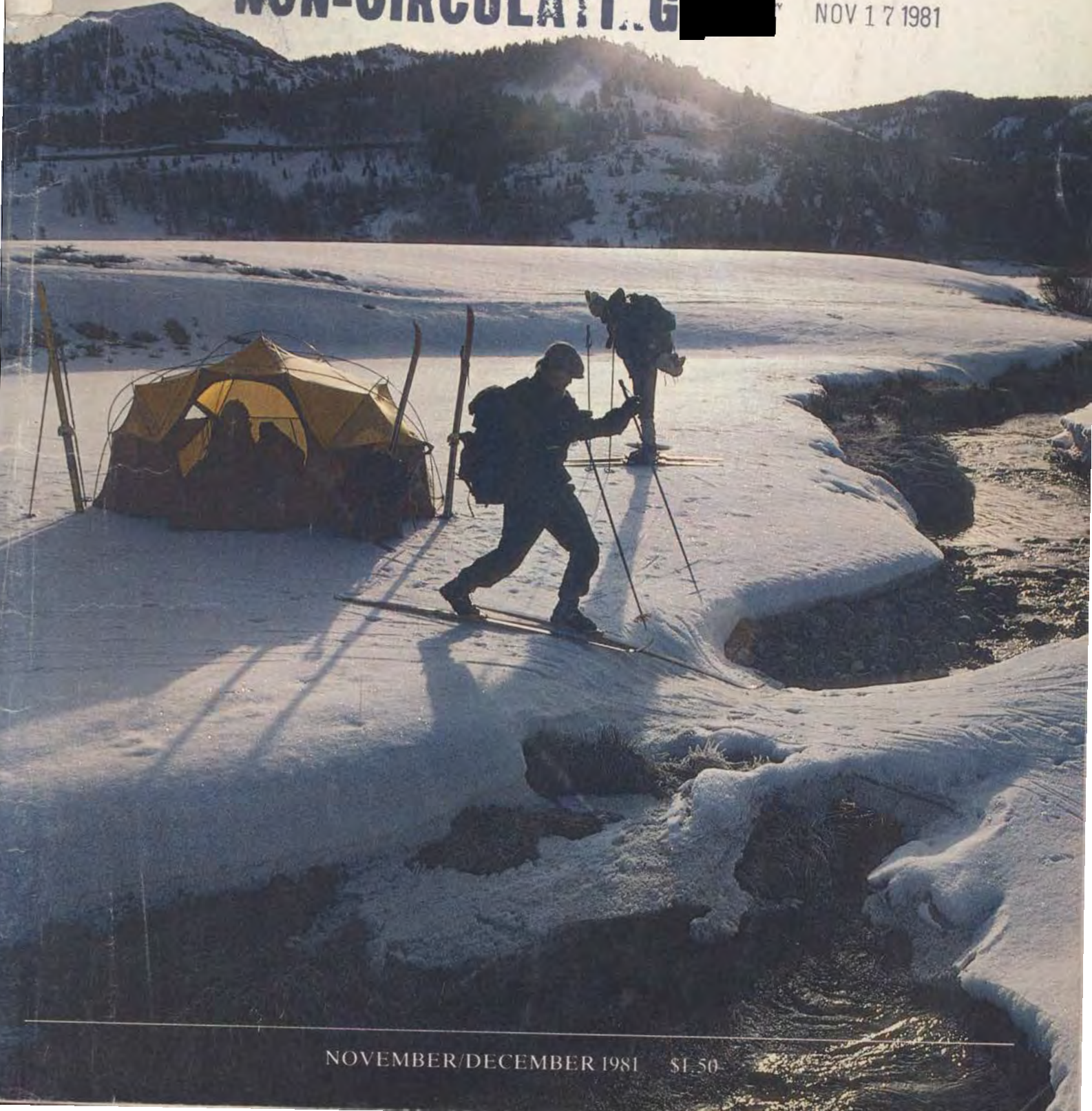


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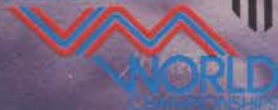
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PHOTOGRAPHERS AND THE PARKS

Thanks for your feature in the September/October *Sierra*, "Photographers for the Parks." I was embarrassed, however, to be given credit where credit is not due. The excerpt you inadvertently ran under my byline was taken from the curatorial notes written by the exhibit's curator, Robert Glenn Ketchum, the brilliant young photographer who selected and gathered together the photographs that constitute both the book *American Photographers and the National Parks*, and the museum exhibit which is being shown from now until 1983 in eight major U.S. cities. It should also be noted that the book and exhibit were developed by the National Park Foundation under the direction of its president, John L. Bryant, Jr.

Although I had nothing whatever to do with the exhibit or the selection of the remarkable photographs, I am the author of the book's 15,000-word text describing how the national park idea and landscape photography grew up together.

