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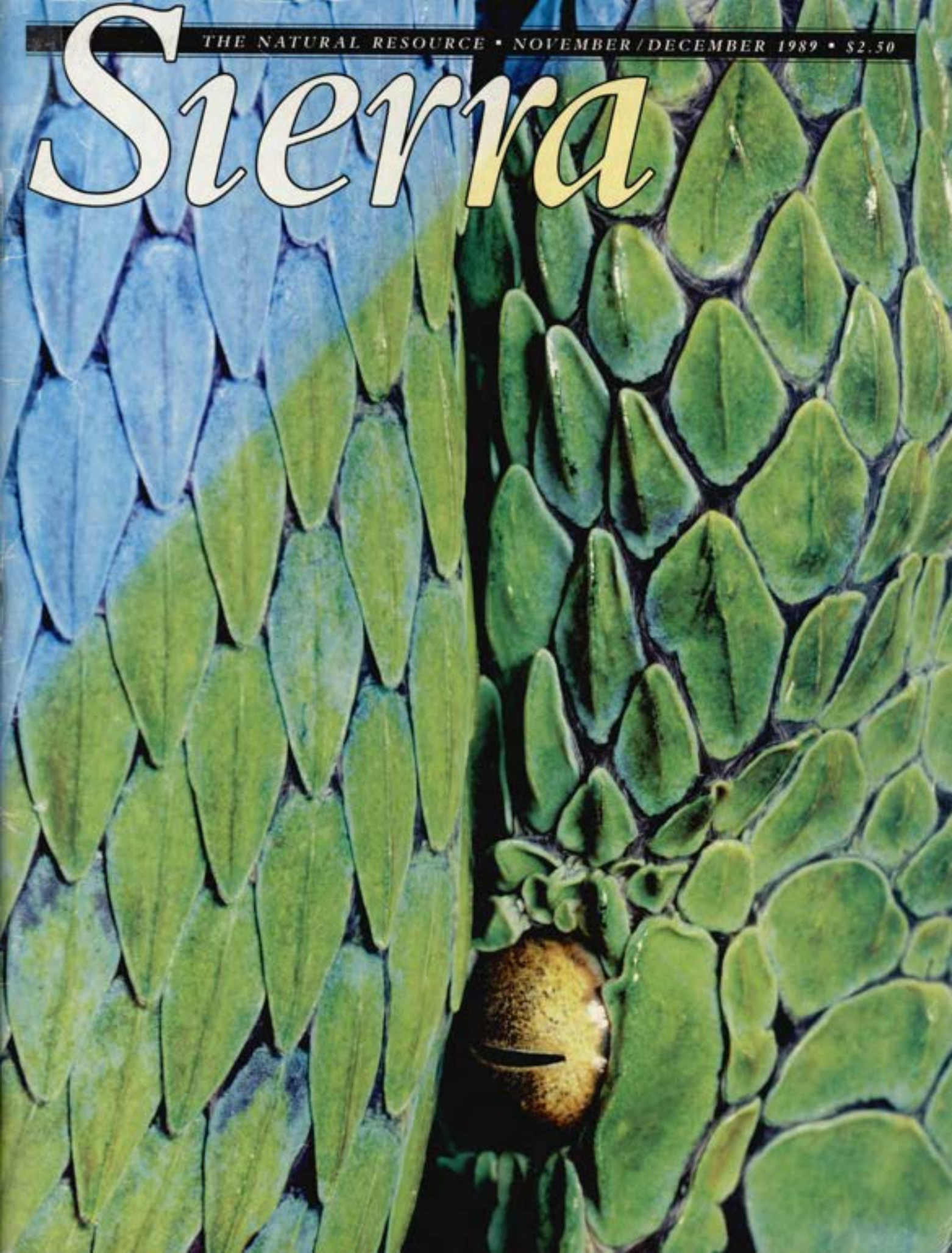

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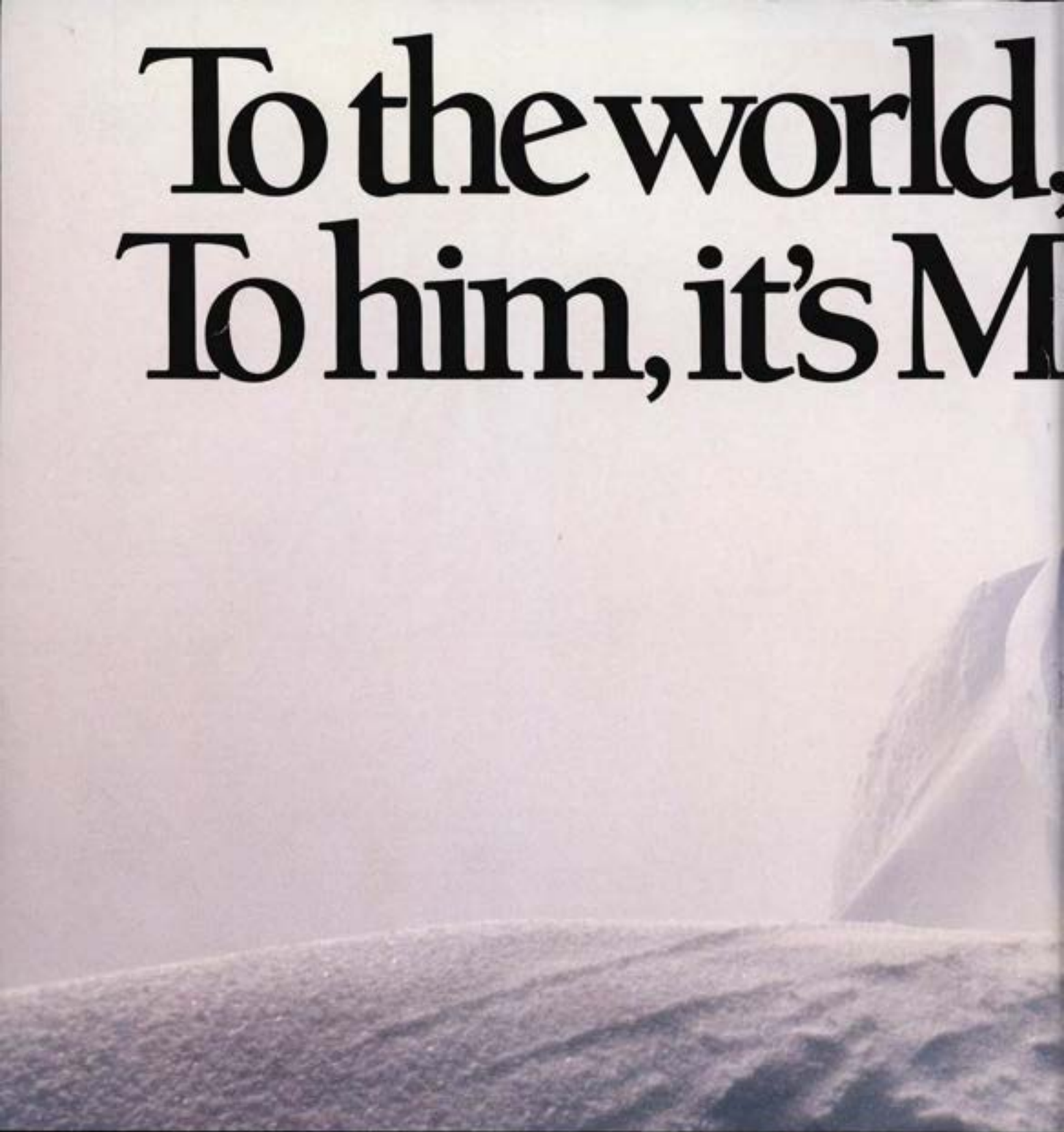

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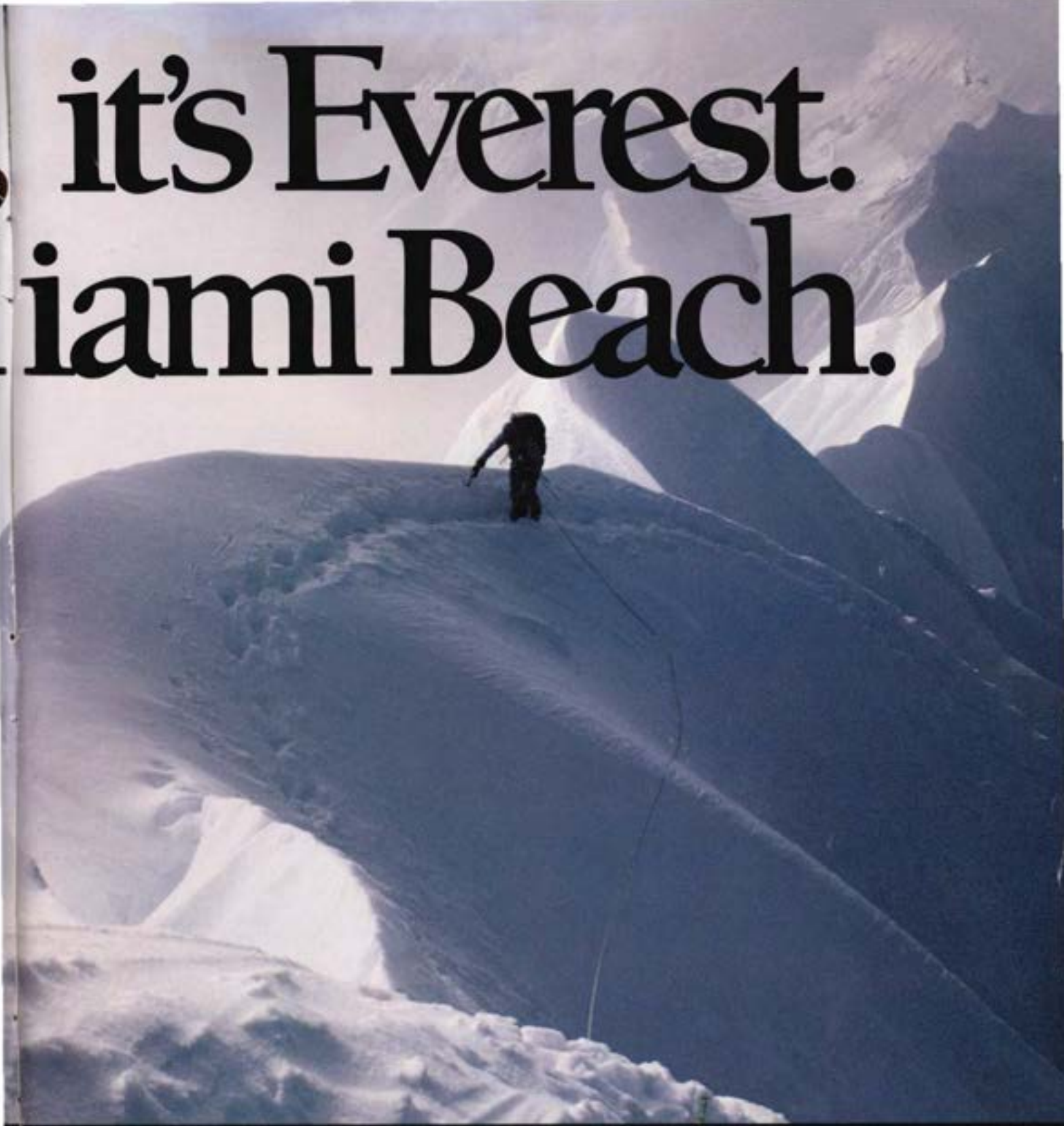

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VOL. 74/No. 6 NOVEMBER/DECEMBER 1989

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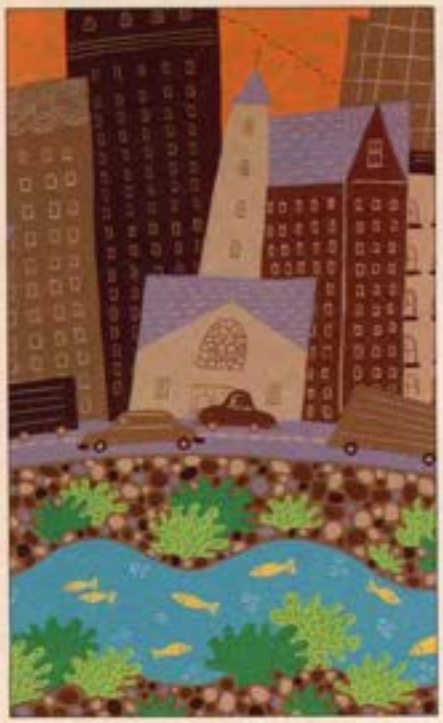
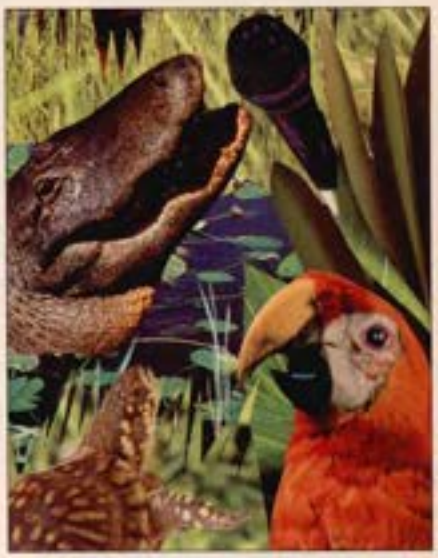
COVER: Rowley's pit viper, the Grand Prize winner in *Sierra*'s 1989 photo contest. See page 48 for the other victors. *Photo by David Barker.*





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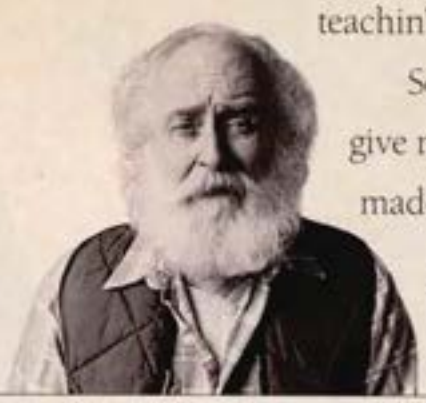
Truth is, I'm pretty doggone set in my ways. But lately those folks at Wigwam® have been teachin' me a thing or two.



Wilbur Wheaton, Back Country Guide

See, 'bout a year ago they give me these **TRAILBLAZER** socks, made from some new-fangled yarn called High Trek.® And dangbusted if they wasn't the driest, warmest things I ever did slip into.

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LETTERS

THE U.S. PUBLIC LANDS

Your September/October issue is superb. The fate of our public lands is certainly a timely theme, and you have compellingly presented the Sierra Club's views. Not only are the photographs and graphics striking and well placed, the writing is provocative, informative, and inspiring. You have established a terrific standard for your magazine.

Peter Carrels
Aberdeen, South Dakota

Congratulations on a fine issue. You've covered a hell of a lot of ground, and done it with wit, style, and seemly brevity. The whole package makes for a splendidly convenient wrap-up of the major public-lands issues in contention and the resources at risk.

I was especially happy to see Charles Wilkinson laying out the water-in-the-wilderness issue ("In Depth"), Dyan Zaslowsky baring the bare facts about the bare ground in her "Priorities" article on BLM reauthorization, and David Darlington's nice piece ("The Pastures of Class-L Heaven") about the Mojave Desert, one of my favorite chunks of earth on the planet.

T. H. Watkins, Editor
Wilderness
Washington, D.C.

I appreciated Bruce Hamilton's review of Gordon Robinson's *The Forest and the Trees* along with my book, *Reforming the Forest Service* ("Books," September/October). Hamilton accurately describes both Robinson's ideas and my proposals. But his closing advice that I should add Robinson's "artistry" to my "number-crunching" misses the point.

Robinson focuses on forest management on the ground, where it is clearly an art. My focus is on the legislative arena, where Congress says it will not make artistic judgments about forestry. Instead, Congress uses the budget to control the Forest Service, so my concentration on numbers is appropriate.

Hamilton is "skeptical" about my proposals because they alone would not save Pacific Northwest old-growth forests. Nor would they prevent nuclear war, but I never claimed that they would do either one. Instead, *Reforming the Forest Service* clearly states that the Endangered Species Act and other laws will always be needed to protect the spotted owl and other old-growth-dependent species. But my proposals will protect millions of acres of wildlands in the Rockies and many other parts of the country from money-losing timber sales.

Reforming the Forest Service shows that national-forest managers now gain huge budgetary rewards when they lose taxpayers' money on timber sales. But they get little or no reward for managing in favor of recreation. The reforms I propose, including recreation fees and funding of national forests out of their net income rather than from appropriations, will balance the incentives that govern forest management.

Because ecological problems are complex and long-term, Gordon Robinson's artistry will probably never be embodied in an act of Congress. However, my legislative reforms will solve numerous environmental problems without precluding—indeed, while encouraging—the artistry presented in Robinson's book.

Randal O'Toole
Eugene, Oregon

I noted in the subhead text to "Who *Are* Those Guys?" ("Afield," September/October) that you intended to introduce the federal politicians who act as "wilderness power-brokers" sometimes affectionately and sometimes critically. You did not, however, add "sometimes inaccurately."

First, you introduced me as the former president of the Great Lakes Chemical Association. Frankly, I have never heard of any such group. I *did* work as an assistant to a vice-president of Great Lakes Chemical Corporation at its headquarters in West Lafayette, Indiana. My duties were administrative and not connected to chemical production.

As for your references to my tenure as

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Indiana's Director of Natural Resources, we did add a few rooms to and modernize the Abe Martin Lodge in beautiful Brown County State Park—but no parking garages. And we did add a slide to the shallow end of a couple of other state parks' swimming pools; there was no criticism, only pleasure expressed by youngsters and their parents.

James M. Ridenour, Director
National Park Service
Washington, D.C.

HAY BALES AND BILLBOARDS

"Climate Shock: A Global Warming" (July/August) was excellent and timely. My only comment is that it may be optimistic to anticipate a doubling of preindustrial CO_2 as late as 2090 (as suggested on page 36). My own models of the mankind-air-sea CO_2 system have, since 1973, consistently given 2025–2030 for this date. Any model should be taken with a grain of salt, of course, but I built mine because I kept finding errors in others', and every correction I made cut the time down.

Just in case I was right, I have over the last 15 years learned to reduce my electricity consumption by 50 percent, to live without a car, to run my house without fossil fuel, and to buy nothing that I can't figure out how to recycle. While such measures may appear Spartan, no lesser response seems adequate, and if taken gradually and intelligently need not lower one's standard of living. It is mostly a matter of substituting thought for coal and oil.

Two approaches that require the reeducating and restructuring of financial, industrial, and governmental institutions might be worthy of consideration:

First, hay bales sequester fixed carbon as well as trees do, have low thermal conductivity, and—covered with plaster—have been found in good shape insulating thick walls of 100-year-old houses. It takes much less fossil fuel to produce hay than fiberglass! A wall of hay bales is self-supporting in a post-and-beam structure.

Second, the temperate soils of the world have been losing humic carbon steadily since we discovered agriculture. "Organic" agriculture—specifically, the plowing under of green manures—will slowly reverse this process and thus offer

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multiple benefits: better soil structure and water retention, which will be increasingly important as the temperature rises; less demand for chemical fertilizers, which are energy-intensive materials; and removal of CO_2 from the atmosphere.

Ferren MacIntyre, Ph.D.
Bergen, Norway

Showing Gannett's "Holy Ozone" billboard and captioning it a "public service" (July/August, page 31) is self-contradictory. Gannett, 3M, and the other national outdoor-advertising companies have long used the public-service-message ploy as a political maneuver. Whenever legislation promises to restrain their theft of the public visual environment for use as an involuntary advertising medium, out come the free billboards pitching Little League baseball, MADD, and Girl Scout cookies. As you have once again demonstrated, this tactic works.

Alan Cunningham
Berthoud, Colorado

MADAGASCAR

Upon my return from a year's stay there, I was delighted to find Margaret L. Knox's article about Madagascar ("No Nation an Island," May/June). I applaud your effort to publicize the incredible ecological diversity and severe environmental problems found there. The photographs are wonderful and convey very well the beauty of the land and the people.

However, the problem of deforestation is treated too superficially in this very brief article. Placing the "blame" for close to a century's deforestation on the shifting cultivation practices of poverty-stricken peasants is blaming the victim. Conceiving the problem in this way ignores nearly 80 years of colonial and neocolonial, extractive, export-oriented land-use practices. Much of the fertile coastal lands are dominated by coffee production, which provides over 40 percent of Madagascar's foreign-exchange earnings. This forces many peasant cultivators to cut down tropical forests in order to grow food crops. Colonists also cut down rainforests for security reasons, to export valuable and rare timber such as palisander, and to

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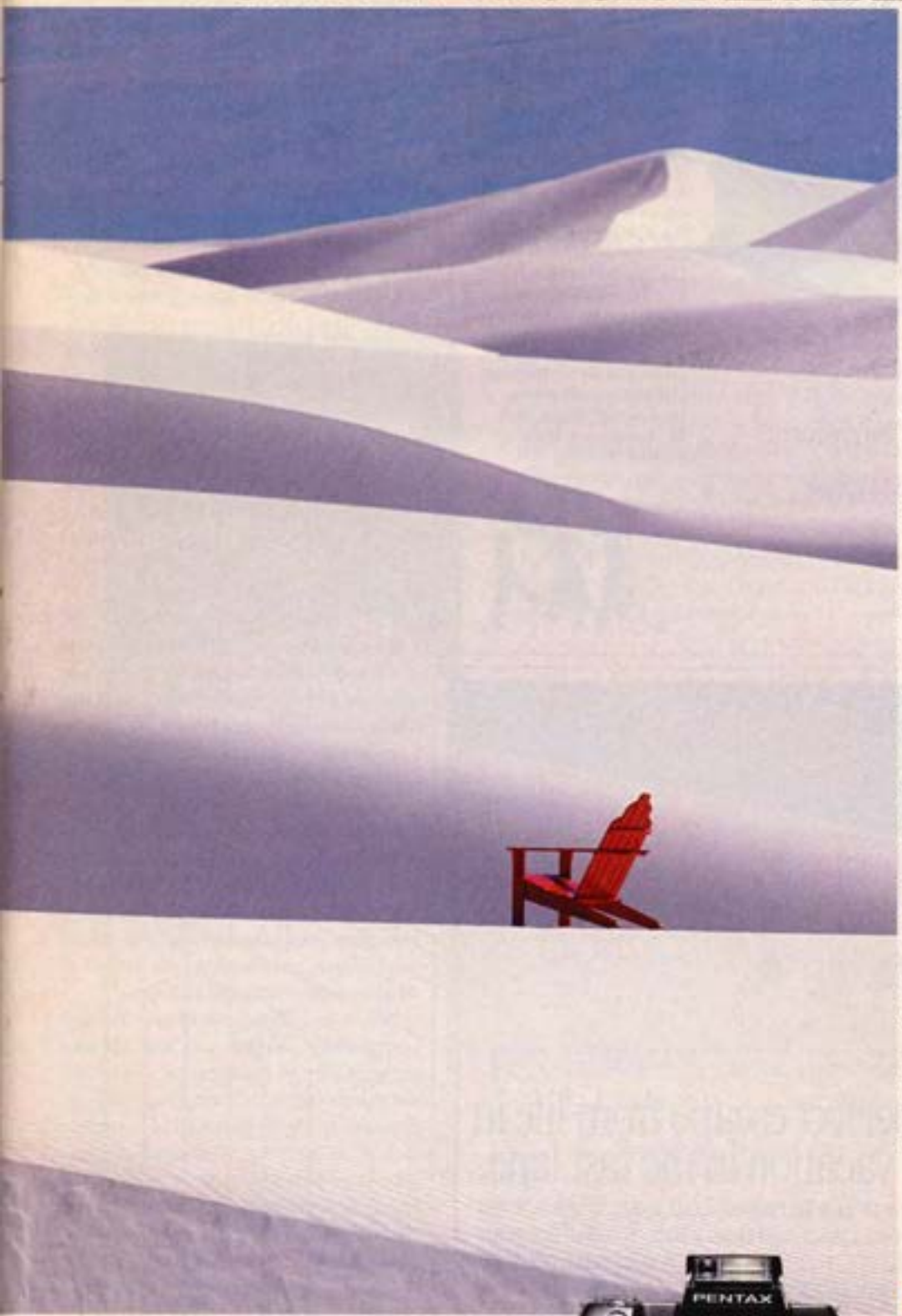

Photo by James Robinson

It had been 115° since 9 a.m. And as a wind began its ascent from the west something jolted the horizon. A red adirondack chair that seemed to smell of pine. The rest is photography. The Pentax art of photography.

Perhaps a moment like this doesn't occur often, but when it does there's an urgency, a quickness of breath that demands a camera that can capture that mood. That camera is the Pentax SF10 with its PROCES Metering System.

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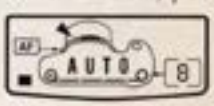

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Ektar 25. The genius is in the details.

clear the land for non-food export crops such as coffee and vanilla. Environmental degradation is tied to history, politics, and economics. In the poorer countries of the world it is all too frequently a by-product of colonial and neocolonial domination. Madagascar is no exception to this rule.

I am also dismayed at the uncritical acceptance of plow agriculture and green-revolution technology as solutions to ecological degradation. It seems to me that plows would exacerbate erosion problems on deforested slopes. How would impoverished peasants afford plows and draft animals even if they were culturally acceptable? Where would draft animals find forage on an already-stressed landscape? Even though peasant refusal to take up plows is explained metaphorically, it seems to make a lot of sense given the added stresses these inappropriate technologies would pose. Green-revolution technology was introduced in other regions of the island in the 1960s and 1970s with dubious and ambiguous results.

The causes of and solutions to deforestation are much more complex and multifaceted than suggested in this all-too-brief article. *Sierra* readers, and the Malagasy people, deserve more.

Lucy Jarosz
Oakland, California

Margaret L. Knox responds: The effect of European intervention in Africa is a topic for endless debate. The best-intentioned aid agencies as well as the most rapacious colonialists—neo- and otherwise—have contributed to the decline of African ecosystems and cultures.

No matter whom we blame, foreign corporations, banks, and aid agencies are probably in Madagascar to stay. So are the problems of land abuse and deforestation—both peasant and commercial. Considering Madagascar's explosive population growth, neither the foreign-development expert nor the Malagasy peasant has the whole answer. Solutions will have to arise from a combination of traditional wisdom and modern expertise.

The Ranomafana rainforest project's recognition of a local taboo against plowing seems to me to be a positive development. ■

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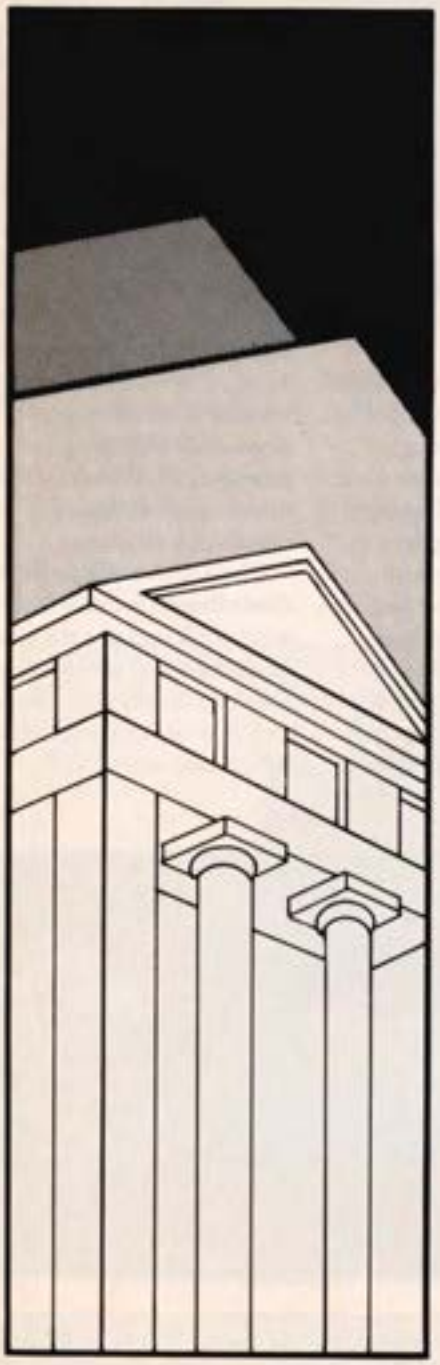

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JOHN MUIR'S SCOTLAND

From a single summit in the Scottish Highlands an adventurous climber can see snow-covered peaks, deep glacial glens, sandstone hills, and waves of 2-billion-year-old gneiss: a grand view befitting the country where Sierra Club founder John Muir was born, and where he lived for 11 years before immigrating with his family to Wisconsin.

But while Muir later helped preserve many such wild places in the United States, no one made a similar effort to protect his native lands. Today only the highest, most remote peaks in the Scottish countryside remain ungrazed, unlogged, or undeveloped.

Now an organization named for Muir hopes to conserve what's left of the wild United Kingdom. "We felt that some of the agencies that manage Britain's public lands were becoming branches of the tourist industry," explains English journalist Christopher Brasher. Together with Denis Mollison and Nigel Hawkins, who had been on the Council of the National Trust for Scotland, and with English novelist Nicholas Luard, Brasher cofounded the John Muir Trust in 1983. Four years later the Trust completed negotiations for its first purchase, a 3,100-acre tract in the western Highlands district of Knoydart.

The group is unique in Great Britain because "we want wilderness for the sake of wilderness," says John Davies, a forestry consultant and chair of the Trust, which now boasts some 1,000

AROUND MY NATIVE TOWN OF DUNBAR, BY THE STORMY NORTH SEA, THERE WAS NO LACK OF WILDNESS, THOUGH MOST OF THE LAND LAY IN SMOOTH CULTIVATION. . . . I LOVED TO WANDER IN THE FIELDS TO HEAR THE BIRDS SING, AND ALONG THE SEASHORE TO GAZE AND WONDER AT THE SHELLS AND SEAWEEDS, EELS AND CRABS IN THE POOLS AMONG THE ROCKS WHEN THE TIDE WAS LOW; AND BEST OF ALL TO WATCH THE WAVES IN AWFUL STORMS THUNDERING ON THE BLACK HEADLANDS AND CRAGGY RUINS OF THE OLD DUNBAR CASTLE WHEN THE SEA AND THE SKY, THE WAVES AND THE CLOUDS, WERE MINGLED TOGETHER AS ONE.

JOHN MUIR, *THE STORY OF MY BOYHOOD AND YOUTH*, 1913

PHOTOGRAPHS COURTESY JOHN MUIR TRUST

members and has 17 trustees, including former Sierra Club President Larry Downing. "We're not putting in facilities for visitors—we want areas that people have to struggle to get to."

The Trust is now working to educate others about the life and philosophies of John Muir, for until recently few Scots knew about the man who has earned such acclaim in the United States. "He's a prophet without honor in his own country," says Davies. "We're making people aware of what a remarkable man he was."

Muir's first hometown is contributing to that effort as well. In 1981 the cottage in which he was born was opened to the public. Located in Dunbar, east of Edinburgh, it now houses a museum dedicated to Muir. Nearby, a clifftop trail winds through the 1,667-acre John Muir Country Park, established in 1976.

The Trust has begun holding celebrations in Dunbar each April to commemorate Muir's birth. As an honored guest at last year's celebration, then–Club President Downing presented the Trust with a $25,000 grant from The Sierra Club Foundation and announced the formation of an account to facilitate future gifts from U.S. citizens.

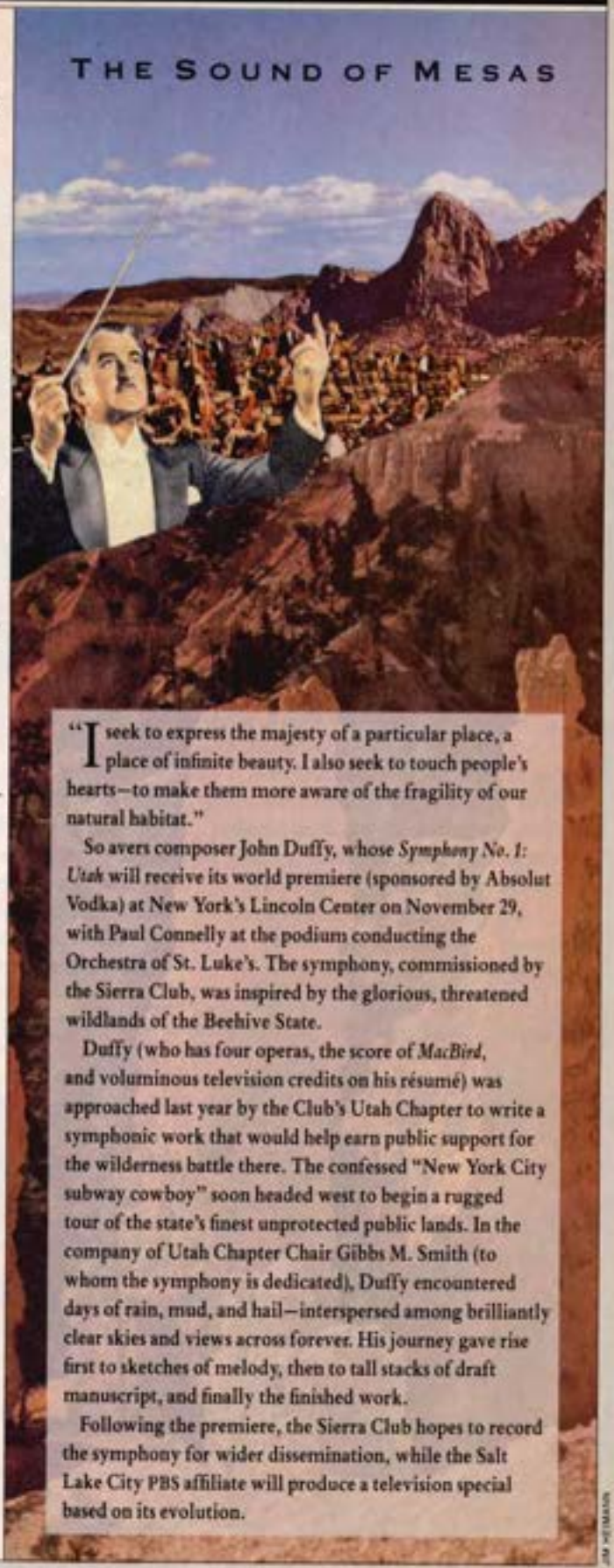
"We value the link of friendship forged with the Sierra Club," says Trust founder Mollison. "We see it as the foundation of an alliance to bring John Muir's ideals home to the land of his birth."

—Barbara Fuller

For information on the work of the John Muir Trust, contact Sierra Club Public Affairs, 730 Polk St., San Francisco, CA 94109.

The Sierra Club will sponsor a two-week outing to Scotland next spring, beginning in Dunbar and including five days in Knoydart (see Outings, page 110).

THE SOUND OF MESAS



"I seek to express the majesty of a particular place, a place of infinite beauty. I also seek to touch people's hearts—to make them more aware of the fragility of our natural habitat."

So avers composer John Duffy, whose *Symphony No. 1: Utah* will receive its world premiere (sponsored by Absolut Vodka) at New York's Lincoln Center on November 29, with Paul Connelly at the podium conducting the Orchestra of St. Luke's. The symphony, commissioned by the Sierra Club, was inspired by the glorious, threatened wildlands of the Beehive State.

Duffy (who has four operas, the score of *MacBird*, and voluminous television credits on his résumé) was approached last year by the Club's Utah Chapter to write a symphonic work that would help earn public support for the wilderness battle there. The confessed "New York City subway cowboy" soon headed west to begin a rugged tour of the state's finest unprotected public lands. In the company of Utah Chapter Chair Gibbs M. Smith (to whom the symphony is dedicated), Duffy encountered days of rain, mud, and hail—interspersed among brilliantly clear skies and views across forever. His journey gave rise first to sketches of melody, then to tall stacks of draft manuscript, and finally the finished work.

Following the premiere, the Sierra Club hopes to record the symphony for wider dissemination, while the Salt Lake City PBS affiliate will produce a television special based on its evolution.

