the 1990 Outings Catalog (January/February *Sierra*) for our reservation and cancellation policy and an application form. Prices are subject to change and do not include airfare. Leader approval is required for all foreign trips. See the accompanying 1990 Open-Trip List for other foreign outings.

### AFRICA

**The Many Faces of Kenya: A Leisure Safari—June 18-30, 1990.** Kenya's abundant and diverse wildlife, dramatic scenery, and hospitable people provide the setting for our African safari. From

Nairobi we'll travel off the beaten path for a unique exploration of the country's ecology and culture, including visits to the premier game reserves of Samburu, Masai Mara, and Mt. Kenya National Park. We'll stay in camps or lodges. No strenuous hiking is planned. *Leader: Ruth*

*Dyche. Price: \$2,360; Dep: \$200. [90575B]*

### ASIA

**China Walking and Cultural Tour—September 3-19, 1990.** Learn about the culture, history, and art of China while visiting Beijing, the Great Wall, the terracotta statues of Xi'an, the Grand Canal, Mt. Tai Shan, and Shanghai. Our short study program will include lectures and demonstrations along the route and opportunities to interact with the Chinese in their daily lives. We'll be accompanied by English-speaking guides. *Leader: Sy Gelman. Price: \$2,510; Dep: \$200. (If sign-up for this trip exceeds 12, the price will be \$2,280.) [90620]*



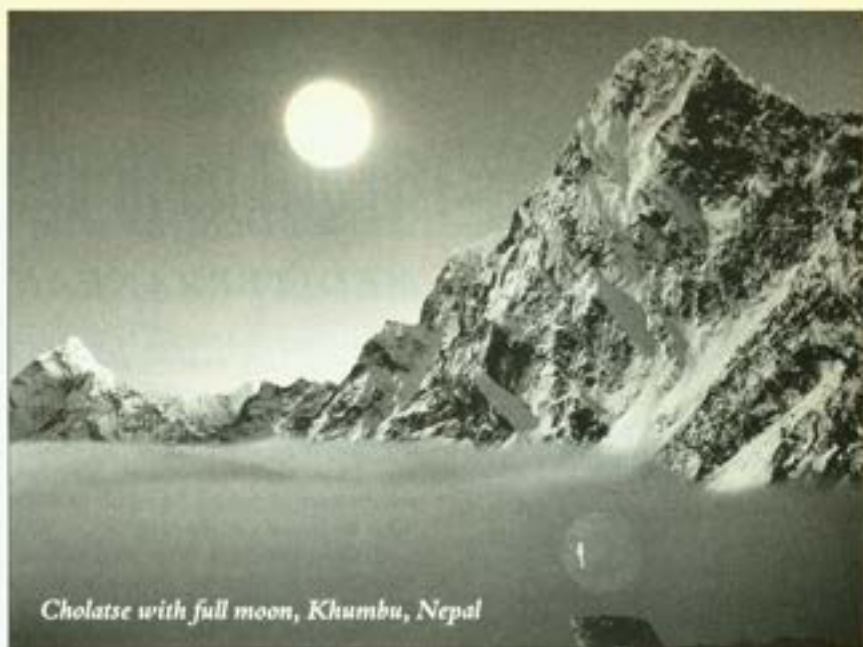
**China by Bicycle: The Yangtze Valley and Grand Canal Tour—September 24–October 14, 1990.** Bicycling with millions of cyclists in China is an experience never to be forgotten! After touring the Great Wall and the Forbidden City in Beijing, we fly to Nanjing and bicycle through the Yangtze Valley and along the Grand Canal to Hangzhou, visiting many cities and villages, each with its own wonders, crafts, and industry. We end our trip with a train ride to the historic port city of Shanghai. *Leader: Bob Anderson. Price: \$3,420; Dep: \$200. [91750]*

**Ganesh Himal, Nepal—October 8–November 3, 1990.** Come join us on a trek into the heart of the Himalaya. Named after Ganesh, the elephant-headed god who casts aside obstacles, this seldom-visited region bordering Tibet contains some of the highest, most beautiful mountains in the world. Beginning in Gorkha, our moderate 23-day trek will camp no higher than 13,000 feet, at the foot of Toro Gumpa glacier. *Leader: Cheryl Parkins. Price: \$1,915; Dep: \$200. [91755]*

**One China, Many Views—October 14–November 3, 1990.** From Beijing, we travel to Xi'an to see the terra-cotta statues, then acclimate in a village with a panda preserve before hiking into the seldom-visited Sigunian Valley (11,000 feet). We'll camp several days here amidst 20,000-foot spires. In southern China we'll view the mist-covered mountains near Guilin, take a boat to Guangzhou, and ride a train to the beautiful port of Hong Kong. *Leader: Dolph Amster. Price: \$3,510; Dep: \$200. (If sign-up for this trip exceeds 11, the price will be \$3,190.) [91760]*

**Springtime in the Annapurna Sanctuary, Nepal—March 16–April 5, 1991.** Rhododendrons in full bloom await us on this 17-day circular trek through picturesque Gurung villages en route to the glacier-covered amphitheater of the Annapurna Sanctuary (13,500 feet), where we'll be surrounded by peaks ranging from 20,000 to 26,545 feet. After trekking to both Annapurna and Machhapuchhare base camps, we'll return via the Gorapani Ridge, with views of Dhaulagiri and adjacent peaks. *Leader: Peter Owens. Price: \$1,565; Dep: \$200. [91805]*

**Dhaulagiri Himal: French Col and Hidden Valley, Nepal—April 13–May**



Cholatse with full moon, Khumbu, Nepal

**9, 1991.** This challenging trek will take us through rhododendron forests and cultivated fields to one of the most dramatic and beautiful regions of the Himalaya. From Pokhara, we ascend Mayagdi Khola Valley to Dhaulagiri base camp, over French Col, and into Hidden Valley. One last push takes us over Dhamplus Pass to Jomosom. This is a strenuous high-altitude trek. *Leader: John DeCock. Price: \$2,365; Dep: \$200. [91810]*

## EUROPE

**Hiking in the Alps: History and Culture, Switzerland—July 2–15, 1990.** Graubünden, the largest canton in Switzerland, offers a variety of hiking choices. From a comfortable hotel in historic Chur, we'll tour local museums and take moderate dayhikes in the surrounding countryside, including the Swiss National Park, before ascending higher into the mountains to enjoy true alpine scenery as we travel from hut to hut. A native of Chur will be our assistant leader. *Leader: Lou Wilkinson. Price: \$1,630; Dep: \$200. [90582]*

**Mountains of Contrast: The Diverse Dolomites, Italy—July 16–29, 1990.** The Dolomites offer a multitude of contrasts—geological, cultural, and scenic—from towering peaks to peaceful meadows and photogenic hamlets. Averaging seven miles each, our walks will include vigorous mountain hikes as well as casual village rambles. Accommodations in family-run hotels and refugios and quiet moments to sketch a wildflower or sip a

cappuccino complete this primo mountain journey. *Leader: Lynne Simpson. Price: \$2,330; Dep: \$200. [90597]*

**Austrian Alps Sampler, Austria—August 4–16, 1990.** Savor and explore three spectacular alpine regions! From Innsbruck we travel east to the picturesque village of Alpbach, surrounded by glistening peaks and pastel meadows, for five days of hiking or relaxing. Continuing east, we ascend the Steinernes Meer and spend four nights in huts. Hiking will be moderate and the accommodations basic but comfortable. Come search for the elusive edelweiss! *Leader: George Neffinger. Price: \$1,725; Dep: \$200. [90610]*

**Hiking in the Stubai and Ziller Alps, Austria—September 4–17, 1990.** Come enjoy the breathtaking Stubai and Ziller Alps! Carrying only daypacks, we will hike from one charming guest house to the next at altitudes of about 7,000 feet; our luggage will be transported for us. Along the way we'll meet the friendly people who live in these wonderful mountains, and share in the renowned Austrian *gemütlichkeit*, or "cozy atmosphere." *Leader: Bert E. Gibbs. Price: \$2,075; Dep: \$200. [90625]*

## LATIN AMERICA

**A Naturalist's Paradise: Brazil's Amazon Basin and Pantanal—July 12–21, 1990.** Our Brazilian adventure to the Amazon Basin commences with an exploration of the dense rainforest out-



side Manaus by canoe and on foot. We then fly south via Brasilia to the Pantanal, home to more than 600 species of birds and thousands of rare animals, where we'll hike, travel by boat, and go horseback riding. Come and observe the greatest variety of wildlife on the South American continent! *Leader: John Garcia. Price: \$2,195; Dep: \$200. [90593]*

**Holidays in Belize: Reef and Ruins, Central America—December 22–31, 1990.** We'll stay at a rustic ranch amidst lush vegetation and exotic wildlife in the interior of Belize, with a daytrip to the magnificent Mayan ruins of Tikal in neighboring Guatemala. Our next stop is a palm-studded Caribbean island with rooms on the beach, where we can snorkel in crystal-clear waters off the barrier reef and feast on fresh seafood. *Leader: Mary O'Connor. Price: \$1,430; Dep: \$200. [91786]*

**Holiday Kayaking in the Sea of Cortez, Baja California, Mexico—December 24–30, 1990.** Explore the sandy coves and hidden canyons of Espiritu Santo and Partida islands in the Gulf of California. We'll spend our days swimming, fishing, and hiking. A highlight will be a visit to Los Islotes, a sea lion rookery. Inexperienced to expert

paddlers are welcome. Airline schedules require arriving in La Paz a day before the trip and leaving a day after. *Leader: Sallee Lotz. Price: \$1,095; Dep: \$200. [91787]*

## MEDITERRANEAN

**Archaeology and Nature in Turkey—September 8–23, 1990.** Turkey's unique combination of art, history, and natural beauty offers the opportunity for an intriguing trip. Traveling by air-conditioned bus, we'll visit palaces, churches, and bazaars in fabled Istanbul, and the ruins of Greek and Roman cities. We'll stroll mountain trails, relax on the beach, and sample the country's fine cuisine and culture. Accommodations will be in comfortable hotels. *Leader: Robin Brooks. Price: \$2,840; Dep: \$200. [90630]*

## PACIFIC BASIN

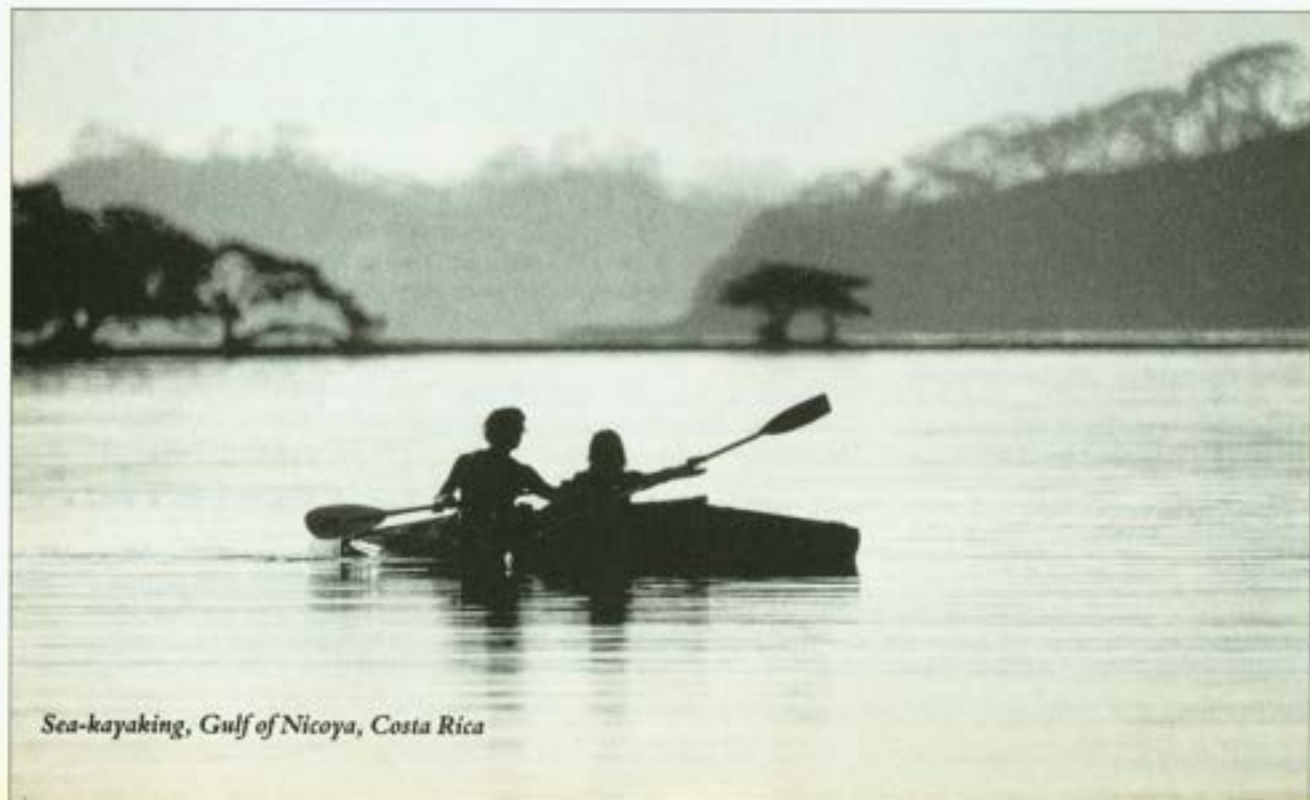
**Australia's East Coast: Wilderness and Wildlife Camping—July 30–August 18, 1990.** Guided by an outstanding Australian conservationist, this camping trip focuses on the national parks of New South Wales and Queensland. Highlights include dayhikes, outback wildlife and birds, whale-watching, rainforests, glowworm caves, and visits to the beautiful beaches of Fraser Island and Lady Elliot Island on the Great Barrier Reef.