Robert Cahn
Leesburg, Virginia

The editor replies:

We are glad to have this opportunity to correct the record on this point. At the same time, we would like to note that the excerpt and photos were from *American Photographers and the National Parks* by Robert Cahn and Robert Glenn Ketchum, © 1981 by the National Park Foundation and Viking Penguin, Inc., and were reprinted by arrangement with The Viking Press. The exhibition is being presented nationally by the National Park Foundation and is funded by the Transamerica Corporation.

E-Z MOSQUITO TABLETS

Having heard previously of the beneficial effects of oral thiamine (vitamin B-1) in discouraging and even repelling mosquitoes, I purchased a supply of thiamine to take on my next hike through the mosquito infested meadows of the Sierra. Then, in the May/June 1981 *Sierra*, I noted the enticing

ad for E-Z tablets: "Mosquito bites, why suffer them?" I sent in my \$11.95 and received my package of 100 tablets of E-Z product promptly. Most interesting, however, is the description of the contents: "thiamine 100 mg."

Now, the E-Z tablets may work wonders. I did, however, call two of the local pharmacies and found that 100 tablets of thiamine, 100 mg in each tablet, sold for \$1.71.

E-Z tabs may be great, but I think your readers should realize that most any drug store sells thiamine tablets at a much reduced rate and without a prescription.

Everett D. Hendricks, M.D.
Prescott, Arizona

Sam Cordova, President of Cordova Laboratories (makers of E-Z Tablets) responds:

Our company has an unconditional guarantee for money back for our E-Z Mosquito Tablets.

E-Z does not contain B-1 exclusively. We add to the B-1 overripe alfalfa buds or alfalfa sprouts, which makes it considerably more effective in keeping mosquitos from biting, or if they do bite, the aftereffects are negligible. We realize that E-Z does not work on everyone. In fact, our studies have shown that it works on about 80% of the people who ingest it, and it helps an additional 5% to 10% in that the aftereffect of the bite is not severe. For that reason we refund anyone's purchase price upon request.

BEAR ETIQUETTE

After reading Peggy Wayburn's article ("Bear Etiquette," July/August), I think the author is unfamiliar with firearms and the laws related to them. To begin with, it is prohibited by federal law to carry a pistol across state lines. Additionally, if the person passes through Canada with firearms he or she risks a long term with all the amenities (such as they are), courtesy of the Royal Canadian Mounted Police.

As a certified rifle and pistol instructor, I can say that under the calmest conditions, such as the firing line of a shooting range, a great number of otherwise normally sensible people act like complete idiots with a firearm in their hands. This is only when the shooter is confronted with a piece of paper and is not set off by a face-to-muzzle encounter with a 900-pound bear.

Oscar W. Ruiz, Esq.
Queens Village, New York

It is surprising that *Sierra* would print an article that advocates burying food or garbage in the back country. But there it is in Peggy Wayburn's "Bear Etiquette." Burying garbage is not acceptable because this is precisely the way bears and certain

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other animals come to associate humans and human odors with food.

In addition, the use of twelve-gauge 00 buck or rifled shot against an animal the size of a grizzly is a poor choice except at very close range and in the most dire of conditions. Buckshot, which usually means nine or twelve pellets at size 00, does not have sufficient penetrating power and, even under full choke, begins to spread fairly rapidly. It may be possible to stop a grizzly with well-placed rounds of rifled shot ("slugs") but one should be aware that precision is not the hallmark of such shot fired through the smooth bore of a shotgun. Accuracy can be improved by using a rifled barrel, available from most manufacturers.

There is no commercially available handgun chambered for .375 magnum cartridges; Wayburn was probably referring to the .357 magnum. The .357 magnum or the .44 magnum will kill a grizzly but will probably require multiple well-placed shots at close range. Because sighting errors are magnified over the short barrel of a handgun, this is a choice only for those with considerable experience firing the weapon.

Stephen L. Piereson
Kent City, Michigan

Peggy Wayburn replies:

Inexplicably, the author and a half-dozen reviewers of the "Bear Etiquette" manuscript—including three Alaskan wildlife biologists who work with bears and use firearms—failed to catch the error (a typographical number reversal) in the caliber of the pistol mentioned in the text. It should read ".357 magnum," of course, and I apologize for not picking this up.

The recommendations for the kinds of guns to carry in bear country came directly from the Alaska Department of Fish and Game. They are contained in the department's publication, "The bears and you"—as is the suggestion that garbage be burned. The thoughtful remarks of Mr. Piereson regarding the inappropriateness of burying garbage in—or out of—bear country are well taken. I expect that Alaskans will stop the practice as more and more people use their beautiful wild country.

As for transporting firearms, the book *Adventure in Alaska*, from which the bear essay was taken, notes that it is illegal to carry a pistol from Canada. It also covers other state regulations pertaining to killing a bear in self-defense. People traveling with guns should, also, check the requirements of any state they pass through.

During the fifteen years I have traveled in Alaska, I have never met any wildlife biologist, hunter or Alaskan who suggests going into known bear country without making your presence as obvious as possible. □

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BY JOHN WILKINSON

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The Meadowland Butterfly Vase will be crafted in fine white porcelain—ideal for portraying the rich colors and graceful lines of Wilkinson's art. For his subject, the artist has chosen the loveliest butterflies that are seen in a sunny spring meadow. The Admiral, with its golden wings and distinctive black markings. The Painted Lady, softer in tone and elegantly graceful in flight. The Mourning Cloak, dramatic in tones of deep rust, blue and yellow. And the Purple Wing, aptly named for the shimmering beauty of its colors.