JIM WEIMAN

THE PAPER CHASE

SINCE THE DAYS OF PAPYRUS, PEOPLE COMPELLED TO COMMUNICATE (AND THAT'S MOST OF US) HAVE DEPENDED ON PAPER. BECAUSE THERE WILL BE, WE HOPE, NO END TO THE NEED TO SHARE THE WRITTEN WORD, THE CHALLENGE NOW IS TO REDUCE THE STIFLING STREAM OF WASTE THAT RESULTS FROM THE FREE FLOW OF IDEAS.

Is Used News Bad News?

Ten states and dozens of cities mandate recycling, but in deciding to do so, policymakers may have put the cart before the horse—a cart overflowing with newspapers.

Most recycling laws address only separating recyclables out of garbage; they don't require anybody to buy or reuse the collected materials. Aluminum and glass containers are easy to sell to reprocessors, but newspapers require de-inking, and thus have a more limited market. Consequently, some of the country's brave, new recycling programs are stuck with piles of newspapers that administrators have to pay to get rid of, just like garbage. Indeed, the old news often ends up in the local landfill.

In pre-recycling days, paper dealers could sell a ton of newspaper for $100. But now a ton fetches as little as $12, one third of what it costs dealers to process and transport the paper.

The price has fallen so drastically because more old newspapers are being collected and there are few uses for them. Approximately 5 million tons of newspaper makes its way to recycling bins in the United States each year; most of that is turned into insulation or paperboard, or is sent overseas.

According to Al Hutchison of the American Paper Institute, only 8 of the 21 U.S. newsprint mills (and only 1 of the 40 Canadian mills) recycle newspaper into new paper—most fresh newsprint is made from virgin wood, sawdust, or wood scraps. The other mills would have to buy $50 million worth of de-inking equipment to make recycling profitable, Hutchison says.

Some folks think capitalism can save the day. "The market will turn. It has to," says Judith Silver of West Coast Salvage, a Northern California recycling dealer. "After a while, people will see a huge amount of cheap newspaper in the marketplace, and will find a use for it."

—Susan D. Borowitz

PAMELA PROCHETT ILLUSTRATIONS

Reach Out and Recycle Something

You've got an In box and an Out box—now add a Recycling box. American companies are finding they can cut down on trash-disposal costs, and even make a few bucks, by selling their old reports, memos, and computer printouts to recycling dealers.

In New Jersey, AT&T admonishes employees with messages like this: "AT&T's Recycling Program—It's the Law! Virtually *all* papers are recyclable at AT&T."

The company's program is a direct response to New Jersey's mandatory recycling law. But AT&T has found that the effort also makes good business sense. Cheryl La Perna, the firm's recycling coordinator, reports that in 1988 the company made $190,000 on the 3,800 tons of used office paper it collected. "Ninety percent of our solid waste is paper," says La Perna. "We're a paper factory, no doubt about it."

Other companies are taking similar steps. The Office Paper Recycling Service, part of the Council on the Environment of New York City, has designed 150 corporate recycling programs that together collect 600 tons of paper each month. Merrill Lynch has set up paper-collection areas in its World Financial Center offices; since 1986 the paper has brought in $300,000 and Merrill Lynch has saved $200,000 in trash-hauling costs.

In Rhode Island every employer of more than 500 people is required to submit a plan for reduction and recycling of waste, and some 20 other states are considering comparable measures.

The recycling ball is beginning to roll none too soon. According to the EPA, 80 percent of the nation's paper is put in landfills, but a third of those burial grounds could be closed in three years. The agency is pushing for a 25-percent cut in waste by 1992.

Prodded by new regulations and monetary rewards, the Fortune 500 could make a significant dent in the nation's pile of solid waste.

—Lyndon Stambler

Students Tackle the Fourth 'R'

When schoolkids finish their reading, writing, and 'rithmetic, what happens to all the paper? Instead of filling trash cans with their old tests and book reports, more and more North American kids are filling classroom recycling boxes.

In New York City, the School Paper Recycling Project has organized programs in more than a dozen public and private schools—keeping some five tons of notebook and computer paper out of landfills so far.

Last spring, 16 Ontario schools began recycling students' cans, bottles, and papers. The province's Ministry of the Environment plans to expand the program to every school in 290 Ontario communities.

Students in Berkeley, California, diverted more than a ton of used paper into recycling bins in a three-school pilot project begun last spring. Junior-high students could earn bonus points for field trips by volunteering to monitor the bins, weeding out the potato-chip bags from the high-quality paper. All 15 Berkeley public schools should be participating by early next year.

—Susan D. Borowitz

RESTORATION

The Charge of the Brook Brigades

From Washington to Florida, grassroots groups are working to restore waterways ravaged by the flood-control projects of yesteryear.

Sarah Pollock

TWO YEARS AGO Lewis MacAdams, a filmmaker and poet, received a grant from the Museum of Contemporary Art in Los Angeles to start restoring the Los Angeles River. In bestowing the grant, the museum agreed that the first step in resurrecting the river belonged within the realm of the spirit: Envisioning a living waterway in place of the 50-mile-long concrete trough that now plows its way through the city would take a great feat of imagination. Only about two miles of the river's banks, near Griffith Park in the center of the city, are exposed enough to support life, and the river absorbs polluted runoff from about 200 storm drains on its journey from the San Gabriel Mountains to San Pedro Bay.

"I went with two friends to the most damaged place on the river," MacAdams recalls, where three freeway overpasses cross and railroad tracks line both banks. "We built a totem for the river. We invoked the great sycamore tree. We asked it to start restoring the river, and it is now one of our symbols."

The channelization of the Los Angeles River was one of the first projects executed by the U.S. Army Corps of Engineers in the 1930s, when federally financed flood control entered its heyday. The Flood Control Act of 1938 made federal cost-sharing arrangements for such projects so attractive to local governments that from the 1940s to the early 1970s "channel improvement" projects were constructed on 34,240 miles of waterways by the Corps of Engineers and the U.S. Soil Conservation Service. By 1973 another 200,000 miles of waterways were modified independently by states, counties, and towns.

In past decades these projects seemed like good ideas: Floods *can* wreak havoc on homes and businesses built on floodplains. But today Americans have begun to realize the loss; their streams have been straightened, turned into concrete ditches, and buried so that developments can move right up to the edges and frequently over the area where water once flowed. And people are beginning to rebel. From innumerable neighborhood protests to save small stretches of urban creeks, to a landmark plan by the state of Florida to dismantle a Corps of Engineers project and restore the Kissimmee River to its natural floodplain, ordinary people and big-league planners and scientists are advocating better, cheaper, and more environmentally sound ways to live with creeks and rivers.

In California alone, where an estimated 95 percent of the creekside habitat is already lost, a recent private study documented almost 300 projects aimed

at preserving or restoring urban streams. Particularly unusual is the state government's response: In 1986 the California Department of Water Resources launched an Urban Streams Restoration Program, which provides grants of up to $300,000 for flood- and erosion-control projects that use environmentally sound techniques. Shaped by engineers, hydrologists, plant ecologists, and planners, state-funded projects often stabilize eroding creekbanks by planting native vegetation instead of pouring concrete, to create parklike settings and encourage the return of native fish, birds, and small mammals.

Among the state's recent beneficiaries is a group of citizens in the San Francisco Bay Area city of Richmond who were angered by plans to channelize Wildcat Creek, one of the last fully open streams in the region. With the help of the statewide Urban Creeks Council, these citizens blocked a plan to bury the creek and suggested an alternative flood-control plan based on the model nature provides: a meandering creek channel to convey frequent storm runoffs, flood terraces to accommodate higher flows, and riparian vegetation to stabilize the banks. A team of federal, state, and local agencies eventually adopted the citizens' major concepts—and construction of the Wildcat Creek project, which began in 1984, is nearing completion this year.

California's restoration program is so much in the vanguard of flood management that its director, A. L. Riley, was recently invited to teach Army Corps engineers the new techniques. The Corps, traditionally regarded as an environmentally destructive behemoth, has been trying to adapt to the new era. "The times they are a-changing, to a certain extent," says Doug Shields, a civil engineer at the Army Corps' Waterways Experiment Station in Vicksburg, Mississippi. "There is a growing awareness that streams are amenities and have an economic value. Even some of the states that used to welcome our projects are insisting that we take a more environmentally oriented approach."

In Snohomish County, Washington, 39 schools and 28 community groups have begun restoring their watersheds under the direction of a group called Adopt-A-Stream. Since its founding in

1980 with a public-education grant awarded by the Environmental Protection Agency, Adopt-A-Stream has become a model for citizens in other states, receiving requests for information from people all over the country.

The Izaak Walton League's Public Lands Restoration Task Force, based in Portland, Oregon, has just launched a major stream-restoration project on New Mexico's Blue Water River. In response to a task-force proposal, volunteers are toiling alongside workers from eight state and federal agencies to plant riparian vegetation and work on trails on the public lands near the river. Immediately after that project began, the task force started a similar effort on Forest Service land along the Pineview Reservoir near Ogden, Utah.

Perhaps the nation's biggest and most unusual river-restoration project is being planned in Florida, where 200,000 acres of wetlands at the headwaters of the Everglades were destroyed by flood-control measures in the 1960s. In the process the Corps of Engineers transformed the meandering, 98-mile-long Kissimmee River into a 52-mile-long concrete ditch, and the floodplain was opened to cattle-ranching and housing. The fish population fell by 75 percent, the number of waterfowl dropped by 90 percent, and the ditch began carrying heavy loads of phosphorus and other pollutants from manure.

In the first attempt nationwide to dismantle such a massive project, the state is now committed to rebuilding the river. One current plan would restore meanders to about 40 river-miles and reestablish as much as 10,000 acres of the floodplain. Estimated costs for that and for more ambitious plans range from $50 million to $150 million, says Theresa Woody, associate Southeast regional field representative for the Sierra Club, which supports the project. Most of the costs involve repurchasing land in the floodplain.

For the city of Los Angeles, however, buying back the Los Angeles River's floodplain, which includes much of downtown, would be prohibitively expensive. Short of that, Lewis MacAdams and the group that he founded, Friends of the Los Angeles River, are lobbying for replacement of the river's

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concrete walls with gabions—rock-filled wire baskets in which plants can grow—and for ordinances that require the developers of new buildings along the river to restore streamside vegetation. The group also wants the river's concrete bed to be torn up so that waterfowl and fish can survive.

MacAdams realizes that the project is formidable. "Most people in L.A. don't even know there is a Los Angeles River, so our work is at an elemental level," he says. "It took 40 or 50 years to mess up the river, so it will probably take that long to fix it."

SARAH POLLOCK *teaches journalism at Mills College in Oakland and is editor of* Pacific Discovery, *the magazine of the California Academy of Sciences.*

LAW

Stand Up and Be Sued

As if activists didn't have enough to worry about, they—and their causes—can find themselves locked in a legal morass.

Jim Stiak

A COLORADO WOMAN circulates a petition to stop a proposed housing development. The developer sues her for defamation.

■ A West Virginia farmer informs the Environmental Protection Agency that a coal company polluted the Buckhannon River and killed all the trout. The coal company files a $200,000 suit against him.

■ Two citizens groups use lawsuits, demonstrations, and letters to local newspaper editors to fight construction of a solid-waste incinerator in upstate New York. Washington and Warren counties countersue for more than $1.5 million.

The message of these suits (and hundreds like them) is clear: Free speech can be expensive. The civil lawsuit—particularly the multimillion-dollar lawsuit—has become an increasingly popular means of stifling political dissent, and only recently have victims begun learning how to strike back.

University of Denver sociologist Penelope Canan and law professor George Pring have identified more than 225 of what they've termed SLAPPs—Strategic Lawsuits Against Public Participation. The two became interested in the trend after noticing a number of suits being filed against environmental groups in the 1970s. But even with the aid of a $175,000 grant from the National Science Foundation, their research, they say, has only scratched the surface of the problem. Every year, they wrote in the journal *Social Problems* last December, "hundreds, perhaps thousands, of civil lawsuits are filed that are aimed at preventing citizens from exercising their political rights or punishing those who have done so."

"Our judicial system is being used to chill debate on public issues," Pring says. "It raises some real concerns about the future of citizen participation in American democracy."

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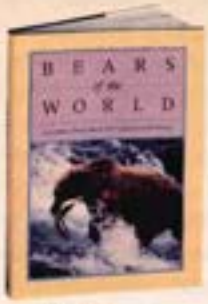

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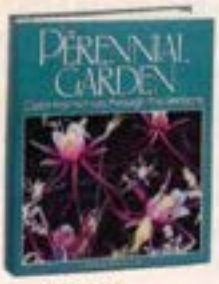

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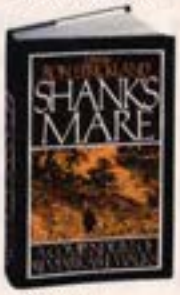

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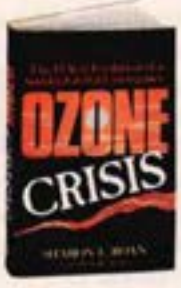

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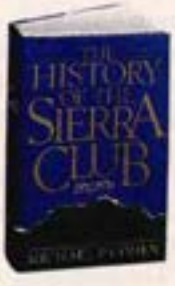

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izens the right to "petition the government for a redress of grievances." And indeed, most SLAPPs are thrown out of court for this reason—almost 90 percent of the suits cited by Canan and Pring were eventually dismissed. But "the point of these suits isn't to win," says attorney David Atkin. "It's to intimidate." In the meantime defendants face lengthy court procedures—an average of 37 months in the ones Canan and Pring studied—and the accompanying legal fees.

In 1987 Atkin represented the "Sapphire Six," a group that protested the logging of old-growth forests in Oregon's North Kalmiopsis roadless area. As punishment for their behavior, the six received short jail terms and were ordered to pay several thousand dollars in fines and restitution; then the Huffman & Wright logging company filed a civil suit against them and won $25,000 more in punitive damages.

"Some of the people feel it'll be a long time before they do anything like that again," says Karen Wood, one of the defendants. "It shakes your faith in our legal system."

Filers of the suits, however, deny that intimidation is their goal. "I don't spend that kind of money to intimidate," says Harold Huffman of Huffman & Wright. "I don't believe they have the right to physically keep me from my means of support."

John Findley of the Pacific Legal Foundation, which handled a $3-million workers' suit against the Abalone Alliance in 1982 after the group staged a nonviolent protest against Southern California's Diablo Canyon nuclear plant, says his clients were only fighting fire with fire. "The purpose of the demonstration," he says, "was to intimidate the plant workers."

To get around the First Amendment, SLAPP filers sue for defamation, business damage, conspiracy, or other personal injury—thereby, as Pring puts it, "masking the original nature of the dispute." He says that now, when citizen suits are used increasingly to enforce health, safety, and welfare laws, SLAPPs waste both judicial and citizen resources on what he calls "non-solutions."

"Perhaps the most offensive aspect of intimidation suits," Pring says, "is that they actually impede solution of the underlying public-policy issues. One side can take a public political dispute and transform it into a private legal dispute. Most of the time, the judge who's ruling on the SLAPP cannot resolve the original dispute."

Canan and Pring report that in the cases they studied, the most common actions triggering SLAPPs were "filing litigation, making formal government protests, reporting violations of law, testifying (even just appearing) at public hearings, and submitting written opinions." The damage claims ranged from $10,000 to $100 million, with an average of $9.1 million. Most of the targets were individuals, while most of the filers—usually developers, public utilities, alleged polluters, and state and local governments—were "acting on economic or occupational interests."

Environmental groups are often a target: The Sierra Club, for example, has been hit with at least five SLAPPs. In a 1972 case that Pring calls the "great-granddaddy of them all," a timber company sued for $500,000 after the Club went to court to stop logging next to the proposed Salmon–Trinity Alps wilderness area in California.

The Sierra Club has also been sued for interfering with a California timber-cutting contract; for supporting an attempt by an Alaskan Indian village to block logging on its traditional hunting grounds; for suing the U.S. government for failing to protect the Grand Canyon from misuse by river rafters; and, together with several individuals, for opposing a resort in California's Squaw Valley. The Club has won each of these cases, but often only after costly and lengthy legal battles.

For large organizations, the toll is heavy; for individuals with limited resources, it can be overwhelming, costing not only legal fees and lost time, but also, according to Pring, "lost wages, psychological insecurity, and potential credit and insurance problems." It's not surprising, then, that Pring considers the 225 documented SLAPP cases the tip of the iceberg. There are "many more cases you'll never discover," he says, because activists were forced to back off from issues when they were threatened with lawsuits.

Judges already have the tools to discourage some SLAPPs: They can fine those who file frivolous suits, dismiss suits quickly, and require filers to prove that the defendants are not protected by the First Amendment. But the most effective solutions may be outside the courts. In some cases, the suits have galvanized the very people they were intended to silence. Betty Johnson, the Colorado housewife who was sued by a housing developer, followed up on her suit with a successful bid for a seat on her city council.

And perhaps the most powerful weapon against these suits is what's been dubbed the "SLAPP back." In some 20 percent of the cases that Canan and Pring have identified, the defendants have turned the tables and sued the suers, with some impressive results:

- After three California citizens groups helped pass a 1980 moratorium on housing developments in the city of Saratoga, one developer, the Parnas Corporation, filed a $40-million suit against them. The case was dismissed by the court. Victor Monia, the president of one group, sued Parnas for malicious prosecution; in May 1989 a jury awarded Monia $260,000 in damages.
- After a Sacramento lawyer, Raymond Leonardini, disclosed that a plastic pipe manufactured by Shell Oil contained the animal carcinogen DEHP, Shell sued him. But when the suit was dismissed, Leonardini countersued, and in May 1986 a jury ordered Shell to pay him $5.5 million in punitive damages.

"I think we're going to see a lot more 'SLAPP backs' filed," Pring says. "I expect they will become absolutely routine as lawyers realize that they can actually slap back, and with a big chance of winning some big bucks."

"Nothing is more educational than high jury awards," Canan says. "Without that, suers will still think the SLAPP is a rational business strategy even if they lose the original case. But if it hits their pocketbook, word will get around."

JIM STIAK *is a freelance writer in Eugene, Oregon.*

NATIONAL PARKS

Yosemite National Parking Lot

By next year the fabled valley will finally be free of cars and commercialism. (And the falls will flow upward. . . .)

Keiko Ohnuma

AS THE SUN SINKS behind the towering granite walls that surround Yosemite Park & Curry Company's offices, Garrett DeBell surveys the landscape of documents in front of him with a sigh. "I don't know why people keep saying that not much has been done about the General Management Plan," says the environmental consultant for Yosemite National Park's concessionaire.

"A lot has been done," DeBell continues. He ticks off the improvements: a recycling program, the removal of some houses and a golf course from Yosemite Valley, and the return of peregrine falcon and bighorn sheep to the park's backcountry. "But a lot needs to be done," he adds.

Indeed, these developments, however admirable, do not represent great strides forward in implementing the 1980 Yosemite General Management Plan (GMP), which calls for greatly reducing the concessionaire's presence in the park.

Concern about the National Park Service's commitment to its own management plan heated up this year when the agency proposed building permanent housing in the valley for 490 Curry Company employees—in direct contradiction to the plan, which calls for moving most of the valley's 1,500 permanent and seasonal workers out.

Yosemite's management plan—which emphasizes natural, not commercial, resources—is considered sacred by many conservationists, who saw many of their ideas formally adopted only after 12 years of exhausting analysis. Bowing to public furor over a draft plan that appeared to have been orchestrated by the Curry Company (a subsidiary of entertainment giant MCA), in the mid-1970s the Park Service solicited

GALEN ROWELL - MOUNTAIN LIGHT

If not for Half Dome, it could be Manhattan.

and for relocating nonessential offices, warehouses, services, and employee housing out of the valley by 1990. In short, it mandated doing away with the shopping-mall appearance of the most awe-inspiring seven square miles of the park.

More than nine years later, Park Service and Curry Company protests to the contrary, most of those goals remain on paper. Lodging has not been reduced in the valley, nor have administrative offices been moved. Visitors can still play tennis, rent videos, and shop for clothes, kitchen utensils, artworks, and sports equipment—what Becky Evans, chair of the Sierra Club's Yosemite Task Force, calls "a lot of crap that has nothing to do with Yosemite, the Sierra Nevada, or the national parks."

DeBell points out that the Curry Company has moved its reservations, purchasing, and freight operations out of the valley. (The company, however, has since moved other personnel into those facilities.) The Park Service has made some headway, notably by replacing the valley's aging sewage system, prohibiting private vehicles in the valley's eastern end, and building 24 employee apartments outside the park in the town of El Portal.

But the concrete, congestion, and commercialization remain. The problem, says the Park Service, is a lack of money. Faced with the austerities of the Reagan era, former Park Superintendent Jack Morehead (who ran Yosemite from 1987 to 1989) pronounced the GMP's goals "unattainable": El Portal doesn't have the space to absorb an employee exodus, and the road leading into the park is too narrow to support commute traffic. Wawona, an alternative site, doesn't have enough water, and other towns are too far away. The proposed parking areas, it turned out, are habitat for great gray owls.

As for the services targeted for removal, the terms of the Curry Company's contract would force the Park Service to buy the concessionaire's inter-

and received the most extensive public input in its history.

The document that was finally approved called for reducing the valley's traffic, parking, and lodging facilities

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est in them and pay for lost profits. The sensible thing to do, Morehead believed, was to "re-evaluate" the GMP, which the Park Service has done in the "Draft Yosemite GMP Examination Report," released in August. It calls for environmental impact studies before the employee-housing project and other developments can proceed, but offers little near-term hope for the major goals of the management plan. (The draft is open to public comment until late November. Write to National Park Service, Western Regional Office, 450 Golden Gate Ave., San Francisco, CA 94102.)

The report places the blame for the lack of progress squarely on budget constraints, and suggests that the park should resign itself to "incremental improvements over a longer time frame." One of the 1980 plan's more significant proposals—drastically cutting the use of private cars—will not be carried out until sometime next century, if ever.

Not everyone accepts the Park Service's reasoning. One agency staffer calls the question of money "a smokescreen for getting down to the nuts and bolts of implementation." He and most conservationists admit that the GMP's ten-year timetable was unrealistic, but maintain that the public's wish for less development is not negotiable. "I think problems can be solved, although they can't always be solved easily or quickly," says the Sierra Club's Evans. "The bottom line," says Bob Binneweiss, who served as park superintendent from 1976 to 1986, "is a resistance on the part of the Park Service to the whole idea of managing Yosemite in a different way."

Whether Yosemite will be treated "as a commodity or a park," as Binneweiss puts it, will be clear by 1993, when the Curry Company's 30-year contract comes up for renewal. Stricter contract terms represent the best chance of implementing the GMP, because the Park Service can stipulate the removal of buildings and employees.

Pessimistic Yosemite-watchers believe the Park Service won't butt heads with the Curry Company because of "sweetheart" sympathies—a charge the agency vehemently denies. "*We* are responsible for defining what is an appropriate level of service," says Park Service landscape architect Don Fox, who reviews construction proposals for the park. But there's no denying that the Curry Company, supported by the resources of MCA and operating under a very generous contract, has political, practical, and public-relations clout that the financially strapped Park Service is hard-pressed to match.

Yosemite's problems don't begin and end in the park. Conservationists concede that administrators on the front lines are crippled by a lack of direction from higher levels of the Interior Department, which under the Bush administration has continued the budget-slashing ways of the Reagan years.

Nevertheless, Binneweiss believes that the Park Service has the advantage over the long run, because it has the public on its side. In the absence of a pro-conservation attitude on high—which would be backed by funds to support the park-management plan—only widespread public involvement can protect Yosemite Valley. ■

KEIKO OHNUMA *is a former* Sierra *editor and a freelance writer in San Francisco.*

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TOXICS

Though manufacturers and marketers may not appreciate it, Proposition 65 keeps California consumers informed about hazardous chemicals normally kept under wraps.

Forewarned Is Fairly Warned

"America's major laws for controlling toxic materials are not working," wrote Sierra Club Political Director Carl Pope in Sierra *in 1985 ("An Immodest Proposal," September/October). "People want a margin of safety to ensure that they are being protected. The task of toxics laws and regulations is to provide the public with this 'margin of error,' a measure of protection against an industry with a very limited concept of responsibility toward public health and the environment."*

Pope's article, widely distributed, served as the intellectual underpinning of a popular movement to bring hazardous chemicals out of the closet. In 1986 an environmentally conscious and concerned California electorate heeded Pope's message and overwhelmingly passed Proposition 65, the toughest toxics-control law the nation has ever seen. The following article surveys the political landscape in which that law now operates.

Cristine Russell

IT IS THEATER in the round at the barnlike Wyatt Pavilion on the campus of the University of California at Davis. But the people on the raised stage are not actors, and the audience is obviously not a student crowd. Instead, a phalanx of briefcase-bearing representatives of industry and government, more than 100-strong, has come to hear a 12-member scientific advisory panel deliberate about which chemicals cause cancer or birth defects.

The play is called Proposition 65, a long-running drama without an ending that is being watched around the world as a harbinger of what can happen when citizens take control of toxic chemicals into their own hands.

Persuaded by a colorful cast of environmental, consumer, and labor activists, California voters handily passed Prop. 65 in November 1986. Formally called the Safe Drinking Water and Toxic Enforcement Act, the law's breadth went far beyond existing state or federal toxics-control laws.

Proponents billed it the toughest weapon to date in regulating toxic chemicals, while critics called it more of a bludgeon. But only now is rhetoric being replaced by reality as the state of California seeks to implement what the voters hath wrought. The outcome could shape commerce across the country, changing the way major products are sold, packaged, and labeled.

Proposition 65 forces the hand of government and industry. It orders the governor to create a list of chemicals "known to the state to cause cancer or reproductive toxicity." It puts the burden on business to provide "clear and reasonable" warnings to those who may be exposed to designated chemicals in consumer products, the worksite, or the environment. It prohibits discharges of the listed chemicals into the drinking-water supply. And it allows exceptions only if a chemical is shown to pose "no significant risk."

"Prop. 65 threatens the whole rabbit warren of nooks and crannies in existing laws," says David Roe, a lawyer for the Environmental Defense Fund (EDF) and a principal draftsman of the new law. "It says, 'Here's the line. Are you above or below?' It turns out to be a powerful approach."

"The law really gets at all paths of exposure, whether workplace, environment, or consumer products," says Steven Book, the state's science adviser on Prop. 65. "It shifts the burden of proof to industry."

Despite a slow start, Republican Governor George Deukmejian has already listed about 300 chemicals, including some 260 cancer-causing substances and 35 reproductive toxicants.

The state's first major actions have focused on some familiar dangers: alcoholic beverages and non-cigarette tobacco products, such as cigars and pipe tobacco. As of April 1, warnings about the dangers of secondhand cigarette smoke began appearing in bars, restaurants, and businesses. There are also warnings about chemicals in hardware stores, in dry-cleaning businesses, and at gas stations.

Affected industries and government agencies are coming to realize that Prop. 65 has potential repercussions in virtually every area of risk: assessment, regulation, and management of toxic substances, as well as communication of the risks to the public. It raises tough questions of science (What is "no significant risk"?), turf (What is the role of the state versus federal laws and agencies?), and ultimately impact (What is a "clear and reasonable warning," and when do too many warnings become unreasonable?).

California can be either a trendsetter for the nation or an aberration, and powerful business opponents across the country have sought to portray the law in the most dire terms: It will send industry out of the state, create chaos in the federal regulatory laws, confuse the consumer with an overabundance of warnings on just about everything in sight, and cause a liability nightmare, they say.

"As other states watch California's experiment, it is worth asking whether this new law will indeed improve human health or whether it is just another novelty from the land of fruits and nuts and sunshine," wrote Michele Corash, a San Francisco lawyer and counsel to the Environmental Working Group, an industry coalition.

"It's a frontal assault on the federal regulatory system," says Eve Bachrach, a lawyer with the Proprietary Association, a Washington-based trade group representing the over-the-counter drug

industry. "California wants to preempt the country."

On the other side, the EDF, the Sierra Club, and other groups responsible for the law's creation are seeking to demonstrate that Prop. 65 is a law that can work, and not an off-the-wall creation of California crazies.

translated the law in a way that has drawn grudging support, if not agreement, from both sides. It has not gone far enough for environmentalists, but too far for industry's comfort.

Setting a tone of quiet reasonableness amidst the competing camps is Undersecretary of Health and Welfare Thomas

shattering, at the very least. In a state where crucial issues are often taken directly to the voters rather than hashed over by the legislature, Prop. 65 appealed to public concerns about toxic chemicals, mistrust of government and business institutions, and desire to gain some control in the process.

Proposition 65's creators, particularly the EDF's Roe and Sierra Club Political Director Carl Pope, were frustrated that the traditional approach offered by federal environmental laws had allowed—even encouraged—endless delays on the part of regulators and the businesses they regulated.

Implemented on a case-by-case basis, the federal Safe Drinking Water Act, the Toxic Substances Control Act, and the air-toxics section of the Clean Air Act had led toward specific regulation of fewer than two dozen dangerous chemicals each, averaging not much more than one chemical per year, notes Roe. The federal Occupational Safety and Health Administration had also been tediously slow in acting on specific cancer-causing chemicals.

Under such statutes the burden was on the federal government to prove that a chemical is hazardous and to develop a standard for controlling it. Under Prop. 65, the onus is on industry.

"Industry has tried to paint the law as totally outrageous and draconian," complains EDF lawyer Roe. He insists the law was intended to put "real warnings on the few things that need them."

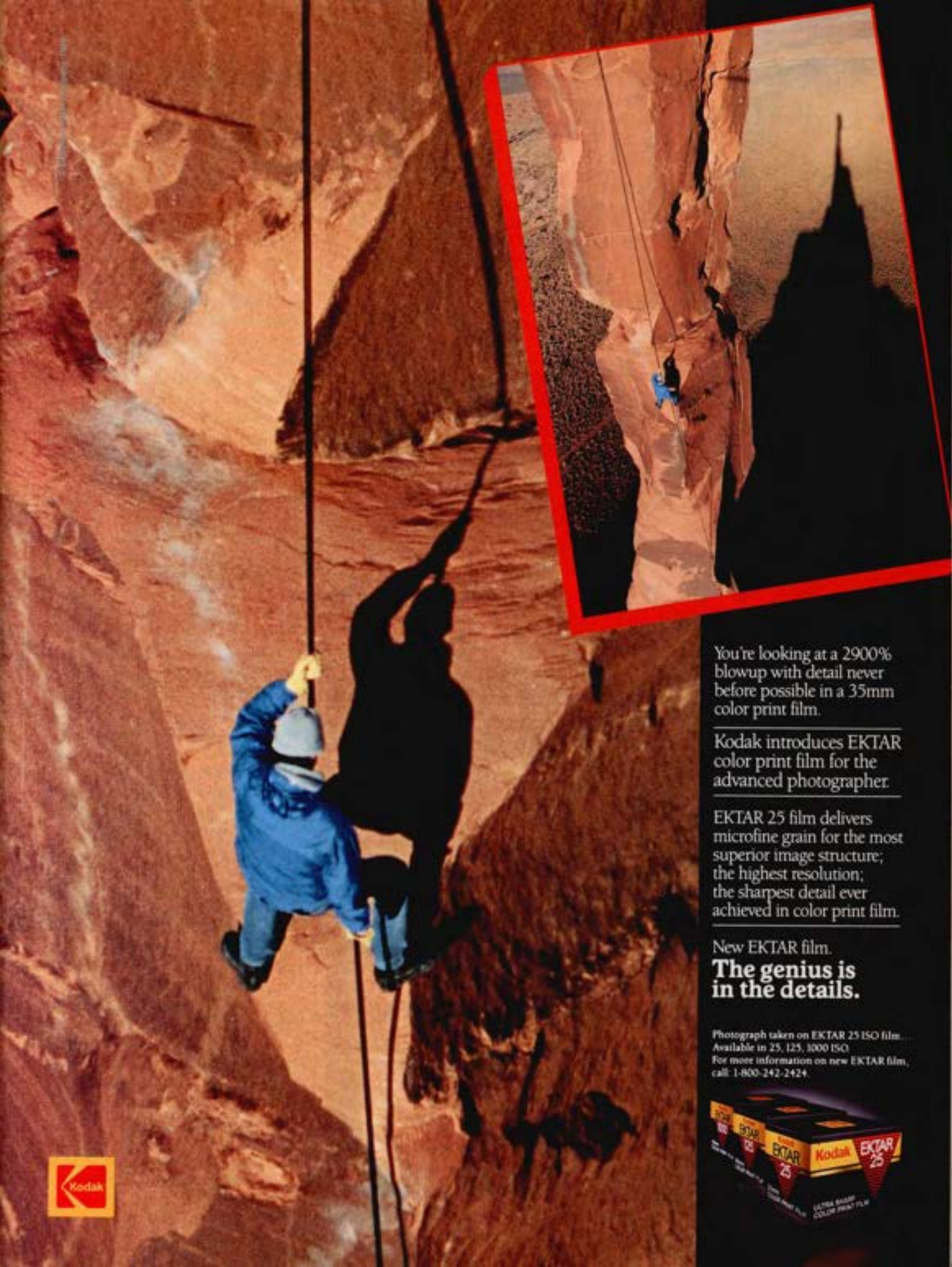
Walking a tightrope down the middle has been the state's Department of Health Services, charged by the governor with carrying out the law. Despite opposition from the Republican administration prior to Prop. 65's passage, the department's leadership has largely

Warriner, an unflappable lawyer whose more than 20 years of service in state government have honed his ability to merge science, policy, and politics. "I'm not obligated to do anything stupid. We've done things that make sense," he says. Three years after Prop. 65's passage, he is pleased that it is slowly but surely moving along without causing California to slide into the Pacific.

In the beginning, however, the battle over the proposition made it seem earth-

Opponents of the measure saw it not as a preventive health measure but as a misdirected use of resources. "The simple scientific fact of the matter is that man-made carcinogens represent only a tiny fraction of the total carcinogens we are exposed to, most of which are natural substances such as tobacco, alcohol, and chemicals in green plants," read the ballot argument opposing the initiative.

By a vote of 63 percent to 37 percent,



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however, the public supported the novel proposal, even though industry outspent the "Yes on 65" campaign by about 6 to 1.

In theory, at least, the state government could have played a minimal role, letting the courts define and enforce Prop. 65 through a sea of litigation. But, as Roe predicted, there was pressure from industry for the state to give some direction to the bare-bones language of the ballot initiative.

The state's strongest actions thus far have gone in a direction that Prop. 65's proponents may not have foreseen. While the campaign rhetoric focused largely on environmental pollution, the implementation has targeted chemicals of lifestyle as well. "The two most dangerous things people do are abuse alcohol and use tobacco. We saw an opportunity to deal with public-health issues," Warriner explains.

The 12-person scientific advisory panel on the Wyatt Pavilion stage was selected by Warriner to advise him on Prop. 65 implementation. The panel first recommended that alcohol be listed as a "reproductive toxicant," based on growing evidence that even small amounts of alcohol during pregnancy can pose dangers to the developing fetus. As of October 1, 1988, signs began appearing in grocery and liquor stores, restaurants, and bars throughout the state, warning that "drinking distilled spirits, beers, coolers, wine, and other alcoholic beverages during pregnancy can cause birth defects."

Later, the panel also indicted alcohol as a carcinogen because of evidence that long-term abuse can lead to liver damage and liver cancer. Additional warnings that alcohol abuse poses a cancer risk were required by mid-1989.

Despite the strong wine lobby in California, the panel and state did not flinch in listing alcohol, although the state regulations did allow the alcohol warnings to be posted as signs rather than placed on the label itself.

In late 1988, after a two-decade debate, Congress passed a federal alcohol-warning law that may have been spurred

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by Prop. 65. The law requires that by November 1989 all alcoholic beverages carry the warning: "According to the Surgeon General, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects. Consumption of alcoholic beverages impairs your ability to drive a car or operate machinery, and may cause health problems."

Even when the federal warning—which doesn't mention a cancer risk—goes into effect, Prop. 65 warning signs will still be required in California, say state officials.

