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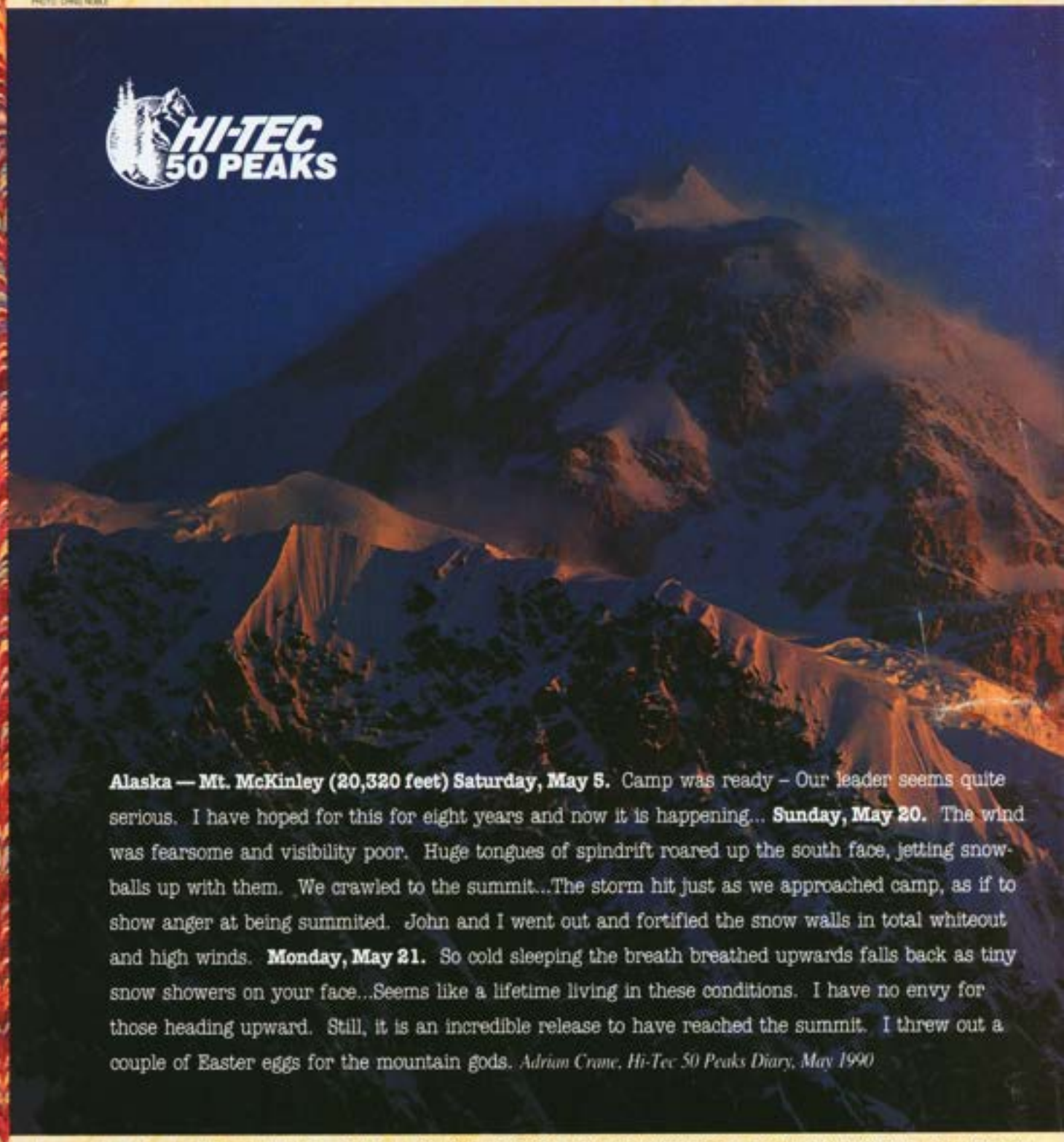
Yosemite Up for Grabs

High-Seas Driftnet Drama

PHOTO: CHRIS NOBLE



Alaska — Mt. McKinley (20,320 feet) Saturday, May 5. Camp was ready – Our leader seems quite serious. I have hoped for this for eight years and now it is happening... **Sunday, May 20.** The wind was fearsome and visibility poor. Huge tongues of spindrift roared up the south face, jetting snowballs up with them. We crawled to the summit...The storm hit just as we approached camp, as if to show anger at being summited. John and I went out and fortified the snow walls in total whiteout and high winds. **Monday, May 21.** So cold sleeping the breath breathed upwards falls back as tiny snow showers on your face...Seems like a lifetime living in these conditions. I have no envy for those heading upward. Still, it is an incredible release to have reached the summit. I threw out a couple of Easter eggs for the mountain gods. *Adrian Crane, Hi-Tec 50 Peaks Diary, May 1990*

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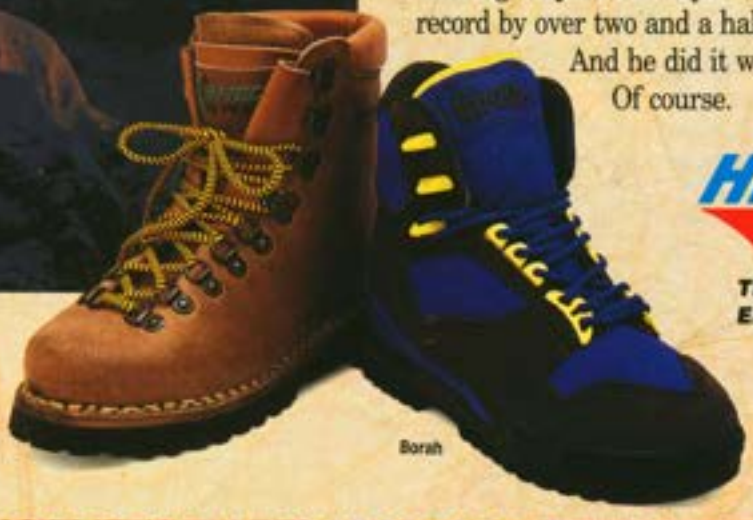

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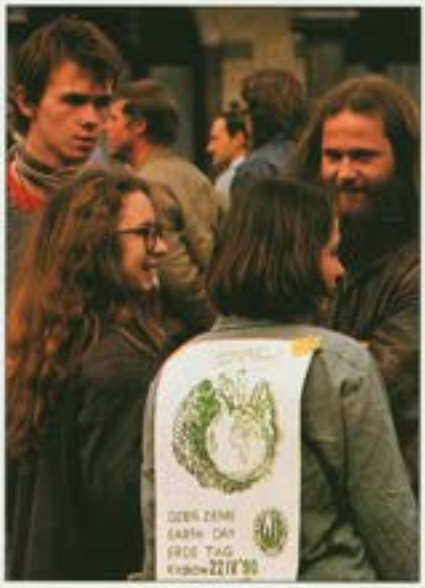
VOL. 76/No. 2 MARCH/APRIL 1991

Sierra



Sierra (USPS 495-920) (ISSN 0161-7362), published bimonthly, is the official magazine of the Sierra Club, 730 Polk St., San Francisco, CA 94109. Annual dues are $35. Members of the Sierra Club subscribe to *Sierra* ($7.50) through their dues. Nonmember subscriptions: one year $15; two years $26; foreign $20; single copy $4.00 (includes postage). Second-class postage paid at San Francisco, CA, and additional mailing offices.

POSTMASTER: Send address changes to Sierra Club Member Services, 730 Polk St., San Francisco, CA 94109. READERS: Send old and new addresses and a *Sierra* address label. Telephone (415) 776-2211 (voice); (415) 398-5384 (TDD).

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USA Newsstand Distribution by Eastern News Distributors, Inc., 1130 Cleveland Rd., Sandusky, OH 44870.

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HUNTING HEAT

"In the Heat of the Hunt" by Margaret L. Knox, which appeared in the November/December 1990 issue, and the shorter pieces that accompanied it prompted a veritable volley of mail from our readers. Many berated us for what they felt sure was our clear anti-hunting position, while others were enraged by our obvious sentiments for slaughter.

We've expanded our "Letters" column this issue, not to fuel this seemingly intractable controversy, but to let you in on how Sierra Club members have responded to one of the most intensely emotional conservation questions of our day.

Whether hunting is right or wrong, a spiritual experience, or an outlet for the killer instinct, one thing it is *not* is a sport. Sport is when individuals or teams compete against each other *under equal circumstances* to determine who is better at a given game or endeavor. Hunting will be a sport when deer, elk, bears, and ducks are endowed with human intelligence and given 12-gauge shotguns. Bet we'd see a lot fewer drunk yahoos (live ones, anyway) in the woods if *that* happened.

Sierra magazine treating hunting as a legitimate "sport"? Shame!

R. Lerner
Livingston, New Jersey

Most human activities result in some negative impact on wildlife or their habitats. Our energy use results in oil development, nuclear power plants, and dammed rivers. Our eating habits require vast acreages of land devoted to raising crops or livestock. Our shelters are made possible by logging. Most of the time these activities are accepted, because no one sees the deer displaced by the subdivision, the birds poisoned by agricultural pesticides, or the antelope caught in the fence.

Hunting does result in the deaths of individual animals, but it is not responsible for the decline of entire populations. It is fashionable to denigrate the contributions of things like the Pittman-Robertson Act, but the fact remains that we have abundant populations of many wildlife species because of hunters' monies and efforts.

Hunting is an integral part of many conservationists' lives. Whether one chooses to be a predator or not should remain a personal choice.

Carl D. Mitchell
Lima, Montana

Your November/December issue was a real eye-opener for us. We cannot support an organization that cannot take a definitive, uncompromised stand against hunting. I wonder if you aren't sure how you feel or if you don't want to alienate any possible contributors. Either way, that does it for us. Please discontinue sending your magazine.

We're very thankful for this issue. Now we know enough to take our contributions to organizations that will take a stand against destruction and life-taking. Period.

Winifred Stoelton
Kathleen Peterson
Saline, Michigan

Well, I tried. I'm a member of the Sierra Club, Greenpeace, The Nature Conservancy, *and* the National Rifle Association. In the NRA, we have our share of fire-breathing, self-righteous "God-Guns-Guts" types. I am aware that all organizations have their lunatic fringes, and I thought I could live with that. But when *Sierra* implied it was presenting an "even-handed" discussion of the pros and cons of hunting, I was deeply disappointed. Forget the text, just look at the photos. I'm not threatening to withdraw from the Sierra Club, only expressing my disappointment at your outrageous failure to deliver a dialogue.

Barry Jay Schwartz, M.D.
Bala-Cynwyd, Pennsylvania

Your articles on hunting were gross and sickening. At this very moment the orange-coated weirdos are out looking for deer in my yard. I do not need *Sierra* making a case for them.

We thought we had found a paradise bordering the Rachel Carson Wildlife Preserve, and now the Fish and Wildlife Department has posted a sign saying "Public Hunting Area." How is that a refuge?

So, do not send your magazine to us anymore; you are on the wrong side.

Cynthia Flolid
Kittery Point, Maine

I found your essay on hunting to be very thought-provoking. In particular "Why We Hunt" by Humberto Fontova deserves special attention. Without mincing words, Mr. Fontova asserts that he hunts because he likes to kill, and that he takes pleasure in killing because of predatory instincts.

However, his unabashed cut to the quick may leave less than the bones of the truth upon the killing field. The skeleton displayed is that of instinct. It is a convenient item to rattle when caught up in acts of violence or greed. Does mankind really possess an instinct to kill? Does any animal? Predators certainly have an instinct to eat, and they will kill to do so. Yet in examples that come to mind, the urge to kill seems secondary to the need to eat. When the stomach is satiated, a predator's urge to kill appears to subside.

One who decries pretense should at least suspect that there may be more than a primal instinct behind the joy of killing.

Some men hunt, some don't. For the most part, hunters had fathers who hunted or have been adopted into a hunting group. In a hunting family, a child observes that the passage to manhood is related to the act of hunting. He becomes old enough for his first gun. He is taught the ways of the woods. He makes his first kill. He is congratulated. There is joy because he has become a man. He has become like his father with whom he now shares something forevermore. Each kill will reaffirm that maleness and that sharing. This, however, is not instinct: It is

In Kentucky, they assume you mean Wild Turkey. Elsewhere, please ask.

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an act of respect for the father and a way of life, a display of maleness. Eventually it becomes simply a habit, a necessary ritual.

If a man comes to realize that this chain is habit rather than instinct, he should experience both relief and anxiety—relief in that he has the power to control his actions, anxiety in that he has the responsibility to do so. He can kill in the name of primal instincts, knowing it is pretense, or he can stop the killing and upset the established patterns of his life. Pretense or sacrifice—a difficult choice, but not one that need be bred out of him.

Vern Loomis
Birmingham, Michigan

How many more times must I read an evenhanded, let's-give-both-sides type story about an issue that cries for advocacy by just such an organization as the Sierra Club? I suppose, considering the rather mousy policies of the Club on wildlife and other related issues, I should be thankful that "In the Heat of the Hunt" was printed at all. That the Sierra Club hasn't delivered a strong anti-hunting policy appalls me, however.

There is no sport to a poorly aimed bullet or even a well-aimed one, to arrows with little stopping power, to poison bait that may take days to kill, or to leg traps. Knox refers to anti-hunting activists as a "militant fringe," but I'd call them a proud and brave group that ought to receive our highest respect instead of petty ridicule.

Knox's article was enlightening, but I hope the day will soon come when it can be replaced by one clearly advocating the end of "sport hunting." What was that saying of the stupid environmentalist—what's his name, Muir?—about everything in the universe being hitched or something? Come on, Sierra Club, lead the way.

Walt Farmer
Chair, Sierra Club Alamo Group
San Antonio, Texas

Among visitors to our American backcountry, mountain bikers hate horseback riders, horseback riders decry mountain bikers, and backpackers can't stand either group. At the bottom of the heap are hunters, who get no tolerance from anybody.

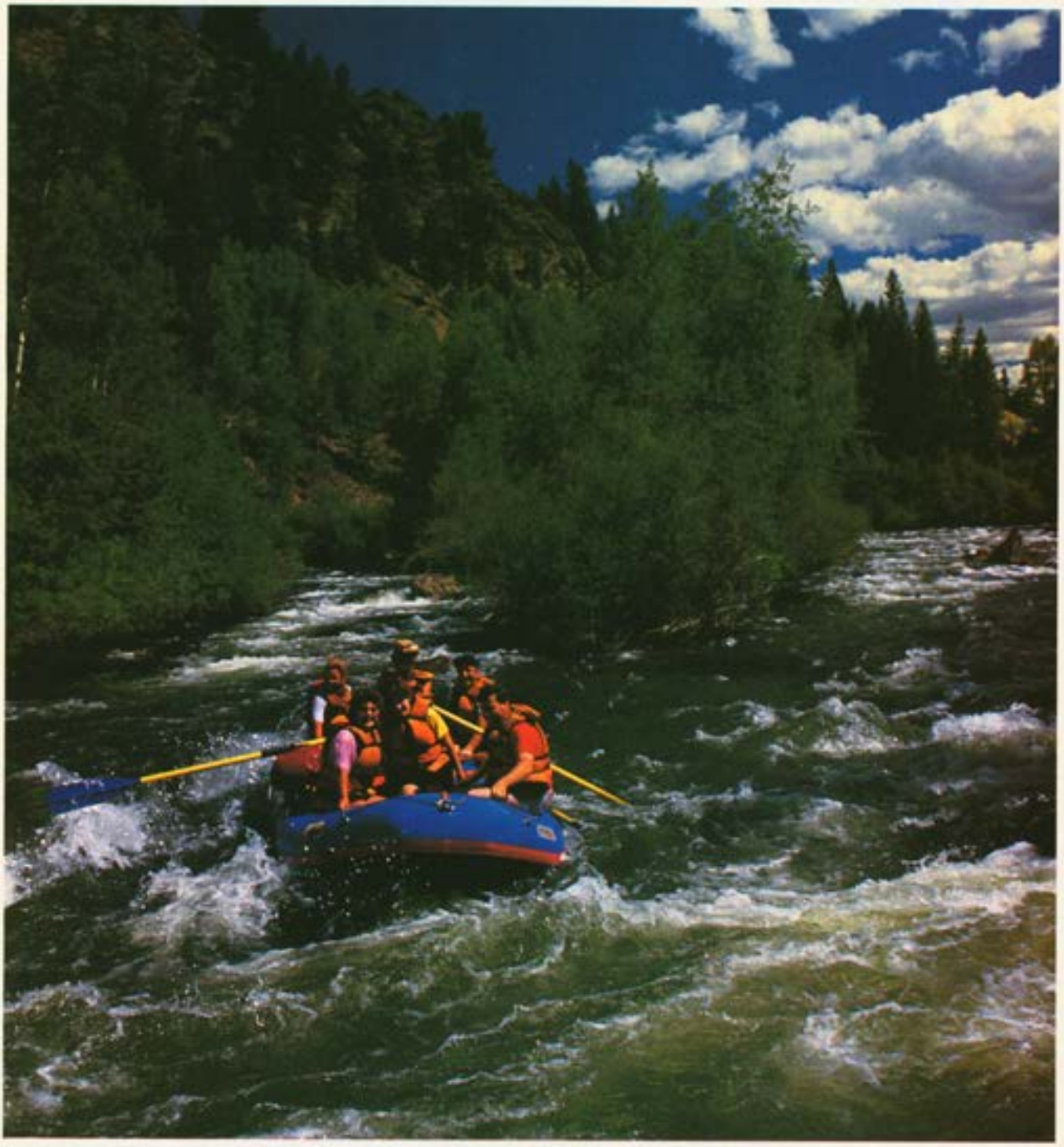
We humans are predators every time we flush a toilet, start a car, flip a light switch, or move in where humans have not lived before, whether it's a new condo development or a cabin in the wilderness. The excesses of 19th-century market-hunting are behind us. Today it is destruction and invasion of habitat that threatens species, not well-regulated hunting.

For these reasons I've quit listening, while serving up venison stroganoff or rabbit in mustard sauce, to anti-hunting arguments proposed by anyone except thoroughgoing vegetarians. They, at least, are consistent, while everyone else is simply paying to have someone else do their killing. Surely the game-bag figures quoted (gratuitously) in Knox's article would be tiny next to a similar tallying of slaughtered cattle and chickens. And why is it that groups like Friends of Animals don't expend the same ire on anglers? Is letting a trout suffocate in a wicker creel somehow more humane than killing an animal with a firearm?

For a complex of reasons, I hike, bike, paddle, backpack, photograph and cross-country ski. I also hunt, again for many reasons, but looming large among them is that hunting is one of the wildest things one can still legally do, in this country or any other.

You do not hunt. I do. But I don't believe that necessarily puts you any more on the side of animals. Sometime in the not-far-off future, maybe in this decade, anti-hunting propositions will appear on the ballot in various states. Then the hunting controversy will descend to the level of any other political debate, which is to say it will be fought out in 30-second TV spots. Prohibitionists, having superior emotional images of slain animals, which cannot be resisted by TV programmers any more than by *Sierra*'s art director, will win. Hunting will go. We will be a little more tamed, a little more divorced from the food we eat, a little less aware of and estranged from our

In Colorado, The Fountain Of Youth Isn't A Fountain.



It's amazing how an exhilarating ride on the waves of a Colorado river can wash the years away and leave you feeling like a kid again. River rafting, however, is just one way a vacation in Colorado can help you rediscover that wide-eyed kid in you. Soaring in a hot air balloon. Hiking in the beautiful Rockies. Fishing a mountain stream. Or exploring ancient Indian ruins or ghost towns seem to have the same effect.

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inevitable role as manipulators of all other species on this planet. Friends of Animals will promptly turn their attention to outlawing fishing. But will wild animals have won? I doubt that very much.

Bruce Thorstad
Fountain Valley, California

I found Margaret L. Knox's handling of the hunting controversy balanced and fair. I doubt, however, if John Muir would have approved of Dan Sisson's use of his thoughts in his "Why I Hunt" sidebar. Although Muir hunted as a youth, in maturity he rarely even carried a gun on his wanderings, surviving on bread, oatmeal, and tea. He referred to hunting for sport or profit as "murder business." It is ironic that hunting should prompt Sisson to contemplate Muir's view on the interconnectedness of all things, when that idea probably best explains Muir's aversion to hunting. According to Muir, "In nothing does man, with his grand notions of heaven and charity, show forth his innate, lowbred animalism more clearly than in his treatment of his brother beasts."

Dena J. Jolma
Paradise Valley, Arizona

In the article on hunting wildlife, I was (not unexpectedly) disappointed to read opinions and moral philosophies that emerge out of the contemporary Western world view.

Sorry, I can't buy any of the "explanations." Hunting animals with guns is not a matter of predatory skill or a pursuit necessary for existence, nor is it conducted with any cleansing ritual that signifies respect for the animal whose life gives one life. None of the "apologies" for hunting you printed lends dignity to the hunt or to the hunter. The man whose life is "simplified" by hunting, the man who feels "redeemed" by gutting and butchering his kill, and the man who sees himself possessed of a genetically based "predatory urge" are all suffering from a lack of fulfillment living in our sterile, competitive society. None recognizes that fact as his source of

Ceremonial Rattle

el Mirador

The easiest way to get there is not easy at all. It requires a three day hike and burro ride through a sunless Yucatan jungle infested with jaguars and giant iguanas and over 67,000 varieties of insects. Finally, with luck, you get your bug-ridden body into a clearing and there you are, standing on the outskirts of what was once one of North America's busiest cities, El Mirador. Well, El Mirador has changed a bit since its heyday. The jungle has reclaimed most of it, and the only people around now are archeologists. The archeologists tell you how El Mirador's the greatest example of preclassical Maya culture yet, and they go on to tell you about the Maya achievements in astronomy and architecture and how they were one of the first to employ zero notations in their mathematics, and they tell you much more about the Maya and their great city, but there is one thing the archeologists can't tell you. Something they just don't understand. Why the Maya ever left El Mirador? You look north, and south; you look east and west. Nothing. Nothing but jungle as far as the eye can see. Now, you don't say anything. But already you're working up your own theory explaining why the Maya left and it has to do with sooner or later everyone needing pay phones, a greasy cheeseburger, and a decent sports section.

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love for killing as a "sport." Hunting today is one of the multitude of ways men seek to find identity, excitement, and self-importance.

Mary E. Clark
Fairfax, Virginia

Margaret L. Knox ably explored many facets of the hunting controversy. One point she touched on, however, warrants additional attention. Hunting advocates, Knox points out, argue that wildlife has thrived since the 1930s, when the existing system of wildlife management was established. To back the contention, hunters cite increased deer numbers since the turn of the century and "the fact that there are now 25 times as many elk and 40 times as many pronghorn antelope as there were in 1910."

This argument is ecologically simplistic. An appropriate indicator of wildlife health is not the absolute numbers of a handful of game species, such as deer and elk, but the general rates of loss for native species. Responsible observers estimate that 3,000 to 6,000 species of vertebrates, invertebrates, and plants should be listed as threatened or endangered in the United States. Given these numbers, we can only consider the existing system of wildlife management a failure.

According to Sara Vickerman of Defenders of Wildlife, more than 90 percent of all state wildlife-agency dollars are devoted to a handful of game species, rather than to non-game species and habitat protection. Thus, while species are vanishing, the state and federal wildlife agencies spend most of their time and money producing deer and ducks for hunters to shoot.

Toppling the junta of hunters that now dominates wildlife policy is a step toward sane management. Once that occurs, we can shift the focus of wildlife management from game production to biological preservation.

Wayne Pacelle, National Director
The Fund for Animals
Silver Spring, Maryland

I'm neither a vegetarian, an animal-

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rights advocate, nor a militant anti-hunter, and compared to many of the current threats to the ecosystem, I suspect that hunting is rather insignificant. Yet the articles about hunting left me with a sense of unease.

My queasiness springs from the fact that I am a member of a species that, to an objective observer noting its rapid population growth with the resulting reduction in the carrying capacity of its environment, might well be judged a subject for "regulation," and it makes me nervous that there is "a segment of the population [that] likes to hunt (and is willing to pay for the privilege to do so)." Like the boy in "Iguana Hunt" by David Sobel "whose hand unconsciously [went] to cover his crotch" when an arrow pierced the iguana he hunted, my mind unconsciously goes to my own descendants when I hear of "shootable surplus populations."

Elaine Hamilton
Pasadena, California

Congratulations on Margaret Knox's hunting/non-hunting article. Intelligent and evenhanded discussion of that topic is hard to come by.

I've been in the Sierra Club since the mid-1970s, and I've served as Central Ohio's group chair, outings chair, and canoe-school director over the years. I went on my first deer hunt with a fellow Sierran, and I've brought a lot of fellow hunters and shooters to Club events and outings.

When I took my 11-year-old son to hunter-safety classes, we found that the crusty old NRA types who instructed us talked more about conservation and wildlife preservation than shooting. At the second lesson T.J. and I handed out Sierra Club membership information, and the NRA types chuckled. They were surprised to find a hunting Sierran.

But the truth is that hunters (and to a lesser degree, I think, fishermen) are the natural allies of the environmental movement. Our area of common interest is extensive. I hope the Club continues to explore that common ground and does not permit the argument over animal rights to raise a wall between the camps of hunters and non-hunters.

I urge any skeptical non-hunting Sierran to do as Margaret Knox did and try hunting, even if you just walk along with some friends. And then invite someone from the NRA on the next hike or canoe trip.