*Leader: Don McIver. Price: \$2,895; Dep: \$200. [90605]*

**Bushwalking in Australia—March 3–24, 1991.** Southeastern Australia's varied, rugged mountain ranges are the focus of our three-week trip Down Under. Alternating backpacking with van travel, we'll explore central Tasmania, the Snowy Mountains of Victoria and New South Wales, and the Blue Mountains near Sydney, with a stop in Canberra to enjoy the Capital Territory's wildlife. (This trip can be combined with #91795, Hiking New Zealand.) *Leader: Vicky Hoover. Price: \$2,410; Dep: \$200. [91800]*

## SOVIET UNION

**Lake Baikal Adventure, Siberia—September 11–28, 1990.** The jewel of Siberia is Lake Baikal, the deepest freshwater lake in the world, where we'll spend six days exploring by boat and hiking along its pristine shores. Our trip includes a two-day ride on the Trans-Siberian Railway and three days in Novosibirsk, the capital of Siberia, where we'll attend the State Opera and Ballet Theater and meet members of the Nature Protection Society. Join us on this first Sierra Club trip to Siberia! *Leader: Bob Madsen. Price: \$3,240; Dep: \$200. [90635]*



Sea-kayaking, Gulf of Nicoya, Costa Rica



## 1990 Open-Trip List

Space is still available on a number of 1990 Sierra Club Outings. If you act promptly, you can probably find a spot on one of the trips listed below. Refer to the 1990 Outings Catalog (January/February *Sierra*) for a complete list of 1990 trips and trip descriptions. Check with the Outing Department for trips not listed below

—vacancies may occur. Please see the catalog for our reservation and cancellation policy and a trip application form. Read the policy carefully before applying. To order more information on any of the 1990 outings, send for the trip brochure (supplemental announcement) using the coupon on page 75.

Trip Number	*Leader approval required	Backpack Rating Key: L = Light M = Moderate S = Strenuous	Dates	Rating	Trip Fee (including deposit)	Deposit Per Person	Leader
<b>ALASKA TRIPS</b> (Prices do not include airfare to Alaska or charter air costs.)							
90083	*Admiralty Island Monument Canoe, Tongass Forest		June 4-14		995	100	Mike Sakarias
90085	*Glacier Bay Sea Kayak		June 17-30		1195	200	Anne Fuller
90090	*Yanert Glacier, Alaska Range		July 8-21		995	100	Harry Reeves
90091	*Prince William Sound Sea Kayak		July 12-20		995	100	Ian Walton
90094	*Yukon-Charley Rivers Preserve		July 23-Aug. 3		1385	200	Barbara Sharpe
90095	*Tundra and Oasis, Thelon River, Northwest Territories		July 27-Aug. 10		2095	200	Carol Dienger
90097	*Glacier Bay and Chilkoot Trail		Aug. 1-11		1295	200	Serge Puchert
90101	*Misty Fjords Sea Kayak		Aug. 14-23		1050	200	Jim Carson
90102	*Coast and Mountains		Aug. 19-Sept. 2		1295	200	Sharon Wilkinson
<b>BACKPACK TRIPS</b> (See <i>Alaska and Hawaii Trips</i> for other backpack outings.)							
90110	*Kern Plateau, Golden Trout Wilderness, Sierra		June 16-24	L	260	50	Mac Downing
90126	*Kings Canyon Park to Owens Valley, Sierra		July 22-29	L-M	310	50	Lee Zimmerman
90127	*Owens Valley to Kings Canyon Park, Sierra		July 22-29	L-M	310	50	Jim Gilbreath
90131	*Silver Divide, John Muir Wilderness, Sierra		July 27-Aug. 4	M-S	355	50	Matt Hahne
90132	*Trans-Sierra Lake Hop, East to West, John Muir Wilderness, Sierra		July 27-Aug. 4	M	310	50	Charles Hardy
90135	*Gardiner Gambol, Kings Canyon Park, Sierra		July 28-Aug. 5	M	290	50	Lasta Tomasevich
90142	*Sierra Crest Peakbag, Sequoia Park, Sierra		Aug. 5-12	M	265	50	Terry Flood
90144	*Tehipite Valley, Sierra Forest and Kings Canyon Park, Sierra		Aug. 11-19	M	300	50	Jim W. Watters
90148	*Ruby Mountains Trek, Humboldt Forest, NV		Aug. 12-19	M	290	50	Charles Schmidt
90150	*From the Cedars to the Clouds, Kings Canyon Park, Sierra		Aug. 12-21	M-S	305	50	Andy Johnson
90147B	*Mammoth-Devils Postpile Leisure Lakes Loop, Sierra		Aug. 13-20	L	250	50	Wes Reynolds
90151	*Lakes Medley, John Muir Wilderness, Sierra		Aug. 17-25	M	340	50	Al Lyon
90152	*Tableland, Sequoia Park, Sierra		Aug. 18-25	M	305	50	Joe Uzarski
90155	*Seven Gables, Sierra Forest and Kings Canyon Park, Sierra		Aug. 23-Sept. 1	M-S	315	50	Gordon Peterson
90156	*Disappointment to Rainbow's End, Sierra		Aug. 24-Sept. 1	M	265	50	Barry Bolden
90157	*Tower Lake, Toiyabe Forest, Sierra		Aug. 26-Sept. 1	L-M	220	50	Frances Reneau
90160	*Humboldt Highrise, Ruby Mountains, NV		Sept. 1-8	M	260	50	Cahit Kitaplioglu
90162	*Pearl Lake Country, John Muir Wilderness, Sierra		Sept. 6-13	L-M	275	50	Bill Engs
90164	*Blackcap Basin, John Muir Wilderness, Sierra		Sept. 8-15	L-M	325	50	Lou Wilkinson
90166	*Dirty Devil and Robbers Roost, Canyonlands, UT		Sept. 16-23	M-S	375	50	Jeffrey Jackson
90167	*Green and Golden, Autumn in the Gila Wilderness, NV		Sept. 22-29	M-S	400	50	Irene Penfield
90169	*Escalante Canyon, Glen Canyon Recreation Area, UT		Sept. 24-29	M	360	50	Blaine LeCheminant
91317	*Canyons of the Maze, Canyonlands Park, UT		Oct. 5-13	S	445	50	Jim DeVeny
91319	*Ozark Highlands Trail, AR		Oct. 13-20	L-M	350	50	Donna Small
91321	*Carlsbad Caverns to Guadalupe Mountains Park, NM and TX		Oct. 20-27	M-S	320	50	John Lemon Sellers



# OUTINGS

## Sierra Club

Trip Number	*Leader approval required	Backpack Rating Key: L = Light		Dates	Rating	Trip Fee (including deposit)	Deposit Per Person	Leader
		M = Moderate	S = Strenuous					
91322				Dec. 16-21	M-S	330	50	Bob Madsen
91333				Dec. 30, 1990- Jan. 5, 1991	M-S	325	50	Nancy Wahl

### BASE CAMP TRIPS (See Alaska and Water Trips for other base camp outings.)

90174	Stehkin Valley, North Cascades, WA	May 20-26		625	100	Bill Gifford
90181	*Ecology and Geology of Yellowstone Park, WY	July 14-21		1015	200	Alan Stahler
90182	Historical Meadow Lake, Tahoe Forest, Sierra	July 15-21		265	50	Serge Puchert
90185	Silver Divide Backcountry, Sierra	Aug. 11-18		605	100	Bill Davies
90188	Stehkin Valley, North Cascades, WA	Sept. 9-15		625	100	Marilyn Gifford

### BICYCLE TRIPS

90193	*Inn-to-Inn Biking in French Quebec, Canada	July 1-8		835	100	Phil Titus
90194	*Prince Edward Island, Canada	July 7-15		745	100	John Keuper
90195	*Lake Placid Circuit, Adirondack Park, NY	July 8-14		330	50	Maurice Rivard
90196	*Avalon Peninsula, Newfoundland, Canada	July 28-Aug. 5		495	50	John Keuper
90197	*Mountain Biking in Adirondack Park, NY	Aug. 5-10		510	100	John Borel
90198B	*Northern Oregon Coast	Aug. 12-18		425	50	Peter Bengtson

### FOREIGN TRIPS (Prices do not include airfare.)

#### Africa

91780	*Africa's Great Wildlife Parks: A Holiday Safari, Tanzania	Dec. 17-31		3400	200	Dwight Taylor
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#### Asia

90570	*Tibet—The Forbidden Wilderness	June 11-July 2		4300	200	Patrick Colgan
90590	*Batura Glacier and Nanga Parbat Treks, Pakistan	July 10-Aug. 4		2160	200	Peter Owens
91765	*Langtang Trek, Nepal	Nov. 5-24		1630	200	Bette Goodrich
91770	*Annapurna Sanctuary, Nepal	Nov. 24-Dec. 13		1610	200	Pete Nelson
91775	*Gorkha Holiday Trek, Nepal	Dec. 17-31		1190	200	Peter Owens
91785	*Face to Face, Hand in Hand, Nepal	Dec. 17, 1990- Jan. 7, 1991		1890	200	Dolph Amster
91790	*Southeast Asian Adventure: Thailand, Malaysia, and Singapore	Jan. 12-26, 1991		1935	200	Carolyn Castleman

#### Europe

90557	*John Muir's Scotland	May 27-June 9		2695	200	Jane Edginton
90565	*Walking in the Peak and Lake Districts, England	June 2-16		2350	200	Robin Brooks

#### Pacific Basin

91795	*Hiking New Zealand	Feb. 3-23, 1991		2690	200	Wayne Martin
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#### Soviet Union

90580	*The Highlands of Central Asia, Soviet Union	July 1-18		3145	200	Jerry Clegg
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### HAWAII TRIPS

90225	Hawaii: Beaches to Volcano Backpack	Sept. 1-10		705	100	Hal Fisher
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### HIGHLIGHT TRIPS

90230	Exploring the Honeycombs of Wyoming's Red Desert	June 8-15		835	100	Len Lewis
90231	Snake River Saddleback and Float Trip, WY	June 11-15		1215	200	Ernie Jackson
90232	Steens Mountain Llama Trek, OR	June 25-30		1195	200	David Horsley
90233	San Juan Mountains, CO	July 9-19		725	100	Don Lyngholm
90234	Palisade Mountains, WY	July 15-21		825	100	Len Lewis
90235	Ruby Mountains, Humboldt Forest, NV	July 25-Aug. 1		880	100	Ernie Jackson
90236	*Weminuche Wilderness Llama Trek, CO	July 27-Aug. 5		985	100	Linda Buchser
90238	Wet Canyons of Southeast Utah, Van and Hiking Tour	Aug. 12-18		760	100	Joe Sinclair
91348	Rainbow Bridge and Monument Valley Van Tour, AZ and UT	Sept. 24-Oct. 5		745	100	Edith Reeves



# OUTINGS

## Sierra Club

Trip Number	*Leader approval required	Backpack Rating Key: L = Light M = Moderate S = Strenuous		Dates	Rating	Trip Fee	Deposit	Person	Leader
		(including deposit)	Per						
<b>SERVICE TRIPS</b>									
90254	*Sierra Club's Own Trail Maintenance, Sierra			June 23-30		175	50		David Simon
90255	*Allagash Wilderness Waterway, ME			June 23-July 1		320	50		Kevin Karl
90256	*Santa Barbara-Trampas Lakes, NM			June 24-July 1		150	50		Linda Buchser
90261	*Graveyard Meadows Trail Maintenance, Sierra			July 10-20		175	50		Homer Rudolf
90262	*Pine Creek Pass Trail Maintenance, Sierra			July 10-20		175	50		John Fischer
90264	*Meteor Lake, Marble Mountains, CA			July 14-24		175	50		Bill Wakelee
90268	*Beginning Campers' Trail Reconstruction, WY			July 17-27		175	50		Ed Thomas
90273	*Black Mountain, Flat Tops Wilderness, CO			Aug. 2-12		175	50		Jonathan Walther
90275	*Teton Wilderness Trail Maintenance, WY			Aug. 2-12		175	50		Todd Rubin
90276	*Pike Forest Trail Maintenance, CO			Aug. 4-11		175	50		Eric Hoyer
90277	*Long Mountain Lake, Selkirk Range, Kamiku Forest, ID			Aug. 4-14		175	50		Tim Cronister
90278	*Targhee Teton Trail Maintenance, WY			Aug. 7-17		175	50		Dennis Grzezinski
90279	*Wind River Trail Maintenance, WY			Aug. 9-19		175	50		Jan Moraczewski
90280	*South San Juan Wilderness Trout Habitat Project, CO			Aug. 10-20		175	50		Gwen Jarrell
90282	*High Uintas Trail Construction, Wasatch Forest, UT			Aug. 15-25		175	50		Wally Mah
90283	*Lost Creek Wilderness Trail Maintenance, CO			Aug. 15-25		175	50		Lee Bowen
90285	*Snowmass Lake Trail, Maroon Bells/Snowmass Wilderness, CO			Aug. 17-27		175	50		Gretchen Muller
90286	*Parker Lake, Panhandle Forest, ID			Aug. 18-28		175	50		Andy Sipp
90292	*Grand Gulch Trail Maintenance, UT			Sept. 8-15		210	50		Jim & John Ricker
90294	*Ice Age Trail, Medford District, WI			Sept. 9-19		175	50		Bart Hobson
91323	*Chiricahua Wilderness Trail Maintenance, Coronado Forest, AZ			Sept. 26- Oct. 6		175	50		Sherri Serna