California took a similarly stern approach toward tobacco products (other than cigarettes) for which no federal health warnings are currently required. Under Prop. 65's aegis, warnings must be posted that pipe tobacco, loose tobacco for roll-your-own cigarettes, and cigars contain chemicals that can cause cancer or reproductive harm.

But in preparing emergency regulations in early 1988 to carry out Prop. 65, the state did bend, at least in part, to the demands of the food industry. Taken aback that an environmental law would cross over into the supermarket, food manufacturers have been among the most vigorous opponents since the law was passed. In a major lobbying effort, grocery, cosmetics, and drug producers sought out-and-out federal preemption in areas under the Food and Drug Administration's jurisdiction.

Following the advisory panel's recommendation, the state took a compromise position, adopting temporary regulations that allow existing FDA standards to apply to food, drugs, and cosmetics on an interim basis.

Warriner stresses that he gave the industry a reprieve in time, but not the exemption it sought. He says that as the state looks at the chemicals in each of these products, FDA interim standards will be phased out in favor of state standards, if the latter are stricter.

In the meantime, a battle has erupted within industry factions over how to alert the public to hazardous chemicals. Initially, perhaps out of concern about

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citizen suits for failing to caution the public, some companies took out vague, blanket warnings that explained little. For example, a "community notice" ad placed in San Francisco Bay Area newspapers by members of the Peninsula Industrial and Business Association warned that "the following facilities contain chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm." A long list of companies like Hewlett-Packard and Data General followed, but readers were not told just what chemicals they were using.

Another strategy was developed to deal with consumer products, particularly in supermarkets and other retail outlets. While the stores did not want responsibility for posting individual warning signs on their shelves, manufacturers didn't want to put the warnings right on the package labels. Instead, under the auspices of an industry-backed group called the Ingredient Communication Council, Inc. (ICCI), notices were posted in stores telling customers to call a toll-free number if they had any questions about the hazards of specific products sold there.

Proposition 65 proponents quickly dubbed the number 800-BALONEY, saying it was impossible to warn the public adequately this way. In August 1988 four environmental groups gave notice that they were ready to test the 800 number in the courts, targeting certain tobacco products and supermarket chains for the first major enforcement action.

[Last August a California superior court judge ruled that the 800 telephone line "does not provide clear and reasonable warnings," because it fails to provide warnings before exposure.]

In October 1988, state Attorney General John Van de Kamp sued eight retailers and twenty-five tobacco companies for failing to comply with the law's warning requirements. Days later, supermarkets decided to force the issue.

Vons, the state's largest supermarket chain, ordered tobacco products removed from its shelves if the manufacturers did not put warnings on their own products. Several other chains said they were contemplating similar actions. The attorney general and tobacco companies soon settled part of the suit, with the companies opting to put warnings on their products by March 1989.

The action has national importance. Although directed initially at tobacco products, all other consumer-product manufacturers are on notice that they too must label or certify that their products do not contain significant amounts of hazardous chemicals. If the manufacturers are forced to label products they sell in California, they are more likely—for reasons of convenience, cost, and legal liability—to do the same elsewhere.

It is unclear how Prop. 65 warnings will affect consumer behavior. Susan Hadden, a University of Texas associate professor who has written a book about warning labels and is completing one on right-to-know laws, is skeptical about the generic warnings that have been used by industry thus far.

"Everything we know about labeling and providing people with information says the way Prop. 65 is working right now is not likely to be successful," she says. "When people see the same words over and over again they just blank them out." Hadden believes that the law's most positive effect is that it may "put pressure on industry to consider how much it needs to include those hazardous ingredients."

Roe of the EDF agrees that the warning provision of Prop. 65 will have its greatest effect as a deterrent to manufacturers rather than to customers. Instead of warnings, he hopes that, whenever possible, there will be changes in product formulation to get carcinogens and reproductive hazards out of products, the environment, and the workplace. ■

CRISTINE RUSSELL *wrote this article while participating in the Alicia Patterson Foundation Fellowship Program. She is currently a freelance writer and a special health correspondent for* The Washington Post.

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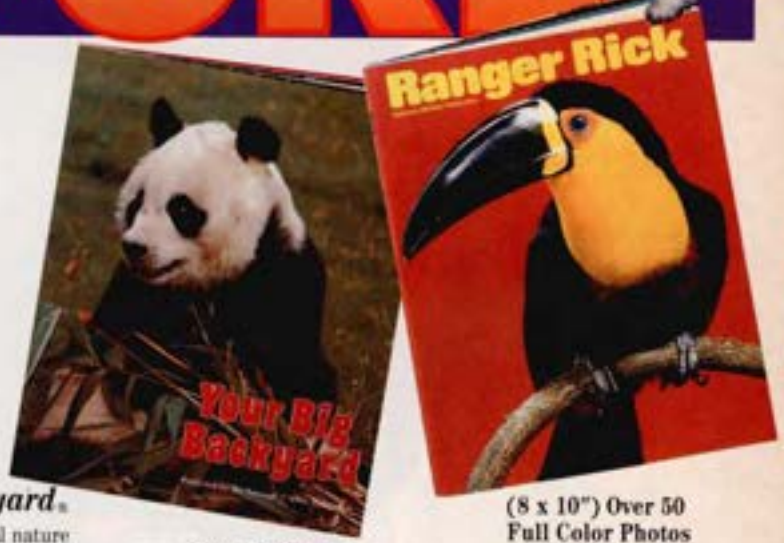

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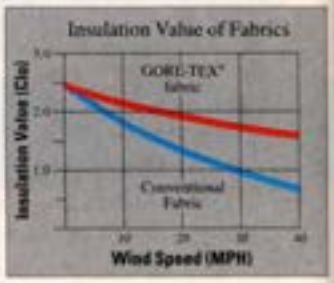

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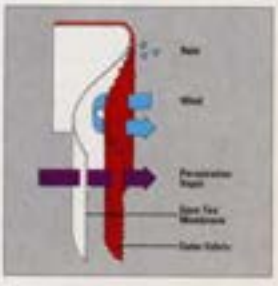

Watch for the following shows as ABC documents the 1990 International Trans-Antarctica Expedition:

Sunday, December 17
7:00 pm EST

Sunday, March 4
7:00 pm EST

Sunday, March 25
4:30 pm EST

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VIEWPOINTS · SIERRA'S

The seventeen prizewinning images in our 1989 photo contest—according to the calculus that governs these equivalencies—are worth 17,000 words. Being verbal types, we editors tend to resist that insight, but a decade of photo contests has taught us how effective it can be to let *your* visions take this space; to let your eyes have their say. ■ At times, only a photograph can tell the truth about our environmental condition. That truth may be fair—and there's an extensive photographic tradition based on this premise—or foul, which is why we created a category ("Our Troubled Earth") to address that which most of us reflexively find unaesthetic. Readers responded beyond all previous experience: 2,000 entries this year. ■ Our thanks to Carolyn Robertson of The Yolla Bolly Press and photographers Stephen Kasper and Christine Alicino, for serving as judges; to Nikon, Giant Bicycle, Vivitar, and Buck Knives, for their sponsorship; and to all those who submitted their prized (if not prizewinning) photographs, for helping to establish this competition as one of the premier amateur photo contests in the nation—and for reminding us just how powerful silence can be.

TENTH ANNUAL PHOTO CONTEST WINNERS

FIRST PLACE

WILDLIFE
COLOR

DONALD JOHNSTON
SUDBURY, ONTARIO

■

DRAGONFLY AND BUR REED
SUDBURY, ONTARIO
[LEFT]

FIRST PLACE

ABSTRACTS IN NATURE
COLOR

JOHN GERLACH
SHINGLETON, MICHIGAN

■

TENT CATERPILLARS
MICHIGAN
[ABOVE]

GRAND PRIZE

DAVID BARKER
LOS FRESNOS, TEXAS

■

ROWLEY'S PIT VIPER
[COVER]

SECOND PLACE

WILDLIFE
BLACK & WHITE

JEFFREY WAHL
SEATTLE, WASHINGTON

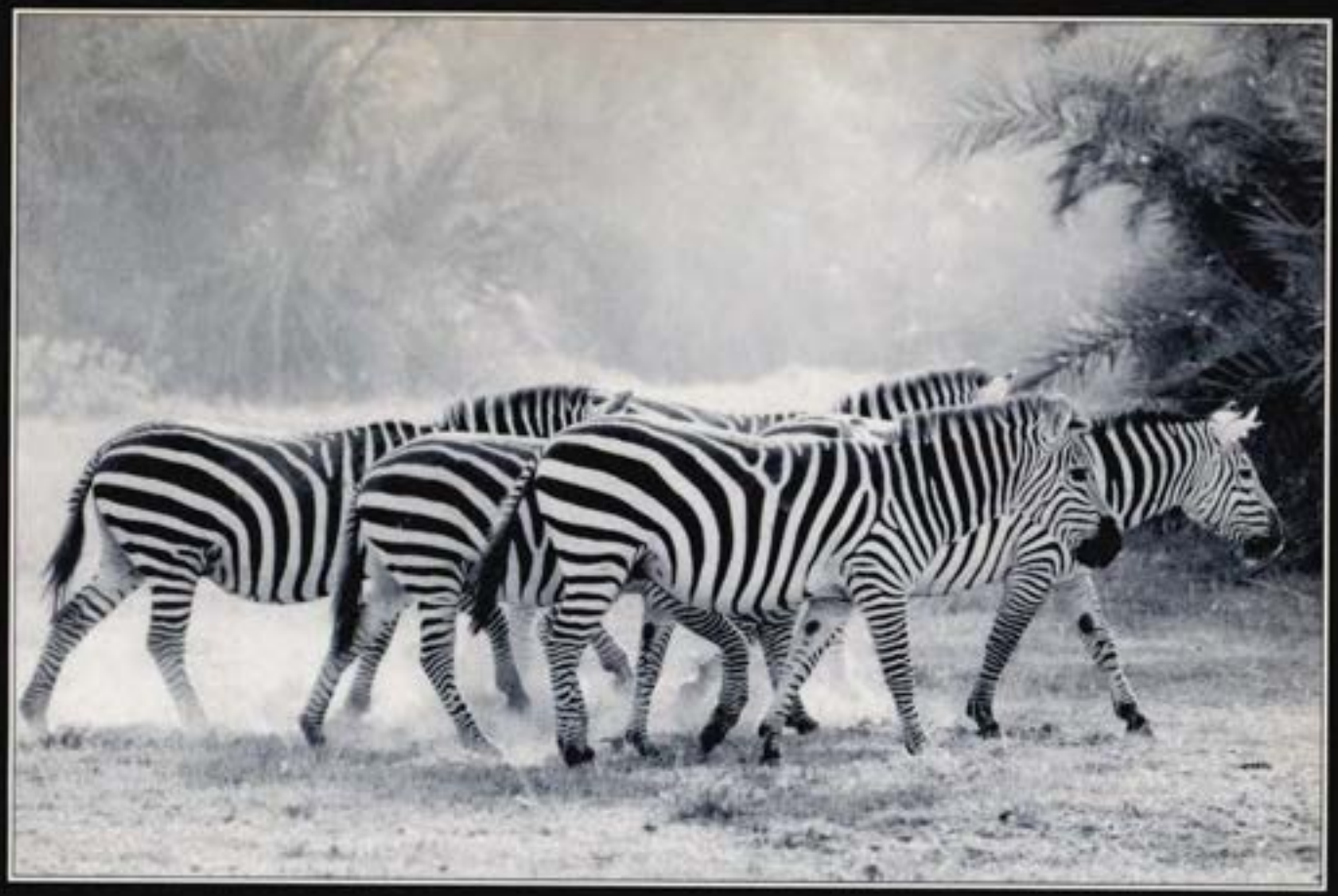
FORAGING DEER
YOSEMITE NATIONAL PARK
[LEFT]

SECOND PLACE

THE MEETING OF LAND & WATER
BLACK & WHITE

JEFFREY ROBBINS
COLORADO SPRINGS, COLORADO

THE GROTTO
ASPEN, COLORADO
[BELOW]



FIRST PLACE

WILDLIFE
BLACK & WHITE

SANDI TAMKIN
ENCINO, CALIFORNIA

■

ZEBRA
KENYA
[ABOVE]

SECOND PLACE

ABSTRACTS IN NATURE
BLACK & WHITE

MARC AUDY
TROIS RIVIERES, QUEBEC

■

LES ECHASSIERS DU GRAND NORD
ST. LOUIS DE FRANCE
[RIGHT]

FIRST PLACE

THE MEETING OF LAND & WATER
COLOR

RON SHOLAND
RENTON, WASHINGTON

TRADITION LAKE
TIGER MOUNTAIN STATE FOREST
WASHINGTON
[ABOVE]

SECOND PLACE

ABSTRACTS IN NATURE
COLOR

WAYNE STEFFES
REDDING, CALIFORNIA

SNOW CAVE
TRINITY ALPS WILDERNESS
CALIFORNIA
[TOP RIGHT]

SECOND PLACE

THE MEETING OF LAND & WATER
COLOR

KATHERINE McCARLEY
ATLANTA, GEORGIA

SURF & SHELL
SAPELO ISLAND, GEORGIA
[BOTTOM RIGHT]

FIRST PLACE

OUR TROUBLED EARTH
BLACK & WHITE

GEORGE ROSE
LOS ANGELES, CALIFORNIA

FACTORY NEAR VINEYARD
UKIAH, CALIFORNIA
[ABOVE]

SECOND PLACE

OUR TROUBLED EARTH
BLACK & WHITE

TIM FISCHER
ARROYO GRANDE, CALIFORNIA

CANDLESTICK POINT, LOW TIDE
SAN FRANCISCO BAY
[RIGHT]

FIRST PLACE

THE MEETING OF LAND & WATER
BLACK & WHITE

GEORGE PEER
MINNEAPOLIS, MINNESOTA

■

STONY POINT
LAKE SUPERIOR
(LEFT)

FIRST PLACE

ABSTRACTS IN NATURE
BLACK & WHITE

JEFFREY GLASSNER
CORAL GABLES, FLORIDA

■

ARALIA LEAVES
MIAMI, FLORIDA
(RIGHT)

SECOND PLACE

WILDLIFE
COLOR

BILL HEAD
HACIENDA HEIGHTS,
CALIFORNIA

■

CANADA GEESE
TULE LAKE, CALIFORNIA
[ABOVE]

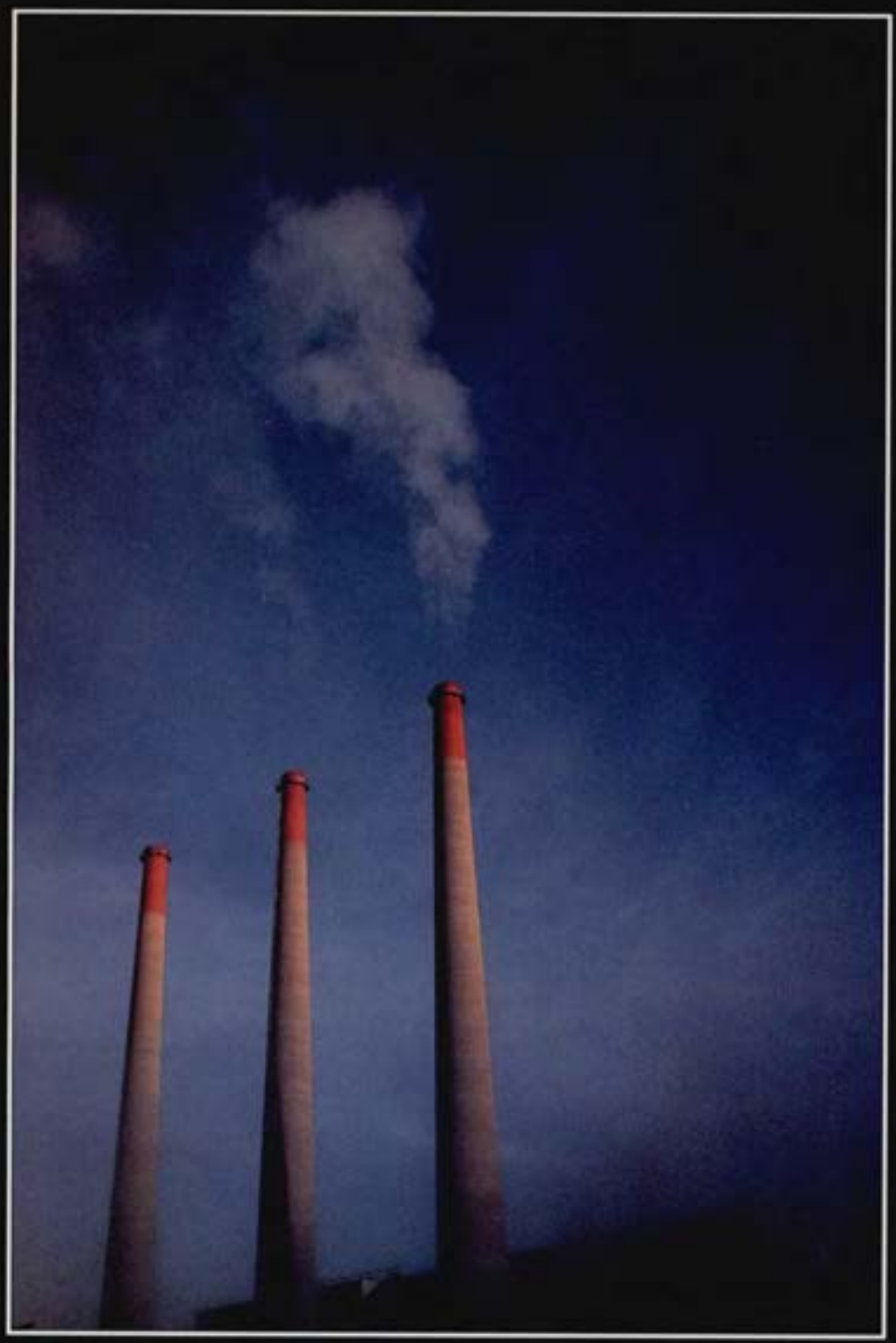
SECOND PLACE

OUR TROUBLED EARTH
COLOR

MIKE BOYLAN
SEATTLE, WASHINGTON

■

GARBAGE DUMP
ADAK ISLAND, ALASKA
[RIGHT]



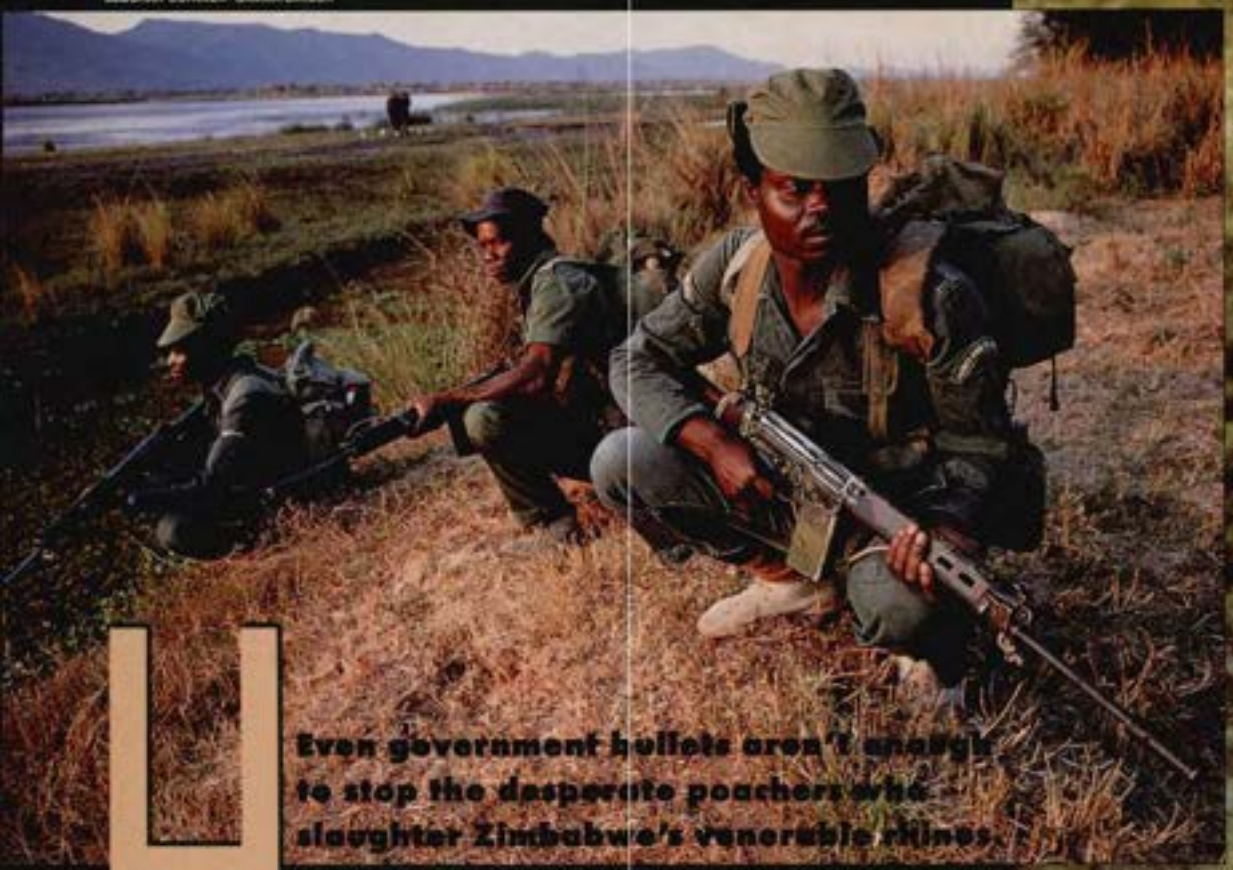
FIRST PLACE

OUR TROUBLED EARTH
COLOR

BUD FOWLE
HOLLYWOOD, CALIFORNIA

SMOKESTACKS
MORRO BAY, CALIFORNIA
[ABOVE]

DEBORAH CORWEIN / GAMMA-LIAISON



Even government bullets aren't enough to stop the desperate poachers who slaughter Zimbabwe's venerable rhinos.

HORNS OF A DILEMMA

BY MARGARET L. KNOX

This was not my idea of a sensitive wilderness trip across a national park. As we wobbled skyward in a roaring cloud of dust, our helicopter panicked a family of elephants. We skimmed acacia treetops like a giant tsetse fly gone berserk, frightening hippopotamuses into the Zambezi River. I wished I could apologize to the flocks of egrets we jolted from their roosts, but by the time my stomach stopped rolling we were touching down in Chewore Safari Area, where Zimbabwe's black rhinoceros herd is concentrated. ■ Zimbabwe's Department of National Parks and Wildlife Management was hoping to show off the successful climax of an anti-poaching patrol. But conservation is never that simple, especially in Africa's youngest republic. What should have been a precision two-day sweep to roust a band of rustlers instead played out like a Keystone Kops farce:

JAMES HANCOCK, PHOTO RESEARCHERS

DAN MCCOY

Rangers on patrol (above left). Black rhinos (right). Slaughtered rhino (left).

Late the previous night, Champion Chundu, a National Parks scout, heard the crack of a poacher's rifle. He, unfortunately, had forgotten his own gun, and could only stand ankle-deep in a malarial swamp shouting coordinates into his radio. The lookout team on a high cliff was socked in by fog and equally useless. So the operation's leader, Mark Brightman, jumped into a motorboat to head off the thieves as they crossed the river to the safety of neighboring Zambia. But the motor's pullcord broke and he drifted ignominiously downstream, silently apologizing to the 508 rhinos lost to poachers since 1984. The morning I arrived, he and his men found the carcass of number 509.

"We're just not winning," Brightman told me on the way back to anti-poaching headquarters in Mana Pools National Park. Like his British ancestors, Brightman is a master of understatement. Much has changed in the more than four years since this southern African country became the darling of the international conservation community with its shoot-to-kill policy against poachers. When announced in May 1985, the approach seemed the only hope for a species that was, in a sense, being impaled on its own horn: Pound for pound, rhino horn is more valuable in Taipei than wholesale cocaine is in Miami. The SAVE African Endangered Wildlife Foundation of New York and the World Wide Fund for Nature (WWF, formerly World Wildlife Fund) of Geneva quietly agreed that nothing short of a rifle slug in the chest was likely to stop destitute poachers from annihilating the world's last viable herd of black rhinos.

The battlefield is the 22,500-square-mile Zambezi Valley, the border between relatively prosperous Zimbabwe and Zambia, a country so needy its export farms are reverting from tractors to oxen. All but wiped out in Zambia, the rhinos seemed to have a chance across the river in Zimbabwe. With his 1985 announcement, President Robert Mugabe put conservation above racial politics by sending white National Parks officers—who got their training in the Rhodesian army he overthrew—back into the bush to hunt down black poachers. In the early days of the rhino war, smartly turned out National Parks scouts sang fight songs as they paraded past dignitaries from wealthy donor organizations. Brightman thought then that the whole grisly affair would be sorted out in a couple of months, that he would soon be leading nature walks rather than combat patrols through his beloved bush.

Instead, Zimbabwe's showpiece campaign has turned into an unfunny good news–bad news joke. The good news is that unlike many African governments, Zimbabwe's recognizes the value of wildlife, genuinely wants to preserve it, and has been artful in attracting the assistance of international conservation groups. The bad news is that conservationists here never have enough money, are often preoccupied with protecting their patch of influence, and have to please not only their donors but tribal chiefs 500 years dead. The rhinos are still being killed faster than they can reproduce.

Wildlife biologists, Texas millionaires, and local farmers all have rushed to the rescue, each with a "better" plan than the

Park rangers discuss the escape of two poachers (top). Issues are ordered by radio to scouts in the bush (middle). Mark Brightman, senior ranger in charge of Operation Stronghold, explains the day's strategy (bottom). National Parks scouts found 61 dead rhinos in 1988, less than half the number discovered in 1987. Nevertheless, says Brightman, "We're just not winning."

last. Kill the poachers. Co-opt the poachers. Sacrifice the habitat to save the species. Save the habitat to keep wildlife wild. Harvest the horn and flood the market. Annihilate the traders and extinguish the market. And every answer leads back to thorny philosophical questions about the definition and value of wildlife.

At the center of all the fuss is a pugnacious tank of a beast whose nose-mounted weaponry, alarming agility, and armor of thick, almost hairless skin are legacies of the Eocene epoch, 55 million years past. Time has whittled away at the family *Rhinocerotidae:* The biggest land mammal of all time, *Baluchitherium grangeri,* a rhino four times as big as today's African bull elephant, is long gone. The North American rhino died out in the Pliocene era, and other extinctions have followed. Today's black rhinoceros, most numerous of five remaining species, is a solitary, near-sighted browser known to charge bushes for no apparent reason. An unfortunate notion of its horn as macho magic has led to the species' losing battle with the automatic rifle.

It all began with European and Asian legends that this bulky creature that wallows in mud and eats thorn bushes was also fond of music, perfume, and virgins. The horn, people believed, contained the animal's strength. In 1298, Marco Polo reported Sumatran rhinos as unicorns, long a symbol of ferocity, and Arab traders were soon selling "unicorn horn" as a drug. The whole world had the same idea: In Africa men bathed in rhino blood for courage; in Borneo fertility rites featured dried rhino penises; in India the horn was considered an aphrodisiac.

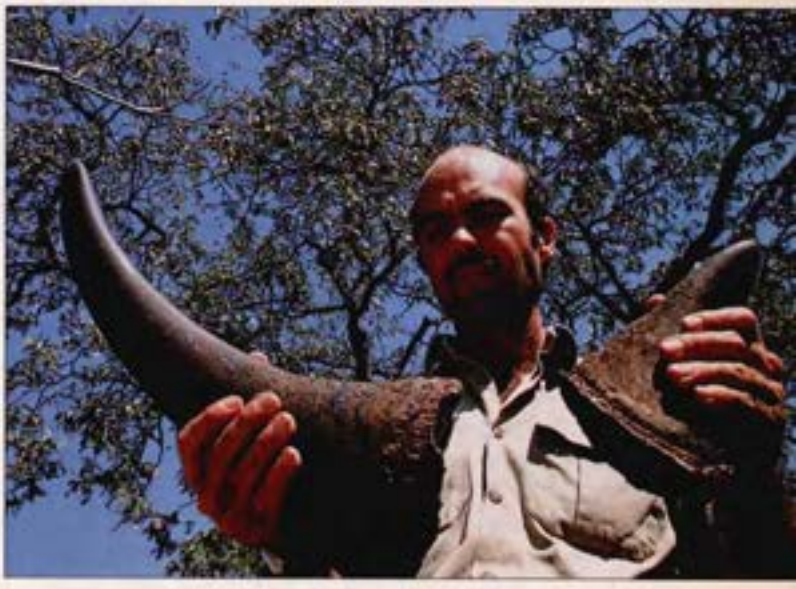
A spate of poaching in the 1970s reduced the black rhino population from 65,000 to less than 5,000 worldwide. Suddenly, young men in North Yemen, flush with wages from Saudi oilfields, could afford rhino-horn dagger handles, an ancient symbol of manhood once reserved for the royal and wealthy. In Hong Kong, Macau, and Taiwan, rhino-horn shavings now sell for as much as $20,000 a pound as cures for everything from failing vision to heart ailments. According to the U.S. Fish and Wildlife Service, more than $5 million worth of medicines containing rhino horn slips into the United States illegally each year. Chemically, customers might as well bite their fingernails. Rhino horn isn't bone. Like fingernails, it is nothing but densely packed fibers of keratin and can be sliced off the beast's nose with a Swiss Army knife.

In Zimbabwe the first line of defense against such lucrative thievery is Operation Stronghold, the paramilitary program commanded in the field by Brightman. With radios and two small aircraft supplied by SAVE, and the helicopter from the WWF, 1988 was Operation Stronghold's best year. Brightman counted only 61 rhino carcasses, less than half the number killed in the previous year. But the estimated 600 rhinos remaining in the Zambezi Valley, reproducing at a maximum rate of 7 percent a year, could only have produced 44 babies.

Perhaps the greatest enemy of the rhino is the poverty that has settled like a plague across the river in Zambia. More than 60 poachers—and one National Parks scout—have been killed in firefights since the advent of Operation Stronghold, with no apparent deterrent effect. The poachers keep coming, stealing across the river at night in their dugout canoes with AK-47 rifles slung over their shoulders. A horn can bring them the equivalent of $200, enough to feed a family for a year with plenty left over to grease the palm of a Zambian constable. Against their pathetic determination, Brightman's force of less than one man per 40 square miles is hardly a match. Peter Matoka, a former Zambian High Commissioner to Zimbabwe who spent much of his term claiming poachers' corpses, said many of his countrymen are so desperate and out of touch they smear their bodies with juju—magic prescribed by witch doctors to make them invisible. As we settled into deck chairs in front of Brightman's riverfront shack at Mana Pools, I told him lots of people argue that no one deserves the summary justice Zambia's barefoot desperadoes are getting.

"The bunny huggers don't like it," Brightman acknowledged, using a pejorative National Parks term for people who like animals but not enough to kill for them. "When a group of Arabs makes an assault on the British crown jewels there is a skirmish and lots are killed—to protect rocks—and nobody minds. Here we're protecting a world heritage, but it happens to be animals and that hangs people up. We're enforcing the law. They're using firearms. We must respond with the same force."

Mustering that force is a problem that drives Brightman



DEBORAH CONKEN - GAMMA-LIAISON PHOTOGRAPHS

Charlie Haley of the Zimbabwean police force holds two rhino horns confiscated from captured poachers. Haley and two colleagues were jailed for killing a poacher in 1988; soon thereafter Zimbabwe officially endorsed the shoot-to-kill policy.

crazy. His funding is puny, and his jurisdiction is trampled by blundering, envious, or downright hostile rival agencies. "We need four times as many scouts and three times as much money," Brightman said as he furiously stacked firewood to cook his dinner. "The government has got to commit itself as it would for any other war." Then he paused to gaze upriver at a tangerine sunset streaked with lightning and dotted with fireflies. Beyond the barbecue, hippos bellowed and three elephants swayed in unison like Motown backup singers. For all his frustration, Brightman can't bring himself to resign.

But something is undermining his campaign that nobody much likes to talk about: racism. It took an eight-year guerrilla war ending in 1980 to turn white-ruled Rhodesia into black-ruled Zimbabwe. Since then, President Mugabe has made reconciliation between the races a top priority. About half of the 250,000 white Rhodesians stayed after independence (the country's total population is approximately 10 million). Whites still own the country's big commercial farms and many hold key positions in business and government. In National Parks and particularly in Operation Stronghold, whites remain, by and large, the "officers" and blacks the "foot soldiers." Some 200 black guerrillas were rewarded with National Parks jobs, and they, among others, tend to resent taking orders from their former enemies. For their part, white officers complain of insubordination, and many feel the government is trying to force them out. Mugabe seemed genuinely surprised when I asked him at a press conference in March about racial tensions in the parks department. He promised to investigate, and old Zimbabwe hands say that is just the kind of promise he is likely to keep. But racial wounds tend to fester.

"There used to be an assumption by people working in National Parks that no black person was competent to deal with conservation," Parks Director Willie Nduku told me a few days later as he lounged in a cheetah-hide chair in his Harare office. Most blacks have never seen Africa's treasure trove of large mammals, which during the past century has been funneled into reserves that only the wealthy (which includes anyone well-off enough to afford an automobile) can visit. "Before independence we used to call wildlife 'white men's property,'" Nduku said.

A lingering perception of national parks as a colonial indulgence often poisons the judgment of supposed allies. The squabbling that erupts between government agencies is nearly as detrimental to the rhinos as superstition or the park department's shrinking budget. (Parks officials say that between budget cuts, inflation, and the declining value of the Zimbabwean dollar, their buying power has been halved since independence in 1980.) The Zimbabwe police and army insist on participating in headline-grabbing Operation Stronghold, but untrained in bushcraft, Brightman complains, their men are as likely to shoot a lion in panic or poach an impala for dinner as they are to save a rhino. National Parks staff particularly resent the Zimbabwe Republic Police, and the feeling is mutual.

Just before Christmas, 1988, the National Parks chief warden and two assistants shot dead their first Zimbabwean poacher. The national police arrested them. After three years and threescore dead Zambians, the police discovered that no legislation allows National Parks to kill people. National Parks officials privately allege that the dead Zimbabwean was the nephew of a government official, and that the police envy the publicity National Parks' rhino campaign is getting. It didn't help that the three parks-agency employees were white.

Amid finger-pointing about racism and jealously guarded turf, morale in National Parks plummeted. Nine rhinos went to the slaughter over the holidays before charges were dropped. Throughout the crisis, police officials sounded like Alfred E. Newman: What, me worry? While the three were still facing charges, Patrick Chingosho, the senior police officer at Mana Pools, told me relations between police and the parks agency had "never been better." That same week, a constable who fell asleep on an anti-poaching ambush was

"We're protecting a world heritage. We're enforcing the law. They're using firearms. We must respond with the same force."

DEBORAH COMAN/ GAMMA LIAISON

Mark Brightman amid retrieved rhino skulls.

devoured by lions within earshot of his horrified comrades, and the police began boycotting anti-poaching patrols. Brightman threw up his hands. "We can carry on killing poachers forever," he said, "but I reckon the rhinos will be gone before we actually stop them. The only way to win is to fight at the level of the dealers."

Getting to the dealers is Graham Nott's job. As National Parks' chief investigator, he tracks horn brokers all over the continent. "For these people the rhino is nothing but a horn," he said, pacing his dingy Harare office like a prisoner. "It doesn't matter that we're running out of animals—that just pushes the price higher."

Coordinating international enforcement in this region is about as easy as getting two male rhinos to share the shade of a sausage tree. Nott alleged, for example, that captured poachers have implicated Zambian government ministers. But Nott's counterpart, Paul Russell, a Briton who heads the Zambian Anti-Corruption Commission, sputtered at me over a crackling telephone line from Lusaka that the Zimbabweans have failed to present a "shred" of evidence. Not only do the so-called frontline states disagree about who is a criminal, they can't even agree on what constitutes a crime. In Zimbabwe the minimum penalty for illegal possession of a rhino horn is five years in prison. In neighboring Botswana, a trucker caught en route to South Africa with 96 horns—the biggest haul Nott has ever heard of—was fined the equivalent of $2,000 and set free.