Tom H. Nagel
Columbus, Ohio

MEA CUPPA

I take issue with John Byrne Barry's contention ("Afield," November/December 1990) that most arable land in coffee-growing countries is given over to export crops, and that as a result people go hungry.

Colombia is the second-largest producer of coffee in the world, and I can assure Barry that if he visits a country market in a typical village on any weekend he will be astonished by the volume of quality fruit and vegetables.

To be sure, there is great poverty in Latin America's urban slums. Much of this can be traced back half a century, to when disciples of the New Deal and Keynesian economics started to spread the notion throughout Latin America that those developing countries needed to industrialize and create large political power centers. Of course, this resulted in mass migrations to big cities and arrested development in the countryside.

Ferde Grofe, Jr.
Marina del Rey, California

Barry dreams of quaint Central American peasants living in a blissful state of nature, uncontaminated by the modern world. In fact, a peasant family would be loath to cook in a clay rather than a metal pot, to wear animal skins instead of manufactured cloth, and to think that their children could not enjoy a better life than they. They would also hate to give up the dream of owning a bicycle, a kerosene lamp, a foot-powered sewing machine.

To procure these things a peasant family must do more than grow their own food; they must earn money by selling part of what they grow. Similarly, their country cannot consist of

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DB

subsistence farmers; their citizens must produce items for sale abroad to pay for the importation of metal pots, cotton cloth, and school textbooks—or better yet, to buy the machines to manufacture these items at home.

Central American peasants don't want to be noble savages living in human zoos for the edification of Mr. Barry and his friends. They are hungry for the goods of the modern world. To obtain them, they must grow cash crops like coffee.

Robert A. Remole
Randle, Washington

John Byrne Barry responds: *To eat, you must either grow your own food or buy it. For landless and unemployed peasants, neither option may be possible. Most agricultural land in the developing world is controlled by a small group of wealthy farmers who can make more money growing for export than for their own people. We in the developing world are unwitting accomplices in the shift away from subsistence farming simply because we can outbid the peasants for produce.*

Dependence on the income from cash crops leaves developing countries vulnerable to unpredictable world market fluctuations and decreases self-reliance. For example, when coffee prices dropped last year, out-of-work pickers in Colombia had few choices other than to migrate to the cities or to get jobs harvesting and processing coca leaves (another cash crop for primarily North American consumption).

Growing coffee and other foods for export doesn't inherently go hand in hand with hunger. "The impact of export agriculture," write Frances Moore Lappé and Joseph Collins in Food First: Beyond the Myth of Scarcity, *"depends on whether or not food for local consumption has been made the first priority and whether the export income earned contributes to a better life for* all. *Neither of these conditions has been met in any of the countries in which people are hungry today."*

To change these conditions usually means reversing the concentration of land and democratizing the political process. It also means challenging those who benefit from the status quo, which includes, in a small way, coffee-drinkers.

Please Don't Eat the Hydrangea

"Think what a poem a salad might be if 'dressed' with primrose vinegar," wrote Florence White, British author of a 1934 book on floral cookery. Unfortunately for White—and for anyone in North America following her recommendation—that poem could end up a dirge: Unlike the British variety (also called cowslip), the three species of flower *we* call primrose are all indigestible.

Borage

Marigolds

Chive Blossoms

In fact, a lot of conventional wisdom about edible flowers is equally hard to swallow, says Rosalind Creasy, author of *Cooking From the Garden* (Sierra Club Books, 1988). She found so many potentially dangerous errors in readily available sources that she decided to do her own research from the ground up, in herbariums, poison labs, and botanical libraries.

Her advice to those home cooks planning to participate in the growing trend toward adding flowers to salads and other dishes? "You have *got* to identify your plants appropriately, using Latin names whenever possible. The average urban American knows from nothing about edible plants—which was all right when people weren't so intent on eating their shrubbery."

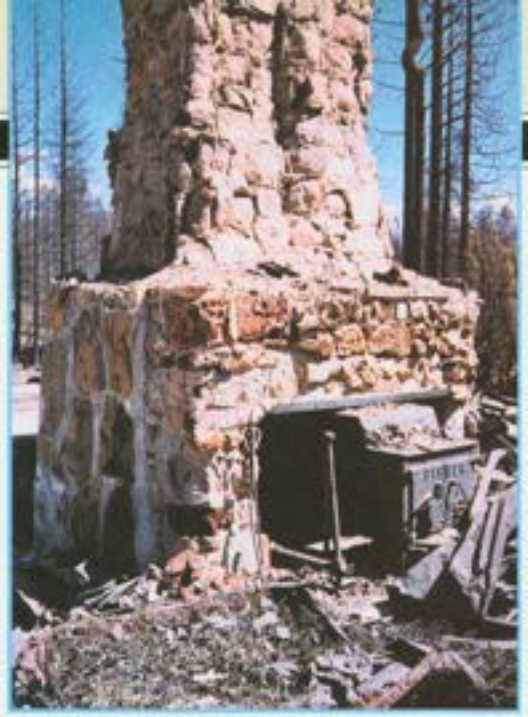
Though some specialty markets are starting to stock edible flowers, growing them yourself for culinary use is the safest way to go. (Commercial flowers, treated with a multitude of unappetizing pesticides, are strictly for decoration.) By tending your own garden you are free to avoid bug sprays and poisons; sprinkling plants with soapy water will deter pests. Clean all blossoms well, and probe carefully to remove any bugs that may remain. Store edible petals in the refrigerator—they'll keep for several days, though they taste best when picked and eaten the same day.

KATHRYN KLEINMAN PHOTOS

Nasturtium Pizza

Most edible flowering plants are consumable from top to bottom, while only the petals of others (roses, gladiolas, lilacs) are palatable. *Caveat plucker,* however: Certain flowers are meant solely for the eye, not the stomach. (Some are poisonous, while others merely taste bad.) The list of forbidden flora includes the innocent-looking and tastily named buttercup, as well as oleander, rhododendron, lily-of-the-valley, foxglove, hydrangea, iris, and lupine, among others.

The menu of edibles is still a generous one. Squash blossoms can be wrapped around small mounds of paté or soft cheese, chopped into casseroles or vegetable dishes, or fried and eaten by themselves. Hibiscus flowers or day lilies can replace the seaweed around your sushi; the latter's dried buds are used in many Chinese recipes. Nasturtiums can be minced into cottage cheese or used to sharpen the flavors of herb butters. Lavender blossoms cut the gamey flavor of venison, while pineapple mint flowers do the same for duck. You can also eat all or part of apple blossoms, marigolds, elderberry, chives, pansies, violets, chrysanthemums, lilacs, orange flowers, scented-leaved geraniums, and dianthus. —***Lisa Napell***



MARY VOCELKA

Flying Spur: The Fire This Time

In 1964 Shirley Sargent, noted historian of the Sierra Nevada, built a home just outside Yosemite National Park, overlooking the rugged Merced River Canyon. The site she chose embraced the ruins of a dwelling built by Theodore Solomons, a charter member of the Sierra Club. Solomons originated the idea of a long-distance trail running the entire length of the Sierra, and pioneered the search for a feasible route. That pathway is now the John Muir Trail.

The centerpiece of Sargent's house was Solomons' old stone fireplace, all that remained after fire destroyed the remote Flying Spur ranch in 1936. The new house became Sargent's study, in which she wrote many of her now-classic histories (among them last year's *Solomons of the Sierra*, a detailed photo-biography of the persistent explorer). It also became an archive of priceless documents, photos, and mementoes relating to the Sierra in general and Yosemite in particular.

Last August, when violent lightning storms ignited three separate blazes at the edges of the park, Flying Spur—vulnerable after four years of drought—once again burned down. Shirley Sargent stood by her home as long as she could; at virtually the last minute she was whisked away to safety in a fire truck.

Many of Sargent's irreplaceable literary and historical treasures were lost when Flying Spur fell victim to the flames for the second time. The toll includes three original paintings by Solomons; 1,000 copies of his biography (as well as the printer's film that could have been used to republish it); six original Ansel Adams photographs; first editions of various John Muir works; Eskimo carvings acquired by Solomons, along with many of his Alaskan photographs; a collection of more than 1,000 postcards and unique stereo views; plus various family portraits, Indian baskets, letters from John Muir, and more. "At least I'd sent my collection of Solomons' correspondence back to his daughter the week before the fire," Sargent sighs.

Living in temporary quarters in the Gold Rush town of Mariposa, Sargent eagerly contemplates rebuilding her homestead. "An inspector has okayed the use of Solomons' fireplace in my new house," she says, "and I'll still be able to use the iron poker he made himself"—one of the few objects to survive the most recent conflagration at Flying Spur.

—Vicky Hoover

More Pence at the Pump = Less Rubber on the Road

MAX SEABAUGH

The graphic at left compares 1988 gasoline prices in several developed nations with their per-capita consumption of motor fuel. Little of the marked difference between consumption levels in the U.S. and those countries can be attributed to significantly better fuel-efficiency; only Japan has imposed mandatory performance standards in that area (though some European manufacturers participate in voluntary programs). Rather, the variance is due to higher fuel taxes (gas in those countries costs two to four times as much as it does here), stiffer auto-registration fees, and a greater selection of transit options.

Source: *Driving Forces: Motor Vehicle Trends and Their Implications for Global Warming, Energy Strategies, and Transportation Planning* (World Resources Institute, 1990).

GEORGE GEISTER / COMSTOCK

Coastal Legislation: Acts of Spigotry

Unwise shoreline land use contributes to the loss of 20,000 acres of wetlands each year; at the same time, roughly 5 trillion gallons of sewage are disgorged into coastal waters. Advocates of coastal protection applauded the 101st Congress for passing two strong bills that address these problems—but lamented the death in the Senate of a third bill that would have controlled heavily polluted underwater sediments. The effect, one activist suggested, was like tightening one leaking spigot while leaving others wide open.

The Coastal Barrier Improvement Act put 788,000 acres of barrier islands, beaches, dunes, and wetlands along the eastern and southern seacoasts, plus 31,000 acres along the Great Lakes, off-limits to the kind of taxpayer-financed subsidies that make new shoreline development attractive to investors. (It also requires that the Pacific Coast be inventoried for similar protection.) More than 50 federal programs currently underwrite coastal development and redevelopment; the biggest of them—the National Flood Insurance Program—has some $170 billion in policies in effect, 82 percent of which insure projects on the marine and Great Lakes coasts.

While celebrating improved coastal-barrier protection, activists say that only full-scale reform of the flood-insurance program will protect the millions of coastal acres still vulnerable to federally subsidized development.

In a second action, Congress improved the Coastal Zone Management Act, strengthening the states' ability to manage shoreline development. The revised law requires states to better protect coastal waters from pollution, and to plan for sea-level rise caused by global warming. It also encourages states to conserve coastal wetlands and provide beach access, and calls for increased public involvement in state decisions affecting the coasts. Finally, a 1984 Supreme Court ruling prohibiting states from participating in the sale of offshore oil-and-gas leases was overturned.

Coastal activists had also worked for legislation that would identify and regulate contaminated underwater sediments, which are stirred up by dredging, wave action, and storms. The pollutants then make their way into the food chain via fish and shellfish.

Despite the severity of the problem, no effective national program is in place to control either the contamination of the sediments or their disposal at 130 licensed ocean dumpsites. Senator George Mitchell (D-Maine) proposed such a program in the last Congress, but it died in the face of strong opposition from the Army Corps of Engineers and many port authorities, who fretted that the cost of harbor dredging and ocean dumping would increase if tough restrictions were placed on the handling of toxic muds.

Rather than take a piecemeal approach to coastal protection, the Sierra Club believes, the new Congress should consider improving the Clean Water Act this year. "If we're going to get the full benefits from 1990's coastal-barrier and coastal-zone legislation," says Brett Hulsey of the Club's Great Lakes campaign, "the Clean Water Act has to be strengthened. It was first passed 20 years ago, but because we haven't cracked down on polluters, or cleaned up contaminated sediments and other pollution sources—including those associated with shoreline development—coastal waters still aren't clean, and much of our shellfish is unsafe to eat."

—Beth Millemann

Box-Bashing With Sting and Raffi

An estimated 250 million compact discs were sold in the United States last year—each one packaged in a disposable 12" × 6" paperboard "longbox." That's enough boxes to circle the equator twice—and more than enough to pose a major solid-waste problem.

CD retailers defend the boxes, claiming that their colorful graphics add marketing zest to each release, while their size helps prevent theft. But an environmental coalition called Ban the Box says alternative packaging can meet retailer needs without cluttering up the landscape.

Ban the Box instigator Robert Simonds, founder of the CD-only label Rykodisc, says the longbox's days are numbered. He credits its impending demise to public awareness of environmental issues, but also points to an economic incentive: "Consumers usually dump their longboxes as soon as they get home, which means they're throwing away a dollar of the purchase price every time they buy a CD."

Retailer efforts to promote recycling of longboxes haven't amounted to much. One chain, Tower Records, set up recycling bins in its stores, then found that recyclers in most localities refused to accept the coated card stock used to make the boxes.

But recycling begs the question, Ban the Boxers claim. Why not just get rid of the longboxes altogether? Large retailers insist that they'd be forced, at considerable expense, to redesign their racks to accommodate plastic "jewel-box" cases alone, since longboxes fit in bins previously used to hold LPs. Smaller stores have experimented with several display alternatives, including reusable plastic frames (similar to those used in many stores to sell audiocassettes), magnetic coding like that used in bookstores to deter theft, and a system whereby CD inlay cards are on display but the discs are kept behind the counter.

BEVERLY BOSSON

Recently, several recording artists have joined the Ban the Box effort. Canadian children's singer Raffi negotiated a contract with his label stipulating that his CDs can't be marketed in longboxes, while Peter Gabriel's new release is being sold in only a shrink-wrapped jewel box. After an initial shipment of several hundred thousand units packaged conventionally, Sting's *The Soul Cages* will be sold in a foldable paperboard container called a DigiTrak, heralded by some industry observers as a promising new packaging prototype.

Floyd Glinert, executive vice-president of Shorewood Packaging Corporation, one of four major paper companies that manufacture longboxes, maintains that the box is not as polluting as its detractors claim. The real culprit, he says, is the plastic jewel box, which is not only petroleum-based but causes significant pollution in its production. His alternative is shown at left: a slide pack made of a paperboard sleeve and a base using two-thirds less plastic than a conventional jewel box. Another option, the "CD Muffin," is made of recycled materials and 75 to 85 percent less plastic.

Retailer resistance remains the key obstacle to a longboxless future, however. "Everyone thinks it's easy just to get rid of them," complains the manager of one Tower Records store. "The press thinks the Ban the Box people are angels and we're the schmucks. But who's going to absorb the cost of refixturing the stores?"

—Dan Ouellette

As a Matter of Fact, I Do Have an Opinion on That . . .

With the environmental crisis escalating, people are clamoring to make their voices heard. In a new department to debut later this year, *Sierra* readers will get to sound off on the most pressing topics of the day; we'll feature as many points of view as we can each issue. To start the ball rolling, we ask you to ponder the following questions:

WOULD YOU EVER BREAK THE LAW IN SUPPORT OF AN ENVIRONMENTAL GOAL? UNDER WHAT CIRCUMSTANCES?

Send your responses to:
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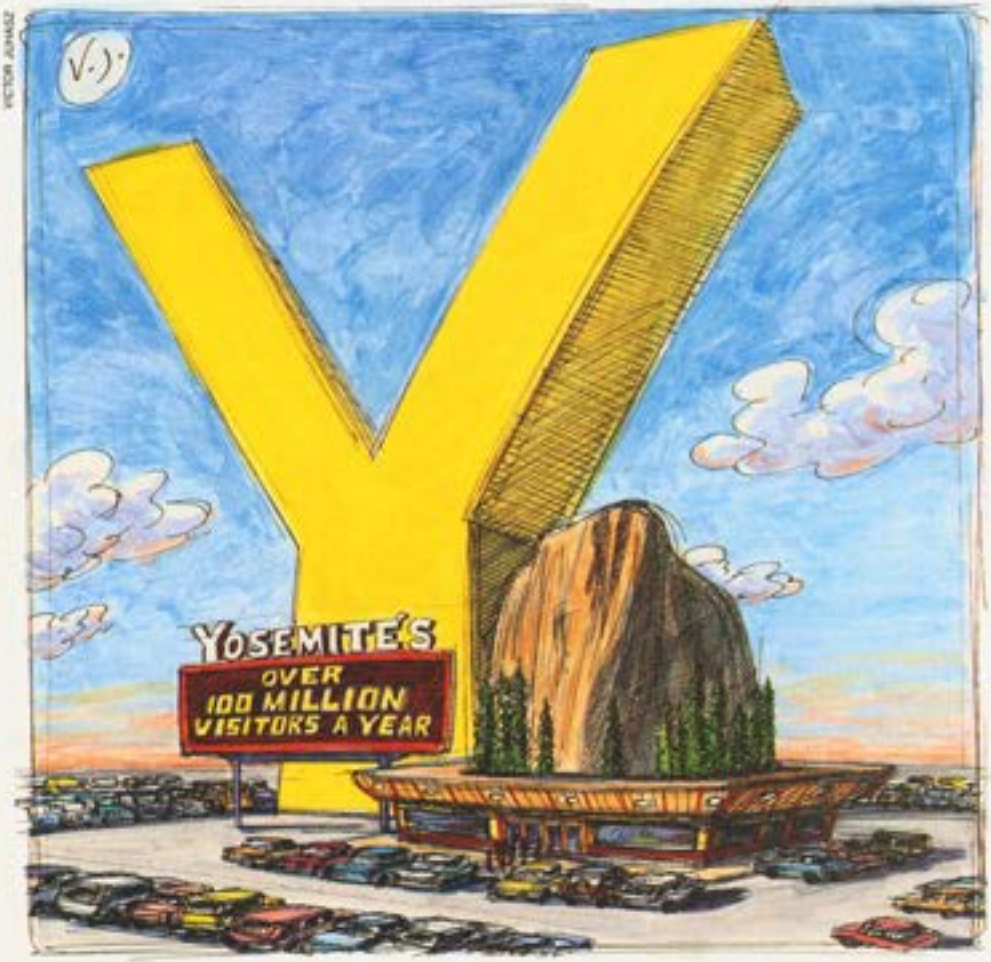
Keep your answers pithy—250 words or less. To include as many opinions as possible, we'll likely edit responses to fit (without, of course, changing their meaning). Suggestions for future questions are welcome.

NATIONAL PARKS

Yosemite: Paradise Regained?

Can an environmental nonprofit run the park without plastic and pepperoni? The contract race is on, and all bets are off.



VICTOR JONAS

Paul Rauber

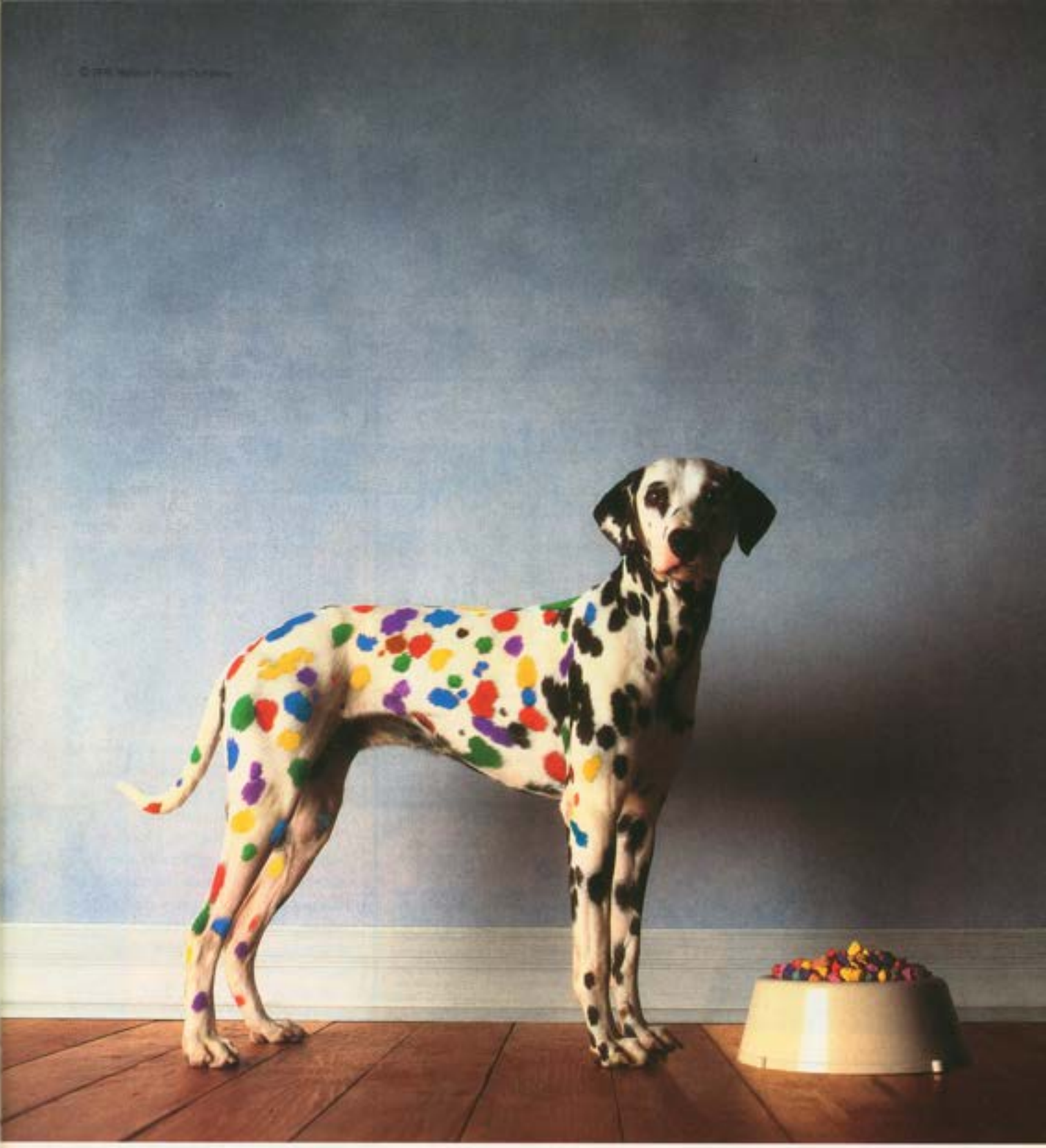
NOT ALL OF THE CHAMPAGNE corks popped early this January were to mark the New Year. Many environmentalists were toasting the announcement by MCA, Inc. that it would be selling its subsidiary, the Yosemite Park and Curry Company, to the nonprofit National Park Foundation in 1993. "I'm happy as all hell," exulted Dean Malley, chair of the Sierra Club's Yosemite Task Force. "We're going to have a chance now to get our parks back from the concession managers across the nation."

But the impending change of ownership may not necessarily result in the de-pizzafication of Yosemite, the nation's busiest—and most lucrative—national park. "An important question remains," says Wilderness Society President George Frampton. "Will this agreement lead to more resource protection and less commercialization at Yosemite?" The answer is: not by itself.

News of the sale marked the end of a long-running battle between Curry and its critics, a conflict that began back in 1973 when MCA bought the concession and immediately announced plans to build a tramway from the valley floor to the top of Half Dome. More recently, the dispute has centered on implementation of the 1980 General Management Plan (GMP), which calls for major reductions in traffic, parking, and lodging in the valley. Curry denies that it has obstructed execution of the GMP (except for those elements it considers "impractical"), but it has nevertheless added 21 new living units to the valley, as well as new commercial "profit centers" such as video rentals, photo-finishing, and take-out pizza.

Curry's shopping-mall vision of the nation's premier national park was challenged last year by the Yosemite Restoration Trust (YRT), an environmentally oriented nonprofit that seeks to decrease commercial activity in the park. The Trust (whose board includes leaders of the Sierra Club and The Wilderness Society) was formed to bid for the Yosemite concession when Curry's 30-year contract expires in 1993; if it wins that contract, it promises to use the park's substantial concession revenues to carry out fully the mandates of the GMP. "Our goal is not to continually increase profits in the valley," says YRT board member Joan Reiss, a regional director of The Wilderness Society. "We want a return to preservationist and natural values in a spectacular park."

The challenge looked like a long



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shot at best. Current national-parks concession policy strongly favors incumbents, and Curry has some heavy hitters on its side: MCA chair Lew Wasserman is a good friend of former president Ronald Reagan, and Curry president Ed Hardy is close to George Bush. But Curry's powerful position began to crumble last October when Matsushita, the Japanese electronics giant, announced its intention to buy out MCA. Although Curry forms only a minuscule part of MCA's holdings, furor over potential foreign ownership of the Yosemite concession came close to scotching the entire $6.6-billion deal.

The clamor was led by Interior Secretary Manuel Lujan and National Park Service Director James Ridenour, both of whom threatened to block the sale over the issue. Alarmed, MCA/Matsushita suggested that it might *donate* Curry to the U.S. government. Upon reflection, however, the company withdrew the offer, saying it would not be "in the best interest of the MCA shareholders." Instead, MCA offered to put Curry in escrow and sell it within a year to a "qualified American buyer." Any interim profits would be donated to the National Park Foundation, a little-known organization created by Congress to funnel private contributions to the parks. The Foundation is headed by Lujan and Ridenour, and its board of directors includes Richard Madden, chair of the forest-products giant Potlatch, and Robert Wycoff, president of ARCO.

Lujan, however, was not satisfied by the escrow offer. Having found Japan-bashing to be a crude but effective weapon, he continued pressing for an outright gift. "Happy New Year!" he proclaimed sarcastically after the MCA/Matsushita deal was consummated. "A Japanese company now owns exclusive rights to do business in Yosemite." Lujan threatened to disapprove the escrow arrangement, and to explore canceling Curry's contract entirely.