The artist has not only depicted the variety of shades and tones of the butterflies—using 16 different colors—but has captured the atmosphere of the English countryside as well. The height of the vase (11¼") provides ample room for this superb depiction. And, to add the final touch of refinement, the vase will be *hand-decorated* with a band of *pure 24kt gold* surrounding the crown and the base.

The Meadowland Butterfly Vase will be issued exclusively by Franklin Porcelain, and the responsibility for its creation has been entrusted to Franklin Porcelain of Japan, where there is a thousand-year-old tradition of crafting vases in fine porcelain.

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To enter your commission, be sure to mail your order to Franklin Porcelain, Franklin Center, PA, 19091, by November 30th.



Vase shown smaller than actual size of 11¼" high. Hardwood stand included.

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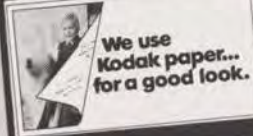
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CLEAN AIR—MORE BILLS INTRODUCED

Maneuverings continue before Congress rolls up its sleeves to work on the Clean Air Act. Two new pieces of legislation have been introduced; one would strengthen the Clean Air Act, the other would weaken it.

Senator George Mitchell (D-ME) has introduced the first comprehensive legislation to control the pollutants that cause acid rain.

The legislation mandates an eighteen-million-ton reduction of emissions of sulfur dioxide by 1990 in the 31 states east of the Mississippi River. Industries in that region currently emit more than 23 million tons annually. The pollution travels hundreds of miles, eventually falling as acid precipitation primarily in the northeastern United States and southern Canada. Senator Mitchell's bill, S. 1706, has bipartisan supporters, including the chairman of the Senate Environment Committee, Robert Stafford (R-VT). Ask your senators to cosponsor this bill.

Once again the auto industry has returned to ask Congress for further relaxation in the emissions standards for new automobiles. Backed by all the major auto companies, representatives Bob Traxler (D-MI) and Elwood Hillis (R-IN) have introduced a bill, H.R. 4400, which would double allowable levels of auto emissions from new cars, even though most new autos already meet tougher standards. Even the auto industry admits that this bill will not increase sales and will not put any auto workers back to work.



Mick Emmons

Before the petitions went to Washington, Club staff posed with them to show how much space a million signatures require. The staff is smiling because so many people support their efforts and oppose Mr. Watt's. That's Executive Director Michael McCloskey waving, chin-deep in petitions.

Readers are urged to ask their representatives not to cosponsor the Traxler-Hillis legislation, and instead to work against it.

OVER A MILLION— THE PETITIONS GO TO WASHINGTON

By mid-November the Sierra Club had many more than a million signatures on petitions calling for Congress to seek the replacement of Interior Secretary James Watt and to resist the wide range of anti-environmental initiatives of the Reagan administration. (The million-plus signatures included those gathered by Friends of the Earth, the Massachusetts Audubon Society and Greenpeace.)

Club volunteers from across the country brought the petitions to Washington, D.C., and on October 19 Sierra Club President Joseph Fontaine presented them to House Speaker Thomas P. O'Neill on the Capitol steps. The presentation was followed a day later by a reception in the Senate Office Building attended by many members of Congress. Club volunteers from nearly every state visited many of their congressional delegates' offices, where they discussed the administration's environmental policies, the Clean Air Act and wilderness legislation, as well as issues of local concern.

A fuller account of the petition presentation and its political impact will be included in the next issue of *Sierra*.

NAS FINDS CAUSES OF ACID RAIN DESPITE ADMINISTRATION'S DENIAL

The Reagan administration has claimed that acid rain's causes are undetermined and its effects unknown, and has called for more research on the problem. But a new report from the National Research Council of the National Academy of Sciences (NAS) says both causes and effects are known today and calls for quick action.

The NAS finds the evidence overwhelming and attributes the causes of acid rain largely to sulfur dioxide (SO₂) and the oxides of nitrogen (NO_x). It also says 88% of this SO₂ and a "huge portion" of the NO_x comes from auto, coal, and utilities' emissions. The industries involved have refused to accept responsibility for acid rain, claiming insufficient proof. The auto industry is even backing a bill to relax auto emission standards (see Clean Air Act news story).

The NAS report says acid precipitation is "definitely killing" aquatic life in lakes with low buffering capacity; such areas include the Adirondacks, where 180 lakes are devoid of fish.

According to the report, one of the more serious side effects of acid precipitation is its ability to leach toxic metals, primarily mer-

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Finally, the report criticized the remedy to the problem often touted by industry—applying lime to the afflicted lakes—saying this is too expensive to be effective over large areas, and a preventive approach must be taken.

"In the long run," the report says, "only decreased reliance on fossil fuels or improved control of a wide spectrum of pollutants can reduce the risk that our descendants will suffer food shortages, impaired health, and a damaged environment."