### WATER TRIPS (See Alaska Trips for other water outings.)

#### Boat and Raft

90307	*Boating and Dayhiking the Canyons of Lake Powell, UT and AZ			June 10-16		310	50		Don Melver
90308	*Parent and Child Paddle Raft, Klamath River, CA			June 25-29	Adult 495	390	50		Tony Strano
90309	*Boating and Dayhiking the Canyons of Lake Powell, UT and AZ			Sept. 16-22		310	50		Blaine LeCheminant
91363	*Boating and Dayhiking the Canyons of Lake Powell, UT and AZ			Oct. 7-13		310	50		Howard Newmark

#### Canoe

90300	*The Wide Missouri, MT			June 25-July 2		725	100		Jeep Lindsay
90304	*Trinity River, CA			Aug. 5-10		400	50		Carol Malcolm

#### Kayak

90305	*Queen Charlotte Islands Sea Kayak, British Columbia			June 26-July 8		1395	200		Martha Schultz
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## For More Details on Outings

Outings are described more fully in trip brochures, which are available from the Outing Department. Trips vary in size, cost, and the physical stamina and experience required. New members may have difficulty judging which trips are best suited to their abilities and interests. Don't sign up for the wrong one! Ask for the trip brochure before you make your reservations to save yourself the cost and inconvenience of changing or cancelling a reservation. The first three brochures are free. Please enclose 50 cents apiece for extras. Write or phone the trip leader if any further questions remain.

Send brochures (order by trip number):

# \_\_\_\_\_ # \_\_\_\_\_ # \_\_\_\_\_

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Enclosed is \$\_\_\_\_\_ for extra brochures at 50 cents each.

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## BOOKS

### Sketches, Photos, and Sermons

#### *The Mysterious Lands: A Naturalist Explores the Four Great Deserts of the Southwest*

by Ann Haymond Zwinger  
E. P. Dutton  
\$22.50, cloth

#### *The Sagebrush Ocean: A Natural History of the Great Basin*

by Stephen Trimble  
University of Nevada Press  
\$34.95, cloth

#### Thomas J. Lyon

THESE TWO BOOKS have a good deal in common. Both make arid-land ecology come alive in bright detail. Both concern themselves primarily with imparting information and encouraging aesthetic response rather than with environmental exhortations. And each of the authors has dual talents, Zwinger adding sensitive, delicate drawings to her exposition, Trimble supplying photographs that verge on the extraordinary. These are books full to bursting with ecological facts, dramatic in their presentation of how natural communities evolve and cohere. After absorbing what these writers have to say, one would need a special kind of perversity to recommend deserts for bomb testing or weapons storage, or (the latest proposal to surface) as merely empty space for electronic warfare practice. Even sand dunes, the ultimate in bareness in traditional imagery, often support "a greater diversity of rodents than many grasslands, forests, and marshes," as Trimble points out.

Within the general framework of telling us how their chosen areas function biologically, the authors take different approaches. Zwinger works after the manner of a pointillist, presenting scores of brief, seemingly self-contained sketches—colorful little dots of scenes and facts that in clever jux-

taposition and in the aggregate suddenly jell as an ecological whole. She takes walks, or just goes out and stays put, in representative places in each of North America's major deserts (Chihuahuan, Sonoran, Mojave, and Great Basin), noting the heat and occasionally the unexpected cold along with whatever plants, insects, reptiles, birds, and tracks she sees or hears or sometimes literally bumps into.

To these triggering encounters Zwinger adds background information (the notes and bibliography are scholarly, thorough, and—best of all—usable) and casts over the whole a strong—perhaps dominant—aesthetic sensibility. Her early training was in art history, a fact that is apparent on nearly every page. Zwinger is like writers Barry Lopez or Richard Nelson (or John Charles Van Dyke, historically) in her attentiveness to her own perceptions, and like them she expresses an ethical stance apparently founded in the experience of the beautiful. The link is very quietly presented:

I lean down to watch a ladybug pick its way down a grass stem and water drizzles down my neck. In my concentration I gradually become aware of silence. The plucking of the rain is gone and it is so still that I hold my breath, afraid that the sound of aspiration will violate the quiet. In the whispery stillness I listen for the resins to gather on the surface of the creosote leaf and leap off into the air. A breeze stirs the branches and the aroma swirls out of every leaf. I inhale that marvelous scent that graces the air, not cloying, not sweet, but resinous and clean. It's what the world ought to smell like when it rains.

Trimble, too, has synthesized an enormous and diverse body of information, but his approach is more methodical, the result more of a progression from general to particular than a



painterly combination of vignettes. The strength of *The Sagebrush Ocean* is its overall grasp and its remarkable clarity: The sections on geological and climatological history, on "island" biogeography (several of the Great Basin mountain ranges have ecological characteristics reminiscent of islands), and on biogeography in general are simply brilliant. Verily, Trimble has done his homework, and perhaps the surest sign of this is his respect for the complexity of things, the uncertainty and variability that obtain within any ecological situation.

What he sees are trends. A biogeographer not only draws maps of what's out there now, but asks when and how it got there and why it has succeeded (so far) in the great evolutionary game. One begins with the known distribution of piñon-juniper woodland, for example, but rather quickly enters a dynamic world where everything is hitched to everything else.

Trimble also presents useful information on the ecological effects of grazing, chaining, the introduction of exotic species, and other environmen-

tally controversial activities, though his own thrust never becomes what might be called activist. Like Zwinger's aesthetic descriptions, his biogeographical and ecological studies lay out ground enough for the reader to form an ethical position in defense of the land. And if his photographs, both poetic and scientifically apt, don't arouse reverence for the Great Basin, one wonders what could.

These two handsome books tell me that if we could just see for ourselves how intensely beautiful wildness is and know something intellectually about how such health is created and what breaks it down, we would not need prompting at all: We would champion the cause of preservation automatically. These writers present the sermons that are already out there on the ground, in the stones, or flying in flocks from piñon grove to piñon grove, or perhaps only sitting still in the thin shade of a mesquite tree.

THOMAS J. LYON teaches at Utah State University. He edited *This Incomparable Land: A Book of American Nature Writing* (Houghton Mifflin, 1989).

## In Her Tree House, Erumpent

**Mary Austin: *Song of a Maverick***

by Esther Lanigan Stineman

Yale University Press

\$25, cloth

**Peter Wild**

**N**OT ALL environmental leaders have the passionate yet essentially well-tempered personalities we associate with reformers John Muir, Aldo Leopold, and Rachel Carson. In her huge flowered hat, displaying a gaudy surfeit of Indian jewelry, Mary Austin often struck the pose of one enamored of herself. Both in her books and at the podium she could burst out with pronouncements that made reasonable people cringe.

In fact, Austin was something of a poseur. She claimed that as a child she had seen God under a walnut tree.

Dressed in flowing Grecian robes, hair streaming to her waist, she could be seen scribbling away in her tree house—another of those eccentrics convinced of their own genius, living on the fringes of society in the artists' colony aborning in Carmel, California, at century's turn. Riddled with contradictions, Austin claimed to adore the ways of the common fold, but showed a blatant elitism in her own self-promotion. She railed against real and imagined persecutions of women, yet preferred the company of strong men. Not at all a placid person to be around.

Whatever her inconsistencies, Mary Austin gave us *The Land of Little Rain*, a book incisive in its delicate perceptions of nature and one of the first to open the eyes of a resource-gobbling people to the spiritual values of sup-

## MURDERED



**What would you do if the forests of Yosemite were torched to make a political point?**

Arson has now joined kidnaping, hijacking and murder as a weapon of political terrorism. In September 1989, fire destroyed thousands of acres of forest on Biblical Mt. Carmel and the Carmel Hai-Bar Wildlife Reserve. During the past year, 450 fires have devastated 30,000 acres of Israel's woods, orchards, cultivated fields and grazing lands. The fires were deliberate acts of arson for which P.L.O.-supported Arab groups proudly claimed credit.

The charred land, painstakingly reclaimed from desert and swamps by Israeli pioneers over the course of more than 80 years, took minutes to destroy but will take decades to replace.

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Ad Hoc Committee Against Environmental Terrorism: P.O. Box 190743, S.F., CA 94119-0743.



posedly worthless desert landscapes. Moreover, Austin didn't just write; she also acted on her beliefs, striving to deflect the juggernaut of an industrializing nation from the pristine landscapes in its path.

One of the earliest women to join the thin but earnest ranks of the environmental movement, Austin worked to stop the megalopolis of Los Angeles from draining rural Owens Valley of its precious water supply, and demonstrated foresight by opposing the damming of the Colorado River.

In judging Austin, we may chuckle at her antics, but we must not let her outlandish personality diminish our awareness of its positive effects. Esther Stineman's biography will help with this, if read with a certain caution.

Stineman accurately depicts Mary Austin as an unusual woman flaunting her rebellion, and traces her with scholarly thoroughness from her birth in Carlinville, Illinois, in 1868, to her failure at homesteading in California's San Joaquin Valley; through her unfortunate marriage to a rather unimaginative schoolteacher; on to her associations with the bohemians of Carmel, until she gained her sea legs as an author, feminist, and environmentalist and went on to become a forceful public figure.

Longtime Austin aficionados may well raise their eyebrows at this biographer's reassessment of Mary Austin's relationship with her husband. Far from being the insensitive boob other writers have pictured, Stafford Wallace Austin emerges here as a "mild-mannered, compliant" man bewildered by his wife's growing flamboyance.

Stineman's honest and documented re-evaluation does not prevent her, however, from swinging to her own extremes. At times she stretches Mary Austin to fit what appear to be her preconceived notions, turning her subject into a feminist icon who nobly appreciates the Earth while the male tribe is brutally wrecking it. Such a view ignores not only Austin's complexities but the sensitive efforts of George Perkins Marsh, John Muir, and other early male reformers. Un-

fortunately, and somewhat puzzlingly in light of the above, Stineman only refers to, but does not detail, Austin's conservation battles.

Be that as it may, conservationists will delight in Stineman's account of the long friendship between Mary Austin and photographer Ansel Adams, a friendship made stormy by the erumpent writer and nursed along by Adams' humor. In the early 1930s, when Adams was struggling to establish himself as an artist, Austin condescended to have him take publicity photos to advertise her lecture tours. Predictably, perhaps, his resulting work failed to meet her exacting expectations. "A photo for publicity must be something other than a likeness," she harrumphed; "it must convey something of the personal drive, the energetic index, the impact of the whole personality as it affects the public."

Nevertheless, young Adams swallowed his pride, let the blows of his mentor slide off his back, and—recognizing Austin's talents—continued to work with her.

What we have here is a new biography valuable for certain insights, but requiring careful reading. The danger with a personality as colorful as Austin's is that it tends to be appropriated by adherents of one cause or another, as has been the case since Austin's death in 1934. In other words, after more than half a century, Mary Austin still awaits a sympathetic but even-handed biographer.

Perhaps that, too, is something of a measure of her mercurial personality.

PETER WILD is a poet, professor, and author in Tucson, Arizona.

#### BRIEFLY NOTED

The Copper Canyon region of northern Mexico's Sierra Madre is both anthropologically significant and topographically complex. This hiker's and backpacker's dreamscape is inhabited by the agrarian Tarahumara Indians, many of whom maintain their lifestyle in the face of missionary zeal, mining and timber development, and

growing tourism. More than a dozen routes through the area of deep canyons, rock-strewn rivers, and high waterfalls—usually only glimpsed by railway passengers at the El Divisadero overlook—are described by M. John Fayhee in *Mexico's Copper Canyon Country* (Cordillera Press, P.O. Box 3699, Evergreen, CO 80439; \$12.95).