Outraged, MCA accused the Interior Secretary of "trying to intimidate a major American corporation into giving the government an asset worth well over $100 million." Within a week, however, it gave in and proposed a new deal, offering to sell its "possessory interest" in Curry to the National Park Foundation for $49.5 million, less than half the valuation it had put on the company only a week before. Curry also relinquished its preferential right to renew its contract in 1993.

A closer look at the deal, however, reveals that MCA didn't do so badly after all. Since the sale of Curry will not take place until the day before its contract expires on October 1, 1993, MCA/Matsushita will continue to reap substantial profits from the park until then. While MCA has promised to donate $2 million a year to the National Park Foundation for the next three years, it also stands to earn as much as $40 million in profits, softening the blow of the "bargain-basement" selling price considerably.

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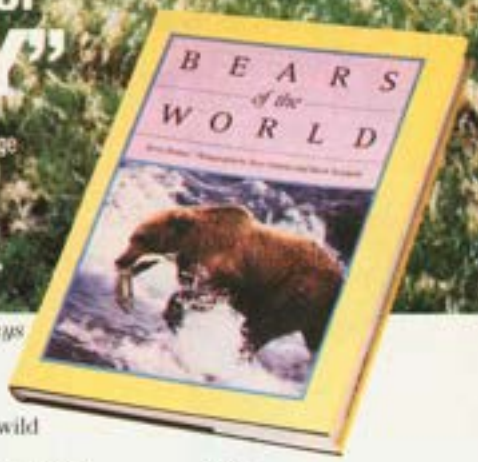

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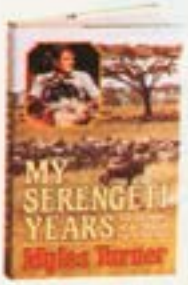

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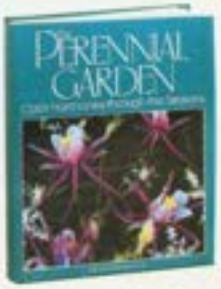

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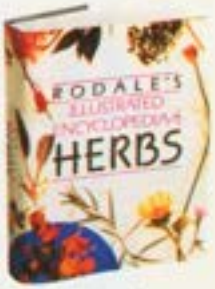

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tional Park Foundation will transfer title to Curry's former holdings in the park to the National Park Service. These will then be leased out to the winner of the new concession contract. Contending for that contract will likely be such major for-profit concessionaires as Disney and Marriott, as well as the Yosemite Restoration Trust—which will probably have a nonprofit rival in the National Park Foundation. According to Foundation President Alan Rubin, "We may consider joining with somebody, maybe Yosemite Park and Curry Company, to put in a bid to operate the concession."

Much depends now on the Park Service. Within a year, it is expected to issue guidelines for the 1993 contract. If it chooses to view Yosemite as a cash cow with a new owner, its requirements could lock the new concessionaire into a high degree of commercial activity. Ridenour has indicated that he expects the next operator to be able to pay off the $49.5 million purchase price for Curry, contribute more than $100 million toward implementing the 1980 GMP, and still turn a profit. Donald Green, executive director of the YRT, fears that this may lead to a situation where a concessionaire proposing a higher level of commercial activity could win a bidding war for the contract. In order to make the process fair for nonprofit bidders, he says, "the government has to be a lot more specific about what activities they're going to allow and what activities they're going to require. The level of commercial activity should be related not to the question of fees, but just to what's appropriate for the park."

"The whole problem is not who profits from the park, but that there are profits to begin with," says Yosemite historian Alfred Runte. "We have to take the profit-taking out of the parks altogether. We have a lot to do yet."

PAUL RAUBER *is an associate editor of* Sierra.

POLITICS

A Shift in Focus for Activists

Frustrated by a distracted, unsympathetic Congress, the Sierra Club devotes more attention to state-level action.

Mark Mardon

GEORGE BUSH's golden promise that he would be an environmental president has yet to pan out. Relations between environmentalists and the Bush administration have soured, Sierra Club Chairman J. Michael McCloskey told those gathered at the organization's annual meeting in San Francisco last November. "A bunker mentality has set in at the White House," said McCloskey. "Most of the good people have withdrawn into their holes to ride out the storm while Chief of Staff John Sununu rules belligerently—with President Bush's blessing."

More discouraging, McCloskey said, was the lack of support for environmental measures on Capitol Hill last year. Apart from a few victories—most notably renewal of the Clean Air Act—the 101st Congress deadlocked on most issues of concern to the Club. Industry lobbyists, backed by Bush, fought the Club and its allies at every turn, and eight key environmental bills went down in defeat. Shortly after Earth Day, moreover, Congress turned its attention to other matters: the continuing breakup of the Eastern bloc, impending war in the Middle East, and a declining U.S. economy.

The federal government's reluctance to address environmental problems should give activists pause, said McCloskey: "The principal vehicle we have chosen to carry our programs seems less able to do so."

The Sierra Club's chairman was only confirming what many grassroots activists have seen for themselves

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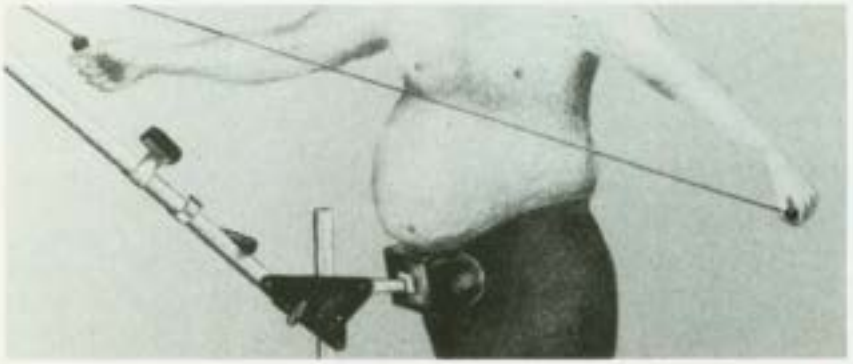

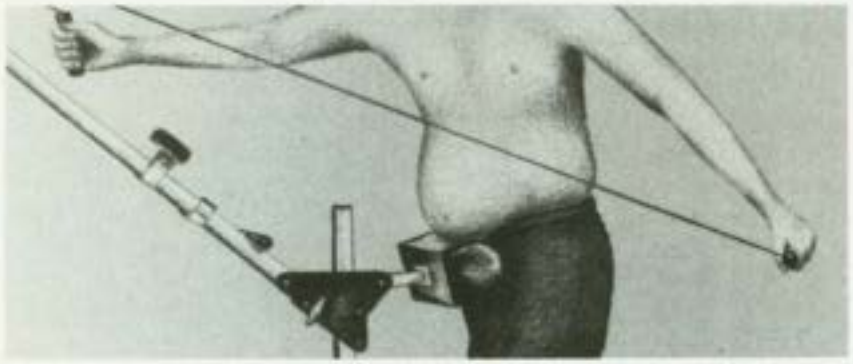

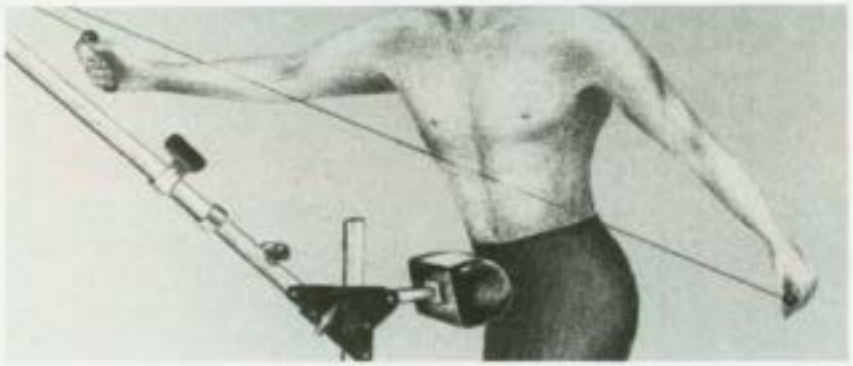

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RAY ELLIS: PHOTO RESEARCHERS, INC.

One issue Congress won't handle that the states must: the specter of solid waste.

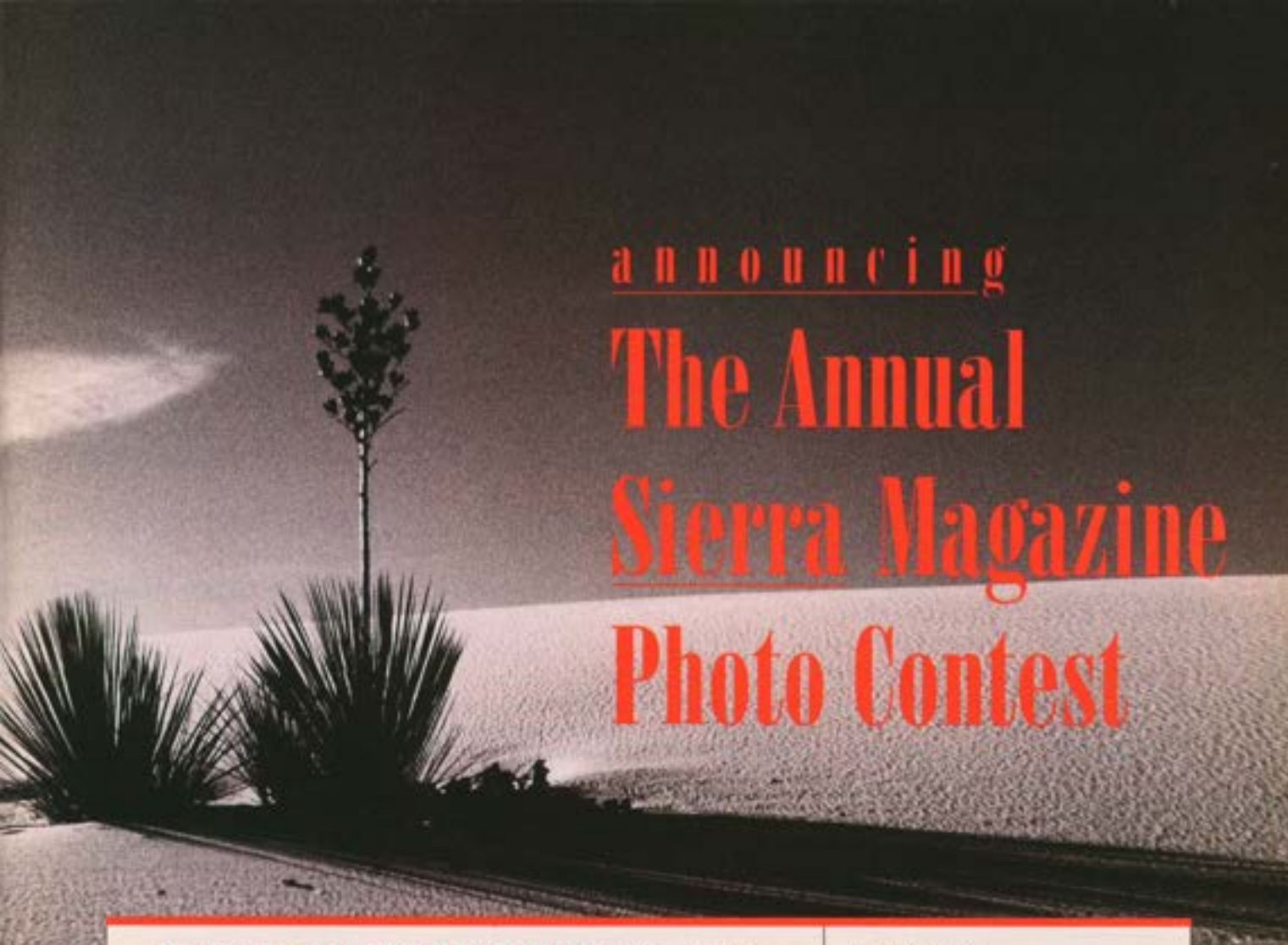
in recent years: Faced with an increasingly unwieldy and indecisive Congress, the Club needs to vary its tactics. At the November meeting, the organization's directors agreed to do just that.

In a departure from previous years, when the board adopted conservation priorities that focused almost exclusively on influencing federal legislation, the directors this year decided to address several critical issues at the state and provincial levels in the United States and Canada. As part of the new strategy, three out of seven major campaigns will be directed by lobbyists and activists below the federal level.

First, now that a new Clean Air Act has been passed in the U.S., the Club is shifting its anti-smog efforts from Congress to state and local governments, which are charged with carrying out many of the act's provisions. Second, Club activists in both nations are proposing solutions to solid-waste problems at state and provincial levels. In the U.S., federal legislation on solid waste is unlikely anytime soon because states are divided on how best to address the issue.

The third state-level campaign focuses on biodiversity, and represents "a new way of looking at our traditional business," says biologist Gene Coan, the Sierra Club's assistant conservation director. Past strategies, he says, emphasized preserving tracts of land and, to a lesser extent, endangered plants and animals. Now, however, activists will urge their lawmakers to protect entire wild ecosystems.

At the same time, chapters are designing campaigns that meet more state-specific needs. Nebraskans, for example, are seeking to control the use



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CATEGORIES

- WILDLIFE • ABSTRACTS/PATTERNS
- LANDSCAPES • THE MEETING OF LAND AND WATER

(each category will be judged separately for color and black-and-white)

PRIZES

GRAND PRIZE: Nikon N6006 35mm SLR camera with an AF Zoom-Nikor 35-70 mm f/3.5-4.5 lens and an all-terrain bicycle by Giant Bicycle

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Detail of 1990 *Sierra* Contest winner, First Place/Horizons by Susan Rummerfield.

ELIGIBILITY

The contest is open to all amateur and professional photographers. Sierra Club staff, their immediate families, and suppliers to *Sierra* (including photographers whose work we have published since 1986) are not eligible. Previously published work, photos pending publication, or photos that have won other contests are ineligible. Contest void where prohibited.

HOW TO ENTER

All entries must be accompanied by *Sierra* magazine Photo Contest Submission Forms. To receive the forms, send $5 (this serves as your entry fee as well) to *Sierra* Photo Contest, 730 Polk St., San Francisco, CA 94109. No phone calls, please. Entries submitted without the 1991 forms, or with photocopies of the forms, will not be considered. All submissions must be postmarked by midnight, June 1, 1991; we suggest mailing your request for submission materials by May 15, 1991.

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of agricultural chemicals, while West Virginians are working on a scenic-rivers program and Georgians are pressing for a state environmental-policy act.

"Problems vary enough from one locale to another that they need to be addressed differently in each," says Paula Carrell, director of the Club's State/Provincial Government Program. "The whole idea is to help the states and provinces be successful at what they want to do, rather than try to impose a national agenda on them."

"In a larger sense," says Sierra Club President Sue Merrow, who led the drive for the new lobbying program, "the state arena is being factored into all our issues." For example, the Club is urging the National Conference of State Legislatures to reject oil-industry resolutions that favor opening the Arctic National Wildlife Refuge to drilling. "With a little effort," she says, "we might be able not only to stop a bad resolution, but to have the states pass one favoring increased auto fuel efficiency."

The state-by-state approach to certain issues can be more productive than chasing federal legislation, says Sierra Club Associate Executive Director Carl Pope. "In addition," he says, "targeting a small number of states that are ripe for legislation can set the stage for later action at the national level." A good example of how state-level campaigns can work occurred recently, Pope says, when eight states outlawed certain kinds of packaging containing heavy metals that create toxic ash when incinerated. The laws effectively banned the sale of some Christmas wrappings. "It would be difficult to get such legislation pushed through at the federal level," says Pope, "because most states don't use incinerators." As a consequence of those few states imposing restrictions, however, manufacturers are likely to eliminate heavy metals from their packaging products in order to sell them in all states.

While the new focus is on the states and provinces, the Club will proceed with its work on the federal level. Conservation staff and volunteer activists will continue pressing Congress and/or the Canadian Parliament for legislation on four other major issues: protecting ancient forests; preserving the Arctic National Wildlife Refuge; increasing the fuel efficiency of new cars; and establishing additional national parks and wilderness areas.

The Club's secondary campaigns will be fought on federal turf as well. These include reforming the lending practices of the multilateral development banks, which continue to fund massive projects that threaten tropical forests and other ecosystems; reauthorizing the Resource Conservation and Recovery Act, which governs how the United States handles the disposal and cleanup of toxic wastes; and stabilizing world population growth through full funding of family-planning programs. The overpopulation problem is viewed as important enough not only to merit its own slot but to be addressed as an element of every major Club effort as well.

Finally, the Sierra Club will engage in six third-tier campaigns: to clean up toxic waste at Energy Department weapons facilities; to restore the water quality of the Great Lakes; to reform the 1872 Mining Law; to replace the Highway Trust Fund with a program friendlier to mass transit and rail systems; to preserve wetlands; and to halt a vast hydroelectric project being undertaken in the James Bay region of Quebec.

The setting of priorities for such a large and diverse organization isn't easy, Club President Merrow acknowledges: "The process reflects input from across the Club. We ask chapters what the hot issues are, what they're willing to work on." The chapters indicated they want to lobby state and provincial governments, and the Board of Directors agreed. The challenge now, says Paula Carrell, is to see to it that the Bush administration's bunker mentality doesn't spread to the presumably more amenable state governments. ■

MARK MARDON *is an associate editor of* Sierra.

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POS

First Steps Down a Safer, Softer Path

There is much in the American way of life well worth emulation. Though the familiar words called upon to explicate the notion—equality, opportunity, freedom, liberty—are bandied about too freely and too often by rascals and rhetoricians of dubious intent, the philosophies that underpin them remain fresh and deserving of defense. Viewed in its noblest aspect, freed from the bonds of cliché, the American way of life is no hoary shibboleth but a continuously inspirational ideal.

Still, there are lesser formulations of the concept that call out for skepticism and even protest—particularly those that equate a Way of Life with a mere "lifestyle" predicated on the wanton consumption of natural resources. Now that the price of a gallon of gas has been established as a virtual index of democratic viability, we find ourselves poised to pillage Alaska and our coasts, revive the nuclear industry, and wage ongoing war in Arabia—all to defend a national energy interest (read: "way of life") that is notoriously wasteful and inefficient, and that would be far better served by conservation and alternative technologies.

ITIVE ENERGY

Stirred by the turmoil of war, people are starting to scrutinize America's energy policy—the combination of laws and economic incentives that enables fossil fuels and nuclear power to maintain their prominence on our menu of energy options. Environmentalists have observed for years that America's current policy is irrational, even insane—and as global conflict threatens, we find ourselves once again seated on the dais for the ceremonial exchange of position papers. But policymakers have perilously short attention spans, and in times of "stability" our counsel goes unheeded. In this context, what prospects for meaningful change can realistically be said to exist?

Before the outbreak of war, there were few encouraging signs from our national leadership. Ever protective of the status quo, the Department of Energy had presented the president with a set of policy options so narrow that to pursue any combination of them would merely encourage our society's worst excesses. In place of bright new energy-saving initiatives, the president's people offer us domestic aid for the energy establishment: programs that boost coal, oil, and nuclear power with scarcely a nod to efficiency and renewable resources. The results of such leadership are predictable: more spills, more polluted air, more radioactive waste; more worries about global warming; and, not least, increased exposure to the perils of involvement in the Middle East.

And yet, technologies that can provide all the warmth and convenience of fossil fuels at a fraction of the cost are ready and waiting to be broadly implemented. Making use of them would not only slash resource consumption, reduce pollution, and increase our energy security; it would give us time to shift to more benign energy sources. Some renewable resources, such as wind turbines, are already churning out megawatts, while others may soon be ready to push fossil fuels and nuclear power to the sidelines. But these alternatives need the time and federal financial support that would allow us to make the most economical and environmentally sane energy choices. As things stand now, our "free" market can't lead us to those choices, for its workings in the energy arena have been distorted by huge taxpayer subsidies to the fossil-fuel and nuclear-power industries.

The politicians and business leaders who are so committed to those industries are telling us that the continued development of their favorite resources is worth the sabotage of our economy and the destruction of our natural heritage. Having sent a great many of us abroad this year to make the ultimate commitment in defense of that proposition, they also seem to feel it worth our flesh and blood. And make no mistake about it: Someday, even after the current crisis is "resolved," they will commit us once again, and then again after that—unless and until we change the terms of the debate.

If the United States, acting rationally and with foresight, were to adopt a national energy policy that provided safe and efficient choices, we could curb global warming, protect the Arctic National Wildlife Refuge from drilling, save money by the barrelful, clear the air, and take the oil weapon away from the likes of Saddam Hussein, all without lowering our standard of living by a single Volvo or VCR. In short: We would all win.

In the pages that follow we outline steps that could be taken by individuals as well as the federal government—and those that *are* being taken by researchers—to loosen the costly ties that bind us to fossil fuels and nuclear power. Taken together, these actions could light up the next century. ***—the editors***

MELISSA CHARLES

A BRIGHTER PROPOSAL

MELISSA DYMENT

The United States must do more than stumble toward safer, cleaner, and more economical energy. Here's a way for everyone—even George Bush—to make the leap, before our dependence on fossil fuels and nuclear power weakens us further.

Since the 1970s environmentalists have been incubating ideas for a national energy policy. To assemble a list of the most timely, important, and practical suggestions for the 1990s, *Sierra* tapped the National Energy Efficiency Platform drafted by the Energy Conservation Coalition (to which the Sierra Club belongs), the Natural Resources Defense Council, the American Council for an Energy-Efficient Economy, and the Alliance to Save Energy. We also spoke with energy engineers Warren Liebold and Joel Swisher (both Sierra Club activists) and Club lobbyists Dan Becker and Melanie Griffin. A long-term view of energy problems and solutions emerged, one that deserves attention in a society that thinks about its energy problems, when it does so at all, only during times of dramatically rising oil prices.

"The steps we've outlined won't help us end the current energy crisis—it's too late for that," says Becker. "But they will help us avoid the next one."

Going Farther on a Gallon

Congress should raise the fuel-economy standard for new cars to 45 miles per gallon and for new light trucks to 35 mpg—a technically and economically achievable goal that is 60 percent higher than today's standards. To push average auto efficiencies even higher, Congress should offer rebates to consumers who buy vehicles that exceed the standard and increase the existing "gas-guzzler tax" on those who choose vehicles that fail to meet it. It should also require "truth in testing": Cars currently get about 15 percent lower mileage on the road than in EPA tests.

In an effort to move toward this goal, senators Richard Bryan (D-Nev.) and Slade Gorton (R-Wash.) have introduced a bill that would require 40 mpg for new cars and 30 mpg for light trucks. In the House, a fuel-efficiency bill introduced by Barbara Boxer (D-Calif.) would set 45 mpg and 35 mpg standards—and require truth in testing.

The energy and economic savings achieved by such measures would be enormous. A decade after passage, the Bryan-Gorton bill would save us 2.8 million barrels of oil a day. That's ten times as much as the Arctic National Wildlife Refuge would yield under the most optimistic projections, ten times as much as we'd be likely to get from more offshore leasing in California, and a million barrels more than we import each day from the Persian Gulf. In addition, consumers would enjoy an annual savings of more than $50 billion in gasoline not purchased, and the atmosphere would be spared more than a million tons of Earth-warming carbon emissions daily.

A Utility Revolution

From society's standpoint, it makes perfect economic sense to meet increasing demand for electric power with energy-efficiency programs wherever possible. By adopting just the cheapest efficiency improvements, those that save a kilowatt-hour at a cost of 0.6 cents or less, we could reduce electrical use in this country by 75 percent, according to the Rocky Mountain Institute. That price tag is several times less than the cost of fuel for a coal-fired or nuclear-power plant—never mind other operating expenses. The Electric Power Research Institute, the utility industry's research arm, posits higher costs, with savings in the 30-percent range, but affirms that efficiency improvements are an extraordinarily good buy.

Some utilities have benefited from this knowledge. By promoting efficiency in 1983 and '84, Southern California Edison reduced the peak demand of its 10 million customers by more than 8 percent. The program cost the utility only about one percent as much as building and running a new power plant.

But for utilities not planning to build a new plant soon, the economics don't work out as well. If they help consumers save energy, sales go down, costs sometimes go up, and they may be on the road to financial disaster.

A few states have taken the lead in making efficiency profitable for the institutions that have traditionally met our power needs. In California, for instance, regulators have divorced utility profits from sales, so utilities can benefit from successful conservation programs. In New York and Massachusetts, regulators have given efficiency a boost by requiring utilities to consider environmental costs when they compare various energy sources.

Congress should encourage state utility commissions to make efficiency more financially attractive. It should also consider amendments to the Public Utility Regulatory Policies Act (PURPA) that would allow efficiency to compete more effectively with other power sources.

Tougher Appliance Standards

Most of the machines that fill our homes—from furnaces to freezers—were designed in an era of cheap, abundant energy. In many cases more efficient models are now available (or soon will be). Federal appliance-efficiency standards, which set minimums that all manufacturers must meet, should be upgraded to reflect advances in technology. Congress should adopt state-of-the-art requirements for lighting, windows, and plumbing fixtures as well.

The savings could be enormous. Raising refrigerator and freezer standards by one third, for instance, would reduce electricity use a decade hence by some 18 billion kilowatt-hours per year. That's equal to the yearly output of four large nuclear plants.

Better Buildings

Energy use in residential and commercial buildings, which swallows up more than a third of the nation's supply, could be cut in half by 2010, according to *Scientific American*, saving $100 billion a year in energy costs.