POLL SHOWS ADMINISTRATION ON WRONG COURSE

A large majority of the American public supports continued strong environmental protection, even if it requires economic sacrifice, according to the latest poll conducted by *The New York Times* and CBS. Results suggest the administration's policies that would relax environmental laws and step up exploitation of resources are out of tune with most Americans' sentiments.

More than two of every three people questioned agreed that "we need to maintain present environmental laws in order to preserve the environment for future generations." Nearly two-thirds of the 1479 Americans of voting age who were asked said they would keep the Clean Air Act tough.

Support for environmental protection cut across lines of age, income, education and race, and even of political parties. Republicans and Democrats, liberals and conservatives all indicated they approve of strong anti-pollution laws. But, according to *The New York Times*, "The divergence of public opinion from the environmental policies of the Reagan administration does not appear to have any sharp impact on the public's perception of the President himself, at least not yet."

Young people, urban dwellers and people living in the East and West give strongest support for environmental protection. Older people, rural people and southerners are less committed. Black people gave strong support to environmental protection: 54% said there should be environmental protection at any cost, compared to 44% of whites.

REAGAN SCRATCHES MX "RACE TRACK"

President Reagan has decided not to build the expensive and environmentally disruptive multiple protective shelter (MPS or "racetrack") basing mode for the MX missile. The Club had opposed the MPS system, which would have been sited on public lands in Utah and Nevada. A lot of land, water and energy would have been needed to build and operate the system. Reacting to President Reagan's decision, Sierra Club Executive

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- COSTA RICA - Flora and Avifauna . . . Jan. 82
- AMAZON BASIN - unexplored areas of Cuyabeno . . . Jan. 82
- SOUTH PACIFIC - Tahiti, Bora Bora, Moorea, Huahine, Raiatea . . . Feb. 82
- TANZANIA - just for 10 . . . Feb. 82
- THE BEST OF KENYA with Joe and Lu Cadbury, Audubon Maine . . . Feb. 82
- GALAPAGOS and AMAZON . . . Feb., Mar., Jun., Jul., Nov., Dec. 82
- BIRDS OF SURINAM, an ornithology workshop . . . Jun. 82
- THE INCA TRAIL and AMAZON Tropical Forest . . . Jun. 82
- EAST AFRICA photo safaris . . . Aug. 82
- KENYA, ETHIOPIA, TANZANIA . . . Aug. 82
- TANZANIA, SEYCHELLES ISLANDS, KENYA with Dr. New . . . Aug. 82
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Director Michael McCloskey said, "This decision comes not because Reagan recognized the damage that such a 'racetrack' basing mode would inflict, but because the people of the Great Basin rallied, formed an unusual coalition and made such a scheme politically impossible."

COURT FINDS FIVE-YEAR OCS LEASE SCHEDULE DOESN'T PROTECT ENVIRONMENT

The U.S. Court of Appeals for Washington, D.C., has found that the five-year outer continental shelf (OCS) leasing schedule prepared by the Carter administration was legally deficient. The case was appealed from district court, which had decided otherwise.

The suits involved, brought by the states of Alaska and California, the Natural Resources Defense Council and other environmental groups including the Sierra Club, contended that the leasing schedule announced by then-Interior Secretary Cecil Andrus did not adequately evaluate information concerning the marine environment or the impacts of OCS development on other uses of the seas.

Environmentalists maintain that the OCS leasing schedule, as modified by the Reagan administration, proposes a pace so accelerated—a billion offshore acres over the next five years—that such evaluations would be impossible.

The administration has evidently decided not to appeal the ruling, and the Department of the Interior says it will modify the program to provide greater consideration of environmental factors. With this confident assurance from James Watt's office, and with an unchanged leasing schedule, the practical effect of the appeals court ruling is unclear.

MAJOR RULING SUPPORTS BOUNDARY WILDERNESS

Ruling on two cases that had been merged, the Eighth Circuit Court of Appeals decided the law that created the Boundary Waters Canoe Area Wilderness in Minnesota was constitutional. The state of Minnesota and several property owners' associations had challenged the federal government's jurisdiction. The Sierra Club was a co-intervenor for the government.

The court also ruled that the property clause of the U.S. Constitution grants the federal government the authority to restrict the use of snowmobiles and motorboats, and the right to first refusal in purchasing inholdings from private owners.

Charles Dayton, an attorney for the intervenors, said, "The opinion is an excellent and scholarly piece of legal craftsmanship and should become a nationwide precedent in wilderness cases." □



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THE MEDFLY A Mist of Confusion

JOHN ZIEROLD

FOR JERRY BROWN, life as California's governor this year turned out to be a succession of stern lessons in biological and political science. The most recent of these has taught him the cosmic reach of an ancient admonition never to despise a small wound or a humble enemy. A year ago last June, it now appears, there began a period during which some technocrats in his administration may have underestimated both.