The tiny central African nation of Burundi used to be the continent's horn-smuggling hub. But after a coup in 1988 the new government showed astonishing zeal in enforcing the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Now the bulk of the rhino-horn trade flows through South Africa, Nott alleged.

South Africa's success in protecting rhinos within its own borders makes Zimbabweans wonder why Pretoria can't stop the trade in horns brought in from neighboring coun-

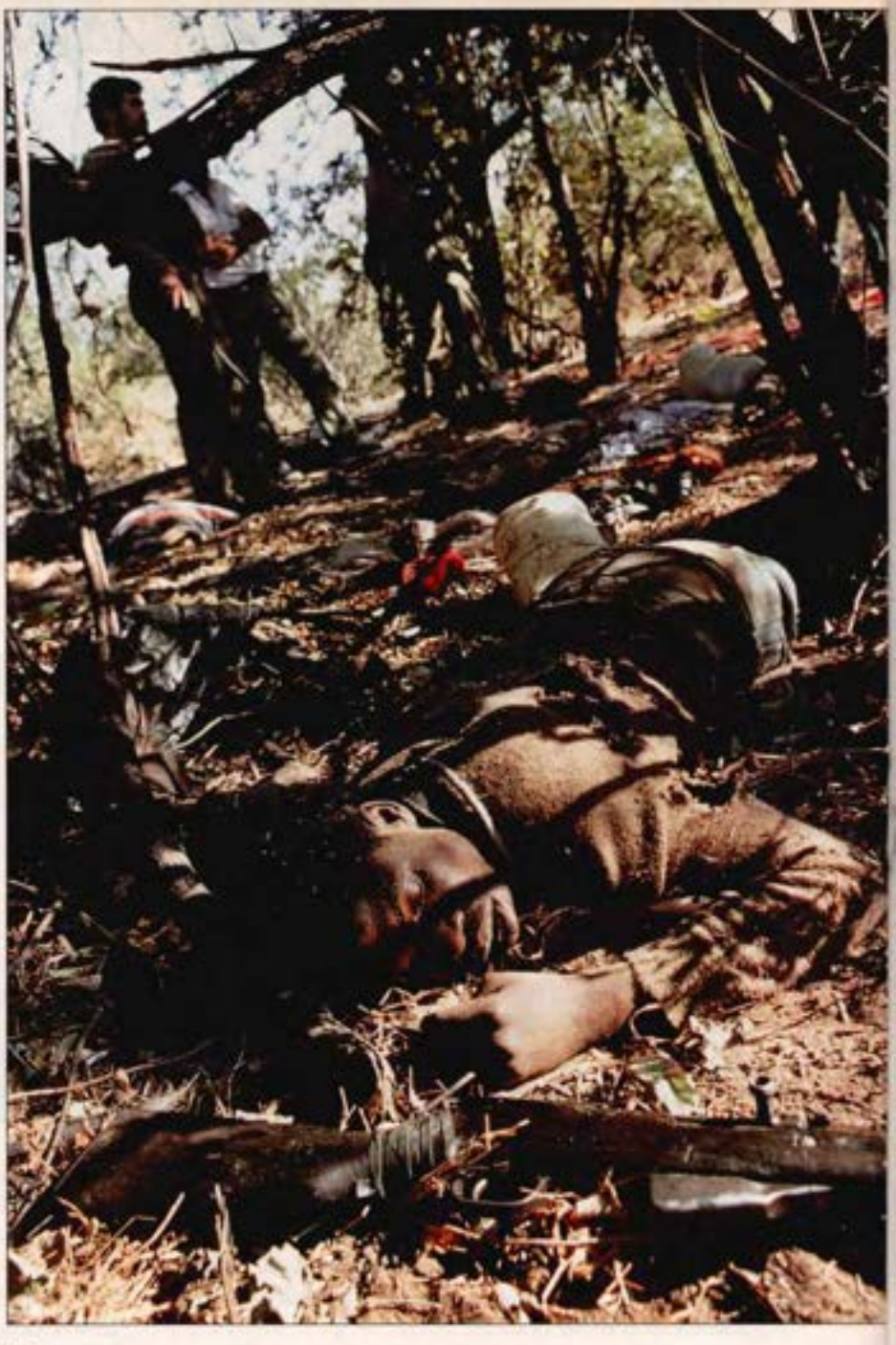
tries. "Perhaps they want us to fail," said Parks Director Nduku, "so they can say, 'See? Black Africa can't take care of its wildlife.'" The South African connection gives Zimbabwe just one more grievance against the implacable racist enemy. "We can't get any cooperation down there at all," Nott sighed.

National Parks can't even get cooperation from its donors. The WWF became so frustrated that it stopped funding the rhino campaign's only helicopter in May. "The Parks directorate is too bloody disorganized," WWF program manager Raoul du Toit told me. "The helicopter was a holding action until the agency could come up with a long-term approach." Du Toit blames all the top park officials—ecologists, enforcers, and executives, black and white. "They still haven't formulated a realistic plan," he said. "Without one, the WWF isn't willing to carry on."

For the first time in three months of following the rhino campaign, I began to despair. If National Parks and the WWF couldn't get along, it seemed the poor beast everyone was bickering about had small chance for survival. When I mentioned my fears to du Toit, he said Operation Stronghold could yet succeed: It will simply mean some painful choices for the parks department. Du Toit wants the agency to stop patrolling the entire Zambezi Valley and concentrate instead on a few small sanctuaries. Rangers could throw a human net around the densest populations, he said, step up the removal of rhinos from other areas, and kiss the rest good-bye.

Texas millionaire Harry Tennyson, founder of Game Conservation International (Game COIN), takes the sanctuary philosophy to an extreme. For him, saving the species—not the habitat—is paramount. "Since we are the predators, it's our job to take care of the prey," Tennyson said, sipping scotch in the lobby of Harare's posh Meikles Hotel while I watched cheetahs chase prey across his necktie. "Your Sierra Clubbers don't like me," he chuckled. "We're conservationists—as in conservative. We don't want to preserve—as in formaldehyde." Tennyson hasn't given up on saving the Zambezi Valley; in fact, he said, he would try to find National Parks a new helicopter. But he advocates "rhino ranching" in Texas, which he claims offers "identical weather, food, and surroundings" to the Zambezi Valley, an assertion that makes Zimbabwean ecologists shudder.

"Rhino ranches" are luxury zoos with no visitors. On vast estates near Fort Worth, Texas, three black rhinos, fenced and guarded round the clock, graze at a cost of $1,000 a month each to their Game COIN hosts. Getting them there cost at



A Zambian poacher lies dead, shot by an anti-poaching patrol. In the early days of Operation Stronghold, rangers simply arrested the raiders who stole across the Zambezi River to Zimbabwe. The rhino war escalated when poachers began shooting rangers rather than face arrest. More than 60 poachers have been killed.

least $25,000 a beast, Tennyson said. "We're not in it for the money. Our board managers are billionaires," he said with a wink. "Except me. I'm just a multimillionaire."

Even the most antagonistic Zimbabweans concede the scheme shows results. Macho and Chula, two black rhinos flown by Game COIN from South Africa to Texas in 1986, became parents in February. Like the Arabian oryx and the North African addax, the black rhino might die out in the wild and have to be reintroduced from such sanctuaries. That, says Tennyson, may be the rhino's only hope.

The rhinos may not have to flee as far as Texas to find a haven. Some 300 have been moved from the Zambezi Valley to other parks and commercial farms within Zimbabwe. So far, not one has been poached off a farm. National Parks officials are also watching South African experiments in dehorning white rhinos to render them undesirable to poachers. But the horns grow back, and Brightman predicts that even if the agency started farming rhinos and harvesting the horn, it would take five tons a year to meet demand.

For all their bluster and fearsome appearance, rhinos are emotionally and physically delicate. Shooting them with tranquilizer darts or dehorning them often causes heart attacks. The animals break their horns on the crates used to move them, and the wounds become infected. Some 20 percent die in the relocation effort. In October 1988, ten black rhinos removed from the Zambezi Valley by presidential order sweltered in crates in Harare while Tennyson haggled unsuccessfully with airlines. One rhino died of stress after a veterinarian ordered their release, a National Parks ecologist told me. For these reasons and more, parks officials still balk at the idea of evacuating the Zambezi Valley.

"Once the rhino goes, the elephant will be next," Brightman said. "It's happened all the way down the continent. And when the big animals that draw tourists are gone, we will have trouble justifying these vast tracts of wilderness."

Wilderness already is a hard concept to sell to Zimbabwe's land-hungry peasant majority. Half of the country's people live on communal lands. Most occupy marginal terrain, such as the fringes of the Zambezi Valley, where soils are poor and rainfall unpredictable. They farm or graze their soils to exhaustion, deplete their wildlife, and begin trespassing on government land as squatters or poachers—of warthog, wildebeest, or rhino. That's bad for the animals, and it's not even good for the people. Under Zimbabwean law, farmers own the wildlife that wanders onto their land; commercially savvy whites already have learned to harvest hefty fees from safari operators hauling Land Rovers full of tourists or hunters on private lands. But the communal farmers live in a different world—without facilities to handle tourists or the experience and capital to attract them. The same elephant that a tourist on a private farm might pay big bucks to photograph or shoot is, to them, nothing but a crop-trampling pest. Some communal districts near the protected areas stand to earn more than $150,000 a year from safari hunting.

"Educated to their rights and given some help managing in the modern economy, these people could be spinning their wildlife into schools, roads—rural development," said Dick Pitman, chair of the conservationist Zambezi Society. Around him in a sunny glade an unlikely group of allies called the Mvuradonha Wilderness Committee had gathered. The committee formed to manage 160,000 acres of land set aside by tribal chiefs who want to market their mountains' beauty just as their white countrymen would do.

The big-money plan is to bring in foreign tourists and wealthy urbanites for mountain climbing, spelunking, horseback riding, and wildlife viewing. Nick O'Connor, who owns a tobacco farm nearby, plans to operate horseback safaris in the area, paying fees to the communal farmers and taking a profit for himself.

"At the moment, the poachers are Robin Hoods," said O'Connor, who looks—and rides—like a leathery bush jockey. "But when the community realizes these animals are worth a lot more alive, anybody who poaches will be an outcast. The community will police itself." The committee, in other words, will use social pressure in place of guns.

Chief Matthew Chiweshi's people are poachers, and it is his job to convince them to sacrifice a kudu haunch today for a piece of Zimbabwe's burgeoning tourist pie tomorrow. The

DEBORAH CONRAD/CAMERA LIGHT PHOTOGRAPHS

A two-year-old rhino whose mother was killed is one of seven rhinos in captivity at Imire Game Park. With the rhino population dropping, poachers have begun killing elephants and hippos for ivory.

Double Jeopardy

Whether Zimbabwe can stop the poaching of black rhinoceroses in the Zambezi Valley may not matter. Mobil Oil has been negotiating with Zimbabwe since June 1987 for exploration and drilling rights from one end of the valley to the other.

Mobil says it has a 5- to 10-percent chance of discovering oil under these 22,500 square miles of wilderness. To find out, the company wants to build base camps, equipment yards, and more than 750 miles of road for seismic machinery. A government geologist told me the discovery of oil could earn Zimbabwe $180 million a year in precious foreign exchange. But a report published in January by the Geneva-based International Union for Conservation of Nature and Natural Resources (IUCN) states that the effects could be devastating. It warns of noise, fumes, chemical spills, and, above all, the grid of roads that would become topsoil-erosion chutes and highways for poachers.

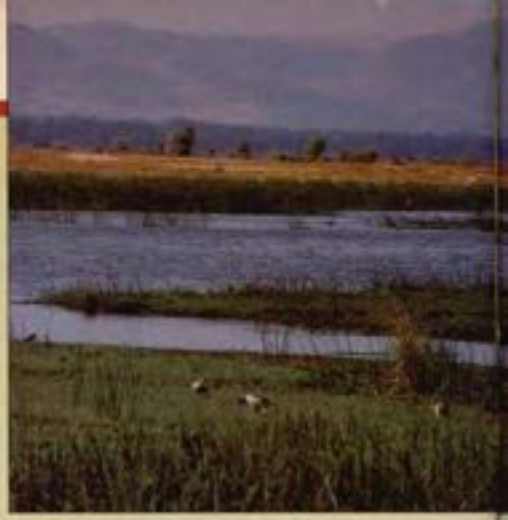
Nobody was surprised to learn that the exploration would be destructive. What surprised environmentalists here was that negotiations had gone on for more than a year without the Department of National Parks and Wildlife Management even being told. National Parks Director Willie Nduku was outraged.

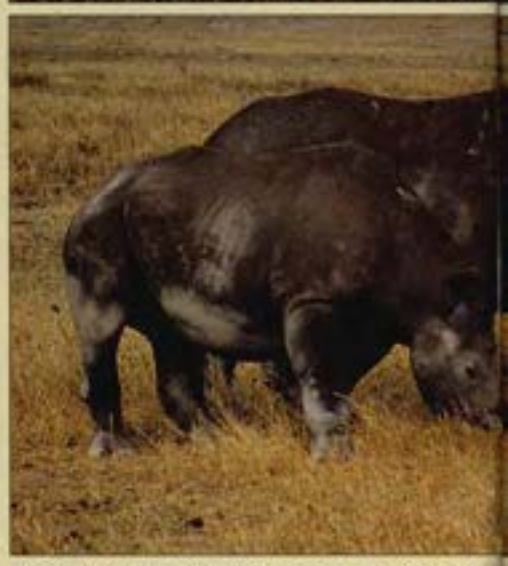
"This is the subject of a serious quarrel between our department and the rest of government," Nduku said. "If they don't modify the contract, I am very much afraid for the rhino."

Mobil says it made a special effort to notify the right people when negotiations began. At least it stuck to the letter of Zimbabwean law, which requires notification of the Ministry of Natural Resources and Tourism when any development on state land is planned. That's when the comedy of errors began. The Ministry has two branches, and Natural Resources—not National Parks—received the message. The Ministry sent to a meeting with Mobil not an ecologist but an accountant, whose report was filed and forgotten.

When National Parks staff learned a contract was about to be signed in September 1988 they stalled negotiations long enough to commission the IUCN report. But when the report came through in all its hair-raising detail, they couldn't get the information to Victoria Chitepo, the department's minister. The number-two official in the Ministry for some reason didn't think the matter worthy of Chitepo's attention and would not return my calls to explain why not.

Dick Pitman, chair of the Zambezi



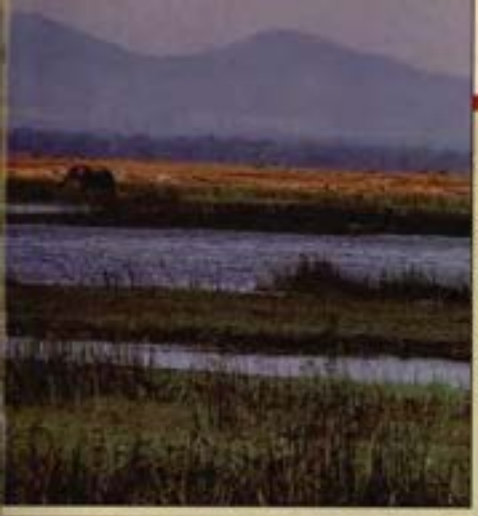


The Zambezi River Valley (top) is home to 600 black

traditional view of wildlife, Chiweshi told me, is "meat in the pot." At first his people were suspicious of the wilderness project, he said: "They thought these people would take the land." Chiweshi asked the committee for $30 to buy a length of black cloth for his tribe's spirit medium. The medium will wear the cloth, he said, to call the royal ancestor whose land this is. A camper had been injured slipping over a waterfall and the chief thought it best to make sure the ancestor understood who these strange visitors were. O'Connor, who consults a medium about his own tobacco harvest—"just for good measure"—voted in favor.

On paper at least, the committee's plans seem to have something for everyone: the white entrepreneur, the black villagers, and the wildlife. But are the Mvuradonha Mountains a good place for rhinos? The bush here certainly looks like rhino habitat elsewhere, and we found evidence that this is potential rhino country in an unusual place. O'Connor took Dick Pitman and me on horseback far into this craggy wilderness of lacy miombo forest and hooting fiscal shrikes. Like pink ghosts, the delicate outlines of horned and hook-lipped creatures painted on rocks hundreds of years ago by Bushmen showed us that this remote corner of Zimbabwe once did nurture the rhinos.

Even with the Bushmen's proof and the ancestor's blessing, the renewal of wildlife—and the rhino in particular—in the Mvuradonha Mountains will depend on the animals' survival 4,000 feet below on the Zambezi Valley floor. Though recreation (tourism and safari hunting) is the country's third-biggest industry after agriculture and mining, the rhino's habitat may yet be yanked from under it. In 1980 conservationists had to fight plans to dam the Zambezi River and flood the valley. Then came DDT and the efforts to wipe out the tsetse fly; eradication of the tsetse would open the valley to livestock and eventual settlement. This year the government is considering giving Mobil Oil exploration and drilling rights throughout the whole valley—across national



DEBORAH COPAKEN / GAMMA-LIAISON

PAUL CONKLIN / UNPHOTO

rhinos (bottom), less than half the population in 1983.

Society, blames Mobil for taking advantage of a government that is green with a small *g*. "They nearly pulled a fast one," said Pitman, whose 500-member group has lobbied and advertised against the contract. "They wouldn't get away with this in the developed world. They wouldn't dare try it in Yellowstone."

Mark Gunther, the Mobil geophysicist in charge of the project, shrugged when I asked him whether the Zimbabwean government made a mistake sending only an accountant to the meeting. "I'd feel pretty silly about that," he said. "But we tried." Gunther, who introduced himself to me as a Sierra Club member, said opponents should visit South Luangwa National Park in Zambia, where he finished a similar project in 1987. "Reports we get from Zambia are pretty good," he said. "The roads allow Parks and Wildlife people greater access to the park."

"Completely false," ecologist Richard Bell shouted over the phone from Luangwa. Bell, who helps run a government resource-management project in Luangwa, said the straight lines bulldozed across gulleys and hills make perfect footpaths into thicketed areas for poachers. "We've found animals killed close by," he said. "Elephants. And rhino."

Zambia is so dependent on drilling that its Mineral Exploration Act completely overrides its National Parks Act, Bell said. Only the arrival of earthmovers alerted National Parks authorities in Luangwa to the Mobil contract. Then followed nine months of argument over ebony and acacia groves, rowdy crews, oversize camps, and a trail of oil drums and old tires. "Mobil's idea of restoration is, after bulldozing the vegetation to one side, to bulldoze it back again," Bell said. "And you must bear in mind what will happen if they find oil: wellheads every square kilometer [each occupying] one hectare (two and a half acres) of 'improved ground,' which means asphalt or gravel with access roads. Zimbabwe must sew Mobil up as tight as it possibly can."

Cautioned by Bell, Zimbabwe National Parks officials finally got through to Minister Chitepo. "Once we managed to get the facts to her, she was terrific," said National Parks ecologist Debbie Gibson, who camped outside the minister's office the morning the Cabinet was to discuss the matter and greeted her with a hastily typed and impassioned brief. Chitepo persuaded the other ministers to put off signing a contract with Mobil until at least an environmental impact statement is guaranteed. The government will also consider excluding three areas critical to the rhino: Mana Pools National Park and Sapi and Chewore safari areas.

"Apart from the fact that we'd like them not to do it at all," Gibson said, "it's an improvement."—***M.L.K.***

parks, safari areas, and a UNESCO-designated World Heritage Site (see sidebar). For all its enthusiasm for the rhino, the government often lets concern for pressing financial problems override conservation. When Pitman described his group's seven-year struggle to keep the Zambezi Valley wild, I thought of the dung beetle, a Sisyphean creature I'd watched time and again in the valley pushing its growing burden uphill only to lose control at the crest and have the load tumble back down.

"You're sitting in the Zambezi Valley," Pitman said as we watered our horses by a bamboo thicket, "and you think about dams, tsetse eradication, rhino poaching, oil—and you wind up wondering: How long is this going to go on?"

To contemplate the problem one last time, I canoed the Zambezi River in April, 100 miles from Mana Pools to the Mozambique border—past the spot where another canoeist had been shot at by poachers, past poachers' camps and armed Zimbabwean patrols, past a safari operator who cynically flouted the law by taking his noisy inflatable Zodiak where motorboats are forbidden. Mostly, though, my small group of paddlers floated quietly among crocodiles and buffalo, under clouds of fluttering quelea and skeins of migrating storks. This sparkling river and the wilderness it bounds are charged with a wary vitality the visitor comes to share. A hippo's head once breached the windruffled surface too close for comfort. We slept on islands to avoid tempting lions and hyenas. The constant thrumming of insects only deepened the valley's silence. It was the kind of experience one returns from with a softer voice, a smaller ego, and a larger soul. Perhaps some bizarre alchemy of sleuthing, diplomacy, gunfire, and a scrap of black cloth will assure a future for this Edenic river valley and the rare beast it cradles. If that happens, the battles will have been worth fighting. ■

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Foxglove Laughter, Hard Listening, and The Cut

THE WINNERS OF SIERRA'S ANNUAL NATURE WRITING CONTEST

Many Pleasures Without Names

BY KIM R. STAFFORD

Where Neahkahnie Mountain road disappears into fog, the lit ears of the deer swivel, flicker, and she turns on small feet. She turns aside up the trail. We follow. Dew from the fern's hand brushes silver into your hair. As a child, I licked water from clover. Now, the earth of the path resonates like a mirage. Ferns crowd your ankles. At the freckled mouth of the foxglove, the native bumblebee tunnels in. Lead me, where the main path switches back to climb higher, but the path the deer made goes on, dips toward spruce shade, faint, intuitive, through a blur of fireweed.

On Neahkahnie Mountain, white sunlight slips a gown over the alder trunks, their fog-nibbled east flank. The trunks take their grace by imperfection, knobby with light. I follow you, softly stamp the damp ribbon of the trail's dust, where I read the deer's hoofprint and your foot's print together, crisp syllables I taste, seeing. Too crooked for lumber, alder sways, climbing like snakes travel, with a shimmer of leaves. Let me be weak their way, reaching as I sway. Turn as I find you. From the dark of the cedars, a mossy breath. Close your eyes now. Lean back against the trunk. Be thirsty a long time. This kiss is rain.

Cedar limbs bow, pine boughs reach, spruce tangles, but the yew encloses. Off the path with you, I reach and bow. Life by life, I have awaited you. The root they call old man of the ground sends out a vine that travels leaf by leaf toward the open. How long a sentence is this vine unraveling upward through thimbleberry, soft-fingered as it passes over the heads of the fern, over devil's club, mounting a silver log and floating onward to kink and reach through spruce toward you. Take me like that. Your arms enclose a creature without a name. I am a leaf yearning like a flame. In this circle lies all I know.

We could be serious the city way, reading with gusto and talking the midnight candles blue. Or like this, on Neahkahnie, tasting berries with a kiss, laughing at the passing throb of hummingbird, chilled by a cloud's shadow, and snug in the fern. We share heart and mind intimate with place.

Face me, now. There is still one salal seed between your teeth—I'm close enough to see it now. Let me.

Beside your face, a flower I cannot name has bloomed. The spruce trunk hovers over us. In your eyes, the spruce rises double and perfectly small. This tingling sprawl—how did we learn to inhabit the sky like this, when we lie deep in spruce shade, breathing August earth? The tall hawk hovers above us, distant and nearly still through the limb net, its

LIZ PHAIR

wingtips spread open wide as your fingers, where they have lit here on moss.

As easily as you open your hand now, unfurl your wishes for me. Tell them always. Open them one by one, as the vine of dewberry opens the small lace of its blossoms trailing across the grass. Let me know the whole landscape of your wish, as the hawk knows the mountain veined with stone, with tree whorl and scatter, the green pelt meadow, silver thread of stream.

Whisper me still. We hear hikers thud along the trail, coming from downhill this way, beyond the hazel thicket, the fireweed haze. Whisper me still. They will turn at the switchback and go on, go higher, toward the ridge where the trail leads, away. My hand feels your heart here. With my ear against earth, I can feel their steps beat softly, and their words travel like sentences in Crow, a jangle I can't translate. Whisper me still.

Did I ever tell you how much I loved that moment once, when you softly kicked my foot as we stood talking, and gently again, kicking like water kicks when it turns at the eddy. You reached me like a leaf swiveling against its twig, a fern tapping on stone. You are a feather upon me. I had never felt a word like that. Whisper me still.

The hikers have gone away up the humming silence of the slope. The hawk swings over the ridge line. Sun opens through clouds, and the soft net of its light rolls across you. You say, "They have gone now." You say, "Tell me your wishes."

Where the ferns rise up, I pull their curtain away. Your voice skips to me. The lattice of the fireweed shows you to me. Pale as the day moon, you rise and turn. The rain is over. Salal shimmers and steams. The air about you is spiced with cedar, and the hill behind you green with yew. You are a cleft in the meadow, a notch in stone where moss grows thick. Let me bow at the spring, set my hands into the splash. Let me taste fern root under your tongue.

In my dream, a woman lay dreaming. Light clothed her. Without your name yet, her face turned away. Without a voice, how could I wake her? How could I reach to loose her hair's tight braid, her body's sleeping clench? How could I unfurl her eyes, unravel her voice into a whisper, then a word, a song? How could I, asleep myself, speak?

When I was a little man, I took a boat at night out onto the lake at Orcas Island when the moon hung low, and at the center of the water I lay down under the stars and let the waves hold my wood bed softly, softly lift me, and behind

my back where I lay, all the arms and fingers of the water fit together endlessly, the small waves' hips and shoulders brushed my hull. I trailed my hand over the side into the water's pelt. The world felt smooth but I was a fragment. I knew it was impossible to become a human being. It seemed easier to long for a simpler transformation: My wish was to be wind, the tall lover, blind traveler in a rush, stroking water like that, for miles and for years.

On the mountain, walking in the fern, older and softer than foxglove, my hand finds your belly now. Tell me your wishes.

While you sleep, let me dream you a story. Let me whisper so softly into your ear, a listener an arm's reach from us would hear nothing. The towhee will not be disturbed, nor the hummingbird tunneling through sunlight behind your shoulder that moves, breathing like a wave.

Early March and I was traveling alone, riding the islands by bike and ferry. At a thrift I had bought a black tie, a gray felt hat with a ribbon-bound brim, and a small testament. Maybe I was so passionate and shy at heart, I thought I had to be a minister like my grandfather. I was born too late to know him well, so I had to make him up in my own self. I thought I would wear the harness of formality and live alone. So I rode with the tie flying over my shoulder, the hat pulled snug and low.

Somewhere in the afternoon my sleeping bag fell off my bicycle. I rode fervently on, and when evening came I coasted through an alder forest, stopped in the shade of a cedar to camp, and found the bag gone. The darkening road unreeled before me. Cold prickled my shoulders. The trees dressed slowly in their evening shadows. Only the road had a gleam. I followed, turned at the fork and followed again, turned and followed. At a barn by a narrow track, darkness caught me. Inside, the air was cold when I wrestled bales in the loft into a sort of bed, filling a slot between two bales with loose hay, tunneling in. I remember dozing chilled with my first exhaustion sleep, and then waking with thistle at my neck, stone-cold feet, and the bone shiver that shook me.

I survived that night by clenching my teeth and turning, turning like a spindle in the hay, talking nonsense and other longing, until I first saw light through the shingle weave above me, shook hay off my shoulders, melted the ice of dew from my handlebars with sheer grip, and set out along the dim road, wobbling and shouting to cheer myself.

And now I have wakened you by my whispering. I put my left hand under your head, and my right upon your hair. I hold light in my hands, when I hold you like this.

If you lay down on this hillside, and the moon came up behind you, my finger might pencil the wrinkle skyline of your hair, your shoulder's long horizon breathing, the shallow valley above your belly, then hip abrupt and definite, and thigh, knee, calf sliding starlight to your foot. I would graze in the shadows.

Lead me off balance now, guide me off the trail. In the tall grass, you seek the path with your feet. Beyond sunlight, the deer, lying down, have flattened the fern in the compact shade of one spruce. I call this tree a room. Every room should have such arms. You crush yarrow, cup your fragrance, hold it to my face. Between your hand and the earth, many simultaneous layers of green hold sway. Dew stands up on the maidenhair, the salmonberry leaves, on dewberry, devil's club, slender grass, salal. You gather berries for my mouth. I gather you. Sip. Breathe. Be tendril. Feed. The harvest of the wild comes in single pleasures woven thick to many—fog, dew, thistle, bee hum, sunlight, star fall, leaf shade, jay-feather blue, moss fur, springwater, and you.

I know the magnetism of all things. I feel you pull. I know the vine's patience. You turn, and then I reach for you. Because we grow, and growing, grow old, I love you like this now.

Let me tell that old story about the man who told his neighbors, "Now it is time for me to go live with the bears. I have been away from my kin too long." And he set out up the hill. They watched him dwindle up the path, and disappear into the trees.

Pretty soon, when evening came and he didn't come back, his neighbors went looking, but they found his tracks got kind of blurred in the path, got bigger, more round, got clawtips, until they could see his footprints had become the tracks of bear. When they got that high on the mountain, they felt the air turn cool, and they turned back.

I think I know what he found. Somewhere up on the mountain, as he rambled along through the meadow, the dreaming woman opened her eyes, looked into him, said her name meant delight. Then for him, too, the smallest blossoms burst open like a moment of eternity inside you.

I have climbed this mountain before. I have looked out at the view where some egotist sawed off the tops from old spruce to clear the horizon. I have looked down, far away down the south coast hazing toward blue. But now, here with you under the boughs of young spruce, I inhabit the place. I view your eyes, taste the blue freckle of huckleberry beside your mouth. I inhabit my own self, honeybee clapper in a foxglove bell. Memory and hope collapse into this moment when we turn inward toward each other, and the farthest tendril of the vine links your finger, and my cedar shoulder leans toward you, and the root delves deep to bring the buds of foxglove laughter.

KIM R. STAFFORD *is director of the Northwest Writing Institute at Lewis & Clark College in Portland, Oregon. He is the author of* Having Everything Right: Essays of Place *(Confluence Press, 1986).*

Succession

BY JOANN METZLER

My feet aren't even touching the ground as I claw through the horizontal jungle gym of Sitka alder. One foot holds down an elastic branch while I pull the rest of my body through the opening. In revenge, the limbs behind me whip up and catch the heel of my trailing boot, bringing me to my knees. Sweating and swearing, I rise to my feet and thrash at the alder, but make little progress through this overgrown avalanche chute.

So I straighten my hard hat and pause a moment to regain my composure. A tiny rivulet of water slips and slides over a narrow strip of exposed bedrock nearly hidden beneath the alder copse. I try to imagine the day, perhaps a hundred years ago, when a thunderous monster was unleashed from the alpine bowl above. It might have happened in the spring, when the unsuspecting creek gushed full with snowmelt runoff and cascaded through a narrow gully in the cool, green forest. In the sparsely timbered bowl above, where deep drifts had accumulated during winter storms, meltwater began to trickle beneath sun-warmed rocks. The free water eroded the bonds between the snowpack and the ground, and the heavy, wet snow began to glide. Suddenly a huge slab took off down the slope, then disintegrated into chunks as it was transformed into a churning, white mass. Gaining speed and feeding on the snow in its path, the avalanche funneled into the gully with a terrible roar. Trees were flung in the air, soil was scoured from bedrock, the whole mountain trembled as the snowy torrent hurtled down the chute, across the valley floor, and halfway up the other side before gravity finally stopped the beast. A gaping vertical slash gleamed cold and gray on the mountainside.

Slowly, lichens colonized the exposed bedrock of the avalanche track. Years ticked by as a spreading moss mat crept across the rock. Soil washed in from the surrounding hillsides, accumulating in cracks and depressions. The roots of ferns and grasses clung tenaciously to the soil, then probed further into tiny cracks in the bedrock. And then the alder seeds arrived, borne by wind and water and animals. These plants flourished in the harsh environment, producing prolific seed crops and shading out their predecessors until they hid the bedrock scar with a bandage of bright-green foliage.

Trying a different tack, I gently part the sinewy, gray branches and slowly pick my way through the maze of alder, finally emerging into a forest of western hemlock, Douglas fir, and western red cedar—the classic "old growth" of the Pacific Northwest. The air is dank and still. The scene is timeless: noble, shaggy monoliths reaching for the sky, decrepit patriarchs returning to the soil, vigorous seedlings sprouting from the bodies of their decaying ancestors. As a gentle rain begins to fall through the forest canopy, I feel out of place, trivial, an extemporaneous interruption caught in an ancient, enduring landscape.

But according to the aerial photo on my clipboard, I'm right where I'm supposed to be—in proposed clearcut unit #6 of Lower Johnson timber sale. As a district hydrologist working for the U.S. Forest Service, it's my job to prevent

damage to soil, water, and fisheries resources. I'm here to help design this timber sale so that unstable areas are avoided, water quality is protected, and erosion problems are prevented.

As I look more closely at the towering giants around me, I get the feeling that this forest is rooted in a more precarious equilibrium than first appearances reveal. Some trees lean in odd directions, many of the butts are curved like the handle of a pistol, and the blown-down trees have awfully shallow root systems. So I climb up the steep slope a few hundred feet and find just what I suspect—an old slide scarp. The soil under my boots is creeping slowly down the hillside, causing the trees to curve and lean as they grow. Below the scarp a prickly patch of devil's club surrounds a seep—evidence of the high water table that caused the trees to be shallow-rooted and susceptible to windthrow.

On my way back down the hillside, I come to an abrupt drop-off about two hundred feet above the creek that twists through the narrow valley bottom. The soil below me is actively eroding, slumping into the water as the slope is undercut by the flowing stream. This place is a time bomb just waiting for a D-9 Cat to pull the trigger. If we slice across the slope with a road, we'll intercept all that shallow, subsurface water, diverting it into the drainage ditch, through the culverts, and onto the soil surface below the road. Furthermore, once we cut these trees, there'll be no more evapotranspiration pumps to suck the water out of the ground. And the interconnected roots that bind the soil together will decompose in a few years. Not only will we disrupt the natural drainage pattern and raise the water table, the shear strength of the soil will be reduced. Just like that snow avalanche, once the shear stress in the saturated soil exceeds the shear strength, gravity wins and down she goes into the creek.

I sit on a log to jot down my observations, outlining the unstable ground on my aerial photo. Thanks to the Environmental Assessment process, which requires us to analyze the impacts of each proposed timber sale, I'm confident that I can prevent harvest of this unit and construction of a road across this slope. But this is only one unit out of eight proposed for the Lower Johnson sale, and it's unlikely that all the units will have similar problems. So I scramble back up the steep hillside through the tangle of alder to another proposed harvest unit on the other side of the avalanche chute.

No signs of instability here; just tall, straight trees and not much blowdown. These trees aren't as big and shaggy as the ones in the other unit; this stand probably burned 150 or so years ago, when natural fires raged through the valley. Down by the creek, bedrock armors the bank, making it impossible for the stream to undermine this hillside. We could put the unit boundary here, on this break in slope, about a hundred feet above the creek. That would leave an undisturbed riparian area to shade the stream, provide a supply of large, woody debris in the future, and, perhaps, serve as a travel corridor for deer and elk. Up there, by that rock outcrop, we could mark a one-acre patch of wildlife-reserve trees to provide a little diversity in the midst of the opening. My professional side tells me that we could clearcut 40 acres here with little adverse impact on soil, water, fish, or wildlife. My heart tells me that I'm signing off on one more blow to the integrity of the forest ecosystem.