How could we reap these benefits? The Department of Energy could start by encouraging states to adopt federal energy-efficient building standards. Meeting these rules should also be required of federal-home-loan applicants.

Federal loan programs that promote efficiency should be more widely publicized. Fannie Mae (the Federal National Mortgage Association), Freddie Mac (the Federal Home Loan Mortgage Association), and the Veterans Administration offer larger loans and lower interest rates for energy-efficient houses, but only one U.S. homebuyer in 10,000 takes advantage of these programs.

A mandatory energy-efficiency rating system for homes would be another worthwhile federal move. If energy ratings were available—as appliance ratings are—homebuyers could comparison-shop, lenders would have a firm basis for offering incentives for efficiency, and builders might begin to compete for energy-saving superlatives.

To improve the performance of existing homes, the federal government should encourage utilities and municipalities to offer home-weatherization programs. It should also spread the word about creative ordinances. Some cities in California, for instance, have enacted laws requiring homeowners to update the energy efficiency of their dwellings whenever they sell.

Redefining Costs

If an energy-guzzling air conditioner costs less than an efficient one, but will run up a bigger bill over time, federal agencies are supposed to purchase the more efficient model because it has a lower "life-cycle cost." In practice, however, the feds rarely do purchase efficiency, because it often entails a bigger initial outlay. Adherence to the life-cycle-cost rule would cut energy use in federal buildings by 20 percent, energy costs by $1 billion a year, and annual carbon-dioxide emissions by 15 megatons.

"Cost" also needs to be redefined when comparing energy sources. If coal's effects on the biosphere were included as part of its overall cost, it would be so expensive that utilities would use it only as a last resort. Some solar-power options, judged by the same standard, would be relatively cheap. And most efficiency improvements would consistently come out at the top of the least-cost list.

Some states have already expanded their notion of costs. In New York, for instance, utility planners add "an environmental cost" of 1.4 cents per kilowatt-hour to the price of fossil-fuel options. It's no coincidence that efficiency programs are expected to reduce peak demand for electricity in the state by 900 megawatts by 1992.

Taxpayers' Best Energy Buys

	Energy Supplied (quadrillion Btu)	Federal Subsidy (billion dollars)	Million Btu Supplied Per Dollar of Subsidy
Efficiency	11.3	0.9	12.6
Coal	19.7	3.4	5.8
Natural Gas	17.8	4.6	3.9
Oil	21.0	8.6	2.4
Non-hydro Renewable*	2.9	1.7	1.7
Fossil-Fuel Electric	6.0	5.6	1.1
Hydroelectric	1.1	2.3	0.5
Nuclear Electric	1.1	15.6	0.1
Synthetic Fuels	0.0	0.6	0.0
Fusion	0.0	0.6	0.0

*Solar, wind, etc.

The federal government spends billions of dollars each year on energy loans, tax breaks, and programs. In 1984, the last time these subsidies were totaled, efficiency improvements provided by far the greatest Btu return per federal dollar spent, while nuclear electricity provided the least.

Today efficiency and renewable resources get even less of the subsidy pie. "If we're not going to eliminate subsidies completely for all sources," suggests Rocky Mountain Institute's Richard Heede (who compiled the 1984 figures shown above), "at least we ought to use them to support the best buys."

Federal Research and Development

Many of the energy-efficient technologies touted in this issue originated in federal R&D programs begun in the 1970s. Yet funding for all forms of energy research has dropped since 1980—for energy efficiency by a factor of three; for renewable energy sources by a factor of ten.

We should consider energy R&D a kind of insurance, says University of California energy and resources professor John P. Holdren: "The funding required to develop these alternatives to the point that we can choose intelligently among them is modest compared with the potential costs of having too few choices."

Funding for efficiency and renewables should be increased to pre-Reagan levels. We won't see results immediately, but ten years from now—before we could build even one new nuclear plant or produce a single barrel of oil from the Arctic Refuge—the effort will pay off handsomely.

Higher Fuel Taxes

In the United States we pay around $1.50 for a gallon of gas. In France the price is more than $3; in Italy, about $4. Most of the variance is due to higher fuel taxes.

Budget legislation passed last year hiked the U.S. gas tax by five cents. This tax should be increased over the next five years by a total of 50 cents, with most of the additional revenues earmarked for mass transit and energy-efficiency programs. To offset the regressive impact of this measure, the government should compensate low-income people through an income-tax credit.

Economists say that such a tax would discourage driving somewhat, reducing gasoline consumption by at least 8 percent. Emissions of carbon dioxide and other damaging substances would shrink proportionally. Meanwhile, back on the highway, we'd be cruising along relatively cheaply.

Another way to raise money for mass transit, efficiency programs, and renewable-energy research would be a carbon tax. Based on the carbon content of fuels (a good indicator of their pollution potential), this levy would boost gasoline prices modestly, but coal prices substantially.

Foreign Policy

In granting loans or aid to energy projects around the world, the U.S. government should support the alternatives that are least costly, as measured by both environmental and economic impacts. When participating in projects through the World Bank, the United States should oppose schemes that don't meet this "least-cost" test.

Wherever possible, our international aid should encourage energy efficiency. Giving developing countries the money to buy home insulation, compact fluorescent lights, and energy-efficient refrigerators, for instance, could improve living conditions without harming the local—or global—environment.

BRAVE NEW BTU'S

MELISSA GRIMES

Can Science Cure Our Energy Ills?

To some environmentalists, hoping for a grand technological fix for the world's energy dilemma is like waiting for Godot. We can't wait around for whiz-bang solutions, they say: If we simply use less energy, we'll create fewer energy-related problems. It's an ironclad blend of skepticism and pragmatism, hardened by years of undelivered promises.

But many technological solutions with real promise get a bad rap. Yes, technology has brought us nuclear power plants (and nuclear waste with nowhere to go) as well as the gasoline engine (and greenhouse gases with nowhere to go). But most of us like being able to heat a kettle of water without first having to build a fire from cow dung. A civilization that rents out seats on space flights to television reporters need not make its citizens shiver to save energy.

Fortunately, energy efficiency and well-designed technology go hand in hand. While we can reduce consumption (by throwing away our car keys, for example), less austere solutions include putting advances in electronics and materials to work in designing more efficient vehicles and cities. Perhaps someday we can even make good on the "space-age" promises of fully automated offices and homes, or guided roadways that propel vehicles using benign energy sources. What follows is a look at a few of the technologies —some proven and merely waiting for political and economic support to succeed, and some existing only on paper —that might help ease us away from our dependence on fossil fuels.

Wind

Energy from the best wind technology is already nearly as cheap as that from conventional energy sources—an all-important benchmark of about six to eight cents per kilowatt-hour. (A California residence that relies on electricity for all its energy needs can be expected to use about 800 kilowatt-hours per month.) Already, 1.5 million kilowatts of electricity are generated by California wind farms, and increasingly sophisticated blade materials and designs are being developed to produce even more power with greater efficiency. The disadvantages: So far, wind farms earn their keep only in areas with consistently strong winds (averaging more than 12 miles per hour); they require considerable amounts of land (although the land can be used for other purposes at the same time); and they have been known to kill unsuspecting birds.

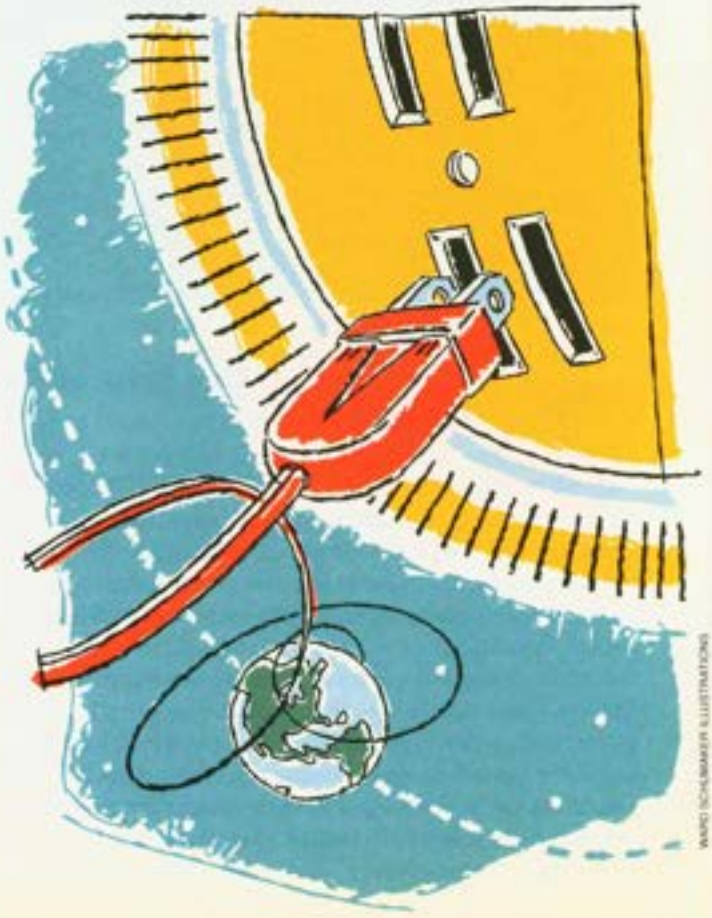
Solar Thermal

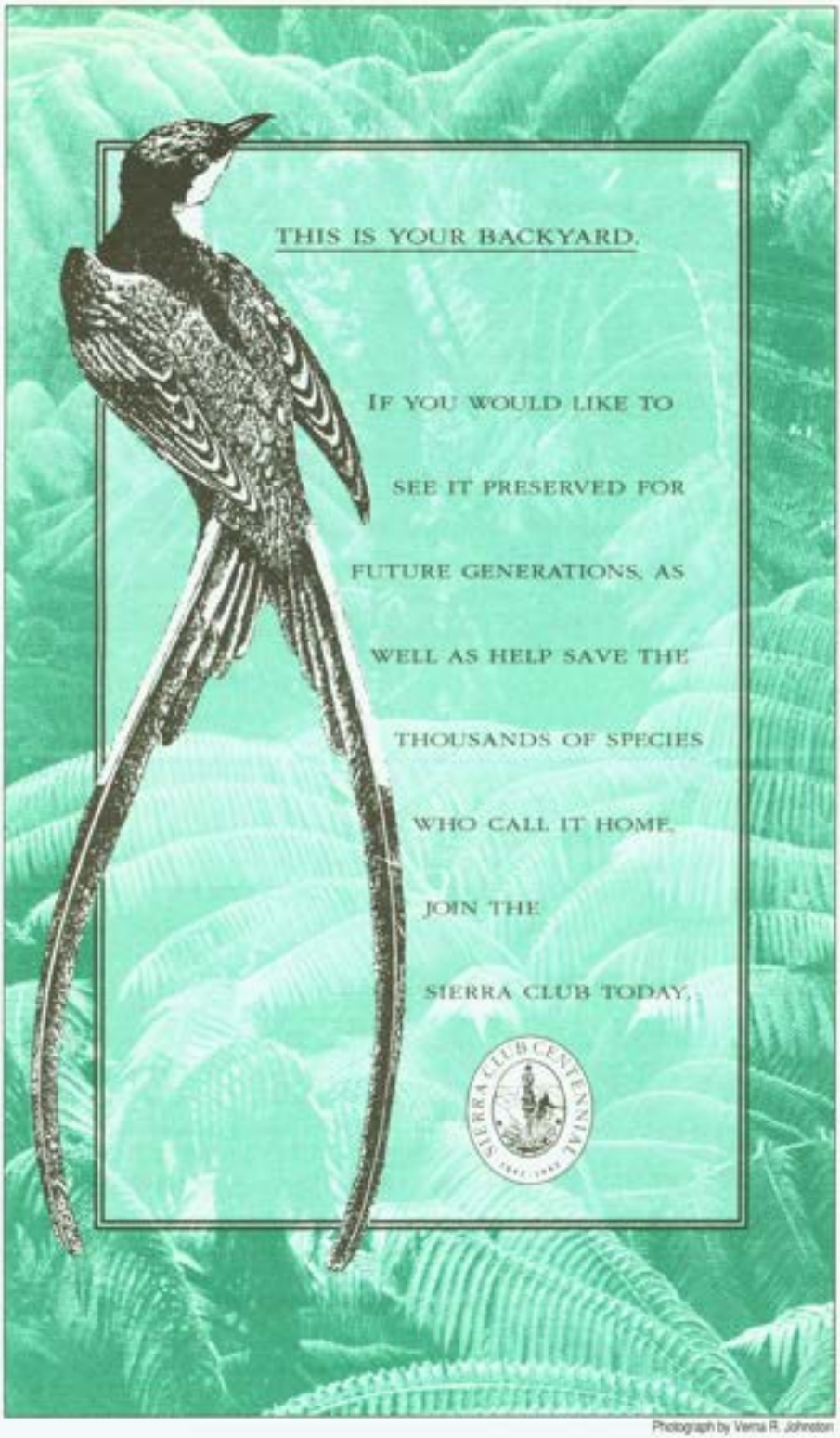
The fastest-growing large-scale method of harnessing solar energy, solar-thermal technology produces about 350 megawatts of power at several plants in California's Mojave Desert. The cost of electricity from these plants is competitive with Southern California's "peak power" rates (what's charged when electrical demand is greatest—for example, in the late afternoon). It's estimated that if the environmental costs of conventional energy sources were considered, solar thermal would already be on an equal footing with lower "base power" rates.

Using a variety of techniques, solar-thermal systems collect the sun's energy and use it to heat a fluid to as much as 3,600 degrees Fahrenheit. The heat can be used to generate steam, which can then be used by boiler plants to produce heat or electricity. Like wind and most other solar technologies, solar thermal's effect on the environment is relatively slight: Once in operation these facilities release essentially no pollution and generate no waste. Solar-thermal systems take up large amounts of land, however, and they're built primarily from high-tech components, the manufacture of which (at least for now) is often polluting.

Photovoltaics

While solar-thermal technology converts the sun's energy into electricity indirectly, photovoltaic technology does it directly: Light is converted into electricity when it hits a special type of solid-state cell composed of thin layers of semiconductor material. Solar cells have become increasingly economical; within two decades, perhaps, declining production costs and increasing cell efficiency will make them cost-effective for utility-scale uses. These nearly maintenance-free systems already earn their keep in virtually any location not hooked up to an electric-utility system, and in consumer goods such as calculators, watches, and walkway lights. As with solar-thermal technology, photovoltaic systems are benign once in operation, but their production relies on a potentially messy combination of high-tech materials.





Photograph by Verna R. Johnston

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Geothermal Energy

These systems tap heat generated by natural processes underground. They are already in use in New Zealand, Iceland, Italy, the Philippines, and California (where geothermal steam generates about 2 million kilowatts), and under development in Central America, the Soviet Union, and elsewhere. Unfortunately, geothermal resources are commonly found in volcanic areas—often some of the most pristine sites on Earth. With more advanced technology, geothermal energy could be extracted from underground masses of hot rock, a nearly limitless resource.

Biomass Energy

Biomass is any plant matter that stores the sun's energy through photosynthesis. It can be converted into practical energy simply (by burning wood for heat, for example) or by using complex systems that gasify plant matter and run it through turbine generators to make electricity. In its most primitive forms, biomass is the main source of energy for nearly half the world. It's available anywhere that plants can grow, and (if produced sustainably) adds no carbon dioxide to the environment. Though plentiful, biomass has its limitations: It's a relatively inefficient storehouse of energy, and in many parts of the world it would consume acreage probably best used to grow food crops or left in a wild state.

Biomass is the only renewable energy source capable of producing premium liquid and gas fuels (primarily ethanol) that are already workable alternatives to oil, coal, and natural gas. (Methanol, a much-vaunted alternative fuel, is only a partial solution to our energy problems, since it is very toxic and most often made from natural gas or coal.) In the United States, corn-ethanol production survives only with significant subsidies. Production of ethanol from cane sugar in the tropics is much more attractive, however, because the conversion process is more efficient, land and labor are cheaper, and biomass growth rates are higher. (About half of Brazil's cars run on ethanol made from sugar cane.) The operation can be made even more efficient if the waste can be burned to make electricity at the same time. It's more difficult and expensive to extract ethanol from woody crops, but the technologies do exist. A process called enzyme hydrolysis could make biomass-based alcohol fuels more competitive in the United States.

Efficient Design

This is a huge area with great conservation potential anywhere energy is used, such as in motors (for everything from home appliances to factory-floor machinery), automobile engines, lighting, space conditioning, and refrigeration.

About half of all energy used in the United States is wasted, and improved efficiency is the cheapest source of "new" energy—although it's not necessarily the easiest to implement. Advances in electronics, manufacturing processes, and complex materials continually conspire to make designed-in energy efficiency less expensive.

On a larger scale, the development of super-efficient electric transmission techniques and storage methods can further increase energy savings. (Unlike liquid and gas fuels, electricity is difficult to store.) "Superconductive" materials being developed reduce electrical resistance nearly to zero; they could maximize the efficiency of electrical wires and provide an effective medium for storing power.

Solar Hydrogen

Sometime after the year 2000, perhaps, hydrogen fuel produced with solar energy could become the antidote to our fossil-fuel addiction. Hydrogen combustion emits no carbon monoxide, volatile organic compounds, particulates, sulfur dioxide, or carbon dioxide. The only byproducts are water vapor and controllable levels of nitrogen oxide. One way to produce hydrogen fuel is by electrolysis—splitting water molecules into hydrogen and oxygen. The key question is where the power for this process will come from. Depending on whom you talk to, the answer could be electricity from nuclear as well as solar sources. Once photovoltaic systems become cost-effective, they could provide the energy for electrolysis.

Nuclear Fusion

You have to be a true optimist to count on fusion, especially after 1989's "fusion-in-a-jar" fiasco. But it's a tempting idea: Whereas fission creates energy by splitting atoms, fusion joins them together. Enormous amounts of energy are released when the nuclei of two hydrogen isotopes, deuterium and tritium, are fused. Deuterium is a component of water; tritium can be made from naturally occurring lithium and, while radioactive, has only a 12-year half-life. In theory, fusion's only waste product is the inert gas helium. To no one's surprise, however, the technology has serious problems: Using current methods, radioactive waste will be produced, and neutrons that escape during the process make the reactor radioactive. The biggest stumbling block is getting the positively charged nuclei of the hydrogen isotopes to attract each other, which normally occurs only at extremely high temperatures. Fusion occurs naturally in the sun, but it has proved elusive to reproduce under controlled conditions. The hydrogen bomb is the most dramatic example of uncontrolled fusion.

Solar Energy in Space

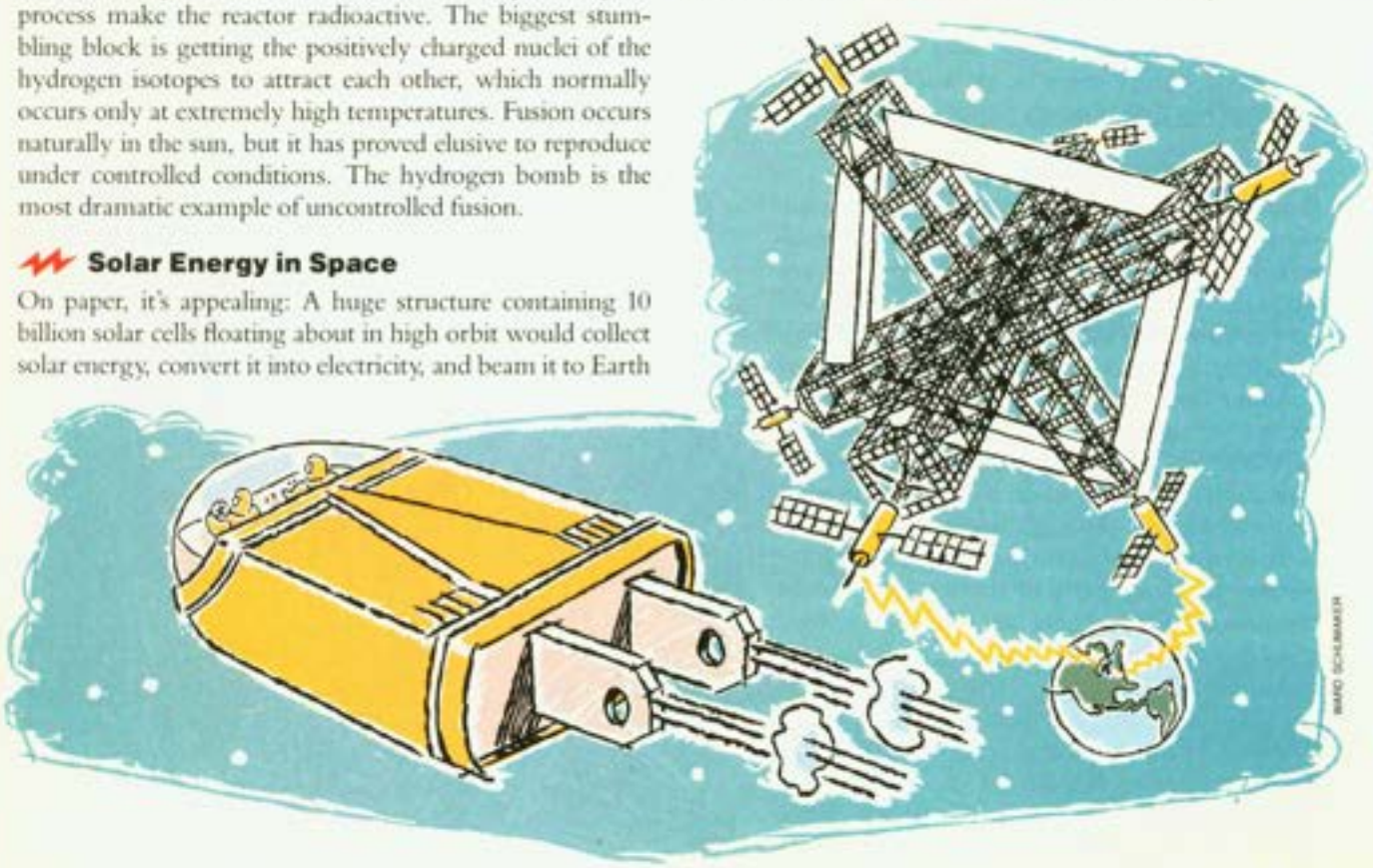
On paper, it's appealing: A huge structure containing 10 billion solar cells floating about in high orbit would collect solar energy, convert it into electricity, and beam it to Earth as microwaves. The atmosphere wouldn't block the sun's rays, and collection could take place 24 hours a day. The best estimate of when the right mix of cheap photovoltaics will coincide with regular cargo shuttles into space puts application of this idea deep into the 21st century, however.

Tapping the Tides

There are endless schemes for exploiting the enormous (but erratic) power of tides, waves, and currents. Tidal power can be harnessed with much of the technology already in use for hydroelectric projects, but it's still very expensive, and effects on local environments can be just as great. In Norway, the world's first commercial wave-energy plant generates 850 kilowatts of electricity. There wave pressure acts like a piston, pushing air in a shaft through an electricity-generating turbine. Another idea that's been successful on a small scale is ocean-thermal-energy conversion, a technology that taps the temperature differences between deep seawater and the sun-warmed surface in tropical oceans to generate electricity.

Cogeneration

Only a third of the energy from a boiler in a conventional power plant is converted to electricity. The wasted heat can be tapped by "cogenerators" to produce both heat and electricity. Because cogenerators are usually fired by oil or natural gas, the process isn't really a "fix" for fossil-fuel dependency, but it uses conventional resources more efficiently.



AND DON'T FORGET TO TURN OUT THE LIGHTS...

Common-sense strategies and cunning new technologies can be combined for a more comfortable, less costly home.

High-Tech Lighting

Introduced in the early 1980s, the compact fluorescent lamp is one of the most promising new energy-efficiency tools around. These lamps don't flicker or make faces look ghoulish as the old tube fluorescents did; they emit light as pleasant as an incandescent bulb's. Yet the lamps are so efficient that an 18-watt compact fluorescent provides as much light as a standard 75-watt incandescent bulb.

Each of these new lamps costs at least ten times as much as an incandescent, but it will last up to ten times longer and use only one-fourth as much electricity. If you can afford the up-front cost, you'll save both money and energy over the life of the lamp.

Compact fluorescents are best suited to areas where you use a light frequently; in such locations they'll save the most electricity and pay for themselves quickest. An 18-watt compact fluorescent lamp used four hours a day, for example, will pay for itself in less than three years. Used 12 hours a day, the lamp will pay off in one year. But if you use the lamp sporadically—two hours a day or less—the payback period will be at least five years.

The lamps come in many designs and sizes, so it may take some shopping around to find the ones that best meet your needs. If local merchants don't stock this important energy-conserving tool, ask them to consider it. In the meantime, you can shop by mail through The Energy Federation, 354B Waverly St., Framingham, MA 01701; Rising Sun Enterprises, P.O. Box 1728, Basalt, CO 81621; or Real Goods, 966 S. Mazzoni St., Ukiah, CA 95482.

Wondrous Windows

The amount of energy that flows out of U.S. windows annually is equal to that delivered each year by the Alaska pipeline. That figure may decline little by little, however, thanks to recent rapid advances in window design.

The first step forward, early in the last decade, was

commercial production of "low-emissivity" glass coated with a substance that blocks the flow of heat but not light. Now almost all U.S. glass manufacturers offer this product.

Some windows now on the market have a layer of nontoxic argon gas—an even better insulator than air—sandwiched between two panes of coated glass. This configuration is four times as effective at keeping the heat (or cold) inside your house as a single pane; it is twice as good as most double-pane windows.