... The same terrain is covered by Richard D. Fisher in *Mexico's Copper Canyon to the Sea of Cortez* (Sunracer Publications, P.O. Box 40092, Tucson, AZ 85717; \$14.95), which benefits from Fisher's "canyoneering" expertise and long acquaintance with the area and its people. The two books are complementary rather than redundant, and anyone planning a Copper Canyon excursion is well-advised to read both: Fayhee for his colorful prose and somewhat more extensive route descriptions, and Fisher for stunning photography, greater practical detail, and broader geographic scope. . . . On Mt. Shasta, Northern California's great volcanic peak, adventurers can hike through conifer forests or climb with ice ax and crampons to the towering summit, then ski down glaciated slopes. Andy Selters and Michael Zanger, authors of *The Mt. Shasta Book: A Guide to Hiking, Climbing, Skiing, and Exploring the Mountain and Surrounding Area* (Wilderness Press; \$12.95, paper), are seasoned mountaineers: Selters is a climbing instructor for the American Alpine Institute, while Zanger—who managed the Sierra Club cabin on Shasta for three years—teaches mountaineering at College of the Siskiyous in nearby Weed. . . . "Mile upon mile of sweeping granite ridges, spectacular vistas, and a lifetime of fishing possibilities in literally hundreds of sparkling mountain lakes" are described in *Emigrant Wilderness and Northwestern Yosemite* (Wilderness Press; \$14.95, paper), by Ben Schiffrin. This trail guide covers a relatively unknown portion of the Sierra Nevada where crowds are the exception rather than the rule. . . . The opposite is true of another Sierran landscape, the Lake Tahoe Fast Food and Summer Home Regional Sacrifice



Area. Still, the surrounding mountains offer escape and renewal to those willing to walk, with special pleasures for the botanizer. *Lingering in Tahoe's Wild Gardens*, by Julie Stauffer Carville (Mountain Gypsy Press, P.O. Box 506, Chicago Park, CA 95712; \$17.95 + \$2 shipping; California residents add sales tax; paper) explores 30 sites of floral interest that also happen to offer delightful strolling, dayhiking, and overnight opportunities. From the boggy seeps of Sagehen Creek, where marsh marigolds and orchids bloom, to Carson Pass and its sturdy old Sierra junipers, Carville points out the tiniest single specimens and the brightest massed trailside displays with equal enthusiasm. . . . Although he excludes all named trails or routes from *Grand Canyon Loop Hikes I* (Chockstone Press; \$5.95, paper), George Steck still finds an off-trail, inner-canyon out-back of a thousand square miles, more than half the area of the national park. Steck describes four week-long hikes starting and ending at the North Rim: "Dedicated and energetic hikers with several weeks to spend can even, with the help of caches near rim access points, string these loops together into an extended roundtrip excursion from Phantom Ranch." . . . Lynne Stone's *Adventures in Idaho's Sawtooth Country* (The Mountaineers; \$11.95, paper) describes 63 trips for hikers and bikers—handy for visitors to the Sun Valley and Ketchum areas, where winters are booming but summers are still a local secret. The book conforms willingly to The Mountaineers' policy against bike use in designated or proposed wilderness areas. . . . Farther afield, biologists are studying ways to preserve the New World's tropics. For those who wish to visit a research site or two and perhaps explore some trails while there, James L. Castner details locations, logistics, forest types, trail systems, and costs in *Rainforests: A Guide to Research and Tourist Facilities at Selected Tropical Forest Sites in Central and South America* (Feline Press, P.O. Box 7219, Gainesville, FL 32605; \$21.95 + \$1.50 shipping).

—Mark Mardon

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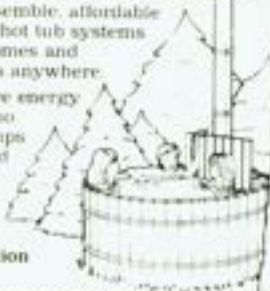
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## HOT SPOTS



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Biodiversity with a negative twist: An alien species invades the Wao Kele O Puna.

## Steamed Up Over Rainforests

### HAWAII

**O**n the Big Island of Hawaii, insults to nature are hardly new. In the early 1800s, slave gangs of hundreds or thousands of men cut tons of fragrant sandalwood from the island's volcanic heights and portaged it to China-bound ships. During the middle of the century, loggers clearcut broad swaths of *koa* and *ohia* forests at the behest of mainlanders, leaving feral pigs, goats, sheep, and cattle to forage unchecked through the remnants. Meanwhile, Californians seeking a good night's rest unwittingly spurred the felling of countless giant tree ferns whose leaf stems provide a dense, woolly material prized for stuffing mattresses and pillows.

But what may prove to be one of the most egregious affronts to Big Island habitat is just now in the making. In order to expand Hawaii's industrial economy while ostensibly reducing oil imports, Governor John D. Waihee and the state's legislators have sanctioned the construction of a 500-mega-watt geothermal project largely within

a 27,000-acre expanse of the Wao Kele O Puna rainforest—the only lowland tropical rainforest left in the United States.

"This area is of immense ecological importance internationally," says Sierra Club Northern California/Nevada Representative Barbara Boyle, who has visited the Puna rainforest and is working with Club volunteers to protect it from development. "A lot of the biota there are unique to the island. Any incursion can mean wiping out whole species."

Entomologist William P. Mull of the Bernice P. Bishop Museum in Honolulu puts it another way: "If we're interested in conserving genetic resources, this is precisely the sort of place we should preserve."

What most concerns Boyle, Mull, and other conservationists is the scale of the geothermal plan. As envisioned by its developer, True Geothermal Company of Casper, Wyoming, the project will comprise 20 power plants on the east rift of Kilauea Volcano, each with wells, steam-gathering systems, converter stations, and transmission lines.





Added to this would be a deep-water cable system for conveying electricity to Oahu.

"It is the largest and most complex development project of any kind ever undertaken in Hawaii," attests Honolulu-based attorney Paul P. Spaulding III of the Sierra Club Legal Defense Fund. On behalf of the Sierra Club, Greenpeace Hawaii, and the Blue Ocean Preservation Society, Spaulding is trying to force nine federal agencies involved in the enterprise to prepare environmental impact statements.

For their part, the participating agencies—which include the U.S. Geological Survey, the Department of Energy, the Army Corps of Engineers, the Environmental Protection Agency, and the National Park Service—have cooperated with the state in moving the scheme forward, but have balked at conducting the environmental impact studies often required of major federal projects, Spaulding says.

"They'd like to view this as a state undertaking rather than a federal one," he explains, as they would then be under no obligation to hold public hearings or provide scientific information. But because the Department of Energy has already appropriated more than \$27 million for cable research and development—and plans to contribute another \$15 million toward work on the geothermal sites—Spaulding contends that federal involvement and responsibility are undeniable.

The Sierra Club's Hawaii Chapter wants to see a moratorium placed on geothermal development in the Wao Kele O Puna rainforest and elsewhere in the state until it is proven environmentally sound, efficient, and cost-effective. "Before attempting any large-scale geothermal development, Hawaii should consider energy-conservation measures," says Sierra Club Regional Vice-President Nelson Ho, who helped to organize a symposium on energy planning last year. "Energy efficiency is the least-cost option to meet the state's needs."

But getting the government of Hawaii to adopt such measures is no small task. "The state listens to the

## Yosemite

### The Embattled Wilderness

By Alfred Runte

Yosemite ranks with Yellowstone as the most visited, cherished, and endangered of the major national parks. *Yosemite: The Embattled Wilderness* is the first to look in depth at the park's environmental history and carries enormous implications for the future of every protected wilderness. \$24.95

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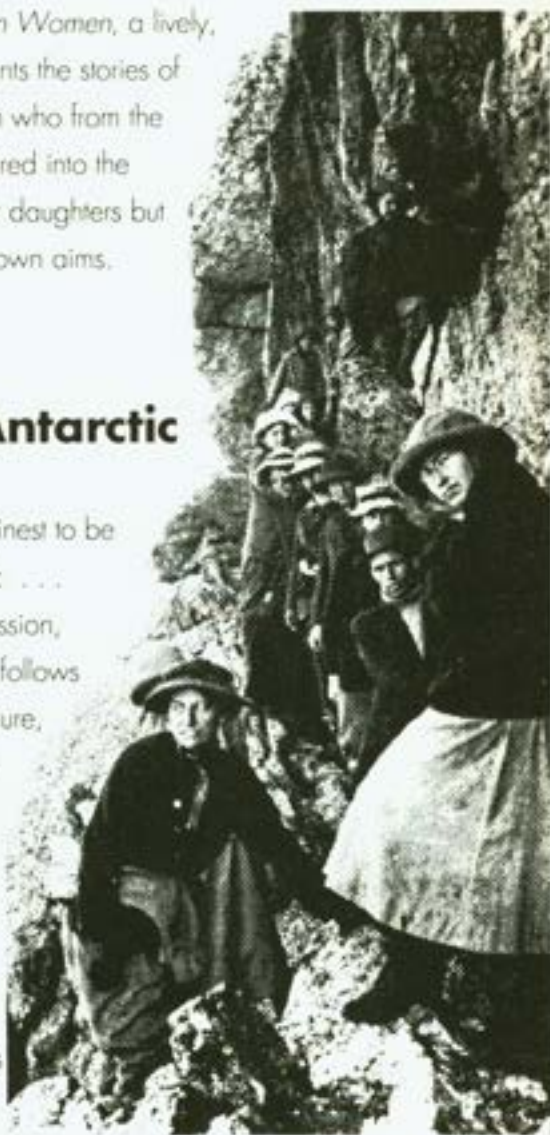
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landowners and the rich politicians," Ho says. "That's the name of the game." Still, he adds, there may be a way for citizens to influence the process. "Governor Waihee is up for election this fall. Letters and attention

focusing on his decision [Office of the Governor, State Capitol, Honolulu, HI 96813] would be helpful for the Club and the community." Not to mention the Wao Kele O Puna.

—Mark Mardon

## How to Drown a Wilderness

### JAMES BAY, CANADA

In the vast subarctic wilderness surrounding Canada's James Bay—an inlet off Hudson Bay bordering Ontario and Quebec—wetlands and waterways permeate a land teeming with polar bears, beaver, moose, and waterfowl. A 700,000-head caribou herd ranges east and north across the tundra of the Labrador-Ungava peninsula, and since long before Henry Hudson "discovered" James Bay in 1611, Crees and Inuits have strapped on snowshoes every winter to spend months hunting and fishing in the bush.



But Quebec's prime minister, Robert Bourassa, views the area as something other than a wilderness. From his Montreal office some 400 miles to the southeast, Bourassa sees the James Bay watershed as a vast hydroelectric plant in the making, where every day millions of potential kilowatt-hours flow downhill and out to sea. "What a waste!" he wrote of the region in 1985.

Bourassa has been touting the area's energy potential since at least 1971, when he first proposed a grandiose hydroelectric project as a way to expand Quebec's economy. His vision calls for dozens of relatively small rivers to be diverted into larger ones, creating sufficient water volume to power a network of dams that would produce enough electricity to meet all of Quebec's needs, with plenty left over for export to the northeastern United States.

"This would be the largest development project ever undertaken on this continent," says Karen Lohr of the Sierra Club's Native Sites Committee,

which seeks to protect the area's cultural heritage by preventing Bourassa from realizing his dream.

Phase One of the provincial prime minister's ambitious plan has already become reality. In a \$16-billion project completed in 1985, the government-run utility Hydro-Quebec diverted five smaller rivers into the La Grande River, which now sports three reservoirs and power-generating dams. The utility is constructing six more dams on the La Grande, and plans to complete two other major projects in the next 15 years.

The Sierra Club and other environmental groups say that Hydro-Quebec has paid little heed to the cumulative ecological impacts of its extensive development. Each dam, they say, exacts a devastating toll from the wilderness. In areas around the La Grande, for example, the diverted rivers now reach James Bay with as little as 10 percent of their former volume—far short of the



The traditional ways of the Cree Indians could be lost with the closing of a floodgate.

PETER CHRISTOPHER/MASTERFILE



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force necessary to create the ice-free passages that beluga whales in the bay depend upon for winter survival. Dams on the La Grande have flooded forests and coastal areas, destroying migratory-bird nesting grounds.

The 10,000 Cree living in Quebec fear that further development will mean the end of their traditional way of life. In the 1970s, when several Cree and Inuit bands had to be moved from the La Grande area, the province gave them \$500 million in compensation. But the five relocated Cree communities now face heightened social problems such as alcoholism and suicide—the result, says Brian Craik of the Grand Council of the Crees, of an ancient culture being rocketed into the 20th century. Still, Craik adds, the money has afforded them better health care and schools—as well as the means to fight further development.

Theirs will be an uphill battle. Canada, unlike the United States, has no laws requiring electric utilities to hold public hearings on hydropower construction or to conduct environmental studies before beginning. The only opportunity Canadians have to express their views on Hydro-Quebec's plans is by appealing to the National Energy Board, which rules on the licensing of energy exports.

Dam opponents are asking the board to deny new sales of electricity to utilities in New York state and New England, which already depend on Hydro-Quebec's La Grande project for 3 to 11 percent of their electricity.

On the receiving end of the power-transmission lines, Sierra Club activists in Vermont and New York are lobbying their utilities to cancel existing energy-import contracts with Hydro-Quebec.

What the Club's Native Sites Committee and the Grand Council of the Crees ultimately seek is a moratorium on hydropower development until Canada studies its full effects on the James Bay ecosystem. "If these studies show that the environmental impacts are as devastating as we fear," says Lohr, "then we want the projects halted." —Susan Borowitz



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## SIERRA NOTES

To help preserve Alaska's Arctic National Wildlife Refuge, Stephen Capra and Sam Wainer have embarked on a fund-raising hike from Mexico to Canada along the Continental Divide. They plan to give educational talks about the wildlife refuge to high school, college, and Sierra Club groups en route while encouraging tax-deductible contributions to the Sierra Club Foundation's Arctic Refuge Fund.