On June 5, 1980, a detection trap in San Jose yielded two golden-mawed flies thought to be *Ceratitis capitata*, the Mediterranean fruit fly. Laboratory examination later verified this, and the discovery set in motion a cautious, mindful-of-the-impact



Mediterranean Fruit Fly
[*Ceratitis capitata*]

program that in the ensuing year was to become the third-largest Medfly eradication effort ever undertaken in the United States. But whatever the body count of backyard quince and persimmon stripped of host fruit, or the tonnage of pesticides laid down by hand sprayers and helicopters, America's statistically impressive campaign against the Medfly was an unpopular war beset by conflicting advice and recrimination.

It is a cruel irony for someone who tried, as Governor Brown did, to put human health first, that this war on a bug may have done as much harm to his political future as Vietnam did to Lyndon Johnson's. Brown's approval rating has plunged to its second-lowest level in his almost two full terms as governor. He will pay the price for a disheartening series of blunders beyond his effective control—as all chief executives must in such cases—even though the Medfly in California has quite likely been brought under control for now.

Of West African origin, the Medfly is now common to all continents and is of constant concern to any fruit-producing nation. It is a small creature, but it can be a fearsome pest. After mating, female Medflies deposit their eggs just below the skin of ripening fruit. Eggs hatch into larvae, which bore into the fruit pulp. Mature larvae leave the fruit and enter the soil, emerging as adult flies.

During the process, Medfly larvae destroy the pulp of ripening fruit by digestion and induced bacterial contamination; 253 different fruits, nuts and vegetables are Medfly hosts. In California, citrus, loquats, cherries, apricots, quince, peaches, plums, pears, apples, figs and persimmons are heavily infested. Other crops infested occasionally are avocados, bell peppers, tomatoes, walnuts, grapes and cotton.

After a period when most people, including those in agriculture, ignored the subject, all sides contemplated the Medfly in terms of a bleak future. Agriculture interests argued that if the Medfly were permanently established in California, losses would run as high as \$2.5 billion annually. They urged the immediate spraying of the pesticide malathion. That, countered scientists at Stanford University, might well entail long-term genetic risks for people. Reaction to the scientists' estimate of probability was swift in some communities, where city councils hastily adopted what were probably unconstitutional ordinances banning aerial spraying of malathion.

Malathion is an organophosphate, and that is toxic because it interferes with the transmission of nerve impulses. It is one of the least acutely toxic of all organophosphates. The pesticide in pet flea collars is 65 times more toxic when taken into the body through the skin. Still, deaths have been

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reported from workers exposed to massive doses, and little comfort was available for those who might be subject to cumulative, long-term harm.

Thus, constituents' fears and Governor Brown's inherent environmental sensitivity held sway at the outset over how the battle was to be waged. But in the end the economic fears of agribusiness and the clout of the Reagan administration dictated the strategy, and the tactics switched from intensive tree stripping and ground application of malathion to all-out aerial spraying over a broad swath of California.

Brown had opted for a massive ground effort using sweet bait sprays laced with malathion and release of sterile flies. The technique had worked satisfactorily in 1975 to eradicate the Medfly from a 100-square-mile area in suburban Los Angeles. It had worked again in 1980, using fruit stripping, ground spraying and sterile-fly release in San Fernando.

So the ground program began in the Santa Clara Valley on June 18, two weeks after the suspected Medflies were discovered in San Jose's Willow Glen district. Traps were set out to determine the extent of the infestation. Critics now say the trapping was inadequate, and that this was the most serious technical error in the Medfly fight. The charge is based on the theory that agricultural officials were not aware of the Medfly's numbers and therefore their efforts were too little and came too late to combat the infestation effectively.

But other factors were perhaps more critical. Most entomologists were certain the Medflies could not survive the winter, one reason cited for denial of funds for the eradication effort. Staffing was inadequate, so fruit sampling in a 400-square-mile area was left to 20 people. More important, though, the assumption that San Jose's winter was too harsh for the Medfly was open to ques-

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tion. Later, a cursory search of literature in French and Spanish scientific journals dating back to 1931 turned up monographs indicating that the Medfly in Europe survived much colder weather than a San Jose winter. Throughout the summer and fall of 1980, a technical advisory committee met periodically to analyze data and consider eradication techniques. Funding was limited, and the program continued at a relatively low level.

Then in October a week of unseasonable 90° to 100° temperatures struck. Medfly catches dipped from 75 to 100 sterile flies for every fertile wild fly to ratios of 56 to 1 and then 13 to 1—far below the 100 to 1 goal. Flies had spread to neighboring Alameda County, and it was apparent that the program was in trouble.

In December state and federal officers announced that aerial spraying of Santa Clara County would begin. Concerned citizens thronged public hearings to protest, and local governments responded by endorsing continued fruit removal and ground spraying. Medfly program officials dropped plans for aerial spraying but did little on fruit removal. Rural legislators insisted that the governor declare a state of emergency, which he did within a few days.

Changes were made in the campaign leadership, and the program was intensified. Traps were added and plans were adopted to spray known areas of infestation as many as three separate times. An army of both federal and state workers and many thousands of volunteers were marshalled for the effort, which included stripping all fruit from the area's trees.