Even greater efficiencies are possible. A vacuum between two coated panes can make a window 15 times as efficient as a single pane. Though they are crystal-clear, these vacuum-packed windows perform as well as most insulated walls at night. During the day, by providing heat from sunlight, they act as a solar furnace.

Unfortunately, you can't buy vacuum windows yet; researchers are still working to find a cost-effective manufacturing process. But you can consider a variety of energy-efficient models that take advantage of improvements in energy-saving window technology over the past decade.

WARD SCHUMAKER ILLUSTRATIONS

Frugal Refrigerators

Six million refrigerators are sold in the United States every year. If only the most efficient in each size category were purchased, the energy saved annually could replace one large power plant—at one-sixth the cost of building it.

An excellent guide to frugal refrigerators—and other appliances—is *A Consumer Guide to Home Energy Savings* (see listing, page 47). At the top of the efficiency list are the refrigerators manufactured by Sun Frost (P.O. Box 1101, Arcata, CA 95521). The firm's 16-cubic-foot model, for instance, uses only about a third to a fourth as much energy as its competitors. (It is also more expensive—around $2,400.)

Those who won't be buying refrigerators this year can tend to the ones they already have. Dust the coils at least once a year. Test the door seals; if they can't firmly hold a dollar bill when the door is shut, they should be replaced.

Savvy Controls

If you're the type who forgets to turn down the heat at night, take heart—you can buy an automatic thermostat ($40–$90) that will do it for you, without fail. The device can also be set to take the chill off your home in the morning before you get out of bed.

Do you have trouble remembering to turn out the lights? Consider purchasing switches that turn lights on when a door is opened and off when it is closed. Or try "people sensors," which automatically turn off lights when a room is unoccupied for five to seven minutes. Outdoors, try a motion-sensing light. Used to illuminate a front porch when someone approaches, for instance, such a light makes it easier to find your keys—and it can discourage intruders.

If you have an electric water heater, a simple $30 timing device will shut it off while you sleep and turn it back on at a given time in the morning. The payback period is less than a year. For more complicated on-off settings, you may need to invest about $100. (Similar devices for gas water heaters are much more complicated, and therefore not as cost-effective.)

Shower Power

By decreasing water use, low-flow showerheads and faucet aerators reduce hot-water costs by as much as 50 percent. A top-quality low-flow showerhead costs between $10 and $20 and will pay for itself in as little as four months. Aerators are just a few dollars each. If they aren't available at local stores, try mail-order outlets. A few are listed in this article under "High-Tech Lighting" on page 45.

While considering hardware, don't neglect the most basic step in hot-water conservation: Insulate your storage tank. Kits that do the job well are widely available for $10 to $20 and pay for themselves in less than a year.

Tried and True Ways to Save

- Keep your car well tuned and maintained. Leave it home or combine trips whenever you can. When buying a car, shop around for the most efficient model. There are wide variations in efficiency within all automobile size and safety classes.
- Fill in the cracks. By putting insulation in your walls and roof and by caulking and weatherstripping doorways and windows, you cut energy consumption and make your house more comfortable. Ask your utility company if it has loan or rebate programs for weatherization.
- Recycle. Making new paper, glass, and metal products from recycled materials saves 40 to 60 percent of the energy required to produce them from virgin materials; it also reduces pollution by an equivalent amount. A move that is equally important in these days when recycling bins are glutted: Expand the market for recycled products by buying them.
- Tap the power of the sun. Purchase useful solar-powered products such as flashlights and outdoor lighting. Consider

installing a solar water heater on the roof of your home.

■ If you buy an automatic clothes dryer, choose one heated by natural gas. It will produce less carbon dioxide and other pollutants than one fired by electricity that is generated by burning coal or oil.

■ If you have a forced-air furnace, check its filter at least once a month during the heating season to see if it needs to be cleaned or replaced. Dust blocks the flow of heat and forces the blower to work harder.

Oil-fired systems should be tuned up and cleaned by a professional every year. Gas-fired systems need the same treatment every two years. Adhering to this schedule will not only cut your energy costs, it will reduce the air pollution from your system.

HOW TO PLUG IN

For those who want their home—or their nation—to be more energy-efficient, a partial guide to publications, organizations, and action.

The Sierra Club has begun a major campaign to help redirect U.S. energy policy. Your chapter newsletter will keep you posted on what's happening in your area and how you can take part.

■ Write to your senators and representative and ask them to support legislation that would require more efficient new vehicles. Ask for at least 45 mpg for cars and 35 mpg for vans and light trucks, more accurate mileage testing, an increased gas-guzzler tax, and rebates for consumers who buy vehicles that exceed the standards.

■ Write again, and ask your members of Congress to protect the Arctic National Wildlife Refuge and our fragile coasts from the vain pursuit of one last fix of oil.

■ To obtain a free list of the Sierra Club's energy publications, write to Public Affairs, Sierra Club, 730 Polk St., San Francisco, CA 94109. Ask for a copy of the ***Sierra Club Sourcebook.*** To place your name on the Sierra Club's list of energy activists who receive action alerts on timely energy issues, write to the Energy Campaign Desk at the same address.

■ ***A Consumer Guide to Home Energy Savings: Listings of the Most Efficient Products You Can Buy . . . and Much More*** is the best and most up-to-date work of its kind. Consummately clear and practical, the 252-page paperback book is published by the American Council for an Energy-Efficient Economy. It's available for $6.95 from major bookstores.

■ The Rocky Mountain Institute sells ***Resource Efficient Housing,*** a useful, 160-page annotated bibliography for the energy-conscious. Copies are available for $15 from RMI, 1739 Snowmass Creek Road, Snowmass, CO 81654; (303) 927-3851.

■ The federally funded **Conservation and Renewable Energy Inquiry and Referral Service** can be reached toll-free by calling 1-800-523-2929, or by writing CAREIRS, Box 8900, Silver Spring, MD 20907. The group offers free brochures on such topics as energy-saving windows and lighting, automatic thermostats, and buying an energy-efficient house. Another federally funded information source with expertise in the renewable-energy and conservation field, the **National Appropriate Technology Assistance Service,** can be reached by calling 1-800-428-2525.

■ ***Scientific American***'s September 1990 issue, "Energy for Planet Earth," offers a scholarly and conservation-minded analysis of the world's energy challenges. It's a weighty, 109-page primer for those new to the topic and has pleasant surprises for the initiated. Copies are $3.95 plus $1 for shipping and handling from *Scientific American,* 415 Madison Ave., New York, NY 10017.

■ Two useful documents are ***Energywise Options for State and Local Governments: A Policy Compendium*** ($15; the Center for Policy Alternatives, 2000 Florida Ave., N.W., Suite 400, Washington, DC 20009) and ***Assessment of Solar Energy Technologies*** ($20; American Solar Energy Society, 2400 Central Ave., B-1, Boulder, CO 80301).

■ ***Powerline,*** an excellent bimonthly newsletter for energy activists, is available for $20 a year for individuals from the Environmental Action Foundation, 1525 New Hampshire Ave., N.W., Washington, DC 20036. ***Building a Brighter Future: State Experiences in Least Cost Electrical Planning,*** a book aimed at policy shapers published by the Energy Conservation Coalition, is $10 for individuals—also from Environmental Action Foundation. ■

NET LOSSES

Boats from Japan, South Korea, and Taiwan harvest the North Pacific's rich tuna and squid fishery—drowning thousands of seabirds and marine mammals in the process.

Most driftnet fishing takes place in a cold, fogbound quadrant of the North Pacific traversed only by an occasional cargo vessel en route from Tokyo to Los Angeles. In the summer of 1990, this forbidding territory was invaded by the Greenpeace schooner *Rainbow Warrior,* on a two-month voyage through the driftnet fishing grounds to gather data and document the destruction. **An eyewitness report by Todd Campbell.**

The *Kokoshin Maru* begins hauling in its nets shortly after midnight. In the darkness, engines roaring, its working deck ablaze in the glare of huge banks of spotlights, it is an ominous, incandescent factory rolling on the swells of the northwestern Pacific Ocean. As day dawns, the Japanese fishing vessel shrinks to a more human scale: about 140 feet long, dark-orange, riding unsteadily over the waves. A filthy black substance oozes down the hull below the foredeck.

By 6 a.m. the *Kokoshin Maru* has retrieved barely half of its 35-mile-long net. Eight deckhands clad in black foul-weather gear work to haul in the seemingly endless skein, which spins up out of the water like a pale-green spider web. Just off the vessel's port side, a ten-foot inflatable boat bobs on the wind-whipped swells. In it are a Greenpeace biologist, a photographer, and a slightly seasick journalist. Although it is just after dawn, we have been dogging the *Kokoshin Maru* for hours, observing the catch. The Greenpeace ship *Rainbow Warrior* looms in and out of the fog on the horizon.

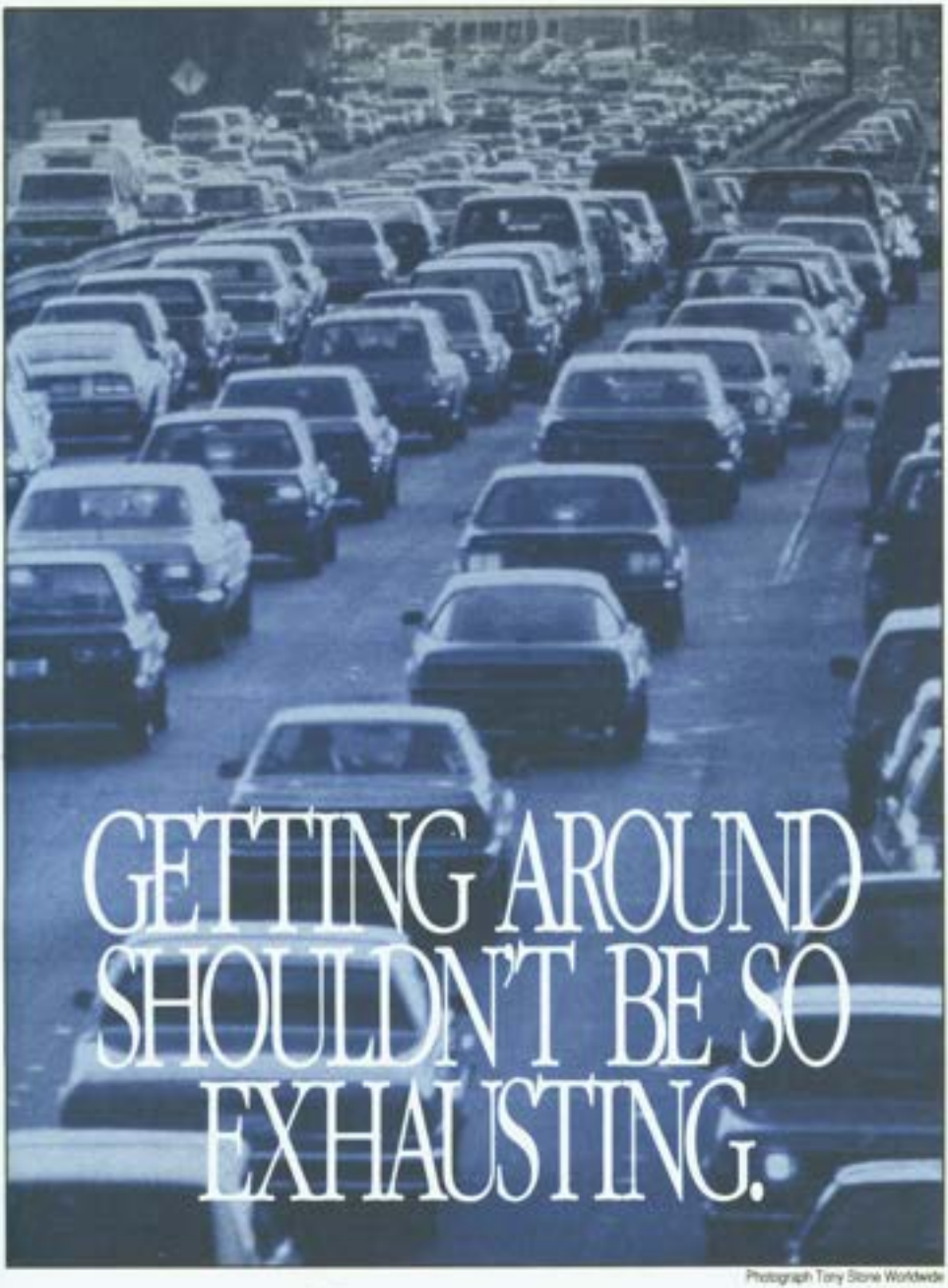
For ten minutes at a time, the boat's nets are brought up empty. Then a 50-yard section appears, jammed with hundreds of neon flying squid. As they come up over the gunnels the squid spurt fountains of black ink that arc through the air, splashing across the faces of the deckhands and staining the sides of the boat. The fishermen scramble to pop the squid out of the net with a quick jerk of their hands; some tear them out with their teeth.

Other animals are also hauled up: blue sharks and salmon sharks, jellyfish, pomfret, saury, shearwaters. Most are dead.

As we watch, a northern right whale dolphin appears. The sleek, six-foot-long mammal, dark black with patches of white across its sides and belly, is completely enshrouded in the webbing, a sign of the struggle it put up before it drowned. Five fishermen strain to gaff the 350-pound creature up over the side. They cut off the tail to untangle the dolphin and hoist the carcass over the rail. It hits the water about ten feet from our inflatable, bobs momentarily on the surface, then sinks from sight.

The *Kokoshin Maru* is one of more than 600 Japanese, Taiwanese, and South Korean driftnet vessels that fish the North Pacific for squid. Dozens more harvest salmon and albacore from these waters. Because the fleet operates in international waters virtually unobserved, very little is known about its impact on the marine ecosystem. But piece by piece, a picture is emerging of an enormously wasteful fishery that vacuums life from the sea, leaving a biological desert in its wake.

The Japanese fleet's mammoth nets, made of nearly invisible plastic line, capture everything the size of the mesh or bigger that swims into them. The amount of waste is tremendous: Up to 70 percent of what is caught is "by-catch"—unwanted species that are dumped over the side, almost always dead or dying. In addition to the target species, the nets snare great numbers of marine mammals



Photograph Tony Stone Worldwide

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The deckhands eye us suspiciously. An unidentified vessel with a white dove painted on the foresail and a rainbow on its bow must be as unsettling as a pirate ship flying the skull and crossbones.

and sea birds—tens of thousands of dolphins and hundreds of thousands of birds every year, according to some estimates—along with countless sharks and other high-seas fish species.

The *Rainbow Warrior*'s 6,000-mile observation mission is coordinated by Ben Deeble, a stocky man with shoulder-length brown hair spiced with gray, making him look older than his 28 years. For the past four years Deeble has worked to turn public opinion against driftnetting, lobbying at the United Nations and in Washington, working with American fishermen, and coordinating Greenpeace's international publicity efforts. Deeble is what you might call a lifelong environmentalist; his first direct action was pulling up surveyor's stakes in a canyon slated for development in his home town of San Diego. He was eight years old at the time.

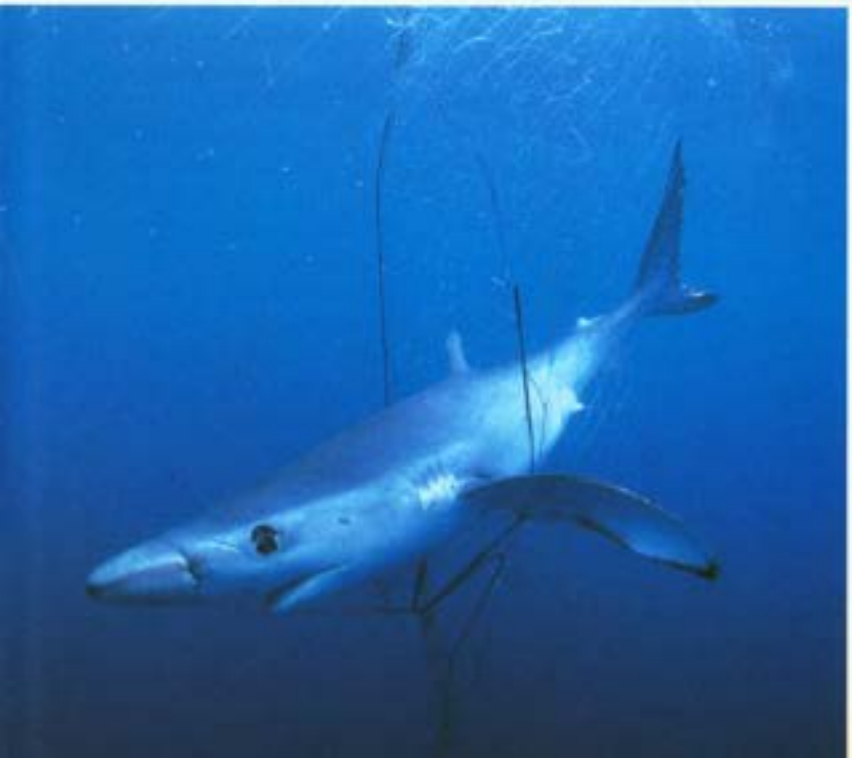
Just before we sail from Honolulu, Deeble speaks to the 30-member crew assembled in the ship's mess at the stern of the *Rainbow Warrior*. Squeezed onto benches or sitting on the floor in a space the size of a big living room, the crew of men and women from 11 countries (including Japan, New Zealand, Australia, Denmark, Canada, and Great Britain) listens intently as Deeble explains the goals of the trip, which include photographing and filming animals trapped in the nets, gathering scientific data, and conducting nonviolent protest against the fishermen.

"One of the main tenets of Greenpeace is to bear witness to atrocity," Deeble says. "It is up to us to record everything we see out there, alive or dead."

The crew is young, but surprisingly experienced; many have been involved in previous Greenpeace campaigns. The ship's captain, Peter Willcox, is only in his mid-30s, but he has been at the helm of the *Rainbow Warrior* for almost a decade. First mate Dave Thoenen, 26, has been with the ship on a year-long voyage from Hamburg to Australia and through most of the South Pacific islands. The ship's Japanese interpreter, 28-year-old Yuriko Hashimoto, ordinarily works on the tropical rainforest issue in Greenpeace's Tokyo office. Cornelius Van Dorp, the 34-year-old ship's doctor, spent a year at Greenpeace's base in Antarctica.

Three weeks out of Hawaii, on a steel-gray afternoon heavy with mist, the *Rainbow Warrior* picks up blips on its radar screen—the first sign of the Asian squid driftnet fleet. The nearest landfall is Attu, westernmost of the Aleutian Islands, which lies 600 miles to the north; Eugene, Oregon, is 4,000 miles due east. By late afternoon we are tracking seven boats, among them the *Kokoshin Maru*.

The Japanese vessels work as a tightly organized team, deploying their nets in parallel lines about a mile and a half apart. Each evening during the seven-month fishing season they blanket more than 500 square miles of ocean with nets made of plastic monofilament woven into 50-meter segments called tans. A line of floats suspends each tan from the ocean surface; the bottom is weighted with lead. A number of tans are stitched together into three-mile sections laid out in a straight line, with a gap of about a half mile between each section.

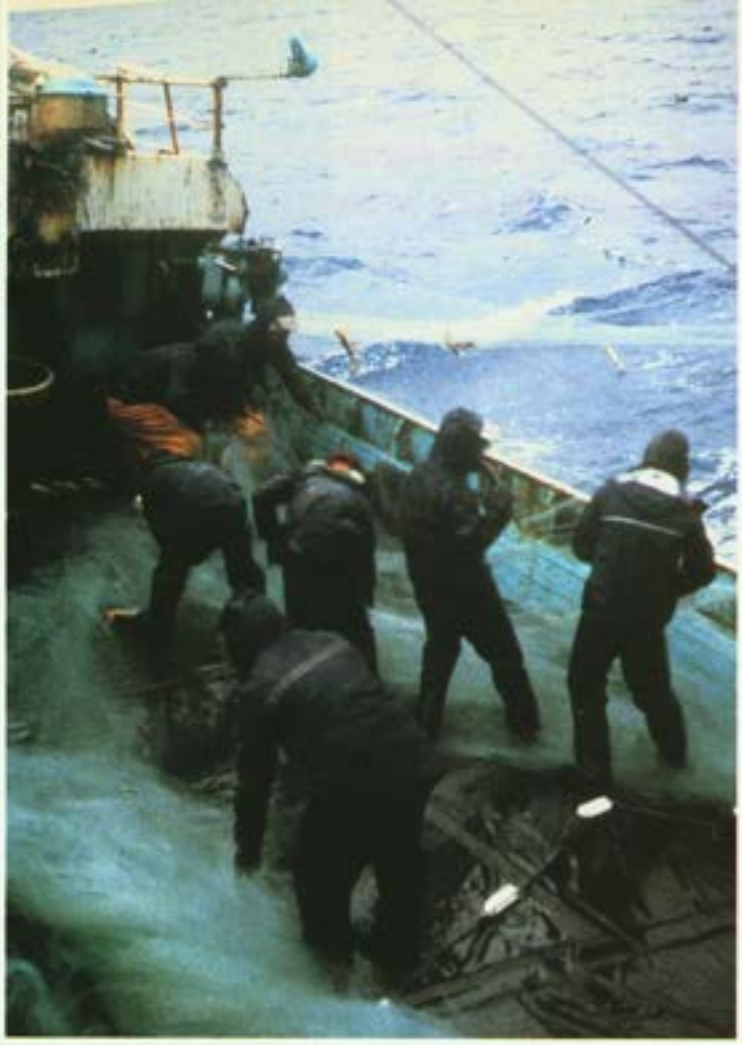


ROGER GRACE / GREENPEACE

High-seas driftnets are gillnets, which catch fish by snagging their fins, gills, or (in the case of squid) tentacles as they swim into the webbing. Gillnets are used by fishermen throughout the world, but most are measured by the meter rather than the mile. The nets used by American salmon fishermen in Alaska range from 100 to 600 yards in length; a typical driftnet, however, would stretch from one end of Manhattan to the other and back again.

Driftnet boats begin laying their nets in the late afternoon, to take advantage of the upward movement of fish at nightfall. In the evening, animal plankton rise to feed on the plant plankton that live near the surface. Smaller fish follow to feed on the animal plankton, and

A blue shark, a common driftnet bycatch. Its tail and dorsal fin will be severed for soup, and its carcass tossed in the sea.



EARTHTRUST / GAMMA-LIAISON

Asian squid-fishing fleets lay 2 million miles of driftnet annually in the North Pacific—a 100-percent increase in only seven years.

squid come up to feed on the smaller fish. Larger predators like tuna, sharks, dolphins, and seabirds feed off the top of the food chain.

Unable to see any of the seven vessels in the fog, we watch on radar, waiting for the boats to start their net-laying run. As dusk approaches, the boats move into formation, and each sweep of the radar beam marks new positions a little farther east. The *Rainbow Warrior* strikes its sails and moves in behind the boats. Half a dozen Greenpeace volunteers armed with binoculars stand at the rail, peering into the fog to locate the net. We finally spot it, just 50 feet off the port bow—a line of mustard-yellow, lozenge-shaped floats that stretch across the surface and disappear into the fog. Dozens of Laysan albatross—huge, graceful birds with white bodies and heads and black wings—swoop and soar over the net, then land to pick at the fish already snared.

As the darkness thickens, the fog lifts for a moment, and four of the seven boats become visible against the horizon. Illuminated by banks of powerful lights, they loom in the distance like floating baseball stadiums. Watching them work brings to mind lines of mechanized harvesters sweeping through fields of wheat, gathering up everything in their path.

It takes the *Kokoshin Maru* eight hours to set all its net. In the hours before dawn the boat reverses direction and moves back up the net, hauling the webbing over the side as it goes. For us on board the *Rainbow Warrior*, it's the signal to go to work. The crew scrambles to launch its inflatables, four of which, carrying divers, still photographers, and a videographer, motor off along the line of floats and disappear into the mist.

As the fishing vessel's ink-stained deckhands pop squid after squid out of the net, a fifth inflatable bobs in the choppy seas off their port side. The pilot maneuvers to keep it within a few yards of the *Kokoshin Maru*'s foredeck—close enough to be doused by geysers of ink, to the considerable amusement of the Japanese crew.

In addition to squid by the hundreds, the night's catch includes scores of unwanted blue sharks and dozens of other fish. Only the squid are kept; the rest are dumped over the rail. A limp black-and-white shape, untangled from the net and tossed out, cartwheels through the air and lands within a few feet of the inflatable. It is a Laysan albatross, barely seven months old. The bird stretches seven feet from wingtip to wingtip; it had been banded by American scientists on Tern Island in the French Frigate Shoals, more than 2,000 miles away.

At first, in the hours after sunrise, the deckhands eye us suspiciously; the appearance the night before of an unidentified sailing ship with a white dove painted on the foresail and a rainbow gracing the bow must have been as unsettling as an encounter with a pirate ship flying the skull-and-crossbones. But by midmorning, as it becomes clear to the fishermen that Greenpeace is there only to observe their operations, they become much friendlier. One fisherman appears at the rail with a plastic bag in his hand and beckons us to maneuver closer. When we bump up against the side of the boat, he hands the bag down; inside are cigarettes, beer, and chewing gum. Although it is barely 8 a.m., we crack open one of the beers and raise it in thanks. The fisherman smiles, revealing teeth that are startlingly white against his ink-blackened face.

The Japanese captain is considerably less amused by our presence. "We're working out here risking our lives to make a living, and they are just out here playing," he complains in a radio transmission that is intercepted by the *Rainbow Warrior* and translated for us later that afternoon by Yuriko Hashimoto.