For more information and a tentative itinerary for the pair's "Hiking in Wilderness for Wilderness" undertaking, contact the Sierra Club Conservation Department, 730 Polk St., San Francisco, CA 94109.

Sierra Club Books offers an array of new titles this spring that explore topics of interest to armchair nature-lovers, outdoor adventurers, and environmental activists.

*Lessons of the Rainforest*, edited by Suzanne Head and Robert Heinzman (\$24.95, cloth; \$14.95, paper), collects essays by several people who have played leading roles in the ongoing drama over the fate of the world's tropical forests.

Based on his 1869 journal entries, John Muir's *My First Summer in the Sierra* (\$9.95, paper) contrasts American Indians' gentle respect for the landscape with whites' penchant for blasting roads through it and building intrusive structures upon it. This volume in the John Muir Library Series features wood engravings by Michael McCurdy and a foreword by Frederick Turner.

One of the premier mountaineers of recent decades, Chris Bonington has climbed and photographed many of the Earth's summits. More than 400 of his images are combined with extensive captions and a series of retrospective essays in his tenth book, *Mountaineer: Thirty Years of Climbing on the World's Great Peaks* (\$29.95).

Naturalist Gerard Gormley depicts

the dramatic lives of so-called killer whales, tracing the summer migration of an orca pod from continental-slope waters into the Gulf of Maine, in *Orcas of the Gulf: A Natural History* (\$19.95, cloth; \$10.95, paper).

In *Walking the Line: Travels Along the Canadian/American Border* (\$17.95), Marian Botsford Fraser combines a poet's sensitivity with a journalist's eye in her account of a two-year exploration of wilderness, rural, and urban areas along the 5,500-mile line dividing the two countries.

*Adventuring in the Chesapeake Bay Area*, by John Bowen (\$12.95, paper), is a comprehensive guide to outdoor exploration in one of the nation's most popular recreation areas, home to a vast array of wildlife.

Hikers, birders, anglers, swimmers, and others will find ideas to help them pursue their activities on the Northeast's public lands in *The Sierra Club Guide to the Natural Areas of New England*, by John Perry and Jane Greverus Perry (\$12.95, paper).

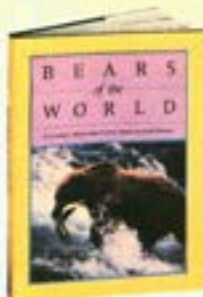
For adventures farther afield, such recreation possibilities as foot safaris, camel treks, river rafting, and hiking on Mts. Kenya and Kilimanjaro are detailed in Allen Bechky's *Adventuring in East Africa: The Sierra Club Travel Guide to the Great Safaris of Kenya, Tanzania, Rwanda, Eastern Zaire, and Uganda* (\$14.95, paper).

The sublime beauty of northern Alaska's landscape is captured in Debbie S. Miller's *Midnight Wilderness: Journeys in Alaska's Arctic National Wildlife Refuge* (\$25), a blend of naturalist observations and regional history.

These books may be ordered from the Sierra Club Store, Dept. T-150, 730 Polk St., San Francisco, CA 94109. Include \$3 per order for shipping and handling. California residents should add applicable sales tax. Sierra Club members may take a 10 percent discount. Allow four weeks for delivery.

*Continued on page 86*





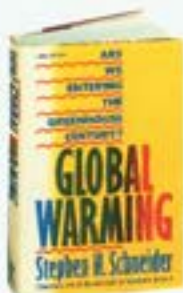
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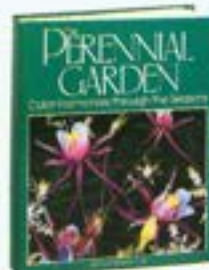
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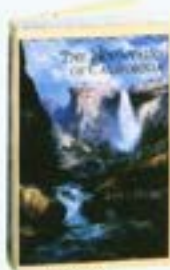
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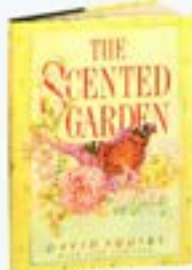
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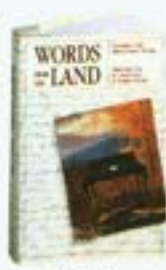
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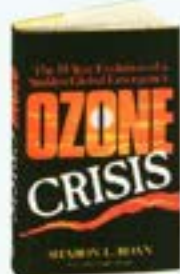
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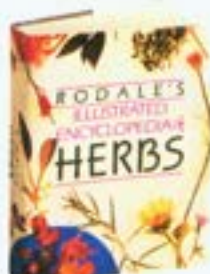
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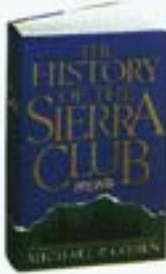
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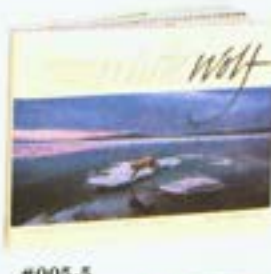
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The **World Directory of Environmental Organizations** is a handbook detailing more than 2,100 organizations and programs worldwide that concern themselves with protecting the Earth's natural resources. The publication is a cooperative project of the Sierra Club, the California Institute of Public Affairs, and the International Union for Conservation of Nature and Natural Resources. Copies of the directory may be ordered for \$38 by surface mail, \$48 airmail, from the California Institute of Public Affairs, P.O. Box 10, Claremont, CA 91711.

To bring computer owners into the environmental fold, enterprising Coloradans Roger and Kathy Cox have developed a piece of IBM-compatible software that uses text and graphics to explain such phenomena as global warming, ozone depletion, and the population explosion. *Save the Planet 1990: Environmental Shareware*, a program that users may copy and pass on to friends, also makes it easy to correspond with legislators: A menu lists the congressional delegations for each state and automatically formats letters.

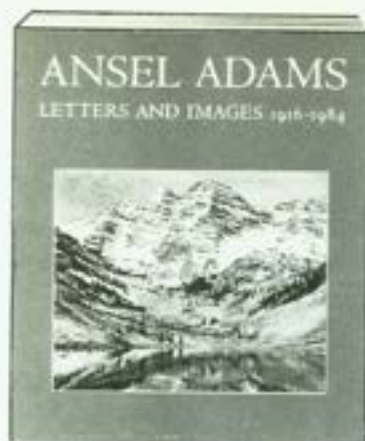
Users of the program are asked to send in a \$10 fee to register their copy of the program, entitling them to receive a free, updated version after the fall congressional elections. To receive a copy of the software, send \$5 to Save the Planet Shareware, Box 45, Pitkin, CO 81241.

The **Pesticide Action Network (PAN)** publishes two triannual newsletters, *Global Pesticide Monitor* and *Dirty Dozen Campaigner*, as part of an effort to coordinate information from some 300 affiliates, including the Sierra Club's International Pesticide and Pest Management Project. The coalition maintains offices worldwide to support safe, sustainable pest-control methods. For subscription and membership information, contact the Pesticide Action Network, North America Regional Center, P.O. Box 610, San Francisco, CA 94101; phone (415) 541-9140. ■



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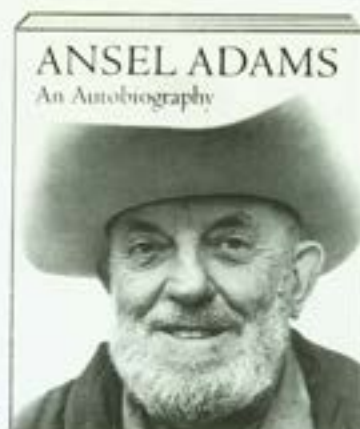
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## At Home on the Range

*A backpacking stove delivers a volcano of heat when and where you need it.*

Reed McManus

**J**UST AS A CAMPFIRE does more than keep you warm, a camp stove does more than boil water. After a day of hiking capped off by watching the sun slip behind alpine peaks (and feeling the temperature plummet 20 degrees or more), the roar of a stove's compact blue flame beneath a fat pot of water warms its owner's heart as well as her tea.

Veteran backpackers are those most prone to an abiding fondness for their stoves. Once they've found a model that works for them, they're unlikely to give it up until it begins to sputter from old age. That's why you'll find plenty of sooty, seasoned backpackers using sooty, seasoned Svea and Optimus stoves. These models are slightly heavier and less efficient than some modern ones, but they've proven their mettle.

Today backpacking stoves are no longer just convenient alternatives to open fires. While they've always been a blessing in treeless areas, in snow and rain, and when time is limited, the list of their virtues now reflects the unfortunate realities of wilderness camping in the 1990s: Open fires are usually prohibited above treeline, and frowned upon (or banned) at lower elevations where downed wood is scarce and fire rings pockmark the landscape.

Stoves also have become quite sophisticated over the years as manufacturers have tried to meet the often contradictory goals of efficiency, convenience, compactness,

and light weight. These requirements mandate a simple approach: The fewer moving parts, valves, and pumps, the fewer things to clog, break, or wear out. The spindly-looking MSR X-GK II, which weighs about a pound without fuel, boils a quart of water in less than four minutes (at least in a sea-level laboratory with no wind)—about half the time it takes several other models.

A stove's efficiency is vastly improved by a windscreen, which ensures that maximum heat reaches the pot. MSR provides windscreens and heat reflectors with its stoves, and sells an elaborate heat exchanger that makes use of the energy that would normally escape up the sides of a pot. Coleman's integral windscreen divides the burner into several sections; if the wind should

blow one out, the stove stays lit.

Discussion of the relative convenience of various stoves begins and often ends with fuel types. Liquid fuels (white gas and kerosene) and cartridges (butane) are the most common fuels used with backpacking stoves. The liquids are inherently inconvenient because they are flammable and can spill, but they're very efficient. Of the two types, white gas, an additive-free version of gasoline better known by its trade names Blazo and Coleman, produces intense heat and evaporates quickly when spilled. Kerosene burns slightly hotter and is less flammable, which is an advantage if the fuel spills but a disadvantage each time you light your stove. Kerosene's chief appeal is that it is available worldwide, while white gas is common only in the United States.

Most white-gas and all kerosene stoves subject their users to the somewhat arcane ritual of priming. To burn efficiently, fuel must be delivered to the stove's burner as a pressurized vapor. By igniting a small amount of fuel in the bottom of the stove, you heat the generator, which draws fuel from the tank and vaporizes it before it reaches the burner.

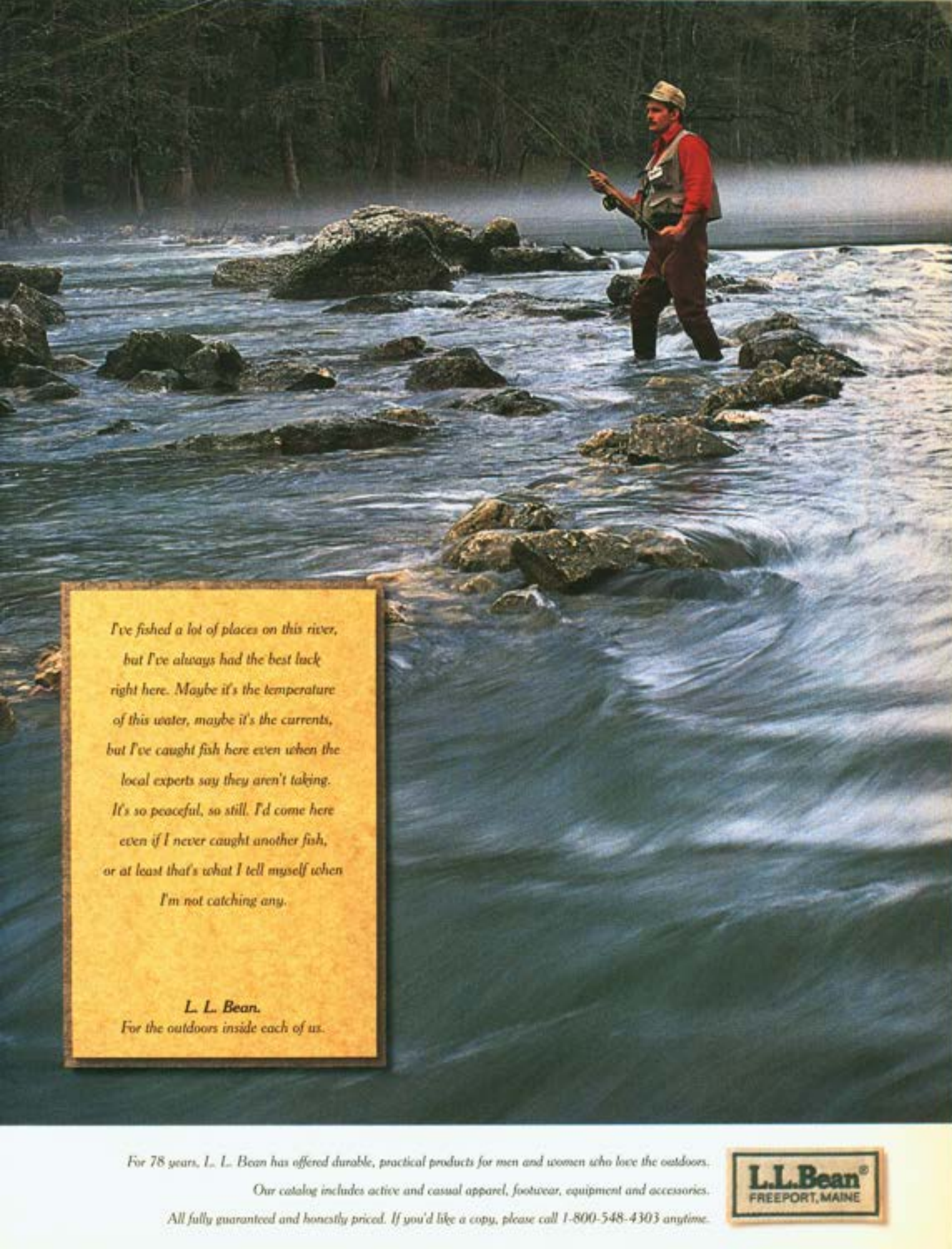
Stove manufacturers have worked hard to minimize the inconvenience of models that use liquid fuels. Coleman's Feather 400 requires no priming except in the coldest weather. MSR stoves hook up directly to their fuel-storage bottles, so you can use as much as 33 ounces of fuel (roughly four hours of full-flame cooking, three to four times longer than some other