Throughout the following spring and early summer, extensive samples of fruit revealed no larvae finds. Had there been



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spring breeding, larvae should have been evident as early as mid-April. The situation was looking up.

But then in late June, homeowners began reporting infested fruit in an area where no flies or larvae had been found before. In early July, a trap yielded a certain female among a batch of sterile Peruvian Medflies that had been deliberately released to reduce the proliferation of the flies. Examination showed eggs in its abdomen, and the worst of all possible fears was realized: Peruvian flies assumed to be sterile were actually fertile. Pressure mounted for aerial spraying, and resistance to it was doomed.

Even so, Governor Brown stood by his commitment to a ground program out of concern for unacceptable health risks. But the Reagan administration threatened a quarantine on all California produce, and after talks with U. S. Agriculture Secretary John Brock and presidential counselor Ed Meese, Brown ordered aerial spraying.

Since then, the Medfly has been discovered in the San Joaquin Valley—followed by the helicopters spraying over a wider and wider area. Nevertheless, the outlook now is that the campaign will be won.

If there is a bright side to all of this, it is the expectation of beefed-up detection programs not only for the Medfly, but for the gypsy moth and other pests. On the other hand, will better detection be matched by better control programs? Or will California simply see more poison in bigger buckets? □

John Zierold is the Sierra Club's Sacramento, California, representative.

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DIABLO CANYON: TWISTS OF FATE

DAVID GANCHER

OCTOBER WAS MARKED by the sudden turns of fortune that have accompanied the nuclear power controversy in recent years—and especially the Diablo Canyon nuclear power plant. The struggle over Diablo Canyon is almost a melodrama of environmental confrontation, full of twists of fate and sudden reversals.

In the nearly two decades since the plant's inception, the dimensions of the controversy have deepened and darkened. What began in 1962 as a simple question of siting gradually broadened to include factors of safety, seismic geology, energy policy, economics and vehement citizen protest. Each time the Diablo Canyon plant has seemed on the verge of being licensed, something new—and unexpected—has happened to stall operation. The revelation, after construction was underway, of the Hosgri fault only 2.5 miles away resulted in a delay starting in 1973 (though the fault had been discovered several years earlier).

Five years later, an earthquake in the nearby Imperial Valley contributed to another lengthy delay when buildings were damaged although, according to federal standards, they had been considered safe.

All along, citizen opposition has grown and intensified. Early local support for the plant reversed when safety questions were raised. Local groups participated in hearings, then became intervenors in the licensing process. Eventually lawsuits were filed, and finally, in September, civil disobedience began when demonstrators opposed proposed low-power testing of the reactor. More than 2000 people were arrested, including 222 local residents.

The protests failed to dissuade the Nuclear Regulatory Commission (NRC) from granting a license to begin the testing that could eventually result in commercial operation of the plant. It seemed that the long struggle was finally over.

But a few days later, when fuel rods were being loaded, a drastic engineering mistake was discovered. Some major safety equipment had been installed wrong, calling into question the structural integrity of many

design features of the plant. Diablo Canyon was back in limbo again. The NRC demanded new tests, raising a whole new set of safety questions.

Pacific Gas and Electric (PG&E), the plant's owner, claimed that "only minimal" repair work would be required. The NRC, however, wondered whether the errors were not "symptomatic of some widespread breakdown."

Then, in late October, yet another set of serious design errors came to light, this time involving structures intended to support the weight of safety equipment. PG&E grimly maintained its corporate optimism.

Along the line, other factors entered the picture. Demand for electricity in California has not increased as anticipated, making Diablo Canyon's power superfluous. The financial picture grew dark for PG&E. The stockholders of PG&E, not the ratepayers, have been paying the costs of the plant so far, and the utility cannot begin to recover its investments until Diablo Canyon actually enters commercial service; PG&E's costs for the facility run about \$1 million a day. But neither the utility nor the Reagan administration seems to have learned from the Diablo Canyon controversy. The administration, advocating a pro-nuclear policy, claims "Nuclear power has become entangled in a morass of regulations that do not enhance safety. . . ." A House of Representatives Government Operations Committee report, on the other hand, claims "The nuclear industry has attempted to blame the NRC for problems that lie within the industry and the energy marketplace. . . ." Indeed, the engineering mistake argues forcibly for *more* regulation, not less.

What lies ahead? According to John Ashbaugh, the Santa Lucia Chapter's Chair, "If Diablo Canyon is allowed to go on line, and if PG&E's operating and maintenance record bears any resemblance to the flawed design and construction of this facility, we can expect nothing but continuing blunders. The entire project should be abandoned before it's too late and should be recognized for what it is: an aging monument to an obsolete and dangerous technology." □

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AS ALWAYS, our Spring Outings are largely concentrated in the warmer parts of the country. There is something here for almost everybody, ranging in effort from the strenuous to the downright slothful. You'll find backpacking, boat trips, biking, skiing, service trips and base camps—even a trip to Hawaii.