"They are working for a total ban on driftnets by next year," answers one of his colleagues.

"The headline in the Hokkaido newspaper will be 'Total Ban on Driftnets.' The next day, it will say 'Hokkaido Fishermen Kill Themselves.'"

"It's stupid. They are just looking at the surface."

"Driftnetting must be banned worldwide—otherwise we'll just end up arguing over who gets to catch the last salmon and tuna, or who gets to kill the last dolphin. —Representative Peter DeFazio

"*Himajin*," hisses the captain of the *Kokoshin Maru*.

As she translates the exchange, Hashimoto erupts in laughter. "*Himajin* means a person who has a lot of time and nothing to do but just hang around," she explains. "That's why they think we are out here in the North Pacific doing this."

The anger spills over to the Japanese deckhands a few days later. Following a night in which the Greenpeace inflatables repeatedly become entangled in the nets, forcing the fishing vessel to stop operations while the boats are cut loose, one of the fishermen yanks a blue shark out of the net and hurls the still-thrashing animal into a boat full of Greenpeace observers. No one is hurt; the shark, released, swims slowly away.

Ecological concerns about driftnetting have led to widespread international opposition to the practice in recent years. In 1989 the 16-member South Pacific Forum, which includes Australia, New Zealand, and a number of South Pacific island nations, banned driftnets in the Tasman Sea effective in 1991. That same year, the United Nations passed a resolution calling for a moratorium on all high-seas driftnetting by 1992. But the resolution also included a provision that would allow the practice to continue if driftnetting nations adopt unspecified "appropriate conservation and management measures."

ROGER GINGE / GREENPEACE

In the United States, fishermen fear that huge numbers of salmon returning to North America to spawn are being snared by high-seas driftnets. Groups like SEACOPS—the Southeast Alaska Coalition Opposed to Pirated Salmon—have joined forces with environmental organizations to fight for a worldwide ban on driftnetting. This unprecedented coalition of fishermen and environmentalists helped push through a 1987 law requiring the U.S. government to negotiate monitoring and enforcement agreements with the driftnetting nations.

Although tougher legislation calling for economic sanctions against Japan, South Korea, and Taiwan was defeated, both houses of Congress have approved a measure that will ban the import of any driftnet-caught fish once the United Nations resolution takes effect. "Driftnetting is a disaster in the making," says Representative Jolene Unsoeld (D-Wash.), who has sponsored anti-driftnetting legislation. "Driftnets need to be removed from the oceans before they exhaust our marine resources."

In July 1990, while the *Rainbow Warrior* sat in port in Honolulu, news reached us that the Japanese tuna driftnet fleet would not return to the Tasman Sea in the fall—a full year before the South Pacific Forum's ban would take effect. Greenpeace crew members, many of whom had sailed aboard the *Rainbow Warrior* during an anti-driftnet expedition in the South Pacific the previous January, were ecstatic.

But for Ben Deeble, the announcement signaled a very small victory in a war that is by no means won. "To know that we conducted an action against that fleet, and then to hear six months later that they have decided not to return, sure, that's extremely positive," he said. "At the same time, we have to acknowledge that the decision is a political one. I have no doubt that the 20 boats that would have been in the South Pacific will simply be driftnetting someplace else. I think the Japanese are trying to give the impression that they are reducing their driftnetting effort when the fact remains that they have a massively destructive fleet in the North Pacific."

One of Deeble's biggest concerns is that, while there is widespread opposition to driftnetting, the United Nations provides the only international framework for dealing with the issue. But the UN's 1989 anti-driftnet resolution lacks muscle, since the organization has no power to enforce its edicts in international waters. Furthermore, neither Taiwan nor South Korea is a member of the UN; hence they are not bound by its decisions.

Deeble also worries about the major loophole in the UN resolution allowing driftnetting to continue if "appropriate conservation and management measures" can be put in place to reduce damage to marine resources. "We believe any notion that driftnets can be used in a way that conserves the marine resource is nonsense," he says. "I'm afraid that countries such as Japan will exploit the loophole to buy themselves some time."

The strongest argument that the three driftnetting nations can put forward in defense of their practice is that no proof exists that driftnets are damaging the ocean. This is partly due to the speed with which the new technology has developed. The modern driftnet fleets are less than 15 years old; the big Asian fleets were built only after huge stocks of squid were discovered in the mid-1970s. By 1983, hundreds of vessels deploying a million miles of net a year were fishing for squid in the cold waters of the North Pacific. Five years later, an estimated 2 million miles of net were being laid each year, and

the fleet had branched out to the warmer waters of the central and South Pacific in search of tuna.

Consequently, much of what is known about driftnetting at present is anecdotal. A single American observer aboard a Japanese squid driftnetter in 1986 reported a bycatch rate as high as 70 percent; a joint fishing venture between Japan and Micronesia in 1989 had to be called off when it yielded one dolphin for every ten tuna; an experimental driftnet fishery conducted by the Canadian government in 1986 and 1987 killed so many marine mammals that Canada became the first nation to ban the use of driftnets within its territorial waters.

Beyond the bycatch problem, there are signs that driftnetting could be taking its toll on stocks of the target species. American fishermen caught just 1,800 tons of albacore tuna in the North Pacific in 1989, one-tenth of the normal annual harvest. Coastal tuna fishermen complain that 80 percent of the tuna they do catch are bruised and net-marked from encounters with driftnets. In the squid driftnet fishery, Japanese sources report, the amount caught per net fell almost 50 percent between 1983 and 1988.

The most complete information about the effects of driftnetting comes from American, Canadian, and Japanese observers who sailed with 32 Japanese squid vessels in 1989. Although their study was more comprehensive than any other to date, giving scientists their first look at what is being caught in the nets, it was too limited for an assessment of the entire fleet's impact. There were no observers aboard any of the 296 Korean and Taiwanese squid boats, or the 300 tuna boats in the North Pacific.

Data from the expanded observer program in 1990 will give researchers a better idea of how much the driftnet fleet harvests and discards every year. But even having an accurate tally of creatures killed doesn't mean that marine biologists will be able to predict how long those species can survive driftnetting.

"The problem is, we need to know how many animals are killed, how big the population is, and how fast it's increasing or declining," says Linda Jones, a scientist at the National Marine Mammal Lab in Seattle. "We don't have the population estimates to say whether mortality from driftnets represents one-tenth of one percent, or 90 percent."

Halfway through the expedition, in warm waters 800 miles northwest of Midway, the *Rainbow Warrior* encounters a lone Taiwanese tuna driftnetter, the *Yang Szu*, an aging vessel manned by a Philippine and Taiwanese crew. The ship's one-day catch includes mahi mahi, striped marlin, shortbilled spearfish, one common dolphin, and 1,000 football-shaped skipjack tuna.

For every six tuna there is one blue shark. Most are small, and almost all are dead. But as we watch, a seven-foot blue shark is hauled over the side, still struggling violently. One deckhand grabs a huge rubber mallet while the others run for safety. Even from 100 yards away the thud of the mallet can be heard over the roar of the *Yang Szu*'s engines. A deckhand severs the tail and dorsal fin—the costly main ingredients in sharkfin soup—and adds them to a growing pile on deck. The mutilated carcass is pushed out a hatch on the starboard side.

Roger Grace, a marine biologist from New Zealand who has joined the expedition as an underwater photographer, is appalled by the number of sharks caught in the net. "There's a terrifically high proportion of what is a bycatch animal," he exclaims. "Just about all the sharks they're catching are quite small, mostly juveniles. What's happened to the adults?"

Right now, that's a question no one can answer. According to Jack Casey, a U.S. government fisheries biologist who specializes in sharks, almost nothing is known about the size or range of the blue-shark population in the North Pacific. No one can say for sure how long it can sustain the level of mortality inflicted by driftnets.

Even less is known about how the marine ecosystem would be affected if the blue-shark population were to be decimated. "Large predators tend to maintain the fitness of the prey species," Casey explains. "These relationships have been studied intensively among land animals, but we're just beginning to learn some of this in the open sea."

On August 15, 1990, as the *Rainbow Warrior* watches yet another Japanese driftnetter haul in its nets, Japan announces that it will continue to driftnet in the North Pacific beyond the 1992 UN deadline. Information obtained from the 1990 observer program, Japan claims, "will be used to formulate more effective conservation measures the government is determined to adopt by 1992." Taiwan and South Korea are expected to follow Japan's lead.

The Japanese are now experimenting with nets that are suspended a few yards below the surface. This, they maintain, will reduce the catch of seabirds and marine mammals. But skeptics say that anything short of a complete ban cannot protect the high seas from serious ecological damage.

"What is going on is obscene," says Representative Peter DeFazio (D-Ore.). "It's like firing a shotgun into a crowd and then saying, 'We will observe public safety by using a rifle instead.' They are destroying a major marine ecosystem and illegally intercepting our salmon. Driftnetting must be banned worldwide—otherwise we'll just end up arguing over who gets to catch the last salmon and tuna, or who gets to kill the last dolphin."

After two months at sea, the *Rainbow Warrior* sails into port in Seattle. "Everything I have seen on this trip convinces me that the devastation has been tremendous," says Ben Deeble. "This technology is too lethal to allow it to continue. It's simply going to wipe out the high seas before we even know what we have out there. We'll probably never know what we've already lost." ■

TODD CAMPBELL *of Seattle writes frequently on fisheries issues.*

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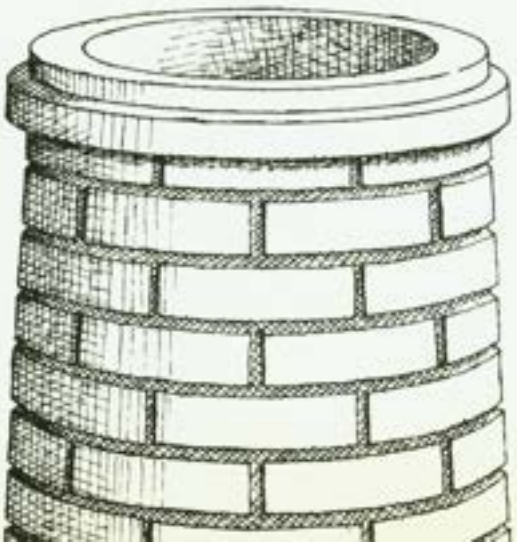
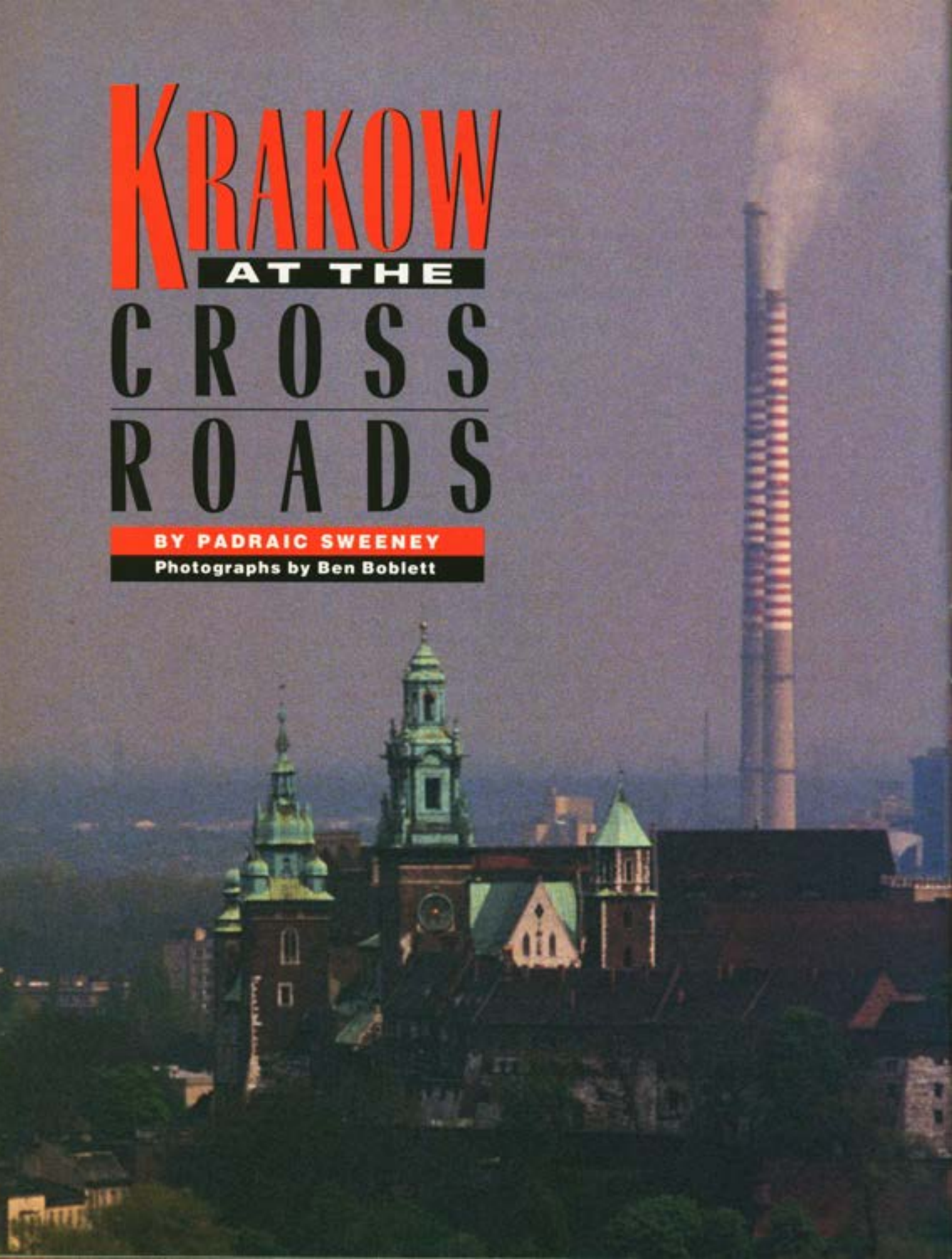
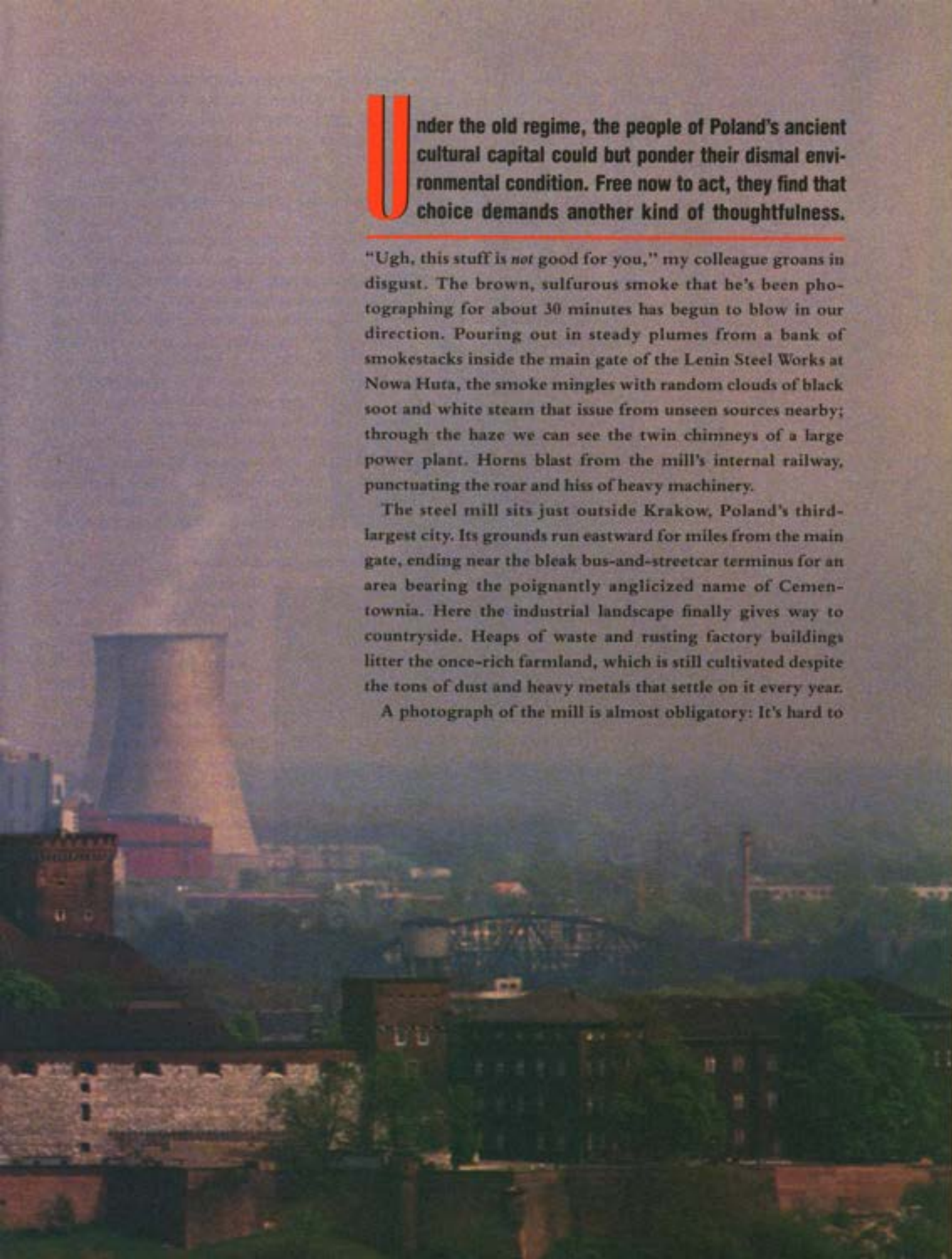


KRAKOW AT THE CROSS ROADS

BY PADRAIC SWEENEY

Photographs by Ben Boblett





Under the old regime, the people of Poland's ancient cultural capital could but ponder their dismal environmental condition. Free now to act, they find that choice demands another kind of thoughtfulness.

"Ugh, this stuff is *not* good for you," my colleague groans in disgust. The brown, sulfurous smoke that he's been photographing for about 30 minutes has begun to blow in our direction. Pouring out in steady plumes from a bank of smokestacks inside the main gate of the Lenin Steel Works at Nowa Huta, the smoke mingles with random clouds of black soot and white steam that issue from unseen sources nearby; through the haze we can see the twin chimneys of a large power plant. Horns blast from the mill's internal railway, punctuating the roar and hiss of heavy machinery.

The steel mill sits just outside Krakow, Poland's third-largest city. Its grounds run eastward for miles from the main gate, ending near the bleak bus-and-streetcar terminus for an area bearing the poignantly anglicized name of Cementownia. Here the industrial landscape finally gives way to countryside. Heaps of waste and rusting factory buildings litter the once-rich farmland, which is still cultivated despite the tons of dust and heavy metals that settle on it every year.

A photograph of the mill is almost obligatory: It's hard to

imagine a story about the environment in Eastern Europe without a looming industrial behemoth. More to the point, the mill symbolizes the future of Krakow, an ancient city now coming face to face with the political and ecological legacy of its Communist past.

The center of Krakow lies a few kilometers west of Nowa Huta, along the river Vistula. The citadel on Wawel Hill dominates the old town; Renaissance and Baroque façades line streets that still follow a pattern set in the Middle Ages. The city's Jagiellonian University is Central Europe's second oldest; its distinguished graduates include Nicolaus Copernicus and Pope John Paul II. For centuries Krakow was an important European capital, and one of Central Europe's major crossroads.

Despite postwar industrialization, Krakow is no wasteland. In the warmer months the city is green and leafy. Low, tree-covered hills rise from the garden suburbs on the western edge of town and roll away into the fields and forests of southern Poland. The city center is surrounded by the Planta, a beltlike park whose shady recesses make hot summer afternoons more bearable. As they have for centuries, flower sellers journey from their suburban gardens to the elegant Central Square.

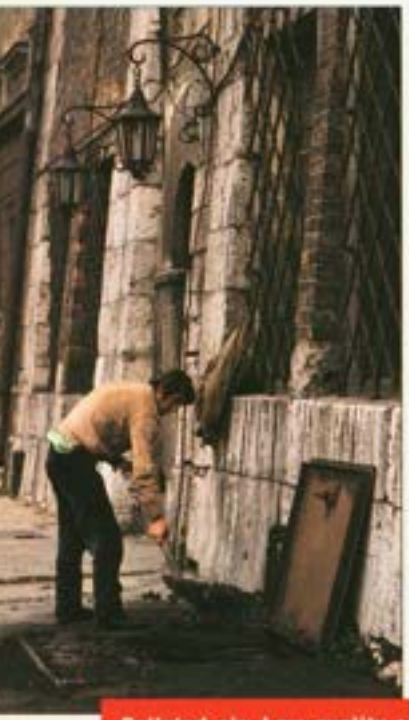
But like the rest of Eastern Europe, the city is shadowed by the staggering environmental consequences of a former regime's policies. Krakow's air has been heavily polluted by completely unregulated heavy industry and by low-quality coal burned to heat houses in the older districts. Brine pumped from coal mines in neighboring Silesia has rendered the Vistula unfit for all but the most basic industrial purposes. Heavy metals and other toxic wastes contaminate the soil.

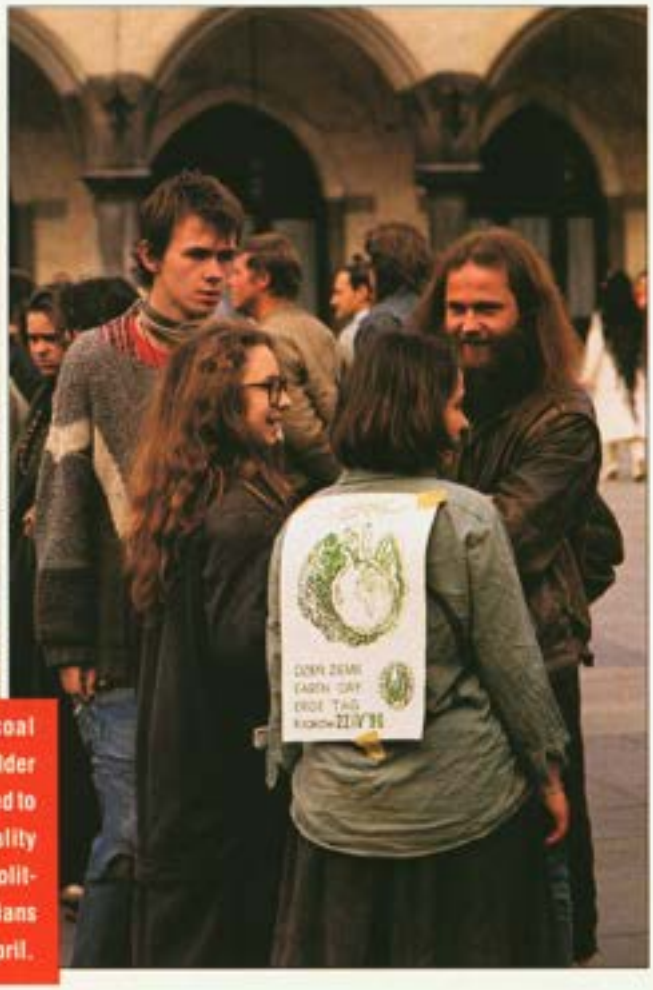
Scientists have only recently begun to assess how the city's 800,000 people are faring under this toxic assault. At School #37 in Nowa Huta, Tadeusz Gawarecki of the local public-health department discovered that, during a four-year period, 61 percent of the children surveyed had been under a doctor's care for chronic ear, nose, and throat ailments and a variety of other illnesses. "It seems that people in Krakow are sicker than those in other parts of the country," Gawarecki observes. He has no doubt that pollution is the culprit, but documenting his case is not easy. The problem is to isolate the influence of specific pollutants.

But to Gawarecki, who is now planning an extensive five-year study of rural as well as urban residents, being afforded an opportunity to dig up grim statistics is itself great progress. "Before, the authorities didn't even talk about pollution; it wasn't pleasant for them."

Today when people discuss Krakow's "unpleasant" public-health problems, the talk eventually turns to the steel mill. The city's department of environmental protection, headed by Jerzy Wertz, is playing a major role in forcing the facility to reduce emissions. The intense, forthcoming Wertz is matter-of-fact about his job: "My goal is protection of the environment; my duty is to implement the law."

Wertz has recently been given strong official backing. In 1989, Krakow was declared an "especially protected region," a status that gave the city greater authority over nearby polluting industries. Wertz quickly homed in on the Lenin Steel Works. His initial proposal to impose a 40-percent cut in overall steel production was ultimately rejected by the Ministry of Industry as too radical an assault on one of Poland's largest manufacturers. This effort led to a compromise, however, whereby the city govern-





Polluted air: Low-quality coal used to heat homes in the older parts of the city has contributed to Krakow's significant air-quality problem. Fresh air: The new political climate allowed Krakovians to celebrate Earth Day last April.

ment and the mill administration agreed to eliminate the worst emissions sources at Nowa Huta by the end of 1991. The mill will cease processing its own coke, pig iron, and lime, which should reduce dust emissions by 35 percent, sulfur dioxide by 24 percent, and carbon monoxide by 49 percent, while cutting emissions of other toxic gases.

According to Wertz, the mill is moving quickly to implement the agreement. Still, he has mixed feelings. Given that so much remains to be done, he says, "No one who is responsible for protecting the environment can be satisfied." Here again, however, the very fact that the issue could be discussed, and any agreement reached, is progress: "Before, the entire political system protected the mill."