*An efficient stove liberates campers from kitchen drudgery.*

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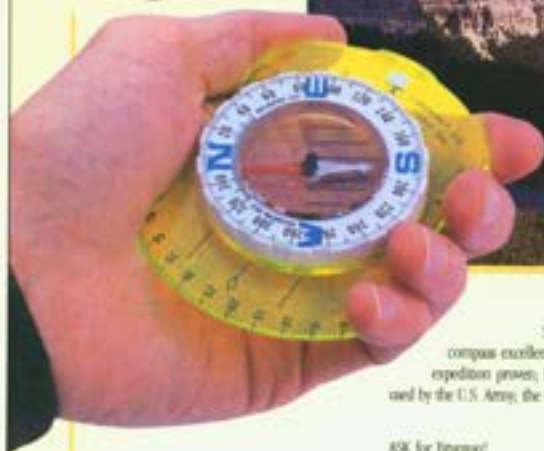
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stoves) before having to switch bottles.

Several stoves can use a variety of fuels. The Coleman Peak 1 Multi-Fuel and MSR Internationale accept kerosene or white gas, while the MSR X-GK II will run on virtually any fuel you feed it, although white gas is the cleanest-burning option. (Automotive fuels release more toxins when burned, and their impurities will clog a stove.)

Since convenience is the mother of consumption, no-effort stoves that use butane canisters are very popular. They require no priming, and can't spill because their fuel tanks are pressurized and sealed. They produce high heat immediately (liquid-fuel stoves need several minutes to build maximum pressure) and simmer quite nicely (liquid-fuel stoves are notoriously uncooperative simmerers).

But butane stoves have their problems, too. The canisters cost more than liquid fuels, they lose efficiency as they empty, and you have no way of knowing how much fuel remains in them until it's gone—although some self-sealing models can be detached from the stove before they're empty. Finally, each canister must be carried out of the backcountry and thrown away, becoming yet another contributor to the garbage crisis.

Most important, butane doesn't burn as hot as white gas, and it fails to vaporize when the temperature drops to 30 degrees Fahrenheit or lower. To combat this problem, Camping Gaz cartridges—the brand most widely available in the United States—now contain an 80-20 blend of butane and the hotter-burning propane, while MSR's RapidFire stove uses isobutane, a more volatile form of butane. Both fuels improve the vaporizing threshold by about 10 degrees.

Alas, a whooshing camp stove won't simulate the aesthetics of a campfire, even if you squint. But stoves do excel at serving up hot meals virtually on command, which is a cool consolation when you're tired and hungry. ■

REED MCMANUS is Sierra's associate editor.



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## JOHN MCPHEE

Continued from page 55

agonizing stages. *Coming Into the Country* took a total of three years. "I swear each time it's going to be my last piece of writing," he says.

ON OUR WAY UPSTAIRS TO HIS office, McPhee tells me he debated whether to clean up before I came. In the interests of candor, he decided against it. The scene that greets us is complex, but not chaotic. The long, narrow room is lined with desks, tables, bookshelves, and a couch. The available flat surfaces are neatly piled with printed matter. I sit in front of the piles on the couch, near the door, while McPhee retires to a seat in what is apparently the inner sanctum, by the computer and the room's only window.

On the inside of the door is a bumper sticker that he picked up in Alaska, depicting an upside-down man buried up to his neck. The punchline: "Improve the forest—plant a Sierra Clubber!" Dozens of other items are displayed on the walls, including family photos, a Yukon Jack hat, a geologic time chart, a postcard of a scantily clad female skin diver, and a colorful rectangular scarf that one of his four daughters knit for him when she was eight years old. Also posted is a 3 x 5 card with the cryptic message, "Coming Into the Country, p. 127"—a reference to a prescient paragraph that McPhee wrote years ago about the dangers of oil spills in Alaska's Prince William Sound.

As a young writer, he thought he should have an office completely bare of decoration except for those items associated with his work in progress. "The walls would become a part of my mind," he hypothesized. Surrounded by a roomful of memorabilia, he now seems more amused than bothered by his failure to carry out the plan.

But if his office is not completely pure, it is amply stocked with lore from his current piece of writing. Most conspicuous is a huge geologic

map of the United States, with each rock formation shown in a different color. A piece of nylon cord pinned to the wall cuts across the swirls of color, showing where Interstate 80 winds its way across the upper half of the country. In three of his most recent books McPhee has set off along this route, exploring Earth's history as revealed in roadcuts and outcroppings in the eastern United States (*In Suspect Terrain*), the Rockies (*Rising From the Plains*), and Nevada (*Basin and Range*). He is now at work on a book exploring the geological origins of California, where the cord ends.

Like many of his projects, this labor of 12 years (and counting) was born of serendipity. McPhee did not start out thinking big; far from it. He merely hoped to produce an offbeat "Talk of the Town" piece on a roadcut near New York City. One illuminating geologist led to another, and soon his ambition had grown to book size. Not until a few years later did he realize that the cord committed him to nothing less than four volumes and a geologic cross section of the continent.

McPhee's diggings delighted geologists. In 1986 they nominated him a fellow of the Geological Society of America, a group made up almost exclusively of professional scientists. In 1988 they gave him the U.S. Geological Survey's John Wesley Powell Award for writing about their field in a way "that has captured the imagination of a large segment of the public." That same year he was elected to the American Academy and Institute of Arts and Letters—another sign that his literary/scientific balancing act was working.

Yet McPhee's rock revelations have come at no small cost. His geology books have each taken four times as long to produce as his other books. Though artfully assembled, they are also denser than his average product: a conglomerate of stories, characters, and words like *orogeny*, *conodont*, and *pyroclastic*. The *New York Times Book Review* found *Rising From the Plains* "delightful" overall, but considered its geological argot disconcerting. "You

need not have passed Geology 101 to enjoy *Rising From the Plains*," said reviewer Evan S. Connell, "but it might help."

"He's lost some readers," McPhee's colleague Howarth admits, "but in time these books will be regarded as his masterwork. In four not-very-long books, he's helping us to see processes that are invisible. He's giving language to the land."

McPhee shrugs when confronted with criticism of the geology series. Some readers didn't like *Curve of Binding Energy* either, because it described the arcane world of nuclear physics. Others marveled at its graceful, entertaining rendering of difficult concepts. The science had to be there to tell the story, McPhee says. "I didn't care who I bored."

IT'S DUSK, AND WE'VE BEEN TALKING since 9 a.m., but McPhee shows few signs of fatigue from the day-long interrogation. He even goes so far as to claim he enjoyed the ordeal, in no small part because "I got up this morning and knew I didn't have to write."

I still have one more question, and McPhee is a patient man. With the broad perspective he's gained from studying the evolution of our physical world over hundreds of millions of years, I ask, what does he see in the planet's future?

He hesitates, looking daunted. "I keep getting scratched about this, but it's difficult to put together a good sentence," he says. "I wouldn't pretend to think I could make a pronouncement." Obliging, though, he tries.

"We're near the beginning of time for people, and yet we've already gotten a 747 up. You wonder what's next. You marvel at it. But the time has come to pay close attention to the things going wrong, too. I hope we haven't awakened too late."

Hearing himself say these words, McPhee straightens in his chair, interrupting his own thought. "Hey, give me a break," he says. "My work is designed to make people think this

Continued on page 96



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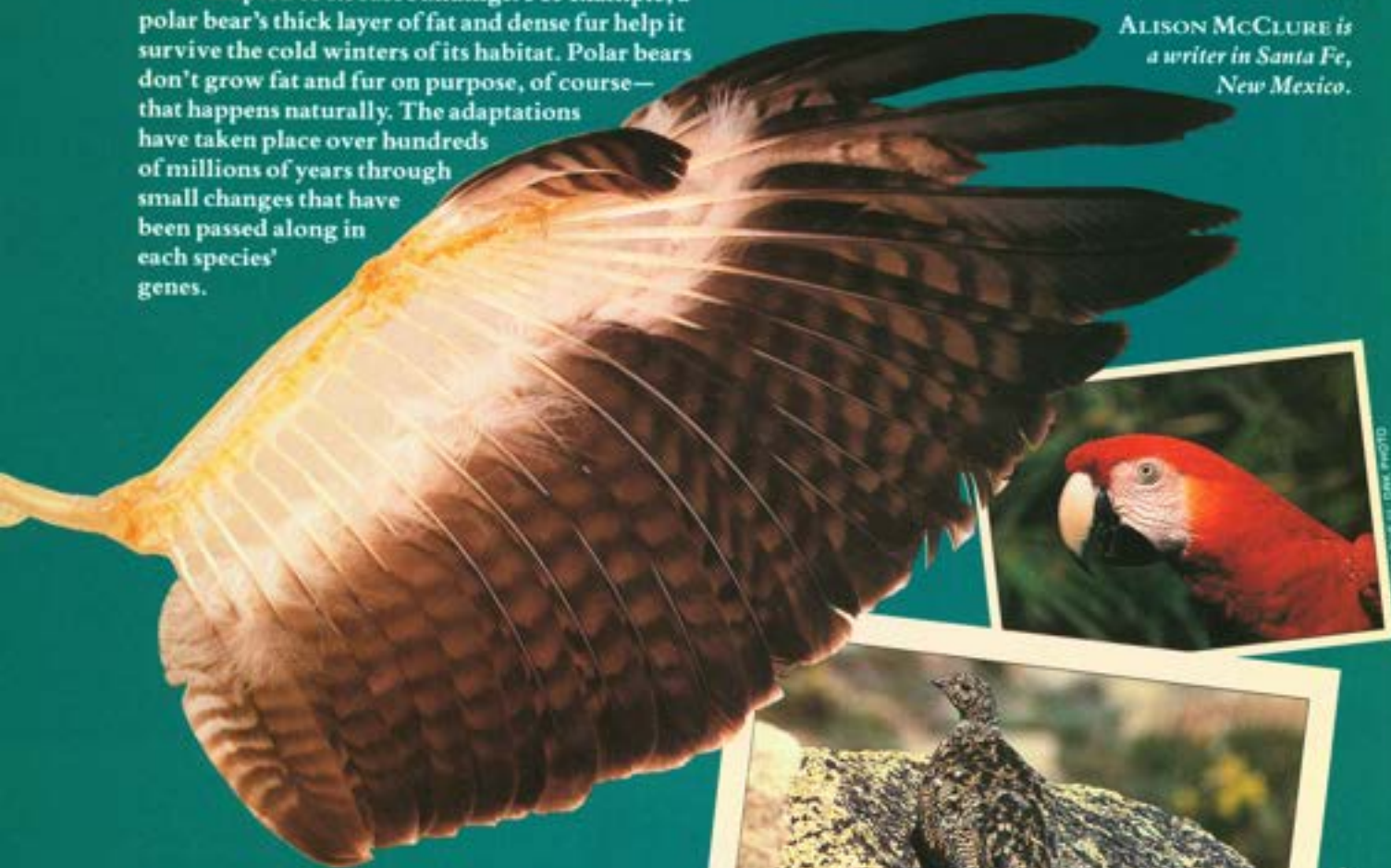
# Fine-Tuned for Feeding and Flying

You can tell many things about the way an animal lives just by looking at it. If a bird has webbed feet, it spends part of its life in the water. Webbing gives these birds a larger area to push against the water when they're swimming, so they can move faster. Humans invented swim fins to mimic the action of water birds' webbed feet.

For any animal, success means developing a form that's adapted to its surroundings. For example, a polar bear's thick layer of fat and dense fur help it survive the cold winters of its habitat. Polar bears don't grow fat and fur on purpose, of course—that happens naturally. The adaptations have taken place over hundreds of millions of years through small changes that have been passed along in each species' genes.

Birds are good examples of animal adaptation. They have developed special ways to find food, build shelter, protect themselves from enemies, reproduce, and fly. All birds have feathers to keep them dry and warm, and most birds have streamlined bodies that are small and light, yet very strong. Beyond these common characteristics, birds are remarkably diverse: There are more than 8,500 species in the world.