Sierra Club trips average from 12 to 25 members and are generally organized on a cooperative basis; trip members help with the camp chores, including food preparation and cleanup, under the direction of a staff member. First-timers are often surprised at the satisfaction derived from this participation. To determine which outing best fits your needs, read the following trip descriptions carefully and see "For More Details on Spring Outings." Reservation requests are being accepted now for all spring trips. See "Reservation Cancellation Policy for Sierra Club Trips" (page 24) and trip application form. Watch for your January/February issue of *Sierra* for the complete listing of 1982 Outings.

(288) Maine Back Country Ski/Snowshoe Tour—January 10-16. Leader, Fred J. Anders, 117 Leverett Rd., Shutesbury, MA 01072. Cost: \$325.

East of Moosehead Lake lies one of the largest wilderness tracts in the Northeast. Our base cabins on Long Pond are six miles from the nearest paved road. The area is

surrounded by numerous mountains 2000 to 3000 feet high. All personal equipment must be skied in via old logging roads. Day trips include The Hermitage, Gulf Hagas Gorge, Trout Pond and the Monument Ledges. Snow, spruce and fir trees and cold, crisp days are assured.

(289) Adirondack Ski Touring, New York—January 24-30. Leader, Walter Blank, Omi Rd., West Ghent, NY 12075. Cost: \$295.

Trips will be run daily for skiers of all abilities in a series of cross-country tours in the Adirondack Forest Preserve. There will be opportunity to upgrade the level of your skiing and to visit remote areas of the Adirondack Park in mid winter. The first four nights will be spent in a lodge on a wilderness lake, with main meals at the lodge and lunches on the trail. The last two nights trip members will ski into two remote cabins heated by wood stoves. Packs and sleeping bags are required for the last two nights. Leader approval required.

(290) Boundary Waters Cross-Country Ski and Snowshoe, Minnesota/Ontario—March. Leader, c/o Keith Olson, 410 Berkeley, Elmhurst, IL 60126. Cost: TBA.

Cross-country ski or snowshoe, listen to the wolves, take photographs, sketch, or enjoy the beauty of the frozen north. Our base camp will be on the Gunflint Trail, 30 miles from Grand Marais, one mile from the Boundary Waters Canoe Area and about three miles from the Canadian border. We will be taking day trips from our cabin-based camp, with overnight trips if desired. No experience necessary. Minimum age is 15.

(26) Sand and Surf Bike Tour, Southern California—April 3-10. Leader, Bob Hartman, 1988 Noble St., Lemon Grove, CA 92045. Cost: \$150.

Our cycle tour will enjoy the full beauty of the lower California desert. We head east from San Diego, cross over the Laguna Mountains and descend into Anza-Borrego

Desert State Park. A pass around the Salton Sea and a steep climb over the Santa Rosa Mountains will set us on a course for the Pacific Ocean. We'll be able to cool off in the surf along the golden beaches that stretch to San Diego. This 450-mile, self-contained bicycle tour is an ideal trip for a hearty cyclist or an enthusiastic newcomer.

(27) Natural History of the Anza-Borrego Desert Base Camp, California—April 4-10. Leader, Ray Des Camp, 510 Tyndall St., Los Altos, CA 94022. Cost: \$205.

Our camp will be located near Borrego Springs, about 90 miles northeast of San Diego, in California's largest state park. The outing is designed for those who would like to explore and study the natural wonders of the living desert. We will use members' cars to travel to various points of interest where our easy day-hikes will begin.

(28) Mazatzal Wilderness Service Trip, Ton-to Forest, Arizona—April 4-10. Leader, Rod Ricker, P.O. Box 807, Cottonwood, AZ 86326. Cost: \$75.

This is a backpack trail maintenance trip in the little-used Mazatzal Wilderness, part of one of the largest roadless wilderness areas in the state. The country has rugged and picturesque mountains that are cut by steep-sided canyons. Pine and Douglas fir in the higher elevations yield to the upper Sonoran Desert. It is especially beautiful in the spring.

(29) Crater Lakes Cross-Country Ski Tour, Oregon—April 4-10. Leader, Marriner Orum, 2389 Floral Hill Dr., Eugene, OR 97403. Cost: \$175.

We will camp at the roadhead for the first three days, taking day trips to become acclimatized. We will carry our gear on a four-day journey following the park road around the lake—38 miles. Views of the lake and Wizard Island are scenic in their mantle of snow. Weather can be stormy, and we cross one small avalanche area. This trip will be a