As it embarks on its clean-up, Krakow finds itself advised by no large, popular environmental groups as they are known in the West. In Communist Poland, the ubiquitous Party apparatus controlled every institution in society except the Roman Catholic Church and, toward the end of Party rule, Solidarity. The "leading role of the Party in society" extended to the press, the courts, industry, and all branches of the government bureaucracy. Only the most courageous individuals dared speak out; troublemakers were quickly and ruthlessly punished.

Heavy press censorship played a major role in suppressing public discussion of environmental issues. Government regulations from the mid-1970s, for example, explicitly forbade publication of "information on direct threats to life or health caused by industry or chemical agents used in agriculture, or threats to the natural environment in Poland." Also forbidden were "specific examples of air, water, and soil pollution that are an endangerment to life or health." [Editor's note: These are quotations from regulations smuggled out of Poland in the late 1970s, and published in *The Black Book of Polish Censorship* (Random House, 1984), translated and edited by Jane Leftwich Curry.]

Nevertheless, Krakow is better prepared than most Eastern European cities to deal with its polluted environs. Two of Poland's oldest and most influential environmental forces, the Polish Ecological Club and the environmental magazine *Aura*, were founded here. Both draw on Krakow's formidable population of scientists, physicians, and engineers, and have taken a rigorously scientific approach to environmental problems.

The Polish Ecological Club is the country's most prominent environmental group. It was founded just before martial law was imposed, and successfully evaded official suppression in the early 1980s.

Aura, which began publishing in 1973, is described by

The people of Krakow live under the shadow of heavy industry gone amok.

managing editor Janusz Zareba as "a popular-scientific, interdisciplinary magazine." Its contents reflect the philosophies of an editorial board composed largely of scientists and engineers. A recent issue included such articles as "Neoclassical Economics and Ecology" and "The Influence of the Sulfur Mining Industry on Surface Waters"; it also contained, unsurprisingly in Catholic Poland, a statement by Pope John Paul II addressing environmental issues. Heavily censored in the 1970s and '80s, "for a time *Aura* could only publish highly theoretical articles," Zareba says. With the lifting of censorship, the magazine has been quick to tackle such formerly taboo subjects as hazardous waste from Silesian uranium mines and the relationship between pollution and health.

If the issues facing Krakow are complex, so are the mechanics of local government in post-Communist Poland. Fledgling municipal authorities will have to battle the familiar tendency to centralize decision-making in the capital; although the Solidarity activists who now head the government ministries in Warsaw spent years struggling against the Communist administration, highly centralized bureaucratic management is the only style of government most Poles have ever known.

As yet unresolved is how municipal government will be financed. A general revision of Poland's tax system is expected in 1991, but in the meantime it is not clear how much local governments will be able to raise in taxes and how much they can expect to receive from Warsaw to help them carry out local policies.

Between the Solidarity-dominated municipal elections last spring and Lech Walesa's presidential victory in December, Polish politics has been marked by considerable confusion. The former outsiders, now on the inside, are quarrelling not so much over substantive issues, but over patronage and bureaucratic turf. This shouldn't be too surprising. "The new government here is going to be very green, pro-ecological, [and] with no experience in government," Krzysztof Goerlich, of the Krakow Citizens' Committee (at the time Solidarity's electoral arm), said in April.

Even after the new city government has settled down, Krakow will have to deal with the tension between environmental and economic demands. Large-scale public and private investment will ultimately be necessary to upgrade the city's housing, reduce emissions from power plants, modernize the sewage-treatment system, and so on. Only a more prosperous economy will be able to afford these improvements.

What a restructured local marketplace will look like is not at all clear, though some see an answer in the transformation of Krakow into a center of services and light industry. Lech Jeziorny, a young entrepreneur and vice-chairman of the Krakow Industrial Society, is sure that "money is the most important question regarding ecological problems here." Jeziorny may be oversimplifying, but he has a point when he brings up the fate of the 30,000 workers now employed at the steel mill: "The question is what to do with the workers, with the firms, with everything. Ecology cannot exist without economy."

Services and light manufacturing alone will not save Krakow's environment. Industries such as electronics bring problems quite different from those encountered up to now. Expanded tourism will increase car and bus traffic, inevitably worsening the photochemical smog the city is prone to in hot weather. A Western-style consumer society, obviously desired by millions all over Eastern Europe, will greatly expand the city's solid-waste disposal problems.

The United States is poised to help. The Environmental Protection Agency has designated $5 million for water- and air-quality programs in Krakow, and Energy Department funds have been earmarked for clean-coal technology programs, with $10 million already allotted to partial retrofitting of the Skawina electric power station located about 15 kilometers southwest of Krakow.

The emphasis on clean-coal technology has not gone over well in Krakow. Solidarity's Goerlich, for example, feels that Poland needs to burn less coal more efficiently. This concern prompted influential members of the Polish Ecological Club to warn U.S. officials that Poland might be better off to decline the DOE funds rather than accept unsuitable technology.

"We are at the boundaries of two periods," says *Aura* editor Zareba. "We should think about the future. The right decisions have to be made now."

Today Poles are faced with nothing less than the total reconstruction of their legal and political systems. No institution will go unchanged, from the courts to the press to local government. As Bronislaw Geremek, longtime Solidarity advisor and a leading member of Poland's first post-Communist parliament, has put it: "We are trying to build a new equilibrium between powers and institutions. We have to learn both how to rule, and how to be ruled."

Back at the mill gates, the wind has shifted again. Breathing becomes a little easier as a new weather system sweeps in from the south. A few kilometers to the west, below the green hills of southern Poland, Krakow sits like an elegant Middle European gem. What will become of the old city, and its failing industrial neighbor, is uncertain.

But Krakow will change; it has no choice. There is no returning to the pre-industrial past, to green fields lapping at the gates of a genteel university city. Nor can it stand still, amid the deadly refuse of 40 years of political and environmental irresponsibility. A year hence, and five years, the picture will be quite different. Whether it will be better or not will depend, for the first time in many decades, on the desires of Krakovians themselves. ■

PADRAIC SWEENEY *lived in Vienna for five years, reporting on Eastern Europe for several publications. He now writes from northern Virginia.*

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*Fortune magazine, March 26, 1990

"The test of an adventure is that when you're in the middle of it, you say to yourself, 'Oh, now I've got myself in an awful mess: I wish I were sitting quietly at home.' And the sign that something's wrong with you is when you sit quietly at home wishing you were having lots of adventures." -Thornton Wilder, The Matchmaker

An adventure, I learned very early, has to do with a group of guys trying to find something. It could be the secret of the old clock, or the lost treasure of the Incas, or even kindly Dr. Cooper who was being held against his will by Nazis. In between the goal and the guys were a series of obstacles; overcoming the obstacles constituted the adventure. ♦ There was Tom, who was the leader; everybody liked Tom. Tom was friendly and brave and smart and humble and tall. Tom's best friend was Billy, who was almost as brave and almost as tall and even smarter, a real brain. Billy could sometimes figure out things that stumped Tom. And there was Butch, who was very tall and very strong and didn't say much. Standing a little apart from the group was Eric, who was a little broody and was always getting into fights. It turned out that Eric's father had died in the war, the last one. And there was The Kid, who was younger and made silly mistakes early in the adventure, but when the chips were down, why, he saved the whole gang. ♦ And then there was Wally. Or Chester. I identified with them both. ♦ I didn't want to go on an adventure. Your Wallys and your Chesters would have to be real dumb to get involved in an adventure. If I did go off with Tom and his pals, through some misguided sense of wanting to belong, I'd be the one who got bumped off. I'd be the one who stepped on the dry stick that made the noise that alerted the Nazis. I'd be the one who dropped the ruby down the rat hole. There'd be a moment of silence for me, but I wouldn't be around to enjoy it.

WITH A LIMP

by Jon Carroll

The thought of humiliation and death can be a real factor in any career decision. When they came around looking for astronauts and Arctic explorers, I was tied up in meetings. I was unable to come to the phone. I was on the other coast.

So until I was 33, I pretty much watched television and took hot showers and played poker. I learned to drive a standard transmission; that was about the apex of my adventure experience.

Then I met a girl. Not the first time that had happened, but this was different. There was a hormonal surge of tidal proportions; there was hopeless adoration mixed with wallowing devotion. This girl liked to backpack; I liked to backpack. I didn't, but I did. That's the glory of, that's the story of love.

Five years later, I was trekking in the Himalayas. Somewhere west of Junbesi, three days into a 30-day experience, I said to myself: I am either committing suicide or having a midlife crisis. Either I am Wally and will die; or I'm not Wally and will live.

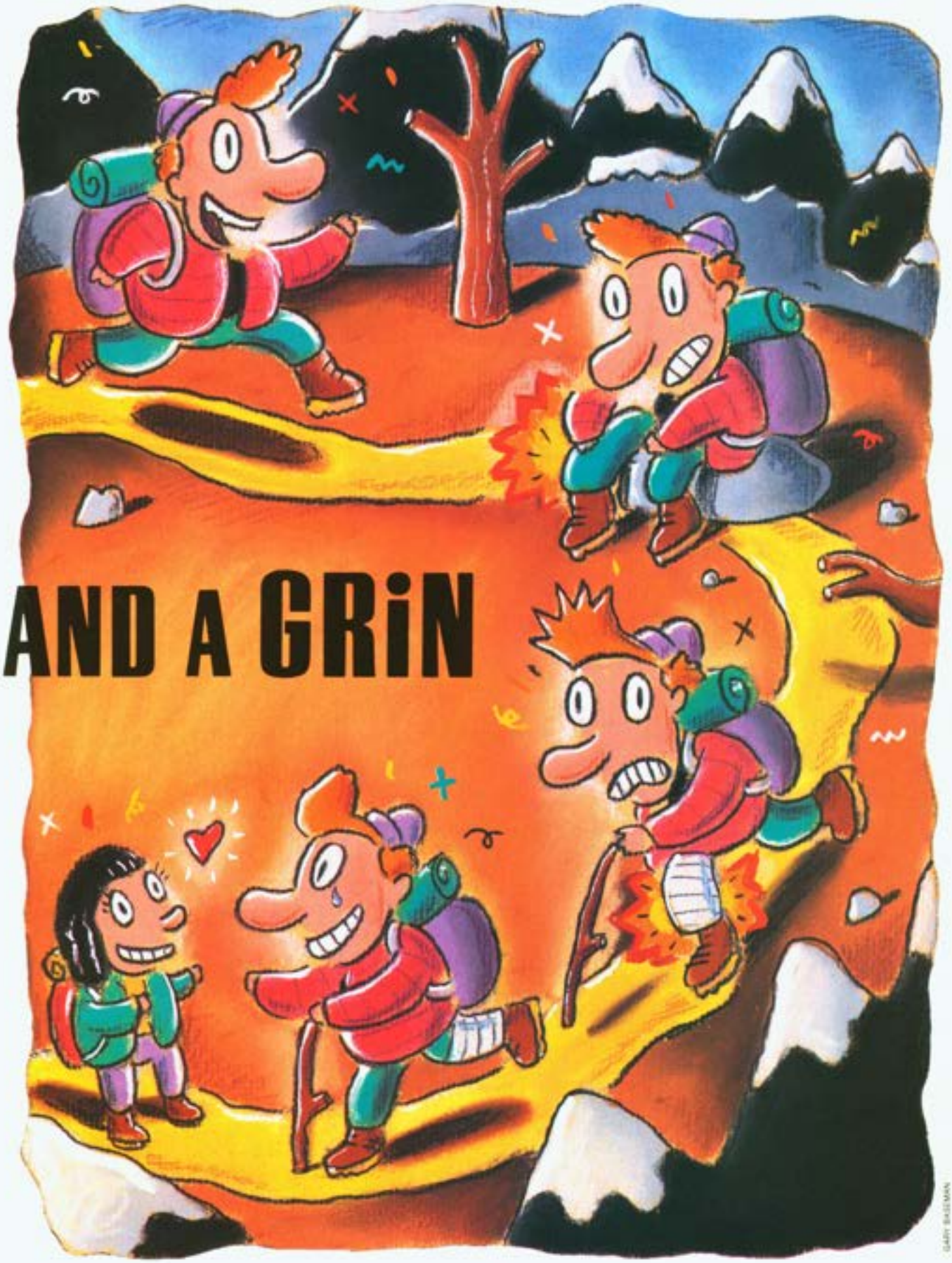
The truth turned out to be rather more complicated. That afternoon, we were standing on a ridge. We had just caught our first glimpse of the very high mountains. Around us, the dead green fields of millet arced in descending circles. A red-robed lama stood with us, beaming, leaning on a ski pole he used as a walking stick. We could see the dark outline of a wall of *mani* stones on the next ridge.

Not Wally, I decided. I began walking down the trail, faster and faster, then skipping, then running, leaping, whirling, laughing, waving to the girl of my dreams, now my wife, my honeymoon chum. Down the mountainside I rushed, happy to be me, happy not to be Wally.

At the bottom, I said to myself: Jeez, I think I've done something to my knee.

The next morning, in a room above a shop in Those, Nepal, my worst fears were confirmed. I had a real throbber. Every step hurt. Sahib's knee, my experienced companions called it, a name I instantly resented. A classic Wally ailment, sahib's knee. Serious jerk material.

I walked on. I hung back from the group and squeezed tears of frustration down my cheeks. That night, at Bhandar in a huge hidden valley, I stood alone in the courtyard of a *gompa* and cursed everyone and everything. This was a


AND A GRiN
GARY BASEMAN

completely stupid experience, a trashy and pathetic activity indulged in by spoiled, self-deluded Westerners. I didn't belong here; I belong in my own bed in my own room with the covers up to my neck. I wanted good wine and bad fiction, and I wanted it now.

Still, I continued. No choice. I gimped on, whining twice a day, feeling lumpy and lost. The landscape was eerie and odd; the teahouses friendly; the *gompas* serene. My knee did not feel better, but I learned to live with it. We walked up to Namche Bazar (they walked, I wallied) and beyond. Ama Dablam stood like a sentry, the crown of creation, as constantly amazing as any sight on earth.

By this time, I had developed a satisfying gait, swinging my right leg in a wide, stiff semicircle as I walked, the foot grabbing gently in for a landing to minimize the shock. I was able to plant my walking stick at just the proper moment so that my weight was balanced just as my foot began its descent.

We got up to Loboche, just across the glacier from Everest Base Camp. The air was thin and fragile; it felt like glass in my lungs. We paused a day, then started back down the valley. At Namche, we reentered the world of traveler's checks and airplane reservations. If we make it back to Lukla in one day, we were told, we could make a morning flight.

(This turned out to be a classic Nepal fantasy—Lukla is an airport in the sense that ketchup is a food—but the point is that we trusted the timetable we were given. Lukla or bust.)

For complicated reasons, my wife started walking an hour before I left. When I finished my business in Namche and started down the trail, I got the notion to make up the hour's differential and catch her before she got to Lukla. The day was warm; the trail was crowded. I'd been hiking for a month; I was in good shape, skinny and brown and clear-eyed. With my swinging leg and my brandished walking stick, I cut a wide swath. I yielded only to yaks.

I caught up with my wife by the middle of the afternoon. "Hello," I said, pulling alongside, casual as all get-out. "Hello," she said, not as impressed as I'd hoped.

And that was, finally, it. A man nearing 40 and his wife, walking in the Himalayan twilight; a man with a limp and a grin pushing through the outskirts of town. Something that started badly had ended well; something that had started as an obstacle had been redefined as a blessing. I suppose it was not much of an adventure: Death was not defied. But it had been for me a triumph, a talisman I could carry with me, a thought I could always think. Whatever I am, I am not Wally.

I think maybe that we do not climb a mountain because it is there. We climb it because we are here. ■

JON CARROLL *is a columnist for the* San Francisco Chronicle. *This article is excerpted from* Adventure Vacations *(John Muir Publications, 1990).*

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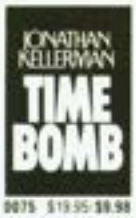

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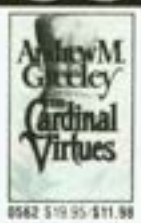

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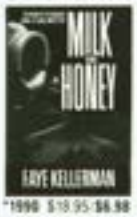

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time positions during the winter. Alex Ocheltree, the major backer of the resort, claims the facility could be built in an environmentally acceptable manner. After all, he says, "ski areas are not chemical factories."

Perry Plummer, a Sierra Club member in Las Cruces, thinks Ocheltree is deluding the public. "The ski area would gut the highest and most popular part of the Gila Wilderness, while providing a couple dozen low-paying maintenance and waiter jobs," he says.

Mike Sauber, local Audubon Society member and part owner of an outdoor equipment shop in nearby Silver City, stands to benefit from the ski resort, but still opposes it. Even if he could be convinced that the project would be economically beneficial, he wouldn't want to set a precedent by developing a wilderness area. Although he agrees that some sort of economic development is needed in this depressed area, Sauber says that the developers' "compass is a little off."

So far, the U.S. Forest Service has stayed out of the fray. "Our position is that the management of that area is mandated by federal law," says Ron Henderson, the wilderness-lands program manager for the Gila National Forest. "We're going to continue to manage it as wilderness until Congress tells us otherwise. Period."

But the arguments on both sides of the issue are less about legalities and ecological precepts than about economics, which conservationists say do not favor the development. Other resorts in New Mexico have been experiencing financial difficulties, says Plummer: "The rest of the ski industry is in a slump, and this new area would only dilute existing business."

Because his project is long-term, however, Ocheltree is not bothered by what he sees as a short-term economic downturn. He expects his group will need anywhere from 6 to 20 years to overcome resistance and build the ski area. Already he and his fellow promoters are generating considerable local support for their plan by capitalizing on anti-environmental sentiment in the region—the result of conservationist challenges to Forest Service timber-harvest plans, which some loggers fear will put them out of jobs.

Rob Smith, the Sierra Club's Southwest representative, is angered that Ocheltree and his partners are pursuing their plan seemingly to spite conservationists, and threatening the integrity of the Wilderness Act in the process. He's convinced that the ski area will be unsuccessful in any event, and wishes that the promoters would back off rather than pit citizen against citizen. "A long fight could create a lot of ill will," he says.

Economics aside, the most significant aspect of the ski-area proposal, says Smith, is its challenge to the National Wilderness Preservation System. He and other activists maintain that the current skirmish is clear evidence that the battle to preserve public lands in the United States calls not only for creating new wilderness areas, but for protecting those already set aside.

—Laurence E. Parent

Nerve Gas Unnerves Hawaiians

JOHNSTON ISLAND

Within minutes of being exposed to even a pinpoint-size amount of the nerve gases Sarin and VX, a person can go into convulsions and die. That explains the alarm of Pacific islanders last November when the U.S. Army shipped 100,000 projectiles containing these gases from Germany to Johnston Island in the North Pacific.

For many environmental activists throughout the region, the maneuver was only the latest setback in their ongoing battle against the U.S. military's plan to use Johnston Island as a site for eradicating stockpiles of unwanted nerve gas.

Johnston Island, a tiny atoll, has never been a cruise-ship port of call. Located some 750 miles southwest of Hawaii and about twice that far from

the Marshall Islands, the one-time 56-acre bird refuge was taken over by the U.S. Navy in 1934 and extended tenfold by landfill to accommodate a naval air station. After World War II the island was used for nuclear-weapons experiments.

Today the atoll is the site of the world's first large-scale chemical-weapons incinerator. The $150-million facility, officially dubbed JACADS (Johnston Atoll Chemical Agent Disposal System), was completed in 1989. Its stated purpose is to destroy the nerve gas that has been stored on the island since being transferred from Okinawa in 1971; JACADS was not intended to receive additional nerve gas from Germany or anywhere else. At least, that's what the Army maintained in 1988 when it circulated the JACADS Environmental Impact Statement in Hawaii.

"The incinerator was supposed to be a one-shot deal," says Hayden E. Burgess, interim director of the Pacific Asia Council of Indigenous People. "That's why many Hawaiians remained silent about its construction."

In March 1990, however, Hawaiians learned that President Bush and then-West German Chancellor Helmut Kohl had agreed to transfer 400 tons of U.S. chemical projectiles from West Germany to the JACADS facility. The shells, containing Sarin and VX, were reportedly leaking, and the Germans wanted them out.

News of the nerve-gas shipment came as a shock to Pacific islanders. "We found out about it through a *Washington Post* article," says Oahu environmentalist Marsha Joyner. Despite vigorous protests by the governments of Hawaii, Kiribati, New Zealand, Papua New Guinea, the Solomon Islands, Tonga, Western Samoa, the Cook Islands, and the Federated States of Micronesia, the Army carried out the transfer, placing the nerve-gas-filled shells in airtight containers and shipping them on a secret route.

Meanwhile, the Army has sought to assure the region's residents that incineration is perfectly safe. "We've been doing chemical incineration since the mid-1970s," says Marilyn Tischbin, public-affairs officer for the Office of the Program Manager for Chemical Demilitarization at Aberdeen Proving Ground in Maryland. "We've burned over 6 million pounds of mustard gas at Rocky Mountain Arsenal near Denver without any injury or environmental damage."

Activists, however, point to a 1981 environmental assessment of the potential hazards at a North Atlantic incineration facility similar to JACADS. In that report, the Environmental Protection Agency noted that "in the immediate vicinity of any future accident in the site or elsewhere, considerable biomass would probably be destroyed [and] clean-up would be difficult and expensive, if possible at all. Effects of contamination could be widespread and possibly long-lasting."

Burgess also criticizes the Army for not giving adequate consideration to promising alternative disposal technologies. He says the Army dismissed one such procedure, called "super-critical water oxidation," which requires temperatures of 600 degrees centigrade to destroy nerve gas effectively. But the Army tested it at only 500 degrees; not surprisingly, the results were deemed unsatisfactory.

Although destroying nerve gas remains politically and technologically problematic, the Army is under pressure to make its Johnston Island facility succeed: Congress has established a 1997 deadline for disposal of 37,000 tons of chemical-weapons compounds now stockpiled across the United States. If the Army deems its tests on the island successful, it will move ahead with the construction of eight mainland incinerators, the first of which is scheduled to go on-line in Utah in February 1993.

Hawaiian environmentalists are now working to keep the chemical weapons on the mainland from being shipped to Johnston Island. Burgess explains the region's prevailing sentiment: "Shipping nerve gas is a foolish gamble with the lives of everyone living in the pathway."

—Myriam Weisang Misrach

The Care and Feeding of Outdoor Gear

Be kind to your equipment, and it will be kind to you.

Reed McManus

THE TENT POLES and stakes are missing again; a hole in your sleeping bag sends plumes of down into the air; rain jackets stowed hurriedly months ago now host colonies of mold. Almost every outdoor enthusiast has at one time reached for a much-needed piece of gear only to be suddenly reminded that routine care and maintenance can make the next trip a triumph or a trial.

The apparent hardiness of quality boots, clothing, packs, tents, and sleeping bags is misleading. How well an "all-conditions" outdoor item survives repeated use depends only in part on its design and construction; equally critical is how well it's taken care of, both on the trail and between backcountry excursions.

Most backpackers today wear enough petroleum-derived clothing to earn a letter of commendation from Exxon. To make the most of these high-tech creations, owners should follow "hang tag" instructions religiously. Many outdoor garments must be washed separately in cold water with gentle non-detergent soap such as Woolite, and dried in the air or on a dryer's lowest setting. Years of hopelessly shrunken socks and long underwear may be sobering enough to persuade you to stick with air-drying.

Down gear requires even more attention. Handwashing is generally the safest method, although you'll need several warm days to air-dry a down sleeping bag: Regularly pull apart clumps of wet down to hasten the process, and make sure that the waterlogged bag is evenly supported. Washers and dryers can be used to clean down gear, but you must be sure the washer's gentle cycle is truly gentle and the dryer's low-heat setting truly low. (Add a pair of clean sneakers to the dryer to keep down from clumping.) A few dry cleaners specialize in down gear, using petroleum-based (rather than synthetic) solvents.

While dirt and grit do abrade fabrics, a simple water rinse is usually sufficient to keep clothing reasonably clean when you're on the trail. (Besides, if you wash with soap—even the biodegradable kind—it's essential to do so at least 100 feet from lakes and creeks, which is inconvenient.) Clothing stains, while not fashionable, harm fabric less than the effort and chemicals needed to remove them.

Resist the temptation to hasten drying by wringing the daylights out of any garment you've washed or rinsed: When you put it on again you'll find it's been reshaped to fit someone much smaller or taller. Slow air-drying is best. If necessary, don wool and pile items before they're dry—they'll still keep you warm.

Fastidiousness fades away when you must deal with torn or ripped fabric. On the trail, adhesive rip-stop tape can be slapped on moderately damaged clothing and gear. (Rip-stop nylon, used in a multitude of outdoor products, has a barely visible grid of seams that retards tears.) Sew-on patches are more durable, but they're obviously harder to affix. Your repair kit should match your sewing ability; some fairly durable temporary repairs can be made with the sloppiest sewing skills. If you have the space, duct tape, the universal fix-all, can hold together a remarkable variety of mangled gear until you get home.

JAMIE HOGAN

Despite our efforts to avoid them, fabric catastrophes—a tent wall burned by an overturned stove, a pack torn by a curious bear, a jacket scorched by a campfire—do occur. If you're willing and able to take on the repairs yourself, an invaluable resource is *Sew and Repair Your Outdoor Gear* by Louise Sumner (The Mountaineers, 1988).