ALISON MCCLURE is a writer in Santa Fe, New Mexico.



Birds are the only animals that have feathers. The wing of a red-tailed hawk (above) shows the bird's flight feathers, which produce power and "lift" and help the bird steer. The exposed wing bone is normally covered by smaller feathers called *coverts*, which provide a smooth surface for air to flow over.



Dull feathers provide protection, while bright ones attract attention. Brilliant feathers help the macaw (top) find partners in the jungle. The black-and-brown plumage of the ptarmigan (bottom) is a perfect match for the rock beneath it. In winter the ptarmigan grows white feathers, which help it "hide" against the snow.





TOM MERRISON / ALLESTOCK

Birds don't have teeth (which would be too heavy), so the ones that eat meat, such as hawks, need another way to cut their food. Hawks have powerful beaks that end in a hook (above), which they use to tear their prey into pieces small enough to swallow. Parrots also have large, strong, hooked bills. They use their hooks to tear apart fruit, and their jaws to open nuts. A parrot picks up a nut, moves it to the base of its bill, breaks the shell, and then eats the seed inside.



MICHAEL FODDEN / DIK PHOTO

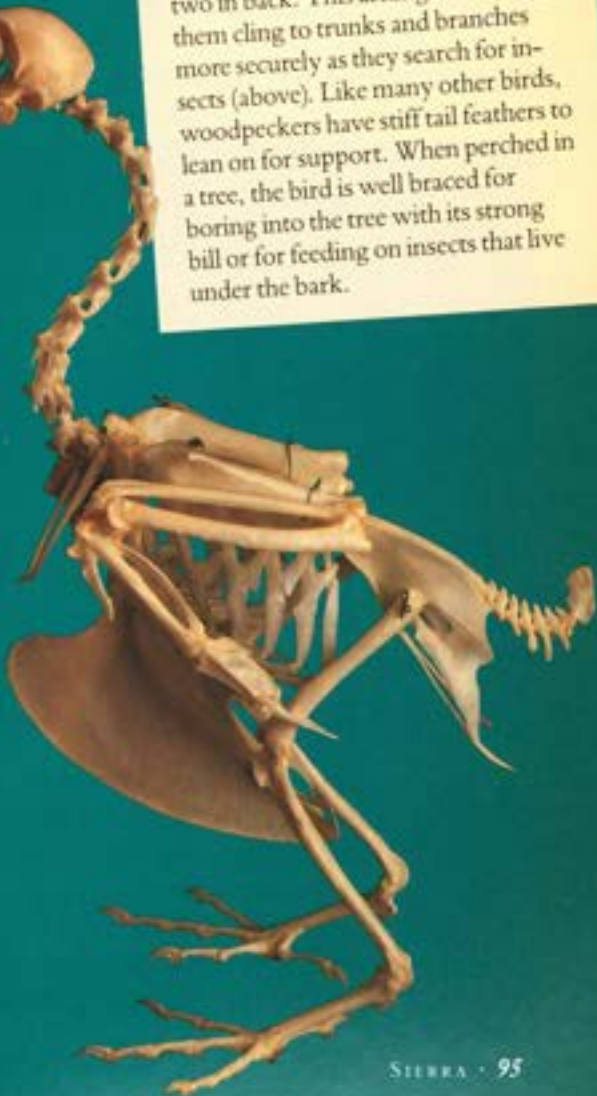
Most birds have four toes—three in front and one in back. But woodpeckers have two toes in front and two in back. This arrangement helps them cling to trunks and branches more securely as they search for insects (above). Like many other birds, woodpeckers have stiff tail feathers to lean on for support. When perched in a tree, the bird is well braced for boring into the tree with its strong bill or for feeding on insects that live under the bark.



STEPHEN J. BRIDGMAN / DIK PHOTO

White-winged crossbills have some of the most unusual beaks in the bird world. These birds live in northern forests, where they eat seeds from the cones of evergreen trees. The seeds are buried under the cone's scales. To get at them, the crossbill sticks its crisscrossed beak between two scales, forcing them apart. It can then remove the seed with its tongue (above).

Streamlined bodies help make most birds very efficient flyers. A typical bird bone (below) is hollow and reinforced for greater strength. Bits of bone that cross the hollow space act as supports, making this bone lighter than a solid one, but still very strong.





Continued from page 92

way, but I can't talk this way. . . . Let the judgments fall where they may. Let the words play themselves out."

McPhee made a similar declaration of artistic independence earlier in the day, over lunch at a dimly lit subterranean restaurant across the street from his office. Interesting as it's been, he said, he'll be relieved when the geology series is finished. Then what will you write about, I asked, shad? The Delaware River? The New Jersey outback?

Grabbing the ketchup bottle and waving it in my direction, McPhee suddenly got that eager glint in his eyes. Was he savoring the thought of a stack of blank notebooks, a long drive somewhere, a new world?

"My next book could be about a ketchup manufacturer," said one of the most liberated people in modern journalism. "My next book could be about anything." ■

JOAN HAMILTON is Sierra's senior editor.

## EXXON VALDEZ

Continued from page 49

dents. More fundamentally, a national policy could help reconcile the inevitable conflicts between corporate objectives and public values.

But perhaps the most compelling reason to develop such a policy is to avoid the kind of grand deception laid bare by the wreck of the *Exxon Valdez*. How can an industry with a record of false assurances be trusted to guide the development, transport, refining, even the use of oil? How can the industry be trusted to avoid disrupting sensitive environments, to provide a continuous supply of energy, and to help reduce the polluting and global-warming effects of its products? Such broken trust calls for regulation.

There's no arguing that we will need large amounts of oil for some time. Tankers will continue to ply the waters off the coasts of Canada and the United States. Nevertheless, certain achiev-

able objectives in both energy conservation and alternative-energy development would reduce the risk to such sensitive regions as the Arctic National Wildlife Refuge and coastal California, Florida, and New England—all targeted by the industry for exploration and drilling.

The question is, who will set the objectives and work toward the goals? Not the industry itself—that much we can be sure of. Public policy backed up by forceful regulators is needed.

Yet, all too easily, recommendations, safeguards, and even laws can fall through the many cracks that appear in an undertaking as massive as that of moving oil from its source. Although Congress deemed Alyeska responsible for oil-spill response, somewhere within those sister companies are individuals who—here and there, now and then—failed to demand the best safeguards and to challenge the assertion that a large spill could be handled. Most of them will remain hidden within the corporate



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ranks. And in the state and federal governments, officials throughout the hierarchy allowed the industry to cut corners. They too are obscured by bureaucratic shadows.

In the end we can rely only on ourselves, as consumers and voters, to act on our consciences to save the places on Earth we call home. The job of ensuring careful, environmentally sound development ultimately lies with those who use the energy. As one aphorism had it, "It wasn't Hazelwood's driving, but the driving of a hundred million Americans that put the tanker on the reef."

"Who is to blame for the nation's worst oil spill?" Mark Holdren of Honeoye Falls, New York, asked in the *Homer News* after his sea-kayaking refuge among the Shuyak Islands was plastered with oil. "I am. You see, I am your typical person living in an affluent suburb. And my lifestyle is choking our planet to death. . . . I commute more than 50 miles a day to work. My wife, in her own car, travels hundreds of miles every week. My children, in their own cars, seem to spend more time at a distant shopping mall than they do at home. . . . I am at oil's mercy."

Individually, it's easy to believe that one's effort to use less gas or live in a more energy-efficient house has little overall effect. But the math of energy conservation is astonishingly convincing. Simple improvements in home and business heating efficiency could save as much oil as is delivered by the Trans-Alaska Pipeline—some 2 million barrels a day. Every mile-per-gallon improvement in automobile fuel efficiency saves about 500,000 barrels of oil a day; a 1.5-mile-per-gallon improvement would save as much oil as is optimistically projected to lie under the Arctic National Wildlife Refuge.

"If the United States could achieve the same energy efficiency per unit of economic output enjoyed by our Western European competitors, our annual energy bill would fall by an astounding \$200 billion," notes Brooks Yeager, author of a Sierra Club pamphlet called *Wasted Energy*. That is \$200 bil-

lion the oil companies would like to keep on their books. For the public, such waste is not only costly but destructive, resulting in oiled shores, fouled air, polluted seas, atmospheric changes, and the loss of wild places like Prince William Sound.

I remember discussing the spill with Jack and Paula Lamb, who fish together out of Cordova. "We ought to be able to trust our government to protect us from this kind of mess," Paula said. "It breaks my heart the way

the whole thing was handled. Look at us: the richest country in the world, and we don't invest enough to clean up our own mess. We have let power and money get out of control. We have to be willing to give up enough to take care of our part of the world." ■

ART DAVIDSON is an Anchorage-based writer and resource planner. This article is adapted from *In the Wake of the Exxon Valdez*, to be published in May by Sierra Club Books.

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SI-3



## RAPID CHANGES

Continued from page 61

single afternoon of rafting I've ever encountered, as though the river gods designed the ultimate four-hour raft ride. By the time we reach the fifth and final canyon we are giddy, and at the last gate, where the river chokes to barely a raft's width, Chuck, Kirby, and I crash into a three-raft pileup that has us spinning and laughing in the currents before we are flushed through. In minutes the canyon tapers, the water slackens, and a hush falls over the group. The river makes its final adjustments, like a stomach settling. We're at the end of the run, at the beginning of the Charvak Reservoir, the first of hundreds of man-made impoundments on the waters that feed the Aral Sea.

A gothic wind blows that night, making it impossible for most of us to sleep. The winds of change, someone comments over breakfast.

When the bus starts rolling on the 120-mile trip to Tashkent, Vanja takes the microphone and begins elaborating on the environmental issues confronting the landscape beyond the windows. His English is difficult to understand over the tinny loudspeaker, and the subject, though important, is not stimulating. We've just completed a thrilling adventure—one that stood well on its own merits as pure endeavor—and we're once again trying to elevate it all with significance. I turn off Vanja's voice and fall asleep.

Vodka flows like a river during dinner that night at the Tashkent Hotel. By the second course of *pyelmeni* (meat dumplings), everyone is toasting everyone else. We're all bathing in the success of our river journey and the goals achieved thus far: "international cooperation and understanding, new compassion for our fellow man, recognition of basic human equality." In the midst of these drunken self-con-

gratulations, I notice the two Zambians off in a corner quietly drinking by themselves. "That's not right," I tell Jana, who is sitting across from me. Immediately she gets up and goes over to them. I watch as she cajoles and gestures, and then the Zambians break into song, pounding the table in rhythm. This captures the attention of the group, and soon everyone has crowded around the Zambians, clapping time to the beat. For a few minutes it's raucous and fun, but something about the show bothers me, and I remain in my seat.

After several flashy choruses the Zambians bow and retire. Jana returns to her place across from me, beaming a beatific smile. "Isn't it amazing what we're doing? We're really changing the world. With all these exchanges, we're making adventure meaningful."

A wave of misanthropy washes over me: I'm not so sure. I can see the reason for the U.S.-Soviet exchange, and even the Czechs seem to fit into the scheme. But Zambians? Isn't that

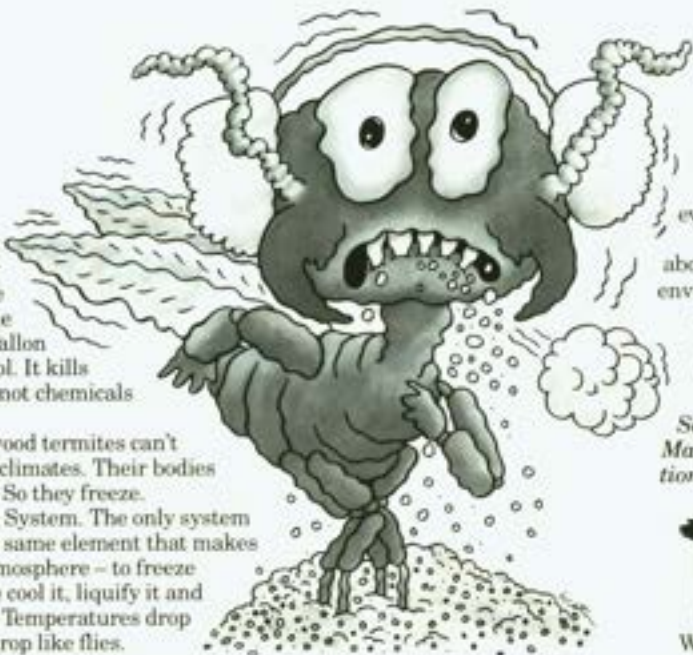
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going too far? Why are the Zambians here—to further relations between our countries? To better understand a hostile culture? Zambia is a nonaligned nation; neither the U.S. nor the USSR has any beef with Zambia. It seems to me they are here as part of a gimmick, contrived to justify our fun and give added meaning to our adventure.

In fact, I think it's worse than that. Our bringing the Zambians here smacks of racism in the Cotton Club sense. They're here for our entertainment: The only time we pay attention to them is when they sing for us. If this were a rafting exchange between South African white supremacists and black Zambians, the effort could be understood; it might even do some good. But shipping Zambians to the Soviet Union to raft with Americans and Czechs is a way to make us look good. And that goes for the Aral Sea as well. Tomorrow we're off to learn about its environmental problems. Why? We're not scientists. We had a great time running the Chatkal—can't it stand at that? Why do we have to tack on relevance?