But the trees do grow back. In fact, the art and science of forestry has come a long way in the nine decades since Gifford Pinchot became the first American forester. We've learned to leave some standing trees for woodpeckers and some down logs for ground squirrels. We've learned that we don't always have to burn the leftover logging slash and congest scenic valleys with smoke, that we can save the precious duff and allow leftover limbs to decompose and return nutrients to the soil. We've learned that we shouldn't plant a monoculture of evenly spaced Douglas-fir trees in every clearcut. And we've even learned how to outcompete the brush without using herbicides.

Five years after we plant a unit, the new trees have usually grown to four feet tall. In ten years we might thin them, creating some openings where deer and elk can forage. We also close the road and scarify the landings that were built to log the unit, seeding the exposed soil with a mixture of grasses that the deer and elk relish. While we don't exactly match the successional ingenuity that Mother Nature employed to heal the scar left by the avalanche, we do usually manage to prevent accelerated soil erosion, protect water quality, and mitigate the impacts of timber harvest on wildlife habitat here on the Packwood Ranger District.

But I'm beginning to realize that it's no longer enough to "prevent" and "mitigate" the impacts of each individual timber sale. Though I might be able to forestall damage to the resources on one site, all I can really do is shift the harvest someplace else. Because we still have to get out The Cut—the board-foot volume of timber that this district is required to put up for sale each year. While we're bound by the National Forest Management Act, the National Environmental Policy Act, the Clean Water Act, and scout's honor to protect the environment, we're directed by Congress, the Chief of the Forest Service, the Regional Forester, and the Forest Supervisor to get out The Cut. And thanks to 60 years of dutifully meeting our timber target, my district now resembles a moth-eaten, patchwork quilt instead of a lush blanket of green draped over the mountains. The ubiquitous Cut overshadows our paltry streamside buffer strips, forage seeding projects, wildlife-reserve trees, and erosion-control efforts.

Overwhelmed by frustration for the umpteenth time since I began this job six years ago, I slump down on a log

Continued on page 103

Calling the Owls

BY ROBERT CRUM

Best to go out just before twilight, in the fall, shortly after the fields have been harvested. Owls will answer in any season, but the singular clarity of that time of year—the sky like a piece of blue stained glass, the air turned suddenly cold—enhances the occasion and brings an irrefutable timbre to your voice. The fields are ochre and bone-colored. The corn shakes in the wind. The deer enter the orchards to snuffle among the windfall. In a forsaken acre of land fronting the stream, the pumpkins lying on bare earth seem almost contemplative, lost in deep thought. Down the road, someone steps out onto the front porch of the farmhouse, and the slamming door—the sound takes a full second to reach you—splits the air like a gunshot.

Early in the spring you discovered the owl's roost. Late one day, walking the gravel road along the creek, into the forest and up the flank of a hill, you came out on an abandoned pasture with oaks, second-growth pine, and a small pond. Walking beneath one of the oaks, you found owl pellets scattered beneath a limb and knew that this is where the owl came to digest its prey each night, after devouring it whole. Though owls' beaks are as sharp as hawks', they do not tear the meat from the bone and pelt the way hawks do; they swallow the whole animal, and later on, at their leisure, they spit up the indigestible parts in compact pellets. About the girth and length of a thumb, the pellets are composed mostly of matted fur and tiny bones. In one you found the beak of a bird; in another a small skull—perfect, clean, shaped like an arrowhead—from a mouse or vole. Along its base were two rows of minuscule teeth.

An oak for roosting, a meadow for mice, and the whole surrounding beech and pine forest for nesting and safety—an owl couldn't ask for more. The pond, though small, seemed fathomless in the way some jewels do, reflecting dark blue, without a ripple to disturb it. Through a gap in the hills you could see miles and miles into the countryside. As night came on, the land seemed to reflect the sky with the scattering of its own lights.

Walking home that evening, you heard the owl. A sequence of low, wooden notes, quick and skipping in rhythm, rich with reedy overtones and potent with intention, ending in a note sliding deep into the basement of sound. A great horned owl. Though the whole forest seemed to resonate with it, you could tell it came from somewhere up on the hill. You stopped in your tracks, and the night concentrated. The trees became coral. The stars drifted west.

You cupped your hands around your mouth and tried to call back. But it was a foolish, intrusive sound, stupidly human. The owl did not call again that night.

A few weeks later you saw the owl. A flock of blackbirds was mobbing it, compelled by instinct to dive at it and screech, to call attention to its presence and maybe drive it off. The owl was sitting halfway up a white pine. It was

stout and upright, a bird built like a concrete block, gray-brown, with the distinctive ear tufts. Once, as you walked behind it, it swiveled its entire head 180 degrees to see you. Otherwise it was imperturbable. It could have sat there all day, oblivious of the blackbirds. But you wanted a closer look—and *that* it couldn't abide. It arose from its branch and took off through the forest, large and silent, its wings stretching more than four feet yet touching neither twig nor leaf in all that dense knit of foliage—a king with its retinue of harpies still hounding it.

On other nights throughout the summer you heard it hooting. You heard it on the edge of the woods behind the farm and in the pines along the creek. You heard it on the hill and on the upland pasture. A few times you heard it down by the road. It was marking its domain, and sometimes other owls from across the valley answered it, marking theirs. For a time you heard the calls it used to woo its mate, tremulous and eerie, an elaborate, extended ritual designed to circumvent the overmastering instinct to kill whatever comes within its talons' reach. A couple weeks later it resumed its normal calls, the deep hoots that spooked the mice into scurrying. You heard it throughout the summer, under the bright stars, or under ragged clouds racing the moon, or in the full blackness of overcast, moonless nights. Whenever it called, you stopped and listened hard.

And sometimes you saw it at night—just a glimpse. Your headlights once caught it flapping over the road, and you saw how broad its wings were, how magisterial. Another time you saw it slicing through the air above the back pasture, diving, scooping something from the grass, then rising again, veering back to the woods.

And now you are headed up the hill again, making your way with a flashlight that now and then catches the yellow eye-shine of a raccoon or possum. Except for the few crickets that survived the preliminary frosts, the woods are silent, and dark. No moon tonight, but the sky is full of stars. A week ago the trees lost most of their leaves in one day. They fell and kept on falling, and for a long time they seemed inexhaustible—a waterfall of leaves. Tonight the bare branches can be seen dividing skyward, and only now and then does a last leaf detach itself and fall.

You stop at the edge of the abandoned pasture. The hills are humped around you, their size and steepness amplified by the darkness. Through the gap you can see the countryside lit with scattered lights. In the far distance they concentrate into villages and towns. Above you the Milky Way arches from one horizon to the other like the handle of a basket.

On the surface of the pond there should be a mesh of ice-spines forming between the cattails. The frogs have already used up the last of their energy to swim to the bottom and wiggle into the muck, lodging there for the winter. The snakes—blue racers, garters, rat snakes—have retired into their coverts. The red-winged blackbird's nest sits empty in the rushes. In the high country the bears must be busy all night, pulling apart rotten logs to get at the grubs, putting on the last fat of the season. They too sense the portents in the air. They know that the future now lies in seeds, in tubers, in fats.

You hear a rustling sound and realize that there are deer in the pasture. They had frozen into stillness when they heard you coming, and only after accepting your presence do they give themselves away by starting to graze again. You can barely make them out—two does and a yearling.

It is all right now to step forward into the field. (The deer remain where they are, heads bowed, still grazing.) It's all right to cup your hands to your mouth and call to the owl. You take a deep breath, wait with the image of the owl in mind, and then the notes fill you as they come skipping out, both piercing and round, rising in pitch and finally descending on the last note through a trill of saliva at the base of the throat. The sound fills the small valley.

"Trying the other day to imitate the honking of geese," wrote Thoreau in his journals, "I found myself flapping my sides with my elbow, as with wings." You find yourself bending forward at the hip, your elbows out, your fingers taut. When it's over you wait not so much for a response as to observe how much stillness you have commanded.

You call again. A muffled echo comes back from the wall of trees, and then the silence rushes back. You wait, listen. The deer are tearing the grass. Somewhere an insect, slow with the cold, makes a rasping noise. Were it here, an owl, collecting sound with its saucer-shaped facial disk, could have heard thousands of other sounds: squeaks, nibblings, scratches, scurrying of rodent feet. Their ears are placed asymmetrically on their heads to help them get a fix on their prey. Homing in, they fly headfirst, tracking the sound, watching with their eyes if they can, and only at the last instant do they rear back and thrust their talons forward.

You call again. You wait. Nothing. A star falls through Andromeda's arms. Saturn rides on the Swan's back. A downdraft of cold air makes the pines sway.

You call again, and this time, a second later, the owl calls back. It's somewhere up the hill, somewhere in the dark mass of pines. You wait, collect your wits, then call again, aiming your voice up the hill. Again it responds, and a little later a broad, gliding shadow floats down the hill above the treetops. You lose sight of it, but know it's coming to see who the intruder is. You call again, but this time there is no response.

You wait a long time without moving. The deer walk off and disappear into the forest. Water trickles from the pond. The sky comes close, bringing its silence with it. You draw a deep breath and call again, and this time the owl is right next to you, fiercer than you've ever heard. It's in the oak, not ten

Continued on page 103

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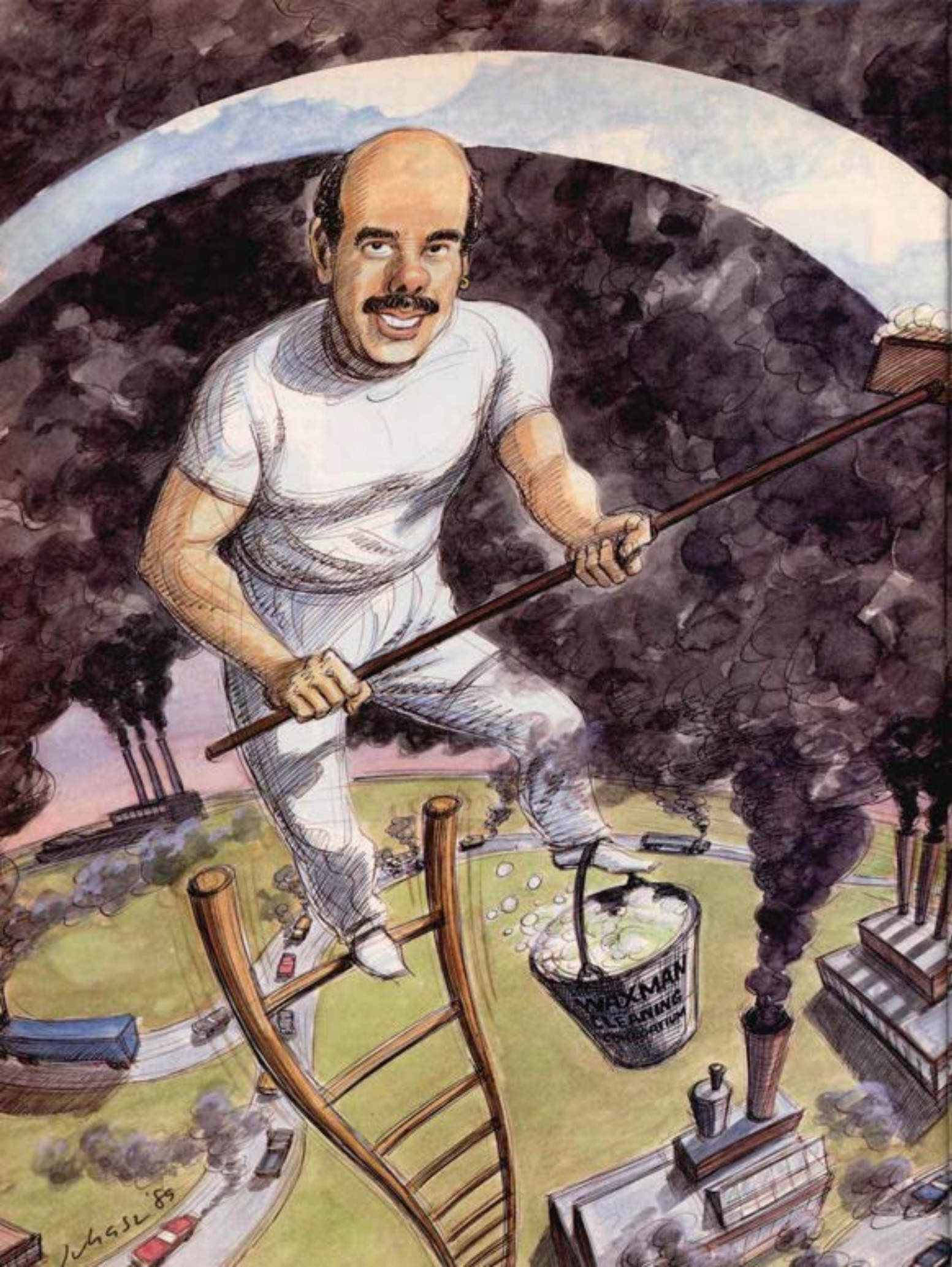
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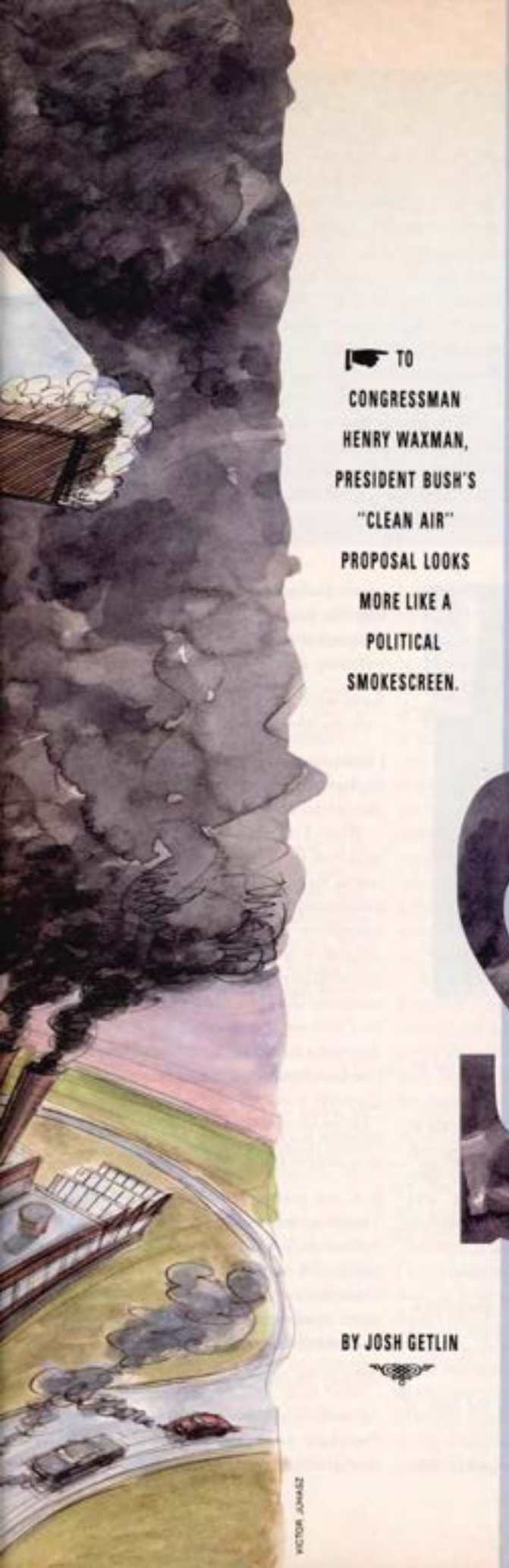


MR. CLEAN'S AIR ACT

TO CONGRESSMAN HENRY WAXMAN, PRESIDENT BUSH'S "CLEAN AIR" PROPOSAL LOOKS MORE LIKE A POLITICAL SMOKESCREEN.

BY JOSH GETLIN

Some 40 years ago, Los Angeles residents still wondered why their eyes and lungs burned every time they took a breath. Al Waxman, the publisher of a small neighborhood newspaper, was sure he had the answer. As a member of a city commission investigating the growing air-pollution problem, he insisted that fumes from automobile exhaust were responsible, and he called for strict new controls. • Waxman's message might have been visionary, but it didn't win him many friends in a city increasingly based on intensive use of the private car. Business leaders were incensed at his suggestions and had him tossed off the commission, saying more studies were needed. Meanwhile, air pollution in North America's smoggiest metropolis grew worse. • This year, as Congress plunges into the task of revising the nation's Clean Air Act (first passed in 1970), another Waxman is raising hell over air pollution. But this time nobody is dismissing him so cavalierly. Indeed, Representative Henry A. Waxman (D) of Los Angeles, the publisher's nephew, is a pivotal player in the fight to pass a tough new law cracking down on automobile pollution as well as acid rain and airborne toxic chemicals. • "I don't think there's anybody in the House who knows or cares more about air pollution than Henry," says Representative Leon Panetta, a California Democrat and staunch Waxman ally. "He has become the point man in Congress for all those people trying to get a new bill passed." • Mr. Clean, as Waxman is known on the air-

pollution issue, also wins grudging praise from his critics. A lobbyist who has clashed with Waxman says few members of Congress are as intellectually equipped to grapple with such a complex subject. Fighting with Waxman, he says, "is like running into a brick wall. If you haven't done your homework, forget it. And even if you have, he's formidable. Nobody fights for what he wants so tenaciously."

Waxman has also become one of the leading congressional experts on health care and has helped pass legislation expanding medical care for senior citizens and low-income women and children. He is deeply involved in efforts to expand federal funding for AIDS treatment and is pushing landmark legislation this year to provide AIDS testing for thousands of potentially infected people.

Short, mustachioed, and nearly bald, the 50-year-old congressman at first seems to belie his tough reputation. In fact, Waxman is quiet, good-humored, and sometimes painfully shy. His serious, almost professorial demeanor seems out of place in the glib, fast-track world of Washington politics.

But when a political fight looms, a startling transformation takes place: Waxman reveals himself as a skilled legislative infighter, one who has been known to grill committee witnesses like an autocrat and pepper his colleagues with sharp-tongued retorts during debates on the House floor. "You don't want Henry as an enemy, let's put it that way," says an aide to one House leader. "The difference between him and a lot of other congressmen is that he really cares about the issues he's dealing with—he lives and breathes them."

Waxman is a native Angeleno, married with two children, and a devout Jew whose Russian grandparents fled Czarist pogroms. He attended UCLA, earned a law degree, and launched his career in the 1960s, when he was elected to the state assembly. Waxman was first elected to Congress in 1974. Over the years he and other Southern California Democrats have established a political "machine" that exerts influence from Los Angeles City Hall to the halls of Congress.

SIERRA: As you were growing up in Los Angeles, did you expect that you would become a public official?

WAXMAN: I don't think I wanted to be a public official at that point. My family was solidly liberal and Democratic, and I liked the issues—even in high school I remember working in local campaigns. But not until college did I get involved in the California Young Democrats and the civil-rights movement, and later on in the anti-war movement.

When you were first getting involved with local candidates in high school, what particular issues attracted you?

It was the 1956 presidential election. Mr. Adlai Stevenson. I was attracted when Stevenson talked about trying to do more for working people and poor people, trying to set up a more peaceful world by emphasizing international cooperation.

What about the influence of your family? To what extent would you say your Jewish upbringing, the experience of your grandparents, shaped your perspective?

Jewish religious tradition points us in the direction of trying to make a better world, trying to bring about social justice. I think it also requires us to stand up and fight for what we believe is right, even if it's not particularly popular at the moment—as Elie Wiesel once said, to speak truth to those who are powerful.

TERRY ASHE / GAMMA-LIAISON

Representative Henry A. Waxman

What were the issues that you worked on with the Young Democrats?

We were considered way-out radicals at the time. In the early '60s we came out with resolutions endorsing a test-ban treaty, recognition of Red China, and disbanding the House Un-American Activities Committee. Each one of those stands now seems quite mild.

So initally you had an outsider's perspective. You were not part of the mainstream.

We were ahead of our time.

Why did you decide to take on the issue of clean air?

I remember as a child the first early days of air pollution. People were shocked that the pristine air was being fouled. I remember walking to school in smog so irritating that my eyes burned.

Later, when you were in the state legislature, were you interested in air-pollution issues?

I was interested, but there wasn't a great deal going on. My interest was in health care in the state of California.

When I came to Washington I applied to go on the House Energy and Commerce Committee, which had a health subcommittee. When I joined that subcommittee in 1975, the first bill we addressed was the Clean Air Act. I was immediately given an opportunity to work on strengthening that legislation. So I've been involved in the Clean Air Act since I first came to the Congress. I've seen how these issues have evolved.

The whole nation knows by now that air pollution is a Los Angeles problem, but it's of great concern in other areas too.

It is not just a Los Angeles problem. There are around 150 million people in this country who live in areas that violate health standards. We keep finding more areas out of compliance, more and more Americans forced to breathe air that's not healthy.

All over the country.

All over the country. Los Angeles has the most severe problem, there's no doubt about that. That is why in Los

Waxman emerged as a national heavyweight in 1979, when he won an uphill battle for the chairmanship of the House Energy and Commerce Committee's powerful Health and the Environment Subcommittee. Ever since, he has been trying to win passage of tougher clean-air legislation. It has not been an easy fight: Democratic Representative John Dingell of Michigan, who chairs the full committee, has consistently defended the interests of the automobile industry against Waxman and others seeking to impose strong controls on auto emissions.

Now Waxman is spearheading the fight for a more rigorous clean-air law, and he has his work cut out for him once again. President Bush surprised many observers in July by proposing a package of new clean-air regulations—something Ronald Reagan never did—and his proposals are expected to dominate the clean-air debate in Congress this year and next. The Los Angeles congressman has bitterly criticized Bush's proposals as weak, especially on the subject of auto pollution, and predicts that Congress will ultimately pass a much more stringent law.

"The stakes are too high to let someone claim rhetorical credit for clean-air legislation, but in reality do nothing at all," he says. "I don't think people will stand for that."

Dingell and others disagree with that assessment, but none of them takes Waxman lightly. "When it comes to rounding up support for a position, nobody does it better around here than Henry Waxman," says Representative Bill Richardson (D-N.M.). "When he gets rolling, when he's really intent on reaching his goal, it's something to see."

Josh Getlin, a New York City–based reporter for the Los Angeles Times, *conducted this interview for* Sierra *in July, just after President Bush had unveiled detailed clean-air proposals. At press time in October the White House–backed clean-air bill was being debated in the House Energy and Commerce Committee and in the Senate Environment and Public Works Committee.*

Angeles we're going to have to be much more aggressive in our policies, looking for every possible pollution reduction, including some from very small sources. But in many areas of the country the air-pollution problem can be dealt with very effectively by reductions in the pollution from mobile sources alone. Los Angeles serves as a warning for the rest of the nation.

What I hear from people on both sides of the aisle, whether they praise or damn you, is that Henry Waxman is someone who managed to protect and in some ways advance the liberal agenda during the height of the Reagan years. How were you able to resist the administration's attacks on the Clean Air Act in 1982?

We went through a difficult time during the eight Reagan years trying to deal with health and environmental issues. So many government efforts were set back. I do pride myself on making some progress and keeping some of the damage to a minimum.

We faced a serious attempt to gut the Clean Air Act in 1981 and 1982. A coalition of all the industry groups that pollute lined up with the Reagan administration and with the chairman of the House Energy and Commerce Committee, John Dingell. Their legislation was based on the premise that every industry could get a break and pollute a little more. The only problem with their plan was that the public was going to have to pay for it with poor health and increased environmental damage.

We were able to stop that bill mainly because voters supported stronger, not weaker, environmental protection. When the legislation came to the full committee, the coalition fell apart. It was a coalition built on greed. When we were able to take away the benefits that the chemical companies and some of the utilities wanted, the whole thing collapsed. The industries that weren't going to get theirs didn't want other industries getting something. So they ended up joining us in pulling the plug on the legislation.

After 1982 we were the ones trying to advance legislation. We felt it was important to adopt bills on airborne toxic chemicals and acid rain. We've been frustrated, but we've been painting the picture and setting the agenda.

Some observers say that the politics of clean air has become snarled, at least at the committee level, partly because of the well-known and strong disagreements between you and Dingell. Is that true?

I've read in a couple of places that this issue is a personality problem between John Dingell and Henry Waxman. I resent that, because there are clear substantive issues. He sees his constituents as the automobile manufacturers rather than the people in Detroit who are suffering from air pollution. I'm not only representing what I think is my constituents' interest, but a broader national interest—the health consequences of air pollution. I've never seen any movement on the part of Chairman Dingell that would give me hope that a compromise could be worked out. So we have staked our positions and are now advancing them.

Ironically, we're together on most other issues that are before the committee, but on environmental issues we have been at odds with each other and continue to be.

I hear people saying that there really is a chance for legislation this year. What makes things different now? What has changed?

The reason I'm convinced we're going to pass clean-air legislation this year or this Congress is that we have an administration that's come forward with a proposal. It's not a proposal that meets the tests that I would impose. But the fact that the President has put this high on the agenda, as has the Speaker of the House, the President Pro Tem, and the Majority Leader of the Senate, means that we're going to move forward.

You've already begun to answer this, but let's go into more detail. What do you think of the Bush proposals?

As much as I was heartened by the President's original statement of objectives, I'm disappointed by the details of the bill. The Bush administration gave up a lot of ground, especially to the auto-

IT'S CLOUDY IN CONGRESS, WITH A CHANCE OF CLEARER SKIES

At *Sierra*'s press time in early October, Representative Henry Waxman's Health and Environment Subcommittee had not yet emerged from a haze of highly controversial debates on the Clean Air Act.

Waxman had asked the subcommittee to use President Bush's bill as the starting point for an overhaul of the 19-year-old legislation. Though he considered the bill a weak one, he hoped to strengthen it with amendments from the three alternative bills he is supporting.

By the end of September, House Energy and Commerce Committee Chair John Dingell (D-Mich.) and Representative Norman Lent (R-N.Y.) had changed the starting point by introducing a modified version of the President's bill that addressed some environmentalist concerns: It eliminated one Bush provision that would have allowed the use of tall smokestacks to evade pollution controls, and another one that would have allowed the EPA to be less vigilant in protecting visibility in national parks.

But despite the concessions, environmentalists generally viewed the Dingell-Lent bill as far from acceptable. "Most of the other changes in the substitute bill are cosmetic," said Sierra Club lobbyist Melanie Griffin, "and some of the new provisions actually weaken the EPA's authority."

With this new bill on the table, the markup process began. Waxman won an important early victory when, by unanimous vote, the subcommittee squashed the administration's plan to allow "emissions averaging" for auto manufacturers. (See column three below.) Then, traditional foes Waxman and Dingell surprised observers by emerging from behind closed doors with standards for auto-tailpipe emissions that, while not as stringent as Waxman's original proposal, represented a big environmental step forward from the Bush bill.

mobile industry, in working out legislation that just won't get the President what he says he wants: clean air for every American.

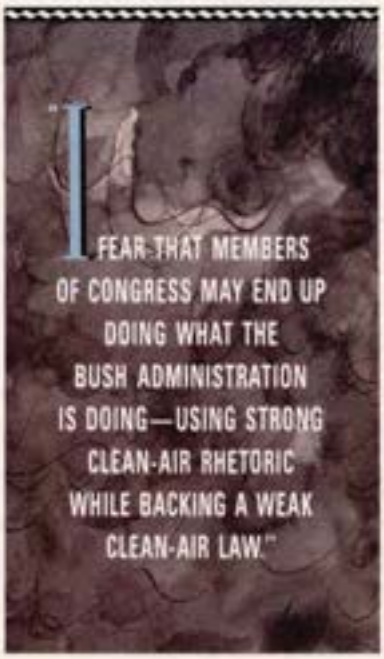
What would your legislation accomplish that his would not?

When EPA Administrator Bill Reilly came before our committee, I went through a litany of things the agency could have done but chose not to do. They could have tightened up the tailpipe standards, at least to what California requires, both for hydrocarbons and nitrogen oxides. They could have done more in the area of light-duty trucks. They could have done more in the area of heavy-duty trucks and urban buses. They could have done more to make sure that the pollution standards met by the automobile would be for the full life of the car or 100,000 miles in ten years—not just for five years and 50,000 miles. They could have had an on-board canister to pick up gasoline evaporation, which in warm weather can produce as much air pollution as tailpipes emit. They could have made a lot of things mandatory that they made discretionary. They passed up all these opportunities to reduce smog.

Some of the discretionary strategies were mandatory in the earlier drafts. I'm convinced that between the time of the June draft of the President's proposal and the July legislation, the automobile industry got concessions from the Bush administration.

Why was there this retreat from the promise of the June statement?

I don't know the full reason for it. I do know that the automobile-industry executives, including the head of General Motors, met with [White House Chief of Staff] John Sununu a couple of days before the bill was introduced. They might have gotten these additional concessions at the time, although the administration denies that.



What other differences do you see between your proposal and Bush's?

Not only have Bush officials failed to take advantage of many opportunities to reduce air pollution, they have proposed changing the law in a way that I think could produce even more pollution than we now have. They would allow motor-vehicle standards to be met through what they describe as a more flexible system of [emissions] averaging, which would allow some cars [in a manufacturer's fleet] to pollute above the standard because others are polluting below it. Now, *every* car must meet the standard—so the average is way below the standard for a whole fleet of cars.

The legislation could also undermine the air quality in our national parks. It would repeal requirements that the EPA promulgate standards protecting national parks from degradation of air quality. It would repeal the existing law discouraging the use of tall smokestacks [as a means of pollution control]. It would weaken the sanctions imposed for failing to meet clean-air standards. It would scrap the provision in current law that requires the EPA to set health standards for emissions of airborne toxic chemicals. Even the centerpiece, the clean-fuels requirement, in which Bush

Sweet as those wins must have been for Waxman, many difficult questions remained in the areas of urban smog, airborne toxic chemicals, and acid rain. At press time the subcommittee was expected to finish its job before mid-October. Then the bill was to go to the full House Energy and Commerce Committee, and finally to the House floor. If Waxman succeeds in delivering a strong bill to the House, the clean-air battle will be more than half won: The Senate is expected to deliver a bill much stronger than Bush's.

Daniel Weiss, Washington, D.C., director of the Sierra Club's pollution program, says that readers interested in clean air should write to their representatives asking them to support the principles embodied in Waxman's three bills when the Dingell-Lent bill reaches the House floor.

On the issue of urban smog, that means backing the provisions of H.R.2323, a bill introduced by Waxman and Jerry Lewis (R-Calif.) with a much more aggressive approach than the Dingell-Lent bill proposes for cleaning up the urban areas now in violation of federal air standards.

On the issue of airborne toxic chemicals, Waxman and the Sierra Club recommend H.R.2585, a bill introduced by the late Mickey Leland (D-Texas) and by Guy Molinari (R-N.Y.). The bill distinguishes itself from Bush's by, among other things, greatly increasing the number of regulated sources of toxic chemicals and by requiring industry to install the best pollution-control technology currently in use (not just the "maximum achievable" technology based on considerations of cost and feasibility).

On acid rain, defining the environmental high ground is more complicated. Environmentalists support the Dingell-Lent bill's proposed cap on sulfur dioxide emissions, which would prevent new plants from increasing overall pollution levels. But on most other matters—deadlines and the size of reductions in nitrogen oxide emissions, for instance—they prefer the stipulations of H.R.1470, a bill introduced by Gerry Sikorski (D-Minn.) and Silvio Conte (R-Mass.).

"The biggest bone of contention—auto pollution—has been resolved," Weiss says. But further drama could lie ahead when the issues of polluted cities, airborne toxics, and acid rain reach the House floor. ***—Joan Hamilton***

originally proposed mandating sale of 1 million clean-fuel vehicles by 1997, has been delayed by two years in the proposed legislation. In fact the requirement can be thrown out the window if the administrator of the EPA thinks it's appropriate to do so.

The bill in its details is filled with relaxations and loopholes and opportunities for the auto industry and others to avoid or fight pollution restrictions—should the EPA have the will to impose them. In other words, this bill just doesn't work.

Given all the things you have just explained, what can Sierra Club members do to try to see that a strong Clean Air Act is passed?

It's so important that people who care about this law make their voices heard. They must write to their representatives and senators. They must try to let them know that they're being watched.

Members of Congress know that 80 to 90 percent of the American people want stronger environmental protection, even if that means they're going to have to pay more money for it. But in Washington, special interests have a lot more power because they are watching things very carefully and have campaign contributions that they will either give or withhold depending on how people vote on specific provisions.

I fear that members of Congress may end up doing what the Bush administration is doing—using strong clean-air rhetoric while backing a weak clean-air law. So members of the Sierra Club should write to their representatives and tell them to vote for and against some of these specific provisions.

It's not enough to write a letter saying we want you to support the Clean Air Act? It has to be more specific?

I think just saying you're for clean air is not enough. You've got to come in and say you're against the weakening provisions of the Bush reauthorization bill and that you endorse the Sierra Club–backed legislation: H.R.2323 on smog, H.R.1470 on acid rain, and H.R.2585 on toxic air pollutants.

Do you think that grassroots activity can act as a counterweight to the impact of special interests?

I think it's the most important counterweight we have. We don't reauthorize the Clean Air Act very often. So the decisions we make this Congress are going to be in place for the next several decades.

If legislation approximating yours is endorsed by the House, do you think that Bush would veto it?

No. I can't see the President vetoing a clean-air bill because the automobile industry isn't happy. I think he would be too embarrassed.

I would hope that he would veto a bill if it *wouldn't* achieve clean air, however. I would hope we have a President who would veto the bill that was sent to us by this one.

How do you rate the performance of EPA Administrator Bill Reilly so far?

I think Bill Reilly is very well-meaning. I think he brings a pro-environmental approach to the EPA. Unfortunately, he's lost a lot of fights within the administration on clean air and is acting as a good team player backing the bill.

Then you understand the situation, but you're disappointed—is that how you would put it?

I'm disappointed that he hasn't been more successful in the internal fights.

Clean air is one of the first broad opportunities Bush has had to show his environmental credentials. What do you think about his commitment, based on his recent clean-air proposals?

I think what we have is a President who wants to look like an environmental President, but who is not coming forward with a strong environmental proposal. I get a sense that President Bush is more interested in how he appears than in what he will in fact accomplish. ■

With an Ear to the Ground, Sea, and Sky

Daniel Glick

BERNIE KRAUSE thinks he's got a worm in his head. He probably picked it up on a recent field trip to record the sounds of animals in the Costa Rican rainforest. Just a few days after his return, with thousands of red bites covering his body and the memory of 200 ticks burrowing into his skin still very much on his mind, Krause is obviously glad to be back in the cool, carpeted confines of his San Francisco home.

"I've never been in a situation quite as scary," says Krause, who has seen much of what the planet can dish out during the 20 years he has spent compiling the world's preeminent private collection of environmental recordings.

This most recent trip took him to Corcovado National Park in the southwestern corner of Costa Rica, just north of the Panamanian border. There Krause recorded all manner of creatures that flieth and creepeth and crawleth.

"The proliferation of insect and reptile life caused the rainforest to be very hostile," he says with characteristic understatement. "There'd been a drought, and there were insects everywhere because of the imbalance in the environment. But they weren't making much noise, because it was over 120 degrees."

He rubs his graying temple, where he thinks the worm must be. "Mosquitoes are nothing compared to the other creatures. The cockroaches were huge, the vampire bats . . ." He pauses, unable to describe the specter. "I mean, just endless numbers of *weird* spiders and creatures that bite. It was overwhelming. I can deal with it most times, I can deal with forest mice and rats and all that, but this, this. . ."

The memory stirs Krause, and he shakes his head to clear the image. In the basement studio that serves as headquarters for his company, Parasound, Krause sits surrounded by computers, synthesizers, tens of thousands of dollars' worth of recording equipment, and huge file cabinets filled with tapes of animal sounds—cockatoos, walrus, killer whales, crickets, cicadas, katydids. He uses all of this to create "habitat sound portraits," which he describes as sound sculptures that use ambient sounds from various natural habitats as elements of a larger composition or orchestration. The thought of sitting in the jungle pointing a microphone at ravenous insects strikes him, and me, as impossibly incongruous. "It's crazy," he says with a note of mock finality. "I'm thinking of becoming a stockbroker."