Even if you're conscien-

A SOOTHING BLEND OF CHAMOMILE, MINT, AND FLAVORFUL HERBS

It had been the kind of **whamBAM** day that s c r e e c h e s to a halt for a slow moving night so I p a d d e d to the stove and poured a big cup, its minty sweetness with a YAWN as I curled my feet under the covers and slowly sipped the hot, honeyed SPEARMINT tea as the warmth wrapped around my face and wrapped around me like a sweet dream that pulled me into the pillowy billowy softness of the sleepy time night which was so very quiet save the soft soothing zzzzzzzzzzzz zzzzzzzzzzzzzz **BEEP BEEP BEEP** of my ALARM CLOCK?!

A DIFFERENT CUP OF TEA

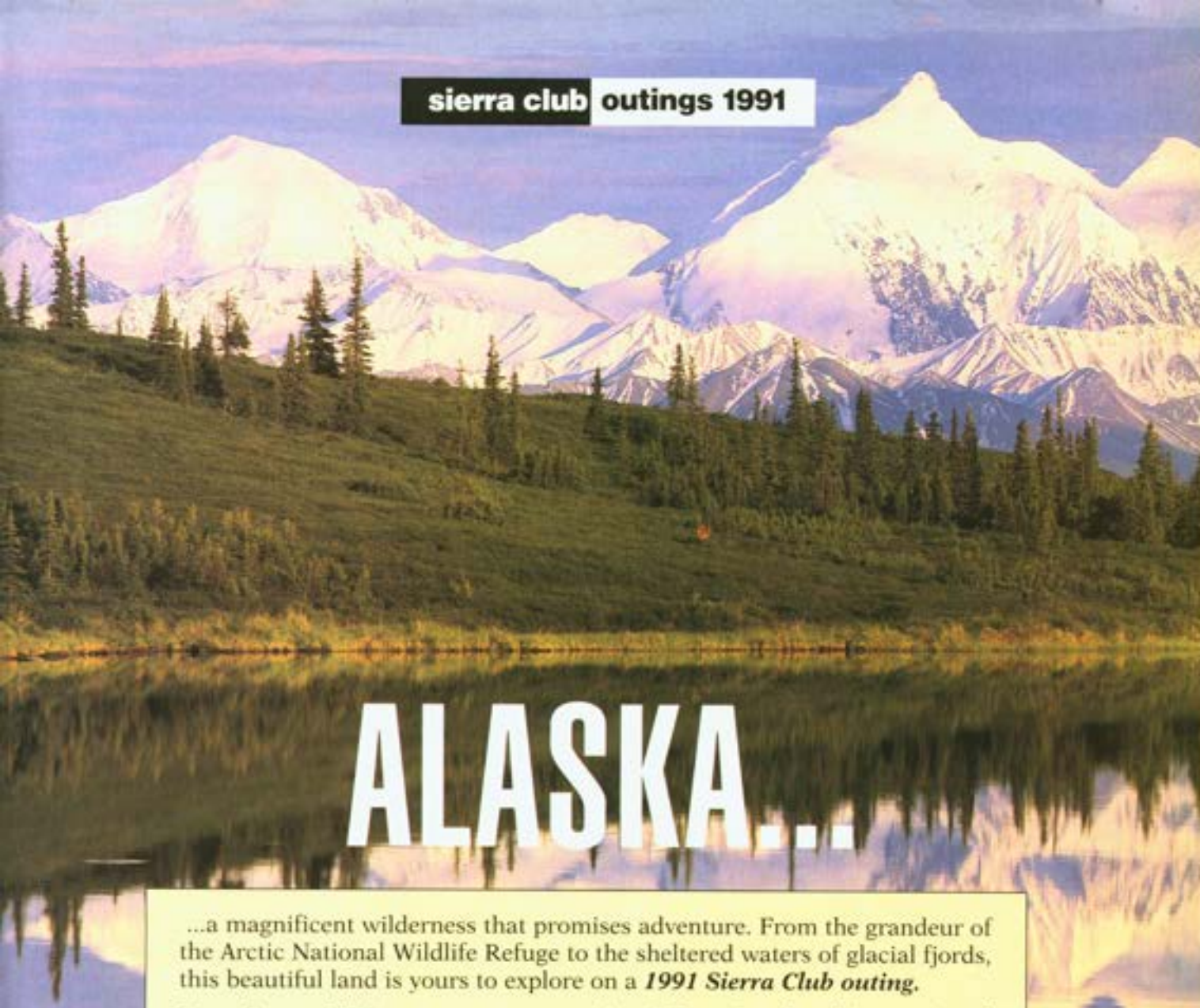
tious, you'll mistreat your gear at times. The dictum to allow wet gear to dry out slowly and completely before packing falls on deaf ears when you must break camp under foul conditions. Try to air out damp and thoroughly soaked gear at the first opportunity, however, and be especially careful with wet down—feathers weighted with water can tear out the insides of a parka or sleeping bag.

It's back at home that the prudent few leave the rest of us behind. Upon returning from a trip it's essential to clean and dry clothing and gear so that they don't mildew in storage. It's also wise to inspect equipment thoroughly and perform repairs while any problems you noted on the trip are still fresh in your mind. Following manufacturer's recommendations, seal boots and seams in clothing, tents, and packs; sealants keep water from seeping through needle holes, along thread, and between layers of fabric. Generally, sealant will hold better if applied to a seam's inside surface.

Restrain the urge to keep gear in stuffsacks in a dank corner of the garage; outdoor gear should be stored dry and uncompressed in a well-ventilated area. (Sleeping bags can be stored safely in oversized cotton sacks if you haven't the room to hang them in a closet.) Waterproof-breathable clothing should be hung on padded hangers, so that sharp creases don't develop that could damage coatings or laminates. If stored flat, they should be rolled instead of folded, and rerolled periodically.

If all this sounds like you're preparing gear for a space flight rather than a ski trip, you're not far off the mark. The engineers at Gore, 3M, Malden Mills, and elsewhere didn't toil in their laboratories concocting Dacron,™ Thinsulate,™ Polarplus,™ Gore-Tex,™ Quallofil,™ and Orlon™ just to have us ruin the stuff through simple neglect. If you treat outdoor gear as if it's precious, it will treat you well in the nastiest conditions you can find. ■

REED MCMANUS *is a senior editor of* Sierra.



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BOOKS

A Jungle of Competing Interests

The Fate of the Forest
by Susanna Hecht
and Alexander Cockburn
Verso; $24.95, cloth
Harper Collins; $9.95, paper

The Burning Season:
The Murder of Chico Mendes and the Fight for the Amazon Rain Forest
by Andrew Revkin
Houghton Mifflin; $19.95

The World Is Burning:
Murder in the Rain Forest
by Alex Shoumatoff
Little, Brown; $19.95

David Graber

EVERYONE SEEMS to know by now, though the news was late in coming: The South American rainforest is being consumed at a hellish rate. Ten years ago, biologists and anthropologists began issuing urgent warnings about disappearing species and the genocide of native peoples. More recently, climatologists warned that massive burning of tropical forests to clear land for cattle grazing could accelerate the greenhouse effect. Finally, the world's communications media began to focus on Amazonia in a big way, contributing their usual, peculiar mix of enlightening information and shallow, exploitative coverage.

A regrettable result of the last decade's attention is that the developed world has re-created Amazonia in its own image, peopling it with noble rustics and rapacious capitalists, and imagining it to be mainly a place of odd animals, majestic trees, and miraculous plants with the potential to cure all the world's ailments. Three recent books do much to adjust this romantic picture being beamed from South America's tropics and bring us back to reality.

The Fate of the Forest is a collaboration between Susanna Hecht, an agronomist at the UCLA Graduate School of Planning, and Alexander Cockburn, *enfant terrible* and left-wing British journalist. The authors force the developed world to confront its own complicity in tropical devastation, and argue that only a "socialist ecology" can save the Amazon. Whether or not that conclusion is correct, Hecht and Cockburn offer—at last—a comprehensive and scholarly look at the situation.

"What is now called the environmental destruction of the Amazon," they write, "is merely the latest surge in a long epic of annihilation." The authors provide a political and economic history to help us understand why this is so.

Nearly a century before Charles Goodyear discovered, in 1839, that rubber could be stabilized through vulcanization, the latex sap of *Hevea brasiliensis* and its relatives was already being sold on the world market as waterproofing for a vast array of materials. By the mid-1800s rubber was the focus of Brazil's economy, and by the end of the century American business interests began moving into Amazonia. Until its collapse when purloined seeds reached their maturity in other tropical regions, the rubber boom led not only to great fortunes but to development far up the Amazon River into the eastern foothills of the Andes.

Despite astronomic surges and catastrophic plunges in the Brazilian economy, the Amazonian forest changed little between European discovery and the end of World War II. But then began a geometric increase in deforestation that in 40 years would lead Amazonia to the brink of disaster. To Cockburn and Hecht, this was neither a consequence of overpopulation, nor a failure of "inappropriate technology." It was instead the product of

foreign capitalists in collusion with Brazilian elites living outside Amazonia attempting to extract maximum wealth from the region while taking virtually no interest in the ecological consequences of their actions.

The effects of this have been all too apparent to the Indians and the *seringueiros* (rubber tappers) of the Amazon basin, and for that matter to the landless peasants who make up most of the remainder of Brazil's population—but these people have never had a real say in their country's fate. Even the government's grand scheme to build a Trans-Amazonian highway and other roads to provide access to the rainforest, and Brazil's "Homestead Act" of the 1970s that granted land to peasants, were cynical projects designed to neutralize both peasants and forest-dwellers (the former would subdue the latter) while offering little prosperity to either group. As the authors note, most of the settlement programs in the region have failed.

The trouble in Amazonia is not the simple product of Malthusian population dynamics, say Hecht and Cockburn. Rather, the region's problems are an outgrowth of Brazil's autocratic and stratified society, and of the vast debts the ruling elite has incurred with First World banks while sending their own capital abroad. The chief threats to the rainforests are money and power, not ecological ignorance. Building walls around parts of the forest and declaring them ecological sanctuaries will not work, and has not worked anywhere in the Third World. Hecht and Cockburn think the only solution for preserving the Amazon is to enfranchise those who live in and draw their livelihood from the forest—who can be its best protectors. These people should be aided and encouraged to conserve the spectacular biotic treasure surrounding them.

This is where Chico Mendes and his friends come in. Almost nobody north of the equator had heard of Mendes until he was murdered in 1988. He was the radical Brazilian *seringueiro* who fought deforestation in order to sustain the culture and livelihood of his people, and who was adopted by the world's environmental avant garde shortly before his predictable murder by ranchers. Today he is the martyr of the rainforest and the hero of *The World Is Burning* and *The Burning Season*, two books with much in common.

The best thing about *The Burning Season* is its insistence on complexity. Andrew Revkin, whose customary beat is science reporting (for *The Los Angeles Times* and *Discover*), took a cram course in Portuguese, then spent a couple of months talking to people in the Amazon basin and another month getting to know the rest of Brazil. Revkin does what reporters are supposed to do but usually don't; he represents reality in multiple dimensions, with characters who have a variety of motivations—often conflicting—and with good guys and bad guys who get to tell their stories and show themselves to be equally human.

The gist of Revkin's report is that an indigenous counterforce has arisen in

Amazonia to fight deforestation by non-natives. The book focuses on Chico Mendes and his fellow rubber tappers, and on their efforts to gain a voice, organize for economic survival, and overcome a clique of autocrats who, abetted by First World moneylenders, have achieved vast wealth at the expense of both human and natural resources in their country. To the tappers, survival once meant eliminating the middlemen who sucked most of the profits from the raw rubber trade. Now it means preserving the very forest wherein they have carved a sustainable niche for themselves. In this, the mixed-blood *seringueiros* have of late discovered a natural alliance with the Indians, who likewise require the forest to live, and who have had even less political power than the tappers.

Contrary to the myth some conservationists have constructed around Chico Mendes, Revkin notes, the man was never a Brazilian John Muir. But he was a quick study, and he rapidly learned the connection between the protection of the tappers' way of life and larger global desires to protect the rainforest. Smart, well-read, and charming, he led his dispersed flock to political awareness, and to alliances first within Brazil and later beyond its borders, thus earning himself a place in the annals of the international conservation movement.

Alex Shoumatoff covers much of the same ground in *The World Is Burning*, but with a strikingly different style. Shoumatoff, a writer for *The New Yorker* and *Vanity Fair*, is city-hip and cynical. He's also an old Amazon hand, having written two other books about Brazil. His conceit here is to use the investigation into Mendes' murder as a chance to explicate—as Hecht, Cockburn, and Revkin have done—the intertwined realities of Brazilian and First World political economics.

Shoumatoff offers up "snapshots"—more than 60 short chapters that span everything from Brazilian elections to the accused (now convicted) murderers of Mendes, from Japanese economic interests in the Amazon to the phenomenon of the recurring El Niño

current off the Pacific Coast and its effects on global weather patterns. Like Revkin, he finds the Amazonian story complex, but he presents it in a frenzy, almost recklessly. His habit of turning the rainforest controversy into a kind of travelogue must be weighed against the truly astounding mass of information he presents. Shoumatoff's particular contribution is a genuine sensitivity to the Brazilian character. While his jump-cuts from one subject to another can be confusing and irritating, by the book's conclusion the reader has come closer to understanding Amazonia from a Brazilian point of view.

All three books make it apparent that the fate of the rainforest is in the hands of the developed world. Our insatiable appetite for raw resources is driving tropical deforestation. Nearly all of our transactions with South America have reinforced an elite that takes little interest in conservation. Rock concerts on behalf of rainforests merely reveal our shallow understanding of global economics. Fortunately, these books go a long way toward improving our knowledge. From them we learn that to save the Amazon we must help to empower the disenfranchised there while trimming our own extravagant lifestyles—which, by any standard, make our protestations to the Third World ring hollow. Otherwise the Amazon, that once remote, vast, and impenetrable ecosystem, will continue to be a victim of our uncontrolled know-how.

DAVID GRABER *is a research biologist with the National Park Service.*

BRIEFLY NOTED

It's a big world out there, and it can be an unsympathetic one when you're traveling far from home. **Lonely Planet guidebooks** (Embarcadero West, 112 Linden St., Oakland, CA 94607) offer logistical support for those occasions when you're exhausted, out of sorts, and looking for something other than an ox-cart to carry you over that final stretch of bumpy road to your destination: a vil-

lage where, the authors assure you, a hostel with real beds and even indoor plumbing awaits. There's a Lonely Planet guidebook for nearly every country in every accessible part of Asia, as well as Australia, the Pacific, Central and South America, Africa, Eastern Europe, the Middle East, and parts of North America. . . . Covering far less of the world but still no slouch in the planetary-guidebook business, **Moon Publications** (722 Wall St., Chico, CA 95928) contain a wealth of travel tips, maps, cultural observations, and accommodation listings—pretty much all the information you'd need to get from place to place in Egypt, Pakistan, a good portion of Asia, and many Pacific islands. Moon's main fare, however, is its America Series, featuring high-quality handbooks that cover Northern California, New Mexico, Texas, Arizona, Utah, Alaska and the Yukon, Washington state, and British Columbia, among other appealing places. These domestic guides convey the same sense of exoticism that their foreign counterparts do, making home-country travel seem like far-flung adventure. . . . Nan and Kevin Jeffrey have backpacked, sailed, bicycled, and canoed much of the world with their twin sons, Tristan and Colin. People they meet often inquire about the mechanics of such challenging family outings: What clothes do they take? Where do they sleep? How do they keep the children from getting bored, homesick, or afraid? The couple provide many answers in ***Adventuring With Children: The Complete Manual For Family Adventure Travel*** (Avalon House Publishing, c/o New England Reprographics, P.O. Box 340, Marstons Mills, MA 02648; $14.95, paper). . . . As development spreads in Latin America, the need for wilderness preservation there becomes more acute. In ***South America's National Parks: A Visitor's Guide*** (The Mountaineers; $15.95, paper), William C. Leitch notes that while that southern continent claims more than 160 nature reserves, only a few of them are managed efficiently, and many exist only on paper. But because conservation programs from Colombia to Chile are starved for funds, Leitch writes, "every time someone visits a South American park, he or she makes a tiny contribution to that park's welfare." This guidebook offers descriptions of and travel tips to 34 national parks in seven countries. . . . Trekking in the developing world requires being especially attentive to your health. As a resource to help you stay fit, Marc Robin and Bradford Dessery have written ***The Medical Guide for Third World Travelers: A Comprehensive Self-Care Manual*** (K-W Publications, 11532 Alkaid Drive, San Diego, CA 92126; $16.95, paper). The book gives detailed advice on diagnosing and treating everything from intestinal disorders to sexually transmitted diseases. . . . Sandra Hinchman became enchanted with the Colorado Plateau when she first saw its domes, spires, cliffs, arches, alcoves, and weirdly eroded sandstone goblins. Beginning

in 1984, she spent her summers exploring the region, notebook in hand. She describes the routes she took—dozens of loop hikes near the Four Corners area of Utah, Arizona, Colorado, and New Mexico—in ***Hiking the Southwest's Canyon Country*** (The Mountaineers; $12.95, paper). As a "gesture toward maintaining the desert's ecological health," Hinchman pledges to donate a quarter of the book's royalties to the Utah Chapter of the Sierra Club, the Southern Utah Wilderness Alliance, and the Utah Wilderness Association. . . . For something innovative in Rocky Mountain hiking guides, check out ***Trail Mates™ of Colorado***. Each $1.99 "Mate" consists of a non-rippable, water-repellant plastic sheet highlighting a single Colorado trail. Every sheet includes a topographic map, two full-color photographs of the region, directions to the trailhead, and natural-history notes. When not in use, the guides snap into a special binder ($3.99). For a catalog, write to Trail Mates of Colorado, 10597 N. Routt Lane, Westminster, CO 80021. . . . S. R. Gage's ***A Walk on the Canol Road*** (Mosaic Press, c/o Kampmann National Book Network, 4720-A Boston Way, Lanham, MD 20706; $17.95) combines journal entries with historical writing to tell the story of an ill-fated oil pipeline constructed in Canada during World War II. The author, who backpacked the length of the old pipeline road, tells how controversy swirled around the project, how its builders ignored the environmental impacts of their work, and what lessons the once-costly blunder holds for today. . . . Snowstorms in mid-July? They're not unheard of in some rugged parts of the West, as you'll discover from ***The Hiker's Guide to Montana's Continental Divide Trail*** (Falcon Press; $9.95, paper). It's the hardy soul who dons boots and backpack to hike this trail, passing through Glacier National Park, the Bob Marshall Wilderness, the southern Bitterroots, the Centennial Mountains, and, of course, Yellowstone National Park.

—Mark Mardon

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Where can I find information on environmentally sensitive housing developments and communities? (Mark Balcom, Clovis, California)

The *1990 Directory of Intentional Communities* lists more than 200 groups across the country organized around a wide variety of purposes, including environmentally aware living. It's $13.50 postpaid; write to: Directory, Sandhill Farm, Route 1, Box 155, Rutledge, MO 63563.

One example of a community designed to go easy on the environment is the 11-acre Ecological Urban Village, currently being planned by Co-op Resources and Service Project for a site north of Los Angeles. The village will feature nontoxic, native building materials, organic gardens, and 100-percent recycling. A sustainable-energy system will avoid use of nonrenewable resources, and a neighborhood layout that integrates living, working, and recreation areas will cut down on auto dependence. For more information, contact Lois Arkin, 3551 White House Place, Los Angeles, CA 90004.

For some fresh thinking about ecologically sound living spaces, you'll want to read *Cohousing* by Kathryn McCamant and Charles Durrett (Ten Speed Press, Berkeley, 1989), *Ecocity Berkeley* by Richard Register (North Atlantic, Berkeley, 1987), and *Sustainable Communities* by Sim Van der Ryn and Peter Calthorpe (Sierra Club Books, San Francisco, 1983).

DEBBIE DRECHSLER

Now that we can recycle some kinds of plastic, can I quit worrying about using it? (Joan Bailey, Ann Arbor, Michigan)

Recycling plastic sounds like a good idea—plastics take up 20 to 30 percent of landfill space—but doing so can be more troublesome and less efficient than recycling glass, aluminum, and paper.

Currently, only one percent of the nation's plastic is collected for recycling. Plastics are light and bulky, so they require more truckloads to make a ton, which increases storage and shipping costs for the recycler. Also, they may contain pigments, toxic additives, or nonplastic materials that limit reuse.

In any case, plastic recycling is more of a one-time transformation than a true cycle. Food packaging can't be made into more of the same, for instance, because the plastic can't be heated to sterilizing temperature, as required by the FDA. So those used take-out containers, soda bottles, and milk jugs you turn in at the recycling center are likely to become things like fiberfill stuffing, magnetic tape, flower pots, pipe, carpeting, or plastic lumber.

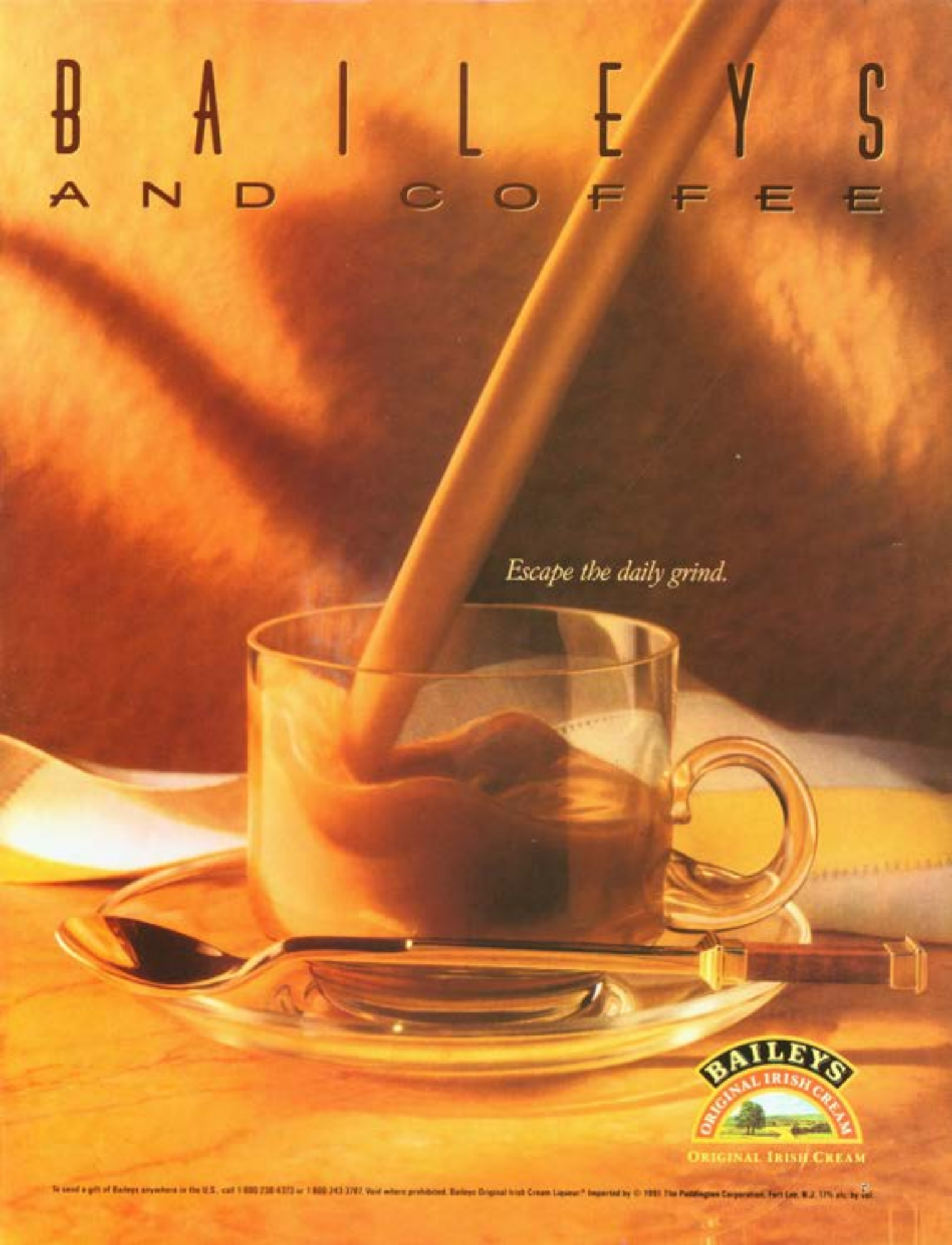
The real answer to the plastics problem is source reduction—that is, making and using less in the first place. So think before you buy, and try to avoid disposable products and overpackaged goods. If you must use plastic, of course, it's better to recycle it than to throw it away.

I know there are national parks and national monuments. What other designations are there in the National Park System? (Halyna Stelmach, New York City, New York)

Aside from national parks and monuments, there are 18 classifications in the park system. These include historic sites, historical parks, battlefields, battlefield parks, lakeshores, memorials, military parks, parkways, preserves, rivers, scenic trails, seashores, and recreation areas.

Some designations are unique. Brices Cross Roads in Mississippi, for instance, is the only national battlefield *site*, and, at one acre, is one of the smallest units in the park system. (Thaddeus Kosciuszko National Memorial in Pennsylvania is the smallest, at .02 of an acre.) And the sole *international* historic site is on St. Croix Island, Maine. There's a single Capital Park, and only one National Mall; neither a covered shopping center nor a monument to the Unknown Consumer, this stretch of greensward in Washington, D.C., extends from Capitol Hill to the Potomac River. The White House (yes, it's part of the park system) is also *sui generis*.

The varied designations can indicate differences in degree of protection. National preserves, for instance, permit hunting and trapping, which are forbidden on most national-park lands. ■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