When I voice some of these thoughts to Jana, she's appalled. "You're missing the point. There can be as much joy in learning as in self-indulgent adventure. We're just wedding the two, and it's about time. I learned a lot having the Zambians on board, and yeah, they entertained me, but we entertained them, and we're all better for it. As for the environmental aspects of this trip, it makes me feel good—better than the thrill of running a rapid—to know I'm working toward saving the planet. If you can't see that, you're blind." She slams down her vodka glass and stalks off to bed. I mutter something about her pseudo-consciousness, throw back one last drink, then stumble off to my room.

At the airport the next morning we are greeted by two 1949 biplanes. Our pilot says "Godspeed" in accented English, and soon we're hurtling northward to the Aral Sea.

After crossing the invisible border into the Karakalpak Autonomous Republic, we land at the capital, Nukus,

on the shores of the waterless Amu Darya River. During this brief refueling stop we meet with local officials who tell us we're only the second group of Americans to visit the Aral Sea in more than 30 years; the first was led by *National Geographic* editor Bill Ellis three weeks before. Until then, all those who tried had been turned away.

Suddenly I feel privileged. As the propellers rev for the final takeoff, the cabin ambience is uncharacteristically somber. We fly over the edge of the

Kyzyl Kum desert, one of the bleakest wastelands in the world, and as we approach the Aral we see what look like toy ships listing in the desert—Tonka Toys dropped into a sandbox from the sky. There's no water in sight. Misha says there used to be so many lakes in this region that from the air it looked like Finland. Minutes later we see the Aral itself, a blue oasis rimmed by white salt and sand.

In Muynak, where we land at 225 feet above sea level, there were once



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31,000 people living in a thriving port; today just 20,000 remain in the landlocked, dying town 45 miles from the Aral. A fish processing plant and cannery is the only means of employment, yet there are virtually no carp or sturgeon left in the Aral. To keep the citizens of Muynak employed, the government flies in frozen fish from the Baltic Sea, 1,700 miles away.

We pile into an old bus and trundle into the desert toward a perished resort, getting stuck in the sea of fine salt and sand along the way. Since there are no trees or bushes for attaching a winch cable, we all file out and push. Finally we reach our destination, the ship cemetery we'd seen from the air. Dozens of huge iron fishing trawlers and other boats are tipped and partially buried, as though tossed miles inland by a massive tidal wave. In fact, as the mayor of Muynak explains, "In the winter of 1974 the sea withdrew quickly, and by the spring, when the boats were usually launched, they were high and dry, and it was impossible to move them."

Back in Muynak we're ushered into a conference room and served salty tea as the local officials tell us about the Aral Sea. One man with a furrowed face announces that the Aral Sea disaster is "ten times worse than Chernobyl." This wakes us up, and the room becomes charged with discussion and accusations. In the calm moments I learn from Tanya, who translates, that the Aral was once the fourth-largest freshwater lake in the world, but now ranks sixth. To date it has lost 66 percent of its water and 95 percent of its fish, leaving in their stead a desert of salt and dust, a fallow graveyard that stands as a monument to resource mismanagement. If nothing is done, experts predict, the Aral will dry up completely by the year 2000.

Tanya explains that in the postwar rush toward industrialization there were hasty decrees from the central government to increase the gross cotton output of Uzbekistan and the Karakalpak Autonomous Republic. Scores of diversion projects were sanctioned on the Aral's two sources—the



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Syr Darya (into which the Chatkal flows) and the Amu Darya—in an effort to irrigate new lands and produce higher cotton yields. The projects were so inefficient and excessive in their thirst that the lower reaches of the two rivers were reduced to little more than sewers. Today virtually no fresh water reaches the Aral.

Already the climate of the area has changed; there is less rain, average temperatures have risen, and the growing season has shortened appreciably. The result is a dramatic decrease in cotton and other crop yields. As the sea has shrunk, it has become increasingly saline (44 percent in some places), killing the native fish population. Locals have had to turn to more land crops to survive, but as the area—already the driest in the nation—has become parched, local farmers have turned to herbicides and fertilizers to compensate. These toxins have leached into the water table, and now the surrounding region is reporting soaring rates of hepatitis, intestinal infections, jaundice, typhoid, and cancer, as well as the highest infant mortality rate in the country (80 deaths per 1,000 births). At one time 173 animal species lived around the Aral; at last count 38 species remained.

The newly formed Aral desert has created enormous dust and salt storms that have damaged crops hundreds of miles away. Rains have dropped Aral salt as far west as the Black Sea coast and as far north as the Soviet Arctic; as it spreads, the salt kills not only cash crops but trees, wildlife, and pastureland.

Many people believe it's too late, Tanya tells me, and that nothing can be done. Others argue for a grand diversion canal from a Siberian river, the specter of astronomical cost and ecological effects notwithstanding. Still others believe the only hope lies with the international community, that as-yet-unconceived solutions will be devised only if enough people become aware of the catastrophe.

Bewildered by a crisis I never knew existed, I raise my hand to speak. "Why did you invite us here and not

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some major media? When Chernobyl was publicized in the international press, help was on its way within hours; same with the Armenian earthquake. Why invite us, a group of outdoor adventurers?"

A wrinkled man in ragged clothes stands and answers. "Because you are the only ones the central government has allowed to visit us," he says. "They believe you are harmless because you are tourists. We are Muslim, and the government is anti-Islam. The Kremlin is committing cultural genocide with the Aral catastrophe. This disaster has been contained for 30 years.

"But now we ask you to help us," he continues. "If you can tell the world of this disaster, you could help save our lives and the lives of our children. You must help us."

The various members of our expedition exchange stunned looks. The idea had been to sprinkle our adventure with a little pertinence, not glaze it with guilt; to recruit some compassion for the issues, not make us join the army. Suddenly, though, I feel like enlisting.

"We will help," I say. "We will tell everyone we know of your situation, of the Aral Sea. We will help to seek a solution." When the translation is finished, there is scattered applause among the Muynakians. They've heard promises many times before, but hope still waters their eyes.

I think to myself that I really have been affected by what I've seen and heard. At this moment, possessed of a passion to help, I feel more charged than at any time running the river. Jana was right: The important part is connecting, engaging, comprehending the problems, and becoming a part of the solutions. Adventure travel can do that—we just had. And I wondered if I could ever just run a river again, or if I would ever want to. ■

RICHARD BANGS is the founder of Sobek Expeditions and co-author of *River Gods* (Sierra Club Books, 1985), *Islands of Fire and Islands of Spice* (Sierra Club Books, 1988), and *Riding the Dragon's Back* (Atheneum, 1989).



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## QUESTIONS & ANSWERS

**I bought a redwood burl in Northern California. Does the sale of such burls endanger the redwoods? What are the chances that my burl will grow into a tree? (Tim Wheeler, Morro Bay, California)**

Botanists have a hard time explaining the knots and lumps that grow out of redwood trunks; some refer to burls as scar tissue, others as "frustrated" or "confused" buds.

Since they are useless as lumber, burls are usually sold to contractors by timber companies, says Redwood National Park Ranger Linda Mealue. As any tourist traveling through redwood country knows, selling geegaws and *chatchkes* made of the decorative knobs can be quite lucrative, so there is some pirating of burls on public land. It's not clear how much damage this causes a tree; certainly the loss of its burls is not enough to kill it.

Amazingly, redwood burls *can* grow into trees, but the proud owner needs a dose of luck and what Mealue calls a "day-glo, neon-green thumb." Generally the burls come packed in peat moss with instructions to keep the moss wet. Partial success takes the form of buds that sprout leaves and branches, but rooting is rare, says Mike Yochim of the Save the Redwoods League. Babying a burl is hardly the easy way to raise a redwood—you're better off purchasing a little tree.



**Does buying Javan coffee contribute to the destruction of rainforests? (Carson Barnes, Reno, Nevada)** Caffeine-loving tree-huggers can rest assured that their morning brew does not play a significant role in tropical deforestation—although the social and economic impacts of coffee may give pause to some.

Suzanne Head of the Rainforest Action Network explains that coffee *did* contribute to clearing of tropical forest in the past, when the crop was introduced (it is native only to Ethiopia, Yemen, and Saudi Arabia), but now most plantations are established. Moreover, coffee consumption has been on a steady decline in the United

States, the world's largest consumer, while international prices have hit a longtime low—so there's little danger of a surge in demand.

Another reason coffee takes a backseat to the problems of cattle-grazing and timber-cutting in the rainforests is that most of the endangered forests, such as those in the Amazon, lie in basins of clay and sand, whereas coffee must be grown on slopes of at least 2,000 feet and higher, on volcanic soil.

That said, the Davis Food Co-op in Davis, California, notes that culturally conscious buyers discourage coffee drinking because of its role in disrupting traditional social and economic systems in

the Third World, where the crop is grown primarily for profit and consumption in the developed world.

**A lot of newspapers seem to be switching to non-ruboff ink. Is it more or less toxic than other kinds of ink? (Carol MacDowell, North Haven, Connecticut)**

A non-ruboff or low-rub ink can be just as toxic as other ink if it contains petroleum, which can make its way into the atmosphere during printing or end up in landfills later. It's generally the combination of varnishes, oils, and other chemicals in low-rub ink—not the petroleum base—that keeps it from soiling your hands, says Duke Nickoley of CAL INK printers in Berkeley, California.

Environmentally safer, naturally low-rub inks have been developed based on soybean and vegetable oils, but the petroleum-based stuff gives bolder reproduction of black, so vegetable-based inks are used mostly for color photos and graphics.

There is a nearly ideal solution: using water-based inks in what is called the Flexographic printing process. These inks reproduce black well and are almost completely safe for the environment, Nickoley says. Unfortunately, the astronomical cost of installing Flexographic equipment has kept most newspapers from taking the plunge—and there's the rub. ■

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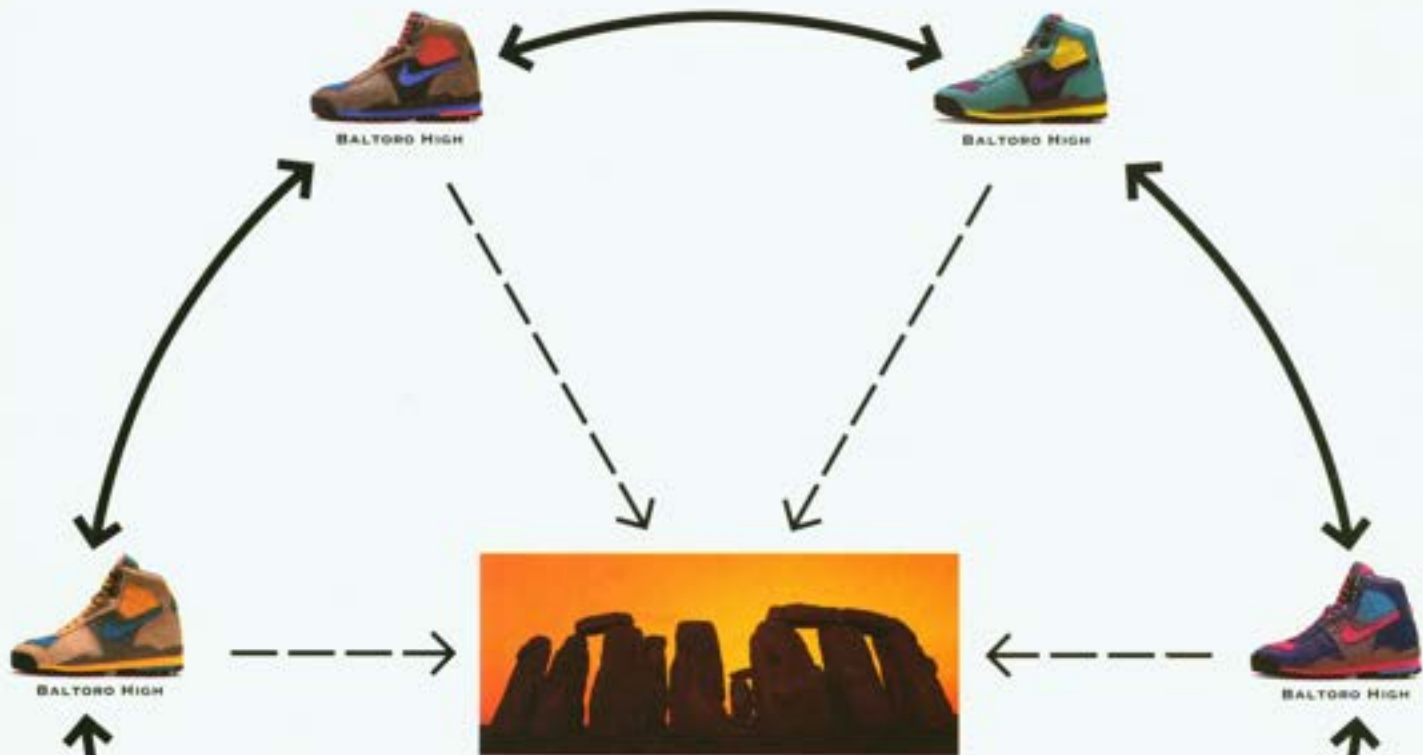
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