Not a chance. A few weeks later—when Krause's red spots have healed and he has recovered from what turned out to be, in fact, the subcutaneous activities of a tropical botfly larva—his recording quest continues. Though one of his life's

"We all help each other. We trade sounds like baseball cards. Somebody says, 'Hey, you gotta gorilla? I'll trade a tortoise for a gorilla.'" —Bernie Krause

JAMIE HOGAN

goals is to record the sounds of all the world's habitats before they disappear (or he does). Krause realizes that his work will never be finished. And now, at 50, he acknowledges that the trips are getting tougher, and that places to record animals without a background of rampant man-made noise are further afield.

Krause has traveled from pole to pole and around the equator to compile an aural history of the planet. From the first commercial use of environmental sound in his album *In a Wild Sanctuary* 21 years ago, to his most recent release of animal sounds mixed into a pop species-symphony, *Gorillas in the Mix* (Rykodisc RCD 10119/RACS), Krause has used the nature sounds he's collected in a myriad of innovative productions. Among many other enterprises, he has created habitat recordings to accompany a traveling photography exhibit of mountain gorillas from Rwanda (by photographer Nick Nichols) and produced a piece using only bee sounds for the apiary exhibit in the St. Louis Zoo ("Bach's fugue in Bee-minor").

Through the different projects, the serious and the comical, Krause carries on his crusade to make people aware of the scope of modern environmental destruction. As more animals and habitats vanish, Krause woefully anticipates that human life will as well.

"The rainforest is disappearing at a hundred acres a minute now, and the increase in habitat destruction is exponential. We're talking about very serious stuff—about your oxygen supply, about fresh water to drink, about food that's not poison. We're talking about unheard-of pressures on what's left of the arable land of the world."

As Krause discusses his reasons for going to such extraordinary lengths to catalog the sounds of the planet, his impish demeanor changes and his face, readily set to grin, becomes intense and focused.

"The objective of all my work is to get the idea out that there are not many uncompromised natural habitats left. For me, recording sound is one way to document what was once on the planet —and maybe to stick it in a time capsule for whoever happens to come to what's left of the Earth.

"We're not talking about an apocalypse or an atomic bomb. We're talking about getting our lives snuffed out because we can't breathe. Within 15 or 20 years. That ain't far down the line, Jack."

Krause's speech changes easily from scientist to hipster in the course of conversation. He is in fact both these things, with credentials from both worlds. He has a Ph.D. in creative arts with an internship in bioacoustics and is a research associate at the Cornell Laboratory of Ornithology and the California Academy of Sciences. He is also a musician with a distinguished and varied career, including a stint as Pete Seeger's replacement with the folk-singing Weavers and studio sessions with Motown Records, the Rolling Stones, Phil Spector, and the Doors, among other pop icons.

After moving to Southern California from New York in 1965, Krause briefly sold radio ads in Orange County. ("They're pretty conservative down there—they still flew a flag with 48 stars on it.") But later that year he moved

again—to Northern California this time—and enrolled at Oakland's Mills College as a student in its pioneering taped-music program.

Around that time Krause joined forces with the late Paul Beaver, who had been involved in creating electronic scores for films since 1951's *War of the Worlds*. Together Beaver and Krause bought one of the first Moog synthesizers and learned to create new sounds with it. The pair soon became indispensable to many artists exploring the new sound technology.

After using a synthesizer to simulate natural sounds, Krause found that it was a simple step to incorporate real environmental sounds into musical compositions. One result was the 1968 recording *In a Wild Sanctuary*, which has been succeeded by 23 other commercial recordings that combine music with environmental sounds.

While gathering sound in the wild against the cacophonous backdrop of civilization, Krause faces reverberations from oil drilling in the Arctic and the din of chainsaws in the Amazon. As he continues to catalog the richness of Earth's natural resonances, his challenges come from all sides.

In Costa Rica, animals had killed two scientists who preceded Krause. One was attacked by a swarm of killer bees, the product of a crossbreeding experiment gone awry. The irony is not lost on Krause.

Just before Krause arrived, a biologist working within the park was killed by a bite from a fer-de-lance, one of the world's deadliest serpents. The death was dreadful, another researcher explained, because along with the neurological effects of the bite, the venom broke down the man's tissue until the skin peeled away from his leg, leaving the femur exposed.

The fer-de-lance episode is a metaphor, however imperfect, for Krause's vision of the planet—a planet he has watched deteriorate like the biologist succumbing to the snake's venom.

"All they could do was give him some morphine to try to take away his pain while he died," Krause says. "I figure that may be all that's left for us. How are we going to figure a way to go with dignity?"

We are driving to a scientific field station in the Sierra Nevada to record the sounds of spring. As we leave the San Francisco Bay Area early in the morning, the commute crush heading into the city makes Krause wince. "There's no way I could do that, man. No way."

But Krause drives himself in ways no civilized city dweller would think of. When spring arrives, he hits the road. This year he has recorded at Mono Lake and in the Mojave Desert, Costa Rica, Alaska, and Australia. He spent three weeks roaming up the 111th meridian from Mexico to Canada, following the 16-mile-a-day northward movement of spring through the Sonoran and Escalante deserts, the Rockies, the Tetons, Yellowstone, and through Montana to Canada.

"It's hard work," Krause says as he lays out his gear before crawling into a sleeping bag. "It's anywhere from 18 to 20 hours a day in the field trying to keep your equipment in good repair, making sure you're getting the recordings. But for me, it's the most peaceful time of my life. I mean, sitting in an office is not my thing."

At four-thirty the next morning, the alarm goes off, signaling the start of our search for the dawn chorus in Sierra Meadow, near Yuba Pass in the northern Sierra. Krause complains briefly about the hour and shivers in the dark. "I'm too old for this, man," he says unconvincingly to someone having far more difficulty greeting the new day. He glances outside the tent. The moon is setting, and the faintest glow appears in the east. "We be late. Let's go get those froggies."

Krause is a cross between a camp counselor and a skier excited about fresh powder that fell overnight. "Boy, it's going to be nice this morning. This is the *perfect* time to be here. We're going to get some great sound!"

He doesn't even drink coffee. "I normally get up at five or five-thirty, so this is really no big deal." Krause grabs the microphones he carefully set out the night before and we pile into the car, drive down a dirt road, and stop near a vernal pool set in the middle of a 25-mile-long valley occupied by a spattering of farmhouses and a small town

at the far end. This is where we'll set up.

He moves quickly, connecting a serpentine pile of cords from microphones to tape deck, and setting the pieces of equipment on folding chairs to keep them off the ground. He is wearing an oversize wool hat that makes him look a little like a forest elf, a ski sweater covered by a down vest, jeans cuffed up like a schoolboy's, and white tennis shoes.

Krause puts on his headphones and beckons me to be silent. Perfectly silent. He rolls some tape and speaks softly into the microphone.

"It's oh-five-thirty hours, May 19th, we're in Sierra Meadow and the temperature is 40 degrees."

Then he sits down and is quiet. Perfectly quiet.

When you're with Bernie Krause, you think about sound in ways you have never imagined. Boots scraping on a gravel road sound like a train approaching, the brush of an unshaven face on Gore-Tex like amplified sandpaper on wood. A truck driving across the valley five miles away sounds like a convoy.

The work takes solitude and patience, and reveals layers of sound most people never hear. "It's like music," he says, listening to the morning filling with calls from red-winged blackbirds and swallows and yellow-headed blackbirds, grouse, and spade-toed frogs. The ensemble sounds like an orchestra tuning before a performance.

He sits, sometimes for hours, listening. Animals often come to him—birds have perched on his shoulder and head, he has stared down foxes at two paces.

Krause recounts how he was crouching in the rain outside the late Dian Fossey's camp in Rwanda, just before a mountain gorilla tossed him like an empty coconut.

"I managed to misread some cues," he acknowledges. "But you learn real quickly, particularly when you get a large, hairy hand on your shoulder from a 600-pounder and all of a sudden you've got a lot of air between your feet and the ground. Luckily, I didn't land on another gorilla. Otherwise I would have been in bad shape."

The sun comes over the hills, the cows begin lowing, a train slithers across the northern end of the valley, a

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small plane's hum precedes its sighting. The brief dawn chorus is over. In an hour and a half, Krause figures, he's garnered five to ten minutes of usable sound. It has been a productive morning, given how difficult it is to find places where the noise of encroaching civilization doesn't play havoc with the sonic ambience of purely natural habitats.

"This last trip to Rwanda, I spent 200 hours recording to get maybe 15 minutes of sound," he says. "Twelve years ago it took me only 22 hours to get the same results."

Now that Krause's work has gained a wide audience, the years spent gathering sound on trips he financed himself are beginning to pay off. His most recent success is the *Gorillas in the Mix* release. On it, Krause arranged contemporary dance tunes made exclusively from animal sounds. In the studio he isolated the sounds, entered them into sophisticated computer-synthesizers, and rearranged them into songs with parodistic titles like "Ape No Mountain High Enough" and "Trout From Ipanema." The sounds have been so cleverly arranged that it's virtually impossible to tell that the horn section rings with African elephants, the keyboards are dolphins, a walrus hums on bass, and the hi-hat is a snapping shrimp.

The Nature Company retail chain has sold more than $3.5 million worth of Krause's work. In his contract, Krause has designated a portion of his profits to be given to the Central American rainforest preservation program of The Nature Conservancy, a group that buys unspoiled land throughout the world and holds it in trust.

His work has had other dramatic environmental impacts. In 1985, Krause was one of the central figures in a story that captured the imagination of the nation. A whale named Humphrey got stuck in the Sacramento River Delta, and hundreds of people mobilized to coax him back to sea. Ultimately, it was Krause's skillful editing of recorded whale sounds that lured Humphrey back through the Carquinez Strait, into San Francisco Bay, and beyond the Golden Gate. The saga of Humphrey earned Krause the media appellation of "Pied Piper" and a flush of publicity.

Looking back on that episode, and more recently at all the expensive fuss over two icebound whales in the Arctic, Krause is dumbfounded by the misspent resources, yet encouraged by the implication that people *can* rally to defend threatened animals—and by extension threatened species, habitats, ecosystems, and perhaps the planet as a whole. "That's the kind of effort we need now," he says. "And I mean *now!*"

Krause takes his successes without too much fanfare, and keeps searching for new ideas. He is still working on the 111th-meridian project, collaborating with keyboardist/composer Phil Aaberg; the recording will be released by The Nature Company late this year. He has proposed a series of albums of animal sounds for children, to add to the constant flow of work he does for museums, zoos, and film, TV, and commercial projects as well as endless contributions to the Cornell University Library of Natural Sounds.

The demand for his kind of work is growing. Museums are using sound to enhance a variety of exhibits, and zoos are experimenting with ways to improve the ambience of animal habitats through sound.

Still, the environmental-sound community is small. "We all help each other," Krause says. "We trade sounds like baseball cards. Somebody says, 'Hey, you gotta gorilla? I'll trade a tortoise for a gorilla.'"

Through his projects, Krause continues to spread his gospel. "People keep saying to me, 'You say we've got 15 or 20 years until the end. What does that mean?' Well, it may not be 5,500 days or 5,600 days, but the point is that the direction we're headed in is one of painful and ultimate destruction. We are party to an incredible delusion that we can live past and through this and that things are going to be OK. We're not paying any attention. Our ear is not to the ground."

But Krause isn't ready to write it all off just yet. "Hope does spring eternal. If you give up all your hope, you might as well take the cyanide now." ■

DANIEL GLICK *is a staff correspondent for* Newsweek *magazine.*

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Whirlybirds Not Welcome

BLACK MOSHANNON PARK, PA

Visitors to Black Moshannon State Park can—depending on the season—birdwatch in a bog, pick wild blueberries, cross-country ski, or take a hike, all the while listening to the wind blowing through white pines or lake water lapping against tree trunks. If a National Guard plan proceeds, visitors will also hear more than a dozen Chinook helicopters whirring in and out of a heliport on the park's border.

The Pennsylvania Department of Military Affairs hopes to move its National Guard helicopter unit from Wilkes-Barre/Scranton International Airport to Mid-State Airport, a little-used facility in central Pennsylvania, this fall. Mid-State, located between the towns of Philipsburg and State College, abuts the 3,500-acre Black Moshannon State Park and is surrounded by state forests.

Under the plan, the National Guard would be allowed to operate its twin-engine helicopters an average of 30 hours per week, annex 40 acres of state forestland, cut down trees, and pave 16 acres for heliport facilities.

The proposed heliport is meeting the resistance of a citizens group called Don't Ruin Our Park (DROP). The Sierra Club's Moshannon Group shares DROP's concern that the large, noisy helicopters will not only disturb area residents and park visitors but also interrupt the mating behavior of birds in the park wetlands that border the airport. Furthermore, activists worry that spills of helicopter cleaning solutions, lubricants, and fuel could harm the groundwater and wetlands.

In August the National Guard Bureau in Washington, D.C., released an environmental assessment concluding that the heliport would have no significant impact, thus clearing the way for immediate development without a detailed environmental impact statement.

But Dennis Thomson, professor of meteorology at Pennsylvania State University and an expert on noise, calls the Guard's noise analyses—based on levels averaged over hourly periods rather than on each flyover—"seriously inadequate." He adds that the assessment's shortcomings demonstrate "either a lack of competence or perhaps even malfeasance."

Activists point to a preliminary environmental assessment of potential impacts that contrasts dramatically with

GRANT HOLLMAN

On guard against the Guard: It's a fragile peace in Black Moshannon State Park.

the final version. Prepared by a Pennsylvania Guard staffer who has since left the agency, the earlier report warned of the potential for noise pollution and for severe impact on sensitive wetlands, groundwater, and wildlife, including two threatened bird species. It also faulted the state Guard for failing to finalize or implement a hazardous-waste-management plan and stated that the agency has disposed of toxic waste in dumpsters or by other illegal means.

In what activists call a whitewash, the National Guard Bureau discredited these early warnings in its later assessment. But spokesperson Bob Foster denies that the Pennsylvania Guard is trying to hide anything. The staffer who prepared the preliminary report "made assumptions that were entirely wrong about our operations," he says. "You'll never hear the helicopters when you're in the park."

This fall DROP plans to seek an injunction halting construction of the Guard facility unless an environmental impact statement is prepared. "All we're asking for is a real hard look" before a heliport is built, says the Sierra Club's Tom Ruscitti, who is also a member of DROP. "An environmental impact statement is mandated by law, and morally it's the right thing to do."

—Susan D. Borowitz

Preserve Protectors Take Heart

BIG THICKET, TEXAS

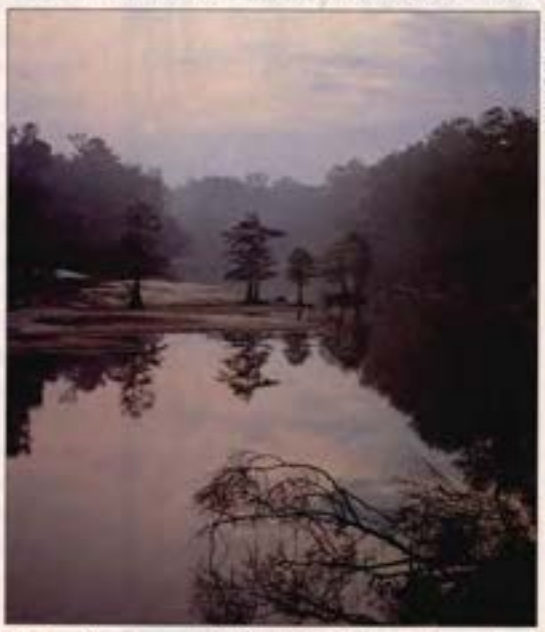
"What we have in the Big Thicket National Preserve aren't unusual species so much as unusual combinations of species," says Ranger Dave Baker. Yucca and dogwoods, otters and armadillos, roadrunners and egrets, prickly pear cactus and cypress, crowd together in the remnants of the Big Thicket, which once covered East Texas from the Louisiana border to as far west as Houston.

The Big Thicket, a congregation of eight biological communities ranging from arid sandylands to acid-bog-baygalls, is home to more than 1,000 species. The United Nations designated it a Man and Biosphere Reserve in 1981 in recognition of its unique natural diversity. In places, it's claimed, the vegetation is so dense that snakes have to slither backward to get out.

But only 8 percent of the original Big Thicket remains. The bears, the mountain lions, and the ivory-billed woodpeckers are gone. Huge tracts have been logged, many of them converted to pine plantations.

New legislation could add 14,000 acres to the 85,000 acres protected in 1974. Conservationists who fought for the preserve then were bitterly disappointed by the omission of key lands they call "the Lost Heart of the Big Thicket." Left out, among other things, was a winding stream with sandy banks and bars, a natural corridor for wildlife called Big Sandy in its northern reaches and Village Creek to the south.

Local Congressman Charles Wilson (D) "made it very plain that if a bill were to be passed, these areas had to be left out," recalls Brandt Mannchen, head of the Sierra Club Lone Star Chapter's Big



WAYNE JOHNSTON

Village Creek, part of Big Thicket's "Lost Heart."

Thicket committee. Wilson, who once managed a timber-company lumberyard, surprised environmentalists in 1986 when he agreed to sponsor a bill (H.R.919) to add the missing lands, including Big Sandy/Village Creek.

"Everyone assumed he was the timber industry's boy," Mannchen says. "But in the past few years he's shown real growth on environmental issues." Lone Star Sierra Club activist Maxine Johnston was "mind-boggled but delighted" by Wilson's support. "We never let him forget that he made a mistake in leaving out Village Creek," says Johnston, who's been fighting to save the Big Thicket for 25 years.

The timber industry opposes the bill, but the fiercest opposition comes from residents who fear losing their property rights. "The locals are being surrounded by clearcuts, but they don't want the federal presence," Mannchen says.

"We really do care about the environment," insists Hector Garcia, president of the Angelina County branch of the Texas Farm Bureau, a private group fighting the bill. "But we oppose the taking of private property."

In response to complaints, Wilson revised his bill to protect homeowners from being bought out, and redrew boundaries to reduce inholdings. But the Farm Bureau still opposes the bill, partly because ranchers could no longer run cattle in thicket areas, and partly because part-time residents could still be compelled to sell.

In July, after Wilson's bill passed the House, fellow Texan Lloyd Bentsen (D) agreed to sponsor legislation (S.1302) in the Senate. The other Texas senator, Phil Gramm (R), who at first opposed Bentsen's bill but is now undecided, may play a crucial role in its passage. "I wouldn't say it's dead if Gramm opposes it," the Sierra Club's Mannchen says. "But it'll have a much better chance if he supports it." To that end, Representative Wilson plans to take Gramm on a float trip down Village Creek. They'll canoe on tannin-dark water beneath cypress, sweet gum, and river birch. Herons will take flight and turtles will slide into the water as they drift by. Says Mannchen, "We hope the Big Thicket will be its own best advocate."

—Susan McCarthy

SIERRA NOTES

Sierra Club Books offers a host of new publications ideal for this year's holiday-season gift buyers.

In celebration of the upcoming Yosemite National Park centennial, acclaimed nature photographer Galen Rowell has assembled more than 100 of his superb color images of the park to illustrate the complete text of John Muir's classic *The Yosemite* ($40; see "At a Glance," page 99). The result is an evocation of Yosemite's lasting beauty and a testament to the importance of protecting it.

Three new Sierra Club Postcard Collections ($8.95 each) afford a convenient way to communicate one's appreciation for the natural world. Galen Rowell's *Yosemite* collection provides a photographic sampler of that park's highlights, while Art Wolfe's *Alaska* portfolio presents vivid images of America's last unspoiled wilderness. The *Home Planet* collection, offering a much different perspective, contains images of Earth taken from thousands of miles above its surface. Each portfolio in this series features 22 ready-to-mail, full-color postcards.

Whatever Happened to Ecology? ($18.95), the latest in the Sierra Club Nature and Natural Philosophy Library, is author Stephanie Mills' personal response to the ecological crisis. Mills, a former editor of *Not Man Apart* and *The CoEvolution Quarterly*, writes of her early days in the environmental movement and of her conviction that bioregionalism—not mainstream environmentalism—holds the key to protecting the world's ecosystems.

Sixty-six poems celebrating the wilderness ideal and affirming the deep connections between humanity and the animal kingdom form the core of *We Animals: Poems of Our World* ($22.95). Editor Nadya Aisenberg includes the work of such poets as Rainer Maria Rilke, Adrienne Rich, Denise Levertov, Pablo Neruda, Robert Bly, and Gary Snyder. Aisenberg contributes five essays of her own exploring themes of reverence, dominion, fraternity, community, and fantasy.

One of John Muir's most popular works has been handsomely reproduced in a Yolla Bolly Press Limited Edition featuring the woodcuts of artist Michael McCurdy. *My First Summer in the Sierra* ($35) is Muir's humorous account of his rough-and-tumble life as a California shepherd. Historian and Muir scholar Frederick Turner wrote the book's foreword.

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 also enclose applicable sales tax. Sierra Club members may subtract a 10-percent discount from prices listed. Allow four weeks for delivery.

Sierra Club 1989–90 Conservation Campaign Briefs is a series of seven brochures examining the priority issues on the Sierra Club's domestic and international agendas. The four-page, illustrated briefs cover global warming, toxics, national parks and forests, clean air, international development lending, the Arctic National Wildlife Refuge, and the California Desert. A complete set of the campaign briefs costs $2.50 (individual brochures are 40 cents each), available from Sierra Club Public Affairs, 730 Polk St., San Francisco, CA 94109. Include $1 postage and handling with each order.

Billboards cost U.S. cities millions in lost tax dollars each year, according to Scenic America, a nonprofit conservation organization working to reduce the blight of outdoor advertising. The group maintains that some billboard companies fail to list many of their signs on local tax rolls, or they undervalue the signs to minimize their tax burdens. To receive information on how to help recoup lost billboard revenues, write to Scenic America, 216 Seventh St., S.E., Washington, DC 20003; phone (202) 546-1100.

Common Future Action Plan, a publication of the International Committee of the Sierra Club, is a guidebook for carrying out the recommendations of

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Our Common Future. That report, produced in 1987 by the World Commission on Environment and Development, challenges the global community to pursue a campaign for sustainable human progress.

The Sierra Club's 44-page action plan includes suggestions for lobbying schools, state and federal legislatures, courts, non-governmental organizations, the United Nations, and Club entities. Copies of *Common Future Action Plan* are $5 each from Sierra Club Public Affairs, 730 Polk St., San Francisco, CA 94109.

Applications for the 1990 National Environmental Achievement Awards are available now from Renew America, a nonprofit environmental-education organization. Many types of programs, ranging from air-pollution reduction to wildlife conservation, are eligible for these awards. Winners will be recognized at a Washington, D.C., awards ceremony in April 1990 celebrating the 20th anniversary of Earth Day. The deadline for entries is January 15, 1990. To receive an application form and a list of criteria, write to Renew America, 1400 16th St., N.W., Suite 710, Washington, DC 20036; phone (202) 232-2252.

Traveling abroad? If so, you might want to call two 24-hour hot lines to learn whether your journey is likely to be marred by political upheaval, natural disasters, malarial outbreak, or other discomfiting circumstances.

The U.S. State Department's Citizens Emergency Center in Washington, D.C., offers recorded information about crisis conditions in eight regions of the world: North America, Europe, Asia and the Pacific, Africa, South America, the Middle East, the Caribbean, and Central America. To receive the latest State Department update, call (202) 647-5225. The service also informs you of every country's visa requirements.

The Centers for Disease Control in Atlanta, Georgia, operates a similar hot line, with information on threats of malaria in many parts of the world. To listen to these recorded messages, phone (404) 639-1610. ■

Timeless Essays of a Good Farmer

Louis Bromfield at Malabar: Writings on Farming and Country Life
edited by Charles E. Little
Johns Hopkins University Press
$18.95, cloth

Keiko Ohnuma

SIXTY-ONE YEARS ago, the young expatriate Louis Bromfield caused such a sensation in the literary world that *Vânity Fair* nominated him for the Hall of Fame—along with Thomas Mann and Ernest Hemingway—under the rubric of "most prominent of our younger novelists."

Bromfield the novelist did not live up to his early promise. The arbiters of literary merit eventually pronounced his works post-Victorian rather than true precursors to the modern novel, and he is perhaps best remembered—if he is remembered at all—as the owner and creator of the country's most famous experimental farm in the 1940s.

Here, near the town of Mansfield in Ohio, Lauren Bacall and Humphrey Bogart married and spent their honeymoon. Joan Fontaine also stopped by, as did 2,000 visitors each year who were curious to see the 1,000-acre, self-sufficient communal farm that had been coaxed from the soil at a time when much of the nation's agriculture had fallen pitifully dependent on government subsidies.

Bromfield was far more than a dabbling gentleman farmer. He set out to prove that a philosophy of nature could be relied upon to produce viable economic results on the modern American farm. From the start he stipulated that nothing would be done on Malabar Farm that any farmer could not afford to do, and he purposely strove to create a large collective farm that would not rely on credit or prohibitive capital expenditures for machinery, chemicals, or other agribusiness inputs.

Like Bromfield's novels, most of the lore surrounding Malabar has been lost. But with this sampling of essays from the novelist's five books on farming (all now out of print), conservationist Charles E. Little attempts to restore Bromfield to the ranks of recognized American writers—this time as a pioneer of the principles of sustainable agriculture. Moreover, Little hopes to prove that the farming essays, dismissed by Bromfield's literary manager as "humus, mucus, wretch, and vetch," were "the best writing of his career . . . and the most lasting of his literary achievements."

As a young celebrity in Paris between the wars, Bromfield hobnobbed with European intellectuals in the salon of Gertrude Stein and Alice B. Toklas. The glamorous life apparently did not entirely satisfy him, however, for his mind returned again and again to the country landscape and lost ideals of his agrarian childhood in Ohio. On the eve of the German occupation, Bromfield finally fled France with his family and returned to his home state, where he bought three overworked farms, named them Malabar after a beloved Indian coastline, and set to work.

In the years since he'd left Ohio, much of the rich soil of the valley had been so badly abused that it would barely yield a profitable crop. Bromfield's first mission was thus to restore the soil, something he believed could be done relatively quickly, "not by shortcutting Nature but by adopting her own methods and by speeding up and intensifying them."

Although a great believer in the "new agriculture" of soil conservationists, farm-equipment inventors, and geneticists, Bromfield subscribed to a simple philosophy: "[B]y working *with* Nature man can be prosperous and even rich and happy and healthy. Fighting or cheating her, man is always defeated, poverty-stricken, bitter, and miserable, and eventually is destroyed himself."

The notions of nature as the stern but

kind mother and the good farmer as her guardian and beneficiary appear over and over in Bromfield's writing and are reflected in his approach to farming, based first and foremost on an almost religious reverence for the soil. Indeed, his essays ring with the tones of moral drama as much as agricultural design, clearly marking the distinctions between good farmers and bad. "Poor, worn-out soil produces specimens handicapped physically, mentally, and morally from the very beginning," Bromfield railed. "Wretched diet aggravates sickliness, and poor, undernourished, stupid people make bad farmers who only destroy the soil still further."

A good example of how this struggle found concrete expression on Malabar's fields is given in a long essay on the benefits of mulch farming. Bromfield shunned the then-current method of turning over and burying the "trash" left on a field after a harvest because it exposed the soil to the burning sun and erosion by wind and water. At Malabar, the fields were instead disked, which chopped the mulch into—rather than under—the soil, creating a spongy, protective layer that reduced evaporation, held the soil in place, and kept the ground underneath cool, damp, and aerated. Most important, it imitated natural conditions.

Experimenting on an alfalfa field, Bromfield found that soil containing mulch held enough moisture to allow 40 percent more seeds to germinate. In winter it kept the plant roots frozen against the dangerous thaw of an early spring, and in summer the thicker growth allowed him to support three times as much livestock as before. In many cases, plants grown in this way also resisted disease and weeds; in every case where natural conditions had been recreated, Bromfield proudly reported the superiority of his crop in quality, quantity, and flavor.

Bromfield's essays, structured loosely like a farmer's journal, reflect the marriage of art and science that characterized his approach to agricultural research. He combines the keen, dispassionate eye of a naturalist with a writer's love of metaphor and the self-contained world of narrative. The merit of this record lies not so much in the validity of his farming techniques themselves—many of which are now outdated—as in the principles of "right livelihood" from which they arose, and in the power of the writing used to process that creative life. Bromfield's moral and philosophical excursions, like those in the essays of Rousseau and Thoreau, distinguish his work from merely pretty agricultural treatises.

"The mysteries of the human mind are certainly fascinating," he allowed, "but . . . for me at least, less important and less interesting than the cosmic mysteries which take place within a cubic foot of rich productive soil, for essentially these mysteries of the human mind are merely a part of an infinitely greater and more intricate and complex mystery which utterly baffles all of us, even the wisest. . . . Man himself, as a physical machine . . . is indeed marvelous as is every part of the universe, but his ego and self-importance, in our time, are given a distorted, decadent, and tragicomic importance."

In his later years, Bromfield came to realize that agriculture—not literature—had been his true creative calling, "for the farmer who takes over a desolate farm, ruined by some evil and ignorant predecessor, and turns it into a paradise of beauty and abundance is one of the greatest of artists," who may rightfully partake "of those treasures . . . by which man lives—his family, his power to create and construct the understanding of his relationship to the universe, and the deep, religious, humble sense of his insignificance in God's creation."

Appearing now, against the background of growing concern over the farm crisis, soil erosion, the use of toxic chemicals in agriculture, and the back-to-the-land flight from the cities, Bromfield's writings have lost none of their power; they are, in fact, more timely than ever. His beloved Malabar Farm is now a state park; little farming takes place there. Its creator, however, may have finally been granted a secure place in history—not only as forefather of a trend that promises to continue into the next century but, as Little hopes, as "an American *essayist* of the first rank." In that respect, Bromfield will keep good company alongside Thoreau, Wendell

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Berry, and Wes Jackson on the bookshelves of country dwellers—and of urban dreamers plotting their escape.

KEIKO OHNUMA *is a former* Sierra *editor.*

The River That Would Be Free

Damming the Delaware: The Rise and Fall of Tocks Island Dam
by Richard C. Albert
The Pennsylvania State University Press
$24.95, cloth

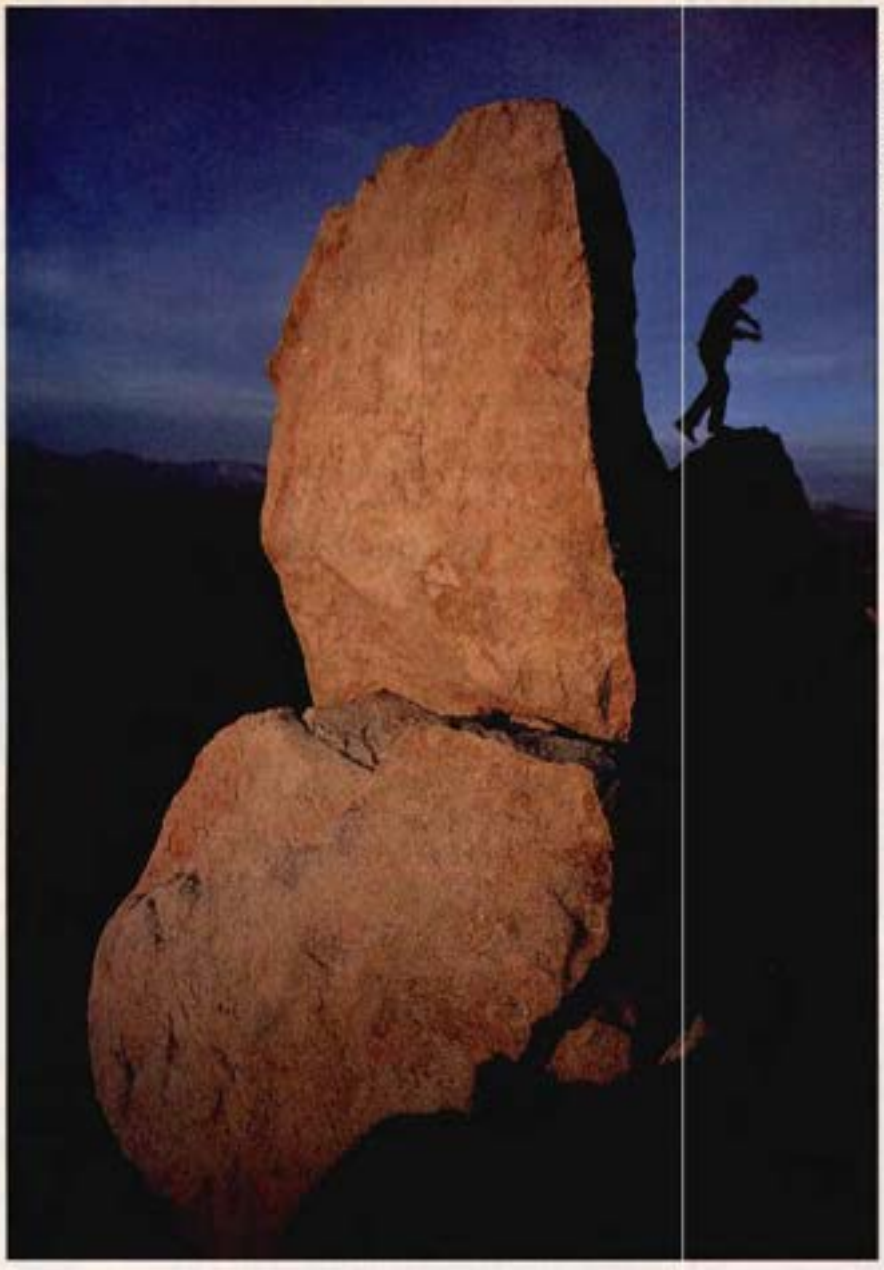
Jim Stiak

FOR MORE THAN A century, people have wanted to dam the Delaware. Though only 331 miles in length, one of the shortest of the country's major rivers, the Delaware supplies the water needs of almost 10 percent of the U.S. population. Despite the efforts of four states, several cities, and a handful of federal agencies, despite studies, plans, proposals—even authorization and funding from Congress—no dam sits across the Delaware's main stem. *Damming the Delaware* is the saga of how that came to be.

Richard Albert, a member of the intergovernmental Delaware River Basin Commission, which oversees the area, chronicles the byzantine history of efforts to dam the river in this fact-heavy story of global forces and local heroes. "More ink has been spilled over the issue," he writes, "than would fill any lake created by the dam."

Philadelphia first tapped the river's water in 1850; the state of Delaware examined it for hydropower in the early 1900s; New Jersey, New York City, and Pennsylvania studied it for decades; and the U.S. Supreme Court heard three cases about it.

Floods in 1955 led to massive federal involvement in the river basin. After four years of studies, the U.S. Army Corps of Engineers suggested nineteen dams, two of which have been built on Delaware tributaries. The largest of the proposed projects, the 3,200-foot-long, 160-foot-high, 900-foot-wide Tocks Island Dam, would have generated 280



GALEN ROWELL: MOUNTAIN LIGHT

The Yosemite by John Muir
with photographs and annotations
by Galen Rowell
A Yolla Bolly Press book published by
Sierra Club Books; $40, cloth

"The mountains are fountains of men as well as of rivers, of glaciers, of fertile soil. The great poets, philosophers, prophets, able men whose thoughts and deeds have moved the world, have come down from the mountains—mountain-dwellers who have grown strong there with the forest trees in Nature's work-shops."

—John Muir

"Muir himself was not only one of those very mountain-dwellers whose great thoughts and deeds have moved the world, but also a man whose life's work, play, and philosophy were amazingly interconnected. Climbing mountains has definitely affected the way I think about the world, and long ago I recognized that many of the strongest voices in the environmental movement—people such as Ansel Adams, David Brower, and Dick Leonard—gained their power from having climbed mountains, from having put themselves in situations where they had to actively adapt themselves to their natural surroundings instead of change the environment to suit their needs, as in everyday life. By immersing themselves both physically and mentally in situations of risk where the very essence of their experience was the natural character of the land, they each discovered, as I did in my own time, a new way of viewing the world that profoundly changed their lives. I'm convinced that this process, which Muir first experienced in Yosemite, gave birth to the environmental movement and has continued to nurture the movement into the best of what it has become today."

—Galen Rowell

million kilowatts of electricity and created a reservoir 37 miles long.

One of the main selling points of Tocks Island was to be the Delaware Water Gap National Recreation Area, envisioned as a "Central Park for Megalopolis." In the mid-1960s, in order to create this playground, the federal government began to empty or relocate some 2,500 homes, 125 farms, 78 churches, 3 schools, and 5,000 graves. It was the first time such a large evacuation had ever been attempted.

Land prices were determined by the owner's clout; scheduled purchases were delayed after farmers had sold their livestock; and as buildings were vacated, arson became common. Some of the empty houses were taken over by "1960s-style hippies" who formed a commune called the Cloud Farm and stayed four years until ousted by a sunrise paramilitary action. The houses, including some historic buildings, were bulldozed, all for a pipe dream. Even today, much bitterness remains.

According to Albert, Tocks Island was finally killed by a one-two punch of international events and dogged activism. At a time when the Vietnam War was a funding priority, the dam's proposed costs quadrupled and it became a favorite pork-barrel target of budget-cutters. Persistent local residents petitioned and paraded their opposition, and delayed the project until it was swept away in a national wave of environmental awareness.

A Monroe County, Pennsylvania, homemaker named Nancy Shukaitis solicited funds from 1,000 local people for a lawsuit to stop the dam. Another resident, Joan Matheson, published an anti-Tocks newspaper, attracting the attention of some Sierra Club chapters. The Club began fighting the dam, and other national conservation organizations followed. The dominoes started falling.

The National Environmental Policy Act of 1969 mandated environmental analyses for development projects, and one of the first such studies focused on the proposed Tocks Island Dam. The report's detailing of the watershed's possible deterioration helped turn public opinion against the dam, despite its ballyhooed benefits.

Tocks Island is more than just a regional issue. It's a symbol of all big hydro projects. It seems likely, Albert concludes, that few high dams will be built in the United States in the near future. It is also clear that water demand will not decrease. New water policies are needed, and that may be the lesson of Tocks Island.

Whether the lesson has been learned is unclear. The good-faith agreement that now governs the river will keep any dam from being considered until the next century, but should the agreement falter, the Tocks Island Dam could surface like a monster from the depths.

Jim Stiak is a freelance writer in Eugene, Oregon.

BRIEFLY NOTED

Ann H. Zwinger's graceful prose is the hallmark of ***Land Above the Trees: A Guide to American Alpine Tundra,*** recently issued in paperback by the University of Arizona Press ($16.95). First published in 1972, the book contains some of the best descriptions of the alpine environments of the Sierra, Cascade, Olympic, Great Basin, Rocky, and Presidential mountain ranges. Coauthor Beatrice W. Willard lent the project her ecological expertise. . . . Minnesota naturalist Janine M. Benyus has "always been comforted by the notion that somewhere out there, beyond the crime lights and the car horns, there are dark, dewy habitats humming with life." That's how she prefaces her two-volume ***Field Guide to Wildlife Habitats of the Eastern and Western United States*** (Fireside Books/Simon & Schuster; $14.95 per volume, paper). The guides will interest anyone who wants to learn about piñon-juniper woodlands, ponderosa pine forests, or plains grasslands, to name a few of the many ecosystems covered. And for those who want to explore the wetlands, forests, and open spaces of Minnesota, Wisconsin, and Michigan, Benyus has also produced ***Northwoods Wildlife: A Watcher's Guide to Habitats*** (NorthWord Press, P.O. Box 1360, Minocqua, WI 54548; $19.95, paper). . . . Daniel Mathews, the author of ***Cascade-Olympic Natural History: A Trailside Reference*** (Raven Editions, P.O. Box 9343, Portland, OR

97207; $19.95, paper), lived like a frontiersman in an isolated cabin in the Cascades for more than five years, preparing the manuscript by lamplight and the heat of a wood-stove. That he took great care in its preparation is evident: The book combines readable prose, concise botanical and zoological descriptions, and a wealth of full-color photographs. . . . New Jersey Governor Thomas H. Kean, who chairs the National Panel on Wetlands Policy, wrote the foreword to ***Walking the Wetlands*** (John Wiley & Sons; $10.95, paper) by Sandra Jordan and Janet Lyons. Kean notes that, just as singer Joni Mitchell never sobbed "I've looked at bogs from both sides now," most artists and public officials (and, forsooth, a few naturalists) have overlooked the splendor and ecological worth of marshes, bogs, and swamps. To help overcome this common failing, Jordan and Lyons offer hikers this field guide to the plants and animals of North America's soggy environments. . . . Baffled by unfamiliar paw markings on the trail? The Mountaineers, mindful of those who can't distinguish lynx prints from minks' prints, has published four ***Animal Tracks*** guidebooks ($4.95 each, paper). They cover, respectively, the Rocky Mountains, New England, the Mid-Atlantic states, and the Great Lakes states. . . . Nowhere is the natural world's diversity more evident than among "terrestrial green cryptogams." That phrase—not generally on the tips of people's tongues—refers to the classes of plants described in ***Mosses, Lichens, and Ferns of Northwest North America*** (University of Washington Press; $17.50, paper). For amateur and professional botanists alike, this regional guidebook offers capsule descriptions and color photographs of a dizzying variety of these variously fuzzy, flaky, squishy, feathery things. . . . The first question that pops into many people's minds when they stumble across fleshy fungi in the field is whether the plants are edible. In America's breadbasket, a way to help answer such a query is to carry along a copy of ***Mushrooms and Other Fungi of the Midcontinental United States*** (Iowa State University Press; $19.95, paper). . . . A wild peninsula nearly severed from the U.S. mainland by the San Andreas Fault is rainy in winter, windy in spring, foggy in summer, and warmest in fall. Jules G. Evens eloquently describes this singular West Coast environment, a place of windswept, twisted bishop pines, in ***The Natural History of the Point Reyes Peninsula*** (Point Reyes National Seashore Association, Bear Valley Road, Point Reyes, CA 94956; $14.95 plus $3 shipping and handling, paper). . . . Habitat loss has brought some 10 percent of the world's bird species to the brink of extinction. To publicize this crisis, the International Council for Bird Preservation has produced ***Rare Birds of the World*** (The Stephen Green Press; $29.95). Guy Mountfort provides the text, dividing the world into seven regions and characterizing the endangered birds in each. . . . Explorers of Central and South America's jungles can expect to find a tangle of enigmatic environments. One way to unravel the mystery is to peruse John C. Kricher's ***A Neotropical Companion: An Introduction to the Animals, Plants, and Ecosystems of the New World Tropics*** (Princeton University Press; $45, cloth; $16.95, paper).

—Mark Mardon

Succession

Continued from page 72

next to the creek. The little stream floats past, uncaring, in its quest for the ocean. This creek doesn't support salmon or steelhead, there are no endangered plants on the ground around me, the view from my log isn't especially scenic, the location isn't particularly remote. Yet there's a tranquillity to this place that is rarely matched, even in a designated wilderness area. Everything's in balance here: the little stream flowing swiftly through a riffle, then gliding into a pool where rainbow trout dart from their feeding stations to snatch up drifting insects; the northern three-toed woodpecker picking beetles out of a snag behind me; the log that I'm sitting on, slowly melting back into the forest floor. Will the mycorrhizal fungi and bacteria in the soil, the burrowing insects and rodents, the log-dwelling mammals, continue to cycle nutrients and build new soil after the next harvest of trees from this site in 80 years, or the next entry after that? How will removal of trees in this unit affect the stream, or the fish, or the wildlife after the adjacent timber sales are logged and mature trees remain on less than one quarter of the entire watershed?

If only we weren't in such a hurry, if only we didn't have The Cut looming over us, we could learn to conform the demand for timber with the needs of the natural processes at work in the forest. We could take time to learn more about species interactions and nutrient cycling and complex ecosystem functions. We could learn to assimilate forest-management practices into the process of natural succession. For the miracle of succession has brought this forest into existence in spite of, or perhaps because of, the tempestuous storms, the raging fires, the unpredictable avalanches and earthquakes that have wreaked havoc across this landscape. And so, in the intricate yet resilient web of Nature, I see not only a fragile treasure to protect, but also a glimmer of hope.

JoAnn Metzler *is a hydrologist currently working for the University of Washington Center for Streamside Studies.*

Calling the Owls

Continued from page 74

feet away. It can undoubtedly see you, and yet it can't help but respond. This synapse between you—it takes your breath away.

A while later—how long you can't exactly say—you try to call again, but something is gone from it now; a self-consciousness has slipped in. The owl knows you as an imposter, and keeps its own counsel. To try calling again would violate the terms which, until just now, you didn't know had been established.

Walking back, there's no need for the flashlight. The way is bright enough with whatever starlight happens to fall on it. The last asters are blooming along the path. On every side, columns of pines open into space. Throughout the length of the valley, the creek trickles silver among the stones.

Robert Crum *is a freelance writer in Gainesville, Florida. His essay "Another Week on the Concord and Merrimack" appears in* Wilderness *magazine's fall issue.*

What Makes a Rainy Day?

Every year some 200 billion gallons of water fall from the sky to the ground. Not all places on Earth receive the same amounts of rainfall, however. The people in dry Arica, Chile, for example, see only 0.03 inches of rain each year, while Mt. Waialeale, Hawaii, gets 460 inches. This inequality is caused by variations in wind, land formations, ocean currents, and temperatures in different parts of the world.

Rain does not begin in the sky, but rather on Earth's surface. Warmed by the sun, water from lakes, oceans, and plants (which emit moisture) evaporates slowly and forms vapors that float up through the air. Vapors come together to form clouds, some of which eventually produce rain that comes back to Earth. This constantly repeating process is known as the hydrologic cycle.

The most important element in creating rain is wind. Wind forms clouds and collects tiny particles called condensation nuclei. For millions of years these particles have come from volcanic eruptions, ocean salts, pollen, and other natural sources. In recent years impurities from factories and automobiles have also contributed condensation nuclei to the atmosphere, making acid rain.

LIBBY WILLS ALLSTOCK

Thunderheads form above Utah's canyonlands.

JIM CORWIN ALLSTOCK

A summer storm pounds Washington's wheatfields.

RON SANFORD ALLSTOCK

Monsoon winds bring torrential rains to Thailand.

The condensation nuclei gathered by the winds are suspended in the clouds and attract water vapors. When vapors attach themselves to the particles, they form droplets and give off heat. The warmer air rises, carrying the clouds to a higher, colder altitude. When the temperature drops, the air reaches its "dew point" and can no longer hold the water. Too heavy to stay airborne, the droplets fall, collide with each other to form larger drops, and descend to Earth as rain.

The most common rain-producing clouds are called cumulus clouds. A large cumulus cloud can contain as much as 150,000 tons of water. The "active life" of any raincloud is less than one hour. The raindrops these clouds produce are as large as a quarter of an inch across, but most are one or two hundredths of an inch. The average-size raindrop holds about a million droplets of water.

The geography of the land determines where and when clouds release their moisture. For example, when clouds borne by winds encounter a mountain range, they are forced rapidly upward into the colder region of the sky, and moisture (rain or snow) falls mostly on the mountains' windward side (the side from which the wind blows).

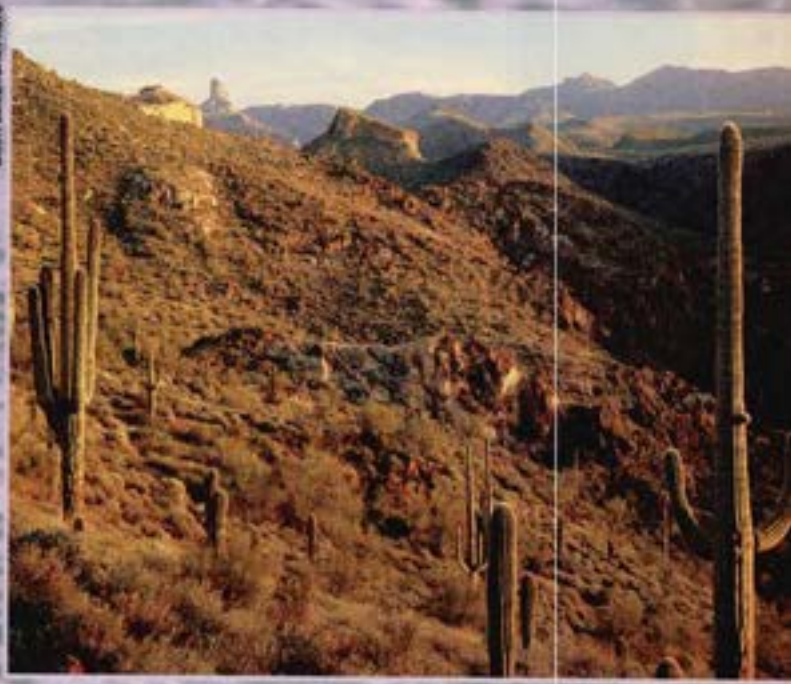
Heavy rainfall nourishes the Pacific Coast forests.

In the western United States, the wind moves across the warm Pacific Ocean before running into the Sierra Nevada of California and the Cascades of Oregon and Washington. A relatively small area between the mountains and the coast receives plentiful rainfall, while the vast region beyond is desert.

The hot air above the desert also acts as a roadblock for any approaching moist air, pushing rainclouds higher and forcing them to spill their moisture before they reach the dry region. Any clouds that make their way into the desert eventually collide with tall mountains and quickly release what's left of their moisture, often in the form of snow.

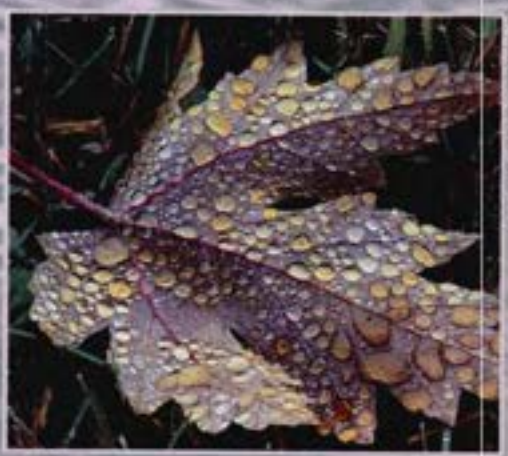
The winds in the eastern United States are unhindered by large mountain ranges, making rainfall fairly uniform from the Gulf of Mexico to Canada's Hudson Bay. The average monthly rainfall in this vast region is more than five inches. In the tropics near the equator, warm temperatures and heavy vegetation keep water constantly evaporating and returning as rain. This region receives more than 400 inches of rain each year. ■

DANIEL ALBERS *is a freelance writer in Hastings, Nebraska.*



The desert gets by with little rainfall.

Mountains wring moisture from the clouds.



Raindrops rest on a maple leaf.

1990 SPRING TRIPS

Celebrate the coming of spring by backpacking in Northern California's coastal redwoods, snorkeling in Virgin Islands National Park, or retracing John Muir's footsteps across the East Lothian dunes in Scotland. The following pages include brief descriptions of the unique winter and spring trips planned by our volunteer leaders. Whether you want to repair a trail in the Grand Canyon or go bicycling in Holland, there's a Sierra Club outing just for you. ◆ Sierra Club trips are cooperative ventures with an average of 12 to 25 participants. Trip members share camp chores, including food preparation and cleanup, an aspect of the outings that most people enjoy. ◆ To order individual trip brochures, send in the coupon on page 114. Reservations are now being accepted for all spring trips as well as for 1990 Foreign trips listed in the September/October issue of *Sierra*. Please note that Foreign trip prices are subject to change and do not include airfare. Before sending in a completed reservation application, please read the recently revised Reservation & Cancellation Policy on pages 113 and 114. ◆ Watch for a complete listing of 1990 trips in the January/February issue of *Sierra*.

Kanab Creek, Grand Canyon National Park, Arizona

BACKPACK

Experience the wilderness on a rewarding and adventurous backpacking trip. Having everything you need for the trip in a pack adds an extra dimension of freedom and satisfaction to your outing.

Trips vary in length and difficulty. We have divided the trips into five categories. Light (L) trips cover up to 35 miles in 4 to 5 travel days, the remaining days being layovers. Moderate (M) trips may cover longer distances of up to 55 miles and involve more cross-country routefinding. Strenuous (S) trips cover as many as 60 to 70 miles with greater ups and downs and continuous high-elevation travel. Light-Moderate (L-M) and Moderate-Strenuous (M-S) are interim ratings. Individual trip brochures explain the ratings in more detail.

Leaders are required to approve each applicant before final acceptance, and will ask you to write responses to their questions. These responses help the leader judge your backpacking experience and physical condition.

[90355] Desert Winter, Big Bend Park, Texas—February 11–22, 1990. *Leaders: John Lemon Sellers and Sid Hirsh. Price: $590; Dep: $100.* If your idea of winter backpacking doesn't include snowshoes, cross-country skis, or frostbite, then this outing is for you. Big Bend National Park contains a variety of landforms and ecosystems. Our route will begin high in the Chisos Mountains and wind through fantastic volcanic monoliths down to the rugged canyon of the Rio Grande. Water and food caches will help lighten the load. (Rated S)

[90031] San Rafael Swell and Reef, Utah—April 14–21, 1990. *Leader: Bert Fingerhut. Price: $370; Dep: $50.* Join Joseph Bauman, Jr., author of *Stone House Lands: The San Rafael Reef,* for a week of dayhiking and overnight backpacks in the San Rafael. The Utah Wilderness Coalition has proposed 620,000 acres of the San Rafael as wilderness; developers and off-road-vehicle interests are opposed. Optional hikes will be strenuous. (Rated M)

[90032] "Mystery" Canyons, Utah—April 15–21, 1990. *Leader: Norm Elliot. Price: $335; Dep: $50.* On our exploration of one or more of southeastern Utah's remote and fascinating canyons we will discover fantastic rock formations, sandstone cliffs, seeps and refreshing pools, blooming cactus, brilliant days, magnificent sunsets, and night skies brimming with stars. We may even find evidence of ancient Anasazi habitation. Prior backpacking experience is required. (Rated M-S)

[90033] Thunder River and Deer Creek Falls, Grand Canyon, Arizona—April 15–21, 1990. *Leader: Bob Cole. Price: $320; Dep: $50.* The scenery in this remote area of the North Rim is the best the Grand Canyon offers to hikers. After descending into the canyon at Indian Hollow, we cross the Esplanade to Deer Creek Falls, where we'll have our first layover day. We'll enjoy Hidden Valley on our way to Thunder River for another layover. This trip is for experienced hikers. (Rated S)

[90034] Galiuro Wilderness, Galiuro Mountains, Arizona—April 22–28, 1990. *Leaders: Robyn and John Lemon Sellers. Price: $355; Dep: $50.* This beautiful wilderness is a study in contrast: High ridges alternate with deep desert canyons, and vegetation includes fir, aspen, and lush riparian zones. Dramatic displays of desert wildflowers color this rarely visited area. Our 45-mile route includes one layover day and numerous dayhiking opportunities. (Rated M-S)

[90035] Santa Lucia Ridge Route, Los Padres Forest, California—April 22–28, 1990. *Leader: Bob Madsen. Price: $215; Dep: $50.* Our 37-mile backpack into the heart of the Ventana Wilderness starts at Botcher's Gap, 20 miles south of Carmel, and ends at Pfeiffer Big Sur State Park. We will enjoy one layover day, two river campsites, and the opportunity to hike to the tops of both Ventana Double Cone and South Ventana Cone for expansive views of this rugged coastal wilderness. (Rated M)

[90036] Appalachian Spring, Slickrock Wilderness, Nantahala and Cherokee Forests, North Carolina and Tennessee—April 28–May 5, 1990. *Leader: Bob Temple. Price: $415; Dep: $50.* Slickrock and adjacent wilderness areas make up an isolated preserve of fast-flowing streams and 5,000-foot peaks. Spring wildflowers, waterfalls, and a walk through one of the largest virgin forests in the East highlight our week. We'll have several layover days for exploratory dayhikes. This trip is for novices and experienced backpackers desiring a leisurely outing. (Rated L-M)

[90037] California's North Coast: Turf and Surf—April 28–May 5, 1990. *Leader: Bill Walsh. Price: $250; Dep: $50.* Spend three springtime days in the redwoods enjoying the silence of strolling on a fern carpet under these awesome giants. Then hike for five days along the lonesome Lost Coast, where you'll find an abandoned lighthouse, delight in a riot of wildflowers, and spot sea lions, harbor seals, and maybe even whales. (Rated L-M)

[90038] Snowy Peaks and Desert Canyons: The Gila Wilderness, New Mexico—April 28–May 5, 1990. *Leader: Irene Penfield. Price: $490; Dep: $50.* As snow melts in the high country, we traverse subalpine forests in the Mogollon Mountains and descend to "river-walk" in canyon bottoms. The Gila Wilderness is renowned for its primeval quality, abundant wildlife, volcanic geology, and Indian cliff dwellings. A car shuttle lets us enjoy a maximum of diverse scenery on this 50-mile, one-way backpack. One layover day is scheduled. (Rated M-S)

[90039] Rainbow Bridge and Navajo Mountain, Arizona and Utah—May 6–12, 1990. *Leader: Jim Urban. Price: $325; Dep: $50.* From a distance, the rounded summit of Navajo Mountain is the most striking feature in this part of the Navajo Reservation. We will explore the twisting canyons and sandstone domes surrounding the mountain, and a layover day gives us time to hike to Rainbow Bridge—the largest natural arch in the country. Wildflowers should be abundant. (Rated M)

[90040] Flora, Fauna, and Rock Faces of Big South Fork River and Recreation Area, Kentucky and Tennessee—May 13–19, 1990. *Leader: Faye Sitzman. Price: $340; Dep: $50.* The natural arch country of the Cumberland Plateau hosts mountain laurel, deer, wild turkeys, and pileated woodpeckers. Our route includes sections of the John Muir Trail; the Twin Arches; and huge, colorful, sometimes curled rock faces. Ten-mile travel days will be mixed with shorter days for exploring and observing. (Rated M)

SIERRA CLUB OUTINGS

[90041] Pines to Palms, Mt. San Jacinto, California—May 14–19, 1990. *Leader: Letty French. Price: $200; Dep: $50.* From luxurious Palm Springs, the aerial tramway carries us high up Mt. San Jacinto. We'll hike to the top, then walk mostly downhill through pleasant pine forests to a cool spring in Palm Canyon. Easy trails will lead us through delightful wilderness areas. This trip is ideal for beginners and laid-back veterans. (Rated L)

[90042] Death Hollow Wilderness–Escalante, Utah—May 26–June 2, 1990. *Leader: Howard Newmark. Price: $410; Dep: $50.* Our rugged adventure begins at 9,000 feet and takes us through a boulder-strewn, pool-filled gorge known as Death Hollow. Imagine cooling off after a difficult scrambling challenge by taking a swim within the confines of this spectacular slot. We'll also explore the historic Boulder Mail Trail and spend time along the Escalante River. (Rated S)

[90043] Paria Canyon, Utah and Arizona—June 3–9, 1990. *Leader: Bob Cole. Price: $340; Dep: $50.* Originating in the canyon country of southern Utah, the Paria River cuts a deep and narrow canyon before reaching the Colorado River at Lee's Ferry, Arizona. Interesting side canyons, towering walls of varnished sandstone, sand-bench campsites, freshwater springs, and natural arches await the experienced hiker in this remote area of the Southwest. (Rated M)

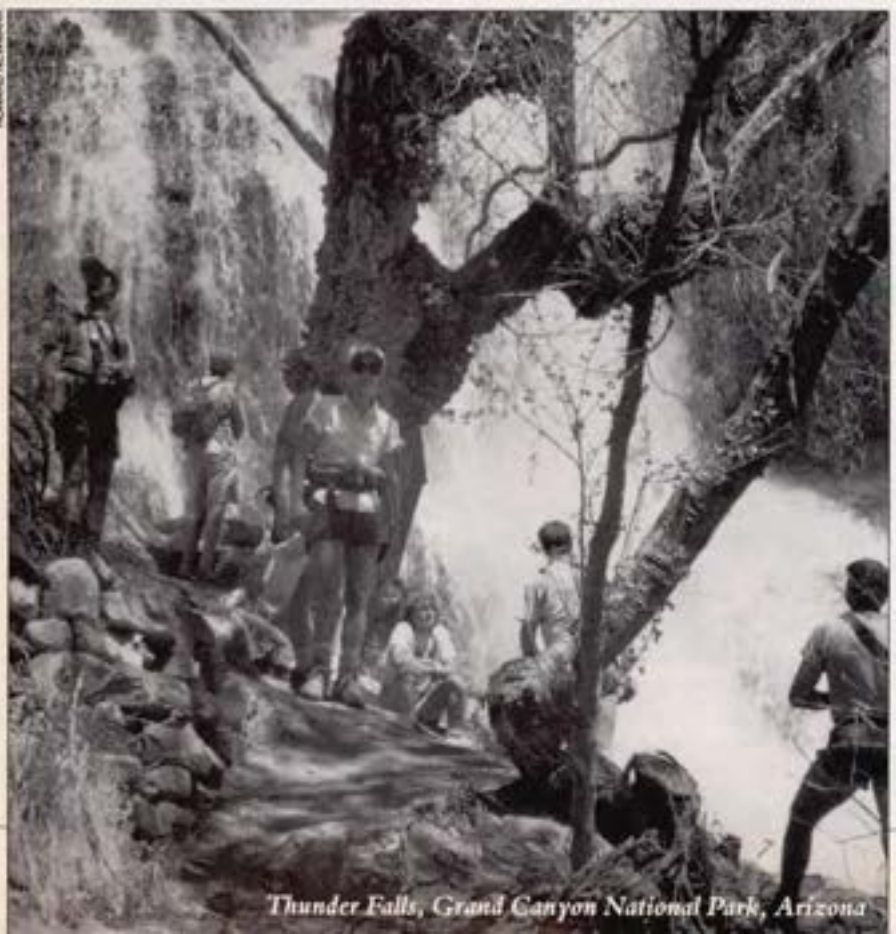
[90044] Appalachian Trail Odyssey, Blue Mountain, Pennsylvania—June 16–24, 1990. *Leader: Mark Lidd. Price: $335; Dep: $50.* Our sixth Appalachian Trail Odyssey has us traversing the beautiful sandstone ridge of Blue Mountain near Port Clinton, considered by many to be the most scenic section of the trail in Pennsylvania. Numerous overlooks provide views of the surrounding countryside. On a layover day we'll visit the Hawk Mountain Sanctuary, created in 1934 as a preserve for birds of prey. (Rated M)

Note: See Base Camp/Highlight trip #90051 for another trip that features backpacking.

BASE CAMP/HIGHLIGHT

[90336] Death Valley National Monument, California—December 21–28, 1989. *Leader: Alan Stahler. Price: $465; Dep: $50.* The emphasis of our trip is on the natural history of Death Valley—its geology, weather, and the plants and wildlife that inhabit this unusual landscape. At night we'll tour the galaxy: Clear skies will allow everyone to learn the stars and constellations. Participants will use their own cars to reach trailheads and various points of interest, including a ghost town.

[90048] Desert Odyssey for Women, Superstition Mountains, Arizona—February 4–10, 1990. *Leader: Carolyn Downey-Castleman. Price: $395; Dep: $50.* Escape the frenzy of daily life and reacquaint yourself with the wilderness on this trip to the Superstition Mountains. You'll enjoy daily hikes, full-moon cookouts, campfire talks—and have lots of time to smell the (cactus) flowers. If you long for quiet and beauty, come and let the springtime desert work its healing magic.



HOWARD NEWMARK

Thunder Falls, Grand Canyon National Park, Arizona

[90049] America's Tropical Paradise, Virgin Islands Park, Virgin Islands—March 4–10, 1990. *Leader: Chuck Cotter. Price: $585; Dep: $100.* Join us for an exploration of St. John, the least-developed of the U.S. Virgin Islands. We'll stay in rustic beachfront cottages and drive to various locations for short walks, snorkeling, or cultural tours. You'll be amazed at the beauty of the forests, white sand beaches, coral reefs, and tropical fish at Virgin Islands National Park. Meals are not included in the trip price.

[90050] Anza-Borrego Natural History, Anza-Borrego Park, California—March 17–24, 1990. *Leader: Carol Baker. Price: $290; Dep: $50.* The Anza-Borrego Desert comprises nearly 700,000 acres in Southern California east of the coastal range. Uniquely juxtaposed terrain and landforms, varying from 6,000-foot piney crags to fossilized badlands to a low inland sea, support a rich variety of desert plants and animals for study with our naturalist. Participants will carpool to trailheads. Hikes are easy to moderate; energetic walkers may climb a peak.

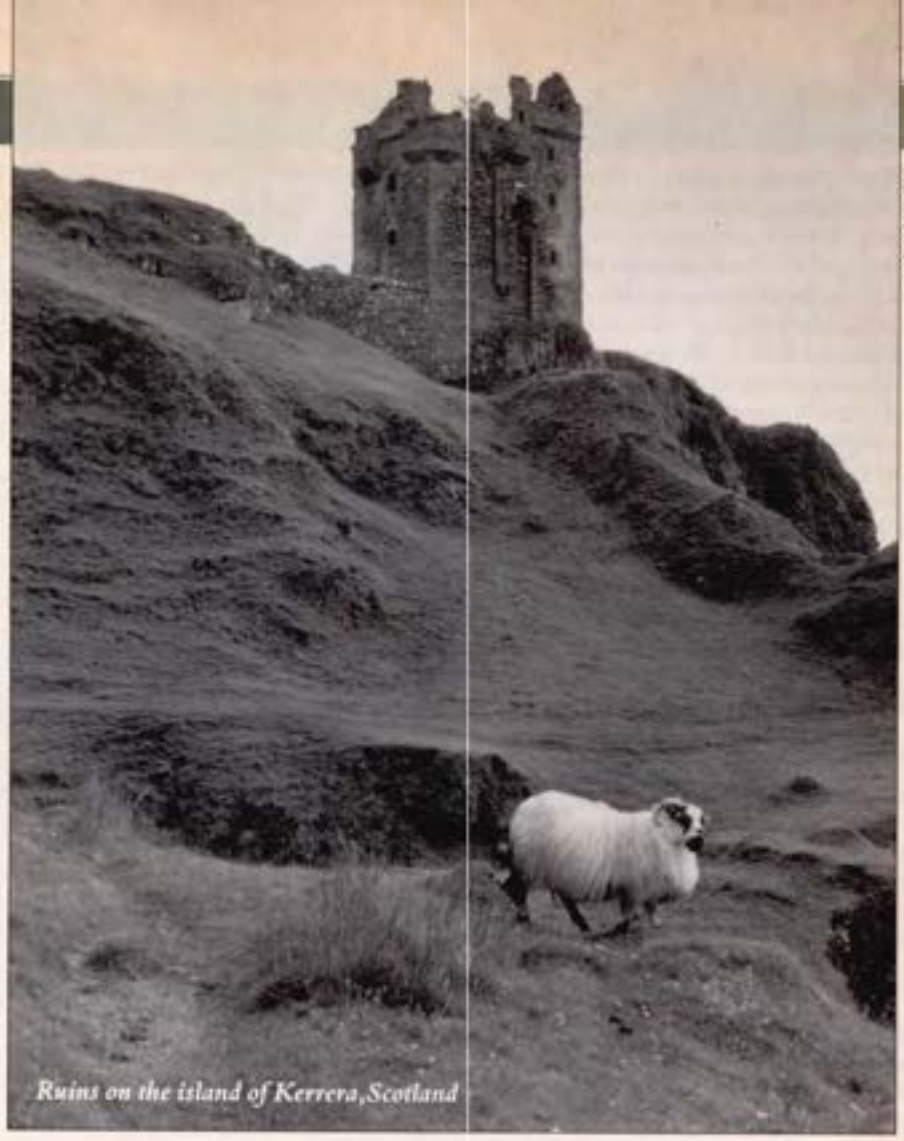
[90051] Wilderness Study Overview, Canyonlands Region, Utah—March 31–April 7, 1990. *Leaders: Shelley and David Mowry. Price: $580; Dep: $100.* Adjacent to Canyonlands and Arches national parks is a wonderful wilderness of deep, narrow canyons and slickrock areas with sandstone arches, bridges, mesas, and spires. By dayhiking and backpacking we'll explore this region, which the Sierra Club is seeking to protect under the Utah Wilderness Bill. Leader approval required.

[90052] America's Tropical Paradise, Virgin Islands Park, Virgin Islands—April 1–7, 1990. *Leader: Ray Abercrombie. Price: $585; Dep: $100.* See description for trip #90049.

[90053] East Mojave Scenic Area, California—April 7–14, 1990. *Leader: Rose Certini. Price: $395; Dep: $50.* The beauties of the California desert are most splendid in spring—the ideal time to visit the region proposed as Mojave National Park. From our 5,600-foot camp, we take leisurely to moderate dayhikes with our naturalist to view spectacular canyons, 600-foot-high sand dunes, cinder cones, volcanic spires, and ancient cultural sites.

[90054] Exploring Sea, Sky, and Sand, Cape Lookout Seashore, North Carolina—May 21–27, 1990. *Leader: Mark Lidd. Price: $335; Dep: $50.* Three islands make up the Cape Lookout National Seashore, and we'll visit two of them, beach-camping on one and staying in cabins on the other. The islands consist of wide, bare beaches, dunes, and large expanses of salt marsh. Activities include hiking, beachcombing, birding, canoeing, fishing, and touring—and just loafing.

Note: See Water trip #90077 for another base-camp outing.



Ruins on the island of Kerrera, Scotland

JOHN EDWARDS

FOREIGN TRIPS

LEADER APPROVAL IS REQUIRED FOR ALL FOREIGN TRIPS.

AFRICA

[90530] Zanzibar to Ngorongoro Crater, Tanzania—February 14–March 1, 1990. *Leader: Kern Hildebrand. Price: $3,460; Dep: $200.* We begin our Tanzanian experience with a tour of the broad beaches and narrow streets of the centuries-old city of Zanzibar. Traveling mostly by Land Rover and staying in hotels or tented camps, we then venture inland via Dar Es Salaam to the best wildlife areas in East Africa: Tarangire, Manyara, the Serengeti, and the unique Ngorongoro Crater, home to more than 30,000 animals.

[90575] The Many Faces of Kenya: A Leisure Safari—June 25–July 7, 1990. *Leader: Mary O'Connor. Price: $2,360; Dep: $200.* 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 tented camps or lodges, and no strenuous hiking is planned.

ASIA

[90535] Gorkha-Chitwan Trek, Nepal—February 26–March 17, 1990. *Leader: Peter Owens. Price: $1,450; Dep: $200.* Our moderate trek starts in historic Gorkha and takes us up rhododendron-covered slopes to an area seldom visited by Westerners, where exciting views of the Manaslu Himal await us: Himalchuli (25,801 feet), Baudha (21,890 feet), and Manaslu (26,760 feet), the eighth-highest mountain in the world. Looping back via Serandanda, our trip will conclude with three days of elephant safaris and jungle walks in Royal Chitwan National Park.

[90540] Rolwaling Trek, Nepal—March 24–April 13, 1990. *Leader: Peter Owens. Price: $1,470; Dep: $200.* The remote Rolwaling Himal, west of Mt. Everest, has always held a mysterious fascination. Tales of the Yeti, the elusive abominable snowman, have poured from the Sherpas who live there. Maximum elevation reached on our 19-day trek into the Rolwaling Himal will be 16,000 feet. Spring comes early to Nepal, and the rhododendron, Nepal's national flower, will be in full bloom.

[90545] China Kaleidoscope II—April 2–22, 1990. *Leader: Phil Gowing. Price: $3,380; Dep: $200.* A walk on the Great Wall, a visit to the Terra Cotta Army of the Qin Dynasty in Xian, a look at the beloved pandas in Chengdu, a river trip through the famous Yangtze gorges, a stroll through the prehistoric Dawn Redwoods, and a hike on the slopes of sacred Tiantai Shan are among the highlights of our kaleidoscopic tour of exotic China. Accommodations will be in the best available hotels.

SIERRA CLUB OUTINGS

[90550] Annapurna Circle Trek, Nepal—April 28–May 25, 1990. *Leader: Peter Ouvens. Price: $1,795; Dep: $200.* Our 25-day trek circles the Annapurna Massif by a route up the Marsyangdi Khola River to the Manang Valley and across 17,650-foot Thorong La Pass. We then descend to Muktinath, a sacred shrine, and proceed down the awesome Kali Gandaki gorge between Annapurna (26,504 feet) and Dhaulagiri (26,810 feet). A side trip to Thulobugin Pass provides fantastic views of Annapurna I.

[90570] Tibet—The Forbidden Wilderness: From Kathmandu to Lhasa—June 11–July 2, 1990. *Leader: Patrick Colgan. Price: $3,560; Dep: $200.* Inaccessible to the West for centuries, Tibet is an incredible ice- and snowbound Himalayan fastness. From Kathmandu we will fly to Lhasa, an ancient Buddhist citadel, and explore this isolated mountain region by chartered bus and on foot. A nine-day trek starting in Tingri and ending in the fabled Rongbuk Valley will provide wondrous views of Everest, Lhotse, and Makalu.

EUROPE

[90527] Cross-Country Skiing in the Austrian Tyrol, Austria—February 10–18, 1990. *Leader: Jeanne Blauner. Price: $1,610; Dep: $200.* The beautiful Sun-Plateau just west of Innsbruck is the setting for our cross-country ski tour of four villages. Lessons and excursions into the countryside are scheduled for the first three days, in preparation for four days of skiing with our Austrian guide from inn to inn along trails connecting the villages. We will stay in comfortable hotels and pensions and enjoy traditional Austrian meals. Our luggage will be transported for us.

[90551] Tulip Bike Tour, Holland—May 4–16,1990. *Leader: John Ruzek. Price: $2,655; Dep: $200.* Holland conjures up images of tulips, windmills, wooden clogs, picturesque villages—and flat roads for bicycling! After a walking tour of Amsterdam, we load our luggage into a van and cycle north over special paths through the coastal dunes and across the IJsselmeer to see some of the 1,100-year-old towns and villages in Friesland. Lecturers will give talks on Holland's ecology and history.

[90555] Picturesque Portugal—May 6–19, 1990. *Leader: John Doering. Price: $2,205; Dep: $200.* From Lisbon we will

Mayan ruins at Tikal, Guatemala

travel in vans to explore the northern two thirds of Portugal, enjoying dayhikes in the forested hills and oceanside dunes of the country's most scenic national parks. We'll also see valleys terraced with vineyards, shop in open-air markets, circle the ramparts of walled villages and explore their castles, and experience Portugal's wines, cuisine, and comfortable hotels.

[90557] John Muir's Scotland—May 27–June 9, 1990. *Leaders: Jane and John Edginton. Price: $2,790; Dep: $200.* Come savor Scotland by retracing John Muir's footsteps across the East Lothian dunes. Starting at his birthplace in Dunbar, we'll explore our way west across the Highlands to the John Muir Trust Preserve on the Knoydart Peninsula to enjoy true Scottish wilderness, and, weather permitting, hike the legendary isles of Skye and Rum. We'll be (bag)piped to dinner, stay in quaint lodges and hotels, and travel by minibus and launch. Hikes are moderate.

[90565] Walking in the Peak and Lake Districts, England—June 2–16, 1990. *Leader: Robin Brooks. Price: $2,440; Dep: $200.* Walking in two of Britain's finest national parks is a delight. Each day we will hike along famed scenic trails and return in the evening to our hotels, where we'll dine and sleep in comfort. In the Peak District quaint villages set off grand estates, and in the Lake District we'll explore Wordsworth country—the peaks and ridges around the lakes of Cumbria.

LATIN AMERICA

[90529] Belize, Central America: Coral, Blue Water, and Kayaks—February 11–18, 1990. *Leader: Margie Tomenko. Price: $1,665; Dep: $200.* Kayak into a Caribbean paradise of warm, crystal-clear water, white sand beaches fringed with palms, and small coral islands as we explore one of the world's longest barrier reefs. We'll island-hop at a relaxed pace and snorkel to see colorful fish. One of our guides is a local fisherman, and we'll dine on the fresh seafood he catches for us. No previous kayaking experience is necessary.

[90531] Tropical Wildlife—Sea-Kayaking in Costa Rica—February 11–19, 1990. *Leader: Carol Dienger. Price: $1,495; Dep: $200.* Costa Rica is unsurpassed in its rich diversity of wildlife and plant species. Sea kayaks will allow us to explore otherwise inaccessible rivers, estuaries, and palm-lined ocean beaches for close-up views of birds, iguanas, crocodiles, and howler monkeys. A bus will take us on side trips to wildlife-observation centers in contrasting habitats. Basic paddling experience is required.

[90532] Belize: Reef and Ruins, Central America—February 17–26, 1990. *Leader: Lela Nelson-Mills. Price: $1,490; Dep: $200.* Using a rustic ranch as a base, we'll explore Belize's lush interior and visit the magnificent Mayan ruins of Tikal in neighboring Guatemala. Then we move on to the Caribbean coast and a palm-studded island adjacent to a grand barrier reef. We'll stay in a guest house on the beach, snorkel in crystal-clear water, and feast on fresh seafood.

[90533] Magdalena Bay Sea-Kayaking, Baja California, Mexico—February 18–24, 1990. *Leader: John Garcia. Price: $1,075; Dep: $200.* Wake up to the sound of whales blowing, paddle the waters of Magdalena Bay, and explore the uninhabited shoreline and dunes of the bay's barrier island. Suited for both novice and expert paddlers, this trip will give us a delightful, close-up look at California gray whales in their winter home. Basic paddling instruction is provided.

[90534] Bio Bio River Run, Chile—February 23–March 7, 1990. *Leader: Blaine LeCheminant. Price: $2,620; Dep: $200.* Surpassing all American rivers in raw beauty and lively rapids, the Bio Bio is a dream river come true, with its clear,

clean water, hot springs, tributary waterfalls, and unbelievable panoramas. Enjoying South America's summer weather all the way, we'll see glaciers and alpine lakes and hike to an active volcano. This is the best time of year to run the Bio Bio.

[90542] A Lost Paradise, Venezuela—March 31–April 8, 1990. *Leader: Grace Hansen. Price: $2,395; Dep: $200.* Home to unique and abundant wildlife, Venezuela offers us three contrasting habitats to explore: the vast grasslands of Llanos, the islands and coral reefs of Morrocoy National Marine Park on the Caribbean coast, and Canaima National Park in the remote Guyana Highlands. We'll enjoy birding, snorkeling, and, as we fly into the highlands, views of ancient rainforests and the world's highest waterfall.

[90546] Family Paradise in Belize, Central America—April 7–15, 1990. *Leaders: Karen Short and Stephen Pozsgai. Price: adult $1,305, child $870; Dep: $100 per family.* Relax on the beautiful beaches of the Caribbean coast and swim and snorkel in aquamarine waters. On this trip to the friendly country of Belize we'll visit the Creole fishing village of Placencia, dine with a Mayan family, explore a barrier reef, and much more! Dinners of fresh seafood and accommodations in beachfront cottages complete this pleasure trip.

[90547] River Rafting, Jungle, and Beach Adventure, Costa Rica—April 12–18, 1990. *Leader: Victor Monke. Price: $1,455; Dep: $200.* Whitewater rapids, deep river canyons, and clear, inviting pools are yours to enjoy on an exciting three-day raft trip on the Rio Pacuare. Then we fly to Manuel Antonio National Park for a hike in the rainforest to observe the colorful birds and take a swim in the blue Pacific. Returning to San José, we'll spend a full day touring this historic city.

[90548] Sea of Cortez Kayaking, Baja California, Mexico—April 16–22, 1990. *Leader: Tony Strano. Price: $1,050; Dep: $200.* This warm-water adventure beckons you to swim, snorkel, and fish as we explore the fascinating geology, hidden canyons, and desert vegetation of Espíritu Santo and Partida islands. We'll also visit Los Islotes, a sea lion rookery. This trip is designed for inexperienced to expert paddlers. Airline schedules require coming to La Paz a day ahead of the trip and leaving a day after.

[90556] Backpacking the Sierra San Pedro Martir, Baja California, Mexico—May 16–25, 1990. *Leader: Wes Reynolds. Price: $695; Dep: $100.* On our leisurely backpacking trip to the highest mountain range in Baja California Norte, we will enjoy 8,000-foot-high alpine meadows with pine and aspen, see evidence of the gold rush in the early 1900s, and perhaps view both the Pacific Ocean and the Sea of Cortez from a nearby peak. The first and last nights in Mexico provide time to relax at the delightful Meling Guest Ranch in the foothills.

HAWAII

[90058] Springtime in Hawaii—April 6–14, 1990. *Leader: Wayne Martin. Price: $810; Dep: $100.* Easter week is a perfect time for leisurely car-camping on the Big Island of Hawaii. Here we'll enjoy a tropical fern forest, walk through an underground lava tube, swim at a black sand beach, visit Pu'uhonua o Hônaunau National Historical Park, marvel at the beauty of Waipio Valley, and—if Kilauea Volcano is still erupting—watch the steam rise as lava flows into the sea.

[90059] Sea-Kayak Kauai's Coastal Wilderness, Hawaii—May 27–June 3, 1990. *Leader: Carolyn Braun. Price: $890; Dep: $100.* Do you enjoy the challenges of tropical sea-kayaking, backcountry hiking, and remote beach camping? If so, this is your trip! We'll kayak Na Pali's wilderness coastline, venturing through caves and under refreshing waterfalls that plunge into the sea. We'll also snorkel among sea turtles and dolphins and hike up magnificent valleys. Leader approval required.

SERVICE

LEADER APPROVAL IS REQUIRED FOR ALL SERVICE TRIPS.

[90063] Deer Creek Trail Maintenance, Mazatzal Wilderness, Arizona—March 4–11, 1990. *Leader: Vance Green. Price: $130; Dep: $50.* Come thaw out during beautiful spring weather in Arizona! We'll be rebuilding the trail in one of Mazatzal's most stunning canyons. Cool pine and spruce forests give way to Gabel oak, juniper, and various types of cacti as Deer Creek descends from its source at 7,000 feet to 4,000 feet. Deep, sparkling pools and moderate temperatures make for great swimming.

[90064] Dutchman Grave Trail Maintenance, Mazatzal Wilderness, Arizona—March 10–17, 1990. *Leader: Jim Vaale. Price: $135; Dep: $50.* After crossing the Verde River Sheep Bridge, we backpack ten miles and ascend 2,900 feet to our base camp at Mountain Spring, where we will reconstruct a historic Basque sheepherder trail. A wide array of spring wildflowers and greenery will adorn the route. Pack animals will carry in our food and tools. Our trip will be moderate to strenuous.

[90065] Superstition Wilderness Trail Maintenance, Arizona—March 31–April 7, 1990. *Leader: Wil Passow. Price: $125; Dep: $50.* The Superstition Wilderness lies east of Phoenix in legendary Apache Indian country. We will backpack three miles to a base camp at 4,000 feet and work on a trail that has been used by cowboys and miners since the 1860s. It won't be all work: We'll have time to explore, climb a peak, and look for evidence of Indian culture. Plan for cool nights and clear, warm days.

[90066] Trail Building, Buffalo National River, Arkansas—April 15–21, 1990. *Leader: Janie Grussing. Price: $130; Dep: $50.* The Buffalo National River area boasts much of the Ozarks' finest scenery. We'll backpack to our base camp, then build trail through rugged country overlooking the river. On our days off we can swim, hike, explore homestead ruins, and take pictures. Expect mild days, cool nights, and a multitude of spring wildflowers. Our trip will be moderate to strenuous.

[90067] Red Rock Trail Maintenance, Munds Mountain Wilderness, Coconino Forest, Arizona—April 22–28, 1990. *Leader: Jim Ricker. Price: $110; Dep: $50.* Located on the southern edge of the Colorado Plateau, this is a beautiful land of deep canyons and forested mountains. During the first part of the trip we will construct the final leg of the Hot Loop Trail. Then we'll enjoy a moderate backpack into one of the many colorful sandstone canyons. Elevations range from 4,500 to 6,500 feet.

[90068] Grand Canyon North Rim Trail Maintenance, Kaibab Forest, Arizona—May 6–15, 1990. *Leader: Deborah Northcutt. Price: $175; Dep: $50.* Amid the spectacular vistas of the remote western Grand Canyon, we'll clear rock and build tread and cairns on a trail that drops from the North Rim. Days off can be spent exploring slickrock narrows and waterfalls in the Kanab Creek/Jump Up areas. This will be a strenuous trip.

SKI

LEADER APPROVAL IS REQUIRED FOR ALL SKI TRIPS.

[90352] Adirondack Wilderness Grand Ski Tour, New York—January 27–February 2, 1990. *Leader: Tom Kligerman. Price: $585; Dep: $100.* In the heart of the High Peaks we will ski from Keene Valley over Klondike Notch to Heart Lake. Traveling through Avalanche Pass, we'll make our way to the Siamese Ponds Wilderness for some of the best backcountry skiing anywhere. Our route follows sometimes challenging, mostly rolling terrain, eight to ten miles per day. For intermediate skiers and qualified novices.

[90353] Zealand Valley Cross-Country Ski Tour, White Mountains Forest, New Hampshire—February 5–9, 1990. *Leader: Craig Caldwell. Price: $480; Dep: $50.* Zealand Valley provides outstanding backcountry skiing. We can visit the iced-over Thoreau Falls and Pemigiwasset River, climb Zeacliffs for the distant winter views, and ski across beaver ponds and through groves of birch and hemlock. We'll stay in snug Zealand Hut, and our day trips will be moderate with strenuous options. Skiers should be intermediate level with experience off groomed tracks.

[90072] Yellowstone Winter Wildlife and Geology, Yellowstone Park, Wyoming—February 25–March 4, 1990. *Leader: Jeffrey Jackson. Price: $1,395; Dep: $200.* Experience Yellowstone's wonders while learning about its ecology, geology, and winter animal behavior. Each evening we'll stay in lodges and enjoy entertaining lectures by our trip geologist and biologist. During the day we'll ski to remote areas of the park. Being comfortable on skis is a prerequisite for this trip. Price includes all meals, lodging, and transportation from Bozeman.

[90073] Sun Valley Hut-to-Hut Skiing, Idaho—March 17–24, 1990. *Leader: Susan Saul. Price: $1,170; Dep: $200.* Ski on spring powder through the white wilderness of the Sun Valley backcountry to replicas of Mongol yurts. These snug huts in the Sawtooth Mountains are heated with wood stoves and have either a hot tub or a sauna. You must ski at intermediate level or better. Instruction will be provided in telemarking and avalanche safety. Skis and poles are provided.

GARY LADD

Winter in Yellowstone National Park, Wyoming

WATER

Traveling by water offers a very special way to experience the wilderness. Beach-camping, exploratory hiking, and swimming along the way provide all the ingredients for a great wilderness adventure. Leader approval is required for all Water trips.

Canoe trips are graded as follows: Grade A—no canoeing experience required; Grade B—some canoeing experience required; Grade C—canoeing experience on moving water required; Grade D—canoeing experience on whitewater required.

[90077] Everglades Park, Florida—March 4–9, 1990. *Leaders: Vivian and Otto Spielbichler. Price: $230; Dep: $50.* Our base camp is at Flamingo, at the southern tip of the park, a unique subtropical wilderness that is home to rare birds and animals. On our daily canoe trips we will explore mangrove and buttonwood environments, freshwater ponds, brackish water, open coastal prairies, and saltwater marshes. This leisure trip is for anyone who enjoys canoeing, bird- and animal-watching, and photography. (Grade A)

[90078] Okefenokee Wilderness Swamp, Georgia—March 20–24, 1990. *Leader: Marvin Hungate. Price: $345; Dep: $50.* Canoe a true blackwater swamp and perhaps one of its historic rivers. This is the land of the "trembling earth." We will paddle among the cypress and in and out of saw-grass prairies and lakes. We'll travel around ten miles each day, and camp at a different site most nights. (Grade B)

[90079] Lake Powell Exploration, Utah—May 27–June 2, 1990. *Leader: Ron Miller. Price: $340; Dep: $50.* Exploring Lake Powell . . . reaching out to the canyons and hewed rifts of the great colored walls of Glen Canyon present an opportunity to enjoy ancient Anasazi ruins and the water-carved geology of this magnificent area. Our adventure will use platform boats for transport to each day's campsite. Suitable for all ages. Boat rental and fuel are not included in the trip price. See trip brochure for details.

RESERVATION & CANCELLATION POLICY

Eligibility: Our trips are open to Sierra Club members, applicants for membership, and members of organizations granting reciprocal privileges. You may include your membership application and fee with your reservation request.

Children must have their own memberships unless they are under 12 years of age.

Unless otherwise specified, a person under 18 years of age may join an outing only if accompanied by a parent or responsible adult or with the consent of the leader.

Applications: One reservation form should be filled out for each trip by each person; spouses and families (parents and children under 21) may use a single form. Mail your reservation together with the required deposit to the address below. No reservations will be accepted by telephone.

Reservations are confirmed on a first-come, first-served basis. However, when acceptance by the leader is required (based on applicant's experience, physical condition, etc.), the reservation is confirmed subject to the leader's approval, for which the member must apply promptly. When a trip is full, later applicants are put on a waitlist.

Give some thought to your real preferences. Some trips are moderate, some strenuous; a few are only for highly qualified participants. Be realistic about your physical condition and the degree of challenge you enjoy.

The Sierra Club reserves the right to conduct a lottery to determine priority for acceptance in the event that a trip is substantially oversubscribed shortly after publication.

Reservations are accepted subject to these general rules and to any specific conditions announced in the individual trip brochures.

Deposit: A deposit is required with every trip application. The amount of the deposit varies with the trip price, as follows:

Trip price per person	*Deposit per person*
Up to $499	*$50 per individual (with a maximum of $100 per family on family trips)*
$500 to $999	*$100 per individual*
$1,000 and above	*$200 per individual*

The amount of a deposit is applied to the trip price when the reservation is confirmed. All deposits and payments should be in U.S. dollars.

Payments: Generally, adults and children pay the same price; some exceptions for family outings are noted. You will be billed upon receipt of your application. Full payment of trip fee is due 90 days prior to trip departure. Trips listed in the "Foreign" section require additional payment of $300 per person six months before departure. Payments for trips requiring the leader's acceptance are also due at the above times, regardless of your status. If payment is not received on time, the reservation may be canceled and the deposit forfeited.

No payment (other than the required deposit) is necessary for those waitlisted. The applicant will be billed when placed on the trip.

The trip price does not include travel to and from the roadhead or specialized transportation on some trips (check trip brochure). Hawaii, Alaska, and Foreign trip prices are all exclusive of airfare.

Transportation: Travel to and from the roadhead is your responsibility. To conserve resources, trip members are urged to form carpools on a shared-expense basis or to use public transportation. On North American trips the leader will try to match riders and drivers. On some overseas trips you may be asked to make your travel arrangements through a particular agency.

Infrequently the Sierra Club finds it necessary to cancel trips. The Club's responsibility in such instances is limited in accordance with the Trip Cancellation Policy. Accordingly, the Sierra Club is not responsible for nonrefundable airline or other tickets or payments or any similar penalties that may be incurred as a result of any trip cancellation.

Confirmation: A reservation is held for a trip applicant, if there is space available, when the appropriate deposit has been received by the Outing Department. A written confirmation is sent to the applicant. Where leader approval is not required, the confirmation is unconditional. Where leader approval is required, the reservation is confirmed subject to the leader's approval. Where there is no space available when the application is received, the applicant is placed on the waitlist and the deposit is held pending an opening. When a leader-approval trip applicant is placed on the waitlist, the applicant should seek immediate leader approval so that in the event of a vacancy the reservation can be confirmed. When a person with a confirmed reservation cancels, the person at the head of the waitlist will automatically be confirmed on the trip, subject to leader approval on leader-approval trips. The applicant will not be contacted prior to this automatic reservation-confirmation except in the three days before trip departure.

Refunds: You must notify the Outing Department directly during working hours (weekdays 9–5; ph. 415-776-2211) of cancellation from either the trip or the waitlist. The amount of the refund is determined by the date that the notice of cancellation by a trip applicant is received at the Outing Department. The refund amount may be applied to an already-confirmed reservation on another trip.

A cancellation from a leader-approval trip is treated exactly as a cancellation from any other type of trip, whether the leader has notified the applicant of approval or not.

The Outing Committee regrets that it cannot make exceptions to the Cancellation Policy for any reason, including personal emergencies. Cancellations for medical and other reasons are often covered by traveler's insurance, and trip applicants will receive a brochure describing this type of coverage. You can also obtain information regarding other plans from your local travel or insurance agent. We encourage you to acquire such insurance.

Trip leaders have no authority to grant or promise refunds.

Transfers: For transfers from a confirmed reservation made 14 or more days prior to the trip departure date, a transfer fee of $50 is charged per application.

Transfers made 1–13 days prior to the trip departure date will be treated as a cancellation, and the Cancellation Policy will apply. No transfer fee is charged if you transfer from a waitlist.

A complete transfer of funds from one confirmed reservation to another, already-held, confirmed reservation will be treated as a cancellation, and will be subject to cancellation fees.

Continued on next page

Sierra Club Outings

Reservation & Cancellation Policy

Continued from previous page

Medical precautions: On a few trips, a physician's statement of your physical fitness may be needed, and special inoculations may be required for foreign travel. Check with a physician regarding immunization against tetanus.

Emergency care: In case of accident, illness, or a missing trip member, the Sierra Club, through its leaders, will attempt to provide aid and arrange search and evacuation assistance when the leader determines it is necessary or desirable. Costs of specialized means of evacuation or search (helicopter, etc.) and of medical care beyond first aid are the financial responsibility of the ill or injured person. Since such costs are often great, medical and evacuation insurance is advised, as the Club does not provide this coverage for domestic trips. Participants on foreign outings are covered by limited medical, accident, and repatriation insurance. Professional medical assistance is not ordinarily available on such trips. Be sure your insurance covers you in the countries involved.

The leader is in charge: At the leader's discretion, a member may be asked to leave the trip if the leader feels the person's further participation may be detrimental to the trip or to the individual.

Please don't bring these: Radios, sound equipment, firearms, and pets are not allowed on trips.

Time or event of cancellation	Amount forfeited per person	Amount refunded per person
1) Disapproval by leader (once leader-approval information has been received) on leader-approval trips	None	All amounts paid toward trip price
2) Cancellation from waitlist, or the person has not been confirmed three days prior to trip departure	None	All amounts paid toward trip price
3) Trip canceled by Sierra Club	None	All amounts paid toward trip price
4) Cancellation from confirmed position or confirmed position subject to leader approval		
a) 60 days or more prior to trip departure date	Amount of deposit	All amounts paid toward trip price exceeding forfeited amount
b) 14–59 days prior to trip departure date	20% of trip fee, but not less than the amount of deposit	As above
c) 4–13 days prior to trip departure date if replacement can be obtained from waitlist	30% of trip fee, plus $50 processing fee, but in no event more than 50% of total trip fee	As above
d) 4–13 days prior to trip departure date if replacement *cannot* be obtained from waitlist (or if there is no waitlist at the time of cancellation processing)	40% of trip fee, plus $50 processing fee, but in no event more than 50% of total trip fee	As above
e) 0–3 days prior to trip departure date	Trip fee	No refund
f) "No-show" at the roadhead, or if participant leaves during trip	Trip fee	No refund

Mail checks and applications (excluding those sent by express mail) to:

Sierra Club Outing Department
Dept. #05618, San Francisco, CA 94139

Mail all other correspondence (including express-mail applications) to:

Sierra Club Outing Department
730 Polk St., San Francisco, CA 94109

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 trip is best suited to their own 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 canceling 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):

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The Backcountry Back Lot

Compact video camcorders are passing cameras like they were standing still.

Pam L. Jones

WHY WOULD a backpacker who might consider sawing off a toothbrush handle to shave an ounce haul a video camcorder into the wilderness? Simple: Video captures motion and sound, two elements of the outdoor experience that are beyond the reach of still photography. On videotape, loons laugh, rapids boil, cottonwoods shimmer, and companions blush. A filmed sequence of a black bear exploring a campsite is guaranteed to recall the encounter better than any photo. Ditto for running a rapid or gliding into a secluded cove. Combine this with the ability to edit the recording and add music, narration, and additional footage such as map close-ups, and it becomes increasingly clear why videos are replacing slide shows as post-expedition entertainment.

Granted, most video camcorders are more cumbersome to carry than a 35mm camera. But some 8mm models now rival single-lens reflex cameras in size, weight, and overall feel. An 8mm camcorder uses cassettes that are about the same size and weight as standard audiocassettes, so the camera is much smaller than the VHS models used for most video recordings. Camera manufacturers familiar to still photographers—Nikon, Pentax, Olympus, Canon, Ricoh, and Minolta—all offer small 8mm camcorders that add as little as two pounds to your gear, compared with four or more pounds for a VHS model. Sony, which offers more 8mm models than any other maker, recently unveiled a diminutive 28-ounce camcorder, the TR-5.

The 8mm camcorder is almost too portable, though. Because it's so small, you can't prop the camera on your shoulder like a VHS, but must hold it in front of your face with both hands. This makes obeying the cardinal rule of motion photography—keeping the camera steady—a bit challenging. In shaky situations you can use a tripod or an accessory rod to stabilize the camera against your chest.

The other drawback to an 8mm recorder is that the tape format simply isn't the industry standard. To play an 8mm cassette on the ubiquitous VHS videocassette recorder, it must first be dubbed onto a VHS tape. This is a relatively simple process, but not as convenient as popping a tape into the first VCR you find back in civilization. However, you can bypass your VCR and connect any camcorder directly into a TV set or monitor. Lastly, 8mm videotapes are more expensive ($9 to $21 for a two-hour tape) than their VHS counterparts (which may run as low as $4).

Though heavier, VHS camcorders have slimmed down in recent years to a manageable four or five pounds, excluding the battery, which adds about another pound. The weight of a VHS camcorder usually restricts its use to boat trips and campsites near the road, but ambitious backpackers sometimes tote them. They treat the camera as a group asset, like a three-person tent: One person carries the camera, someone else is responsible for the tent, and a third shoulders extra cooking gear and food.

Camcorders have become sophisticated as well as portable. Most of the features important to outdoor filming are now standard on all models. These include automatic exposure, focusing, zoom lenses, white balancing (a control that reproduces colors accurately under varying light conditions), and an electronic viewfinder that allows you to play back recordings in the field.

Accessories that aid outdoor recording include rain covers, long-charge battery packs (up to two hours), and adapters that enable you to run the camera off a car battery. Camcorders are delicate instruments that need sturdy (which generally means bulky) cases to protect them.

You can pare down some bulk by wrapping your video gear in clothing and plastic bags, keeping in mind that with a bit of bad luck it may not return home in working

CHRISTINE ALCINO

Waterfalls roar, children fidget: Catch nature at its most natural on video.

condition. Sony sells a camcorder designed specifically for the outdoors—a bright-yellow, water-resistant cocoon protects it from rough handling and bad weather. Like all camcorders, though, even this one isn't waterproof.

Experienced photographers will find that their knowledge of light and lenses pays off immediately when they aim their first video camera. Anyone who photographs the outdoors knows that lighting varies wildly depending upon time of day, weather, and reflectivity of the landscape.

Like still cameras, camcorders are kinder in the light of morning and afternoon. Highly reflective terrain like beaches and snowfields can boggle the electronic mind of a video camera, so it's important to take along a neutral-density filter to lessen the light's intensity. A camcorder's automatic-exposure sensor will read the brightest source, just like those on 35mm cameras, and may need to be manually overridden to expose backlit subjects correctly.

Motion—that of the camcorder or of an object being filmed—is where the similarities between cameras and camcorders end. It's important to become acquainted with the do's and don'ts of videotaping that apply indoors and out. The most annoying sins are inadvertent camera movement, panning too fast, zooming in and out too much, and cutting abruptly from one shot or scene to another—mistakes guaranteed to leave your audience queasy.

Panning is a technique worth mastering early. You'll use it to scan mesas and mountain ranges and to follow moving subjects. Deciding ahead of time on an opening and closing shot and holding each one for at least three seconds will give landscape pans a professional look.

Videotaping in the wilds is bound to become more popular as the cameras continue to shrink in size and weight. A trip to the camera shop calls to mind the scene in the film *The Time Machine* when the protagonist eases his machine into the future, sees the hemline rise on the mannequin in the store across the street, and wonders, "How far will this go?" ■

PAM L. JONES *is a freelance writer in Manhattan Beach, California.*

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How do U.S. cities rank in terms of environmental quality? (Lori Fantry, Worcester, Massachusetts)

Zero Population Growth, a population-education group, recently issued an environmental index as part of its "Urban Stress Test." In this ranking of American cities with populations over 100,000 (and the largest cities in the ten states with no city of this size), ZPG fingered the best and worst for air quality, number of hazardous-waste sites, quality of sewage treatment, and availability and quality of groundwater.

Phoenix out and out flunked: On a scale from 1 (best) to 5, it got a 5 in all categories. Salt Lake City didn't average much better (4.8). Rounding out the list of environmental losers with scores of 4.3 to 4.5 were Baltimore, Honolulu, Houston, Jersey City, Los Angeles, Louisville (Kentucky), Pasadena (Texas), Philadelphia, Seattle, Tacoma, and Tempe (Arizona).

The cities with the best environmental scores have an average population of 121,123, compared with 785,725 for the worst cities. Abilene (Texas), Roanoke (Virginia), and Winston-Salem (North Carolina) topped the list with scores of 1.8; 16 cities had scores of 2, including Berkeley and Concord in California, Chesapeake and Hampton in Virginia, and Peoria and Springfield in Illinois.

The survey also ranks cities for population and economic stability, education, and violent crime. For a copy send $4.95 to Zero Population Growth, 1400 16th St., N.W., Suite 320, Washington, DC 20036.

How can I, as a North American consumer, help conserve tropical rainforests? (Andrea Lane, East Setauket, New York)

Rainforests around the world are rapidly being cleared for cattle ranching, farming, and timber. In exchange we get fast-food hamburgers, dog food, and hardwood furniture.

In addition to boycotting these products (for a list of items to avoid, contact the Rainforest Action Network, 301 Broadway, San Francisco, CA 94133), you can purchase fruits, nuts, and oils harvested from the standing forests.

Cultural Survival, a human-rights group based in Cambridge, Massachusetts, is helping indigenous people in Brazil develop markets for such products. Ben and Jerry's new Rainforest Crunch ice cream contains cashews and Brazil nuts obtained through the Cultural Survival project, and soon you may see rainforest-based nut butters, nutritional supplements, and sherbets. The Body Shop, a natural beauty-product chain with stores on the East Coast, is looking into using rainforest oils, essences, and fibers in its cosmetics.

For more consumer information consult the Sierra Club booklet "Tropical Forests: A Citizen's Guide to Action," available from Keren Ensor, Sierra Club, 408 C St., N.E., Washington, DC 20002; phone (202) 547-1141.

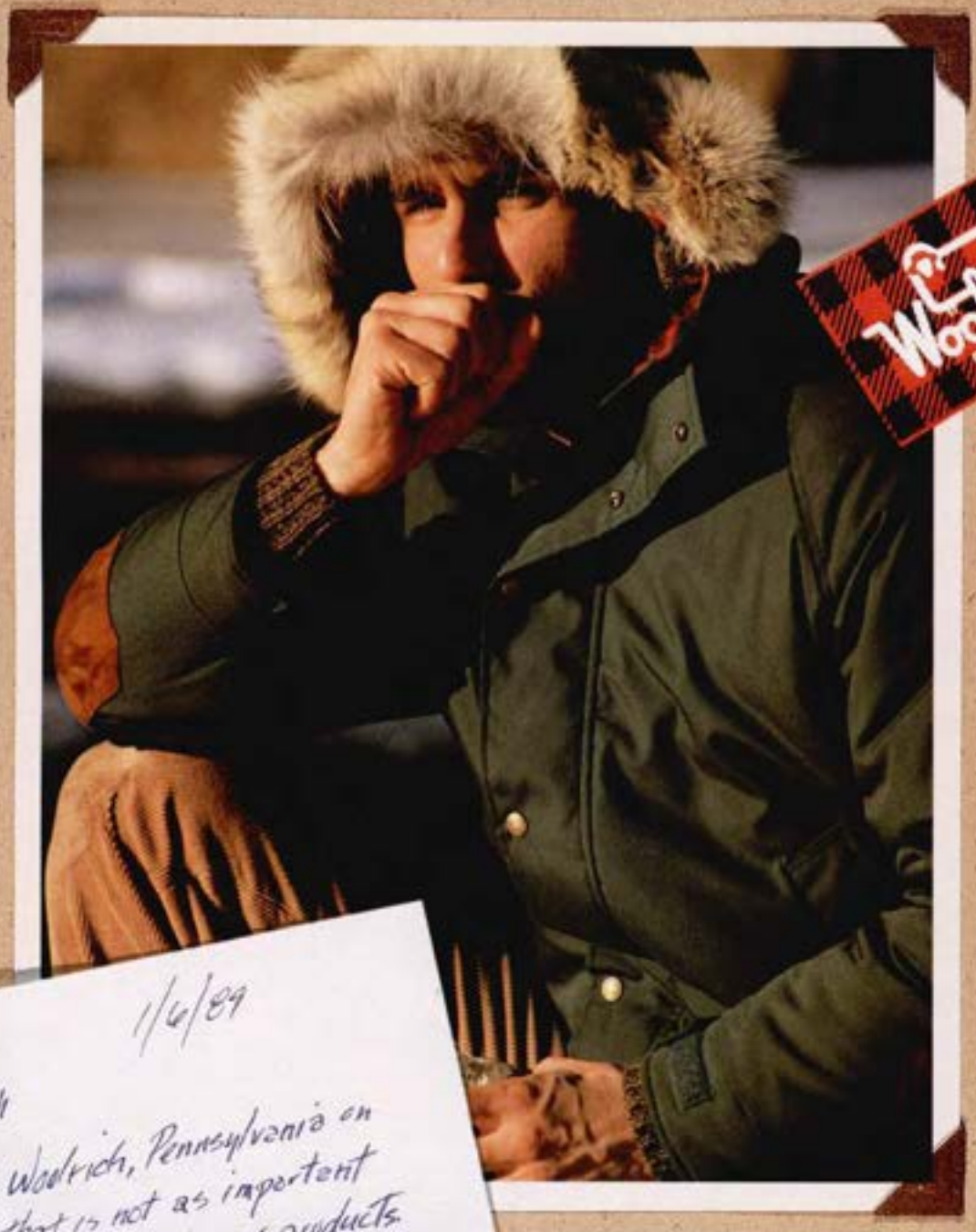
What restrictions apply to U.S. imports of African elephant ivory? (David J. Rice, Eau Claire, Wisconsin)

Despite laws against killing elephants, poaching accounts for 80 percent of the ivory on the world market. In protest, the Bush administration in June banned U.S. imports of raw and carved ivory, eliminating about 10 percent of the market. Now only trophy tusks taken on legal safaris may be brought into the country.

Ten million elephants roamed Africa in the 1930s; today that number is closer to 700,000. In October, after *Sierra* went to press, the Convention on International Trade in Endangered Species was scheduled to consider declaring the African elephant endangered, which would ban ivory trade among the 102 CITES member nations. Although exemptions would be allowed, supporters say a CITES ban would still help cut demand.

Within a week of the U.S. ban, the European Economic Community, which bought and sold roughly the same amount of ivory as the United States, followed with a ban of its own. U.S. Fish and Wildlife Service agent Michael Sutton believes these actions are having a significant effect: "The price of ivory is dropping worldwide because demand is drying up," he says.

Although it is legal to buy ivory that's already in the United States, Teresa Callahan, head of the Sierra Club's Wildlife Committee, urges people not to. "Even legal trade hurts the African elephant," she says. ■



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