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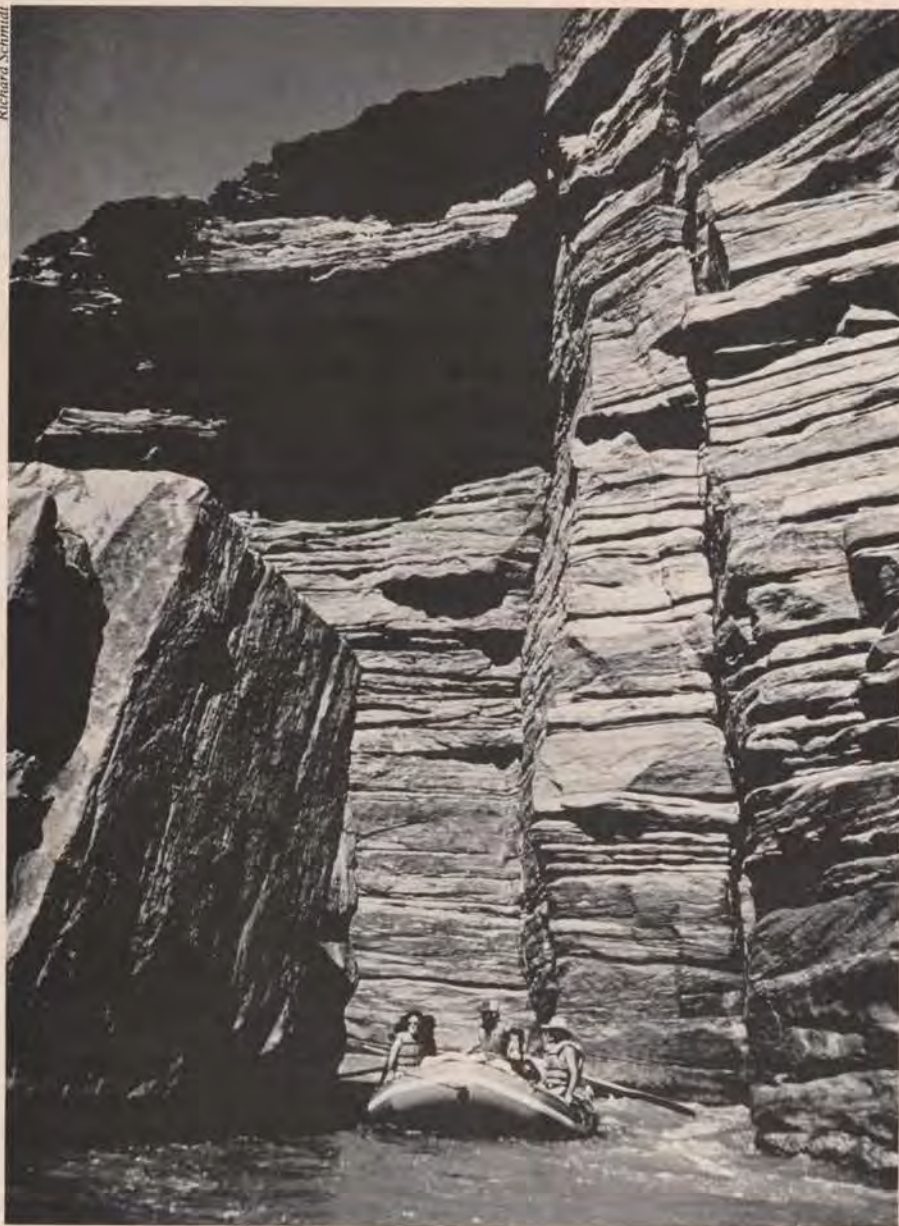
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RIVER AND SAILING TRIPS CANCELLATION POLICY: RIVER RAFT, SAILING, DORY AND SPORTYAK TRIPS HAVE A DIFFERENT CANCELLATION POLICY THAN OTHER TRIPS. IN ORDER TO PREVENT LOSS TO THE CLUB OF CONCESSIONAIRE CANCELLATION FEES. On these trips, refunds will be made as follows:

45 days or more prior to trip	90% of trip cost
30-44 days prior to trip	75% of trip cost**
14-29 days prior to trip	50% of total trip cost**
0-13 days prior to trip	No refund**

**If the trip place can be filled, then the cancellation policy penalty shall amount to the nonrefundable deposit or 10% of the total trip cost, whichever is greater.

PLEASE NOTE: This policy does not apply to canoe trips. The regular policy applies to these trips.



good opportunity to extend your winter camping abilities. Some previous skiing and winter camping experience is needed on this moderate to strenuous trip.

(30) Springtime on Lanai, Hawaii—April 2-10. Leader, Mía Monroe, 428 Tenth Ave., San Francisco, CA 94118. Cost: \$475.

Join our spring island adventure on Lanai. From our base camp at beautiful Hulopoe Bay we will leisurely discover ancient petroglyphs and village sites, beachcomb the "shipwreck coast" and have plenty of time to enjoy the finest swimming and snorkeling on the Pineapple Island. A sampling of delicious island fare will be featured; commissary duty is shared by all.

(31) Red Rock-Wilson Mountain Service Trip, Coconino Forest, Arizona—April 11-

17. Leader, Jim Ricker, 525 S. Elden, Flagstaff, AZ 86001. Cost: \$75.

We will be rerouting and repairing the National Scenic Trail up 6900-foot Wilson Mountain. This is in the heart of Arizona's beautiful Red Rock country. Views from the top include Oak Creek Canyon, Sedona, Dry Creek Basin, Verde Valley and hundreds of square miles of the Coconino Forest. There will be plenty of time for day hikes and we will move our base camp at least once. Expect warm days in the lower elevations with a chance of snow in the higher elevations.

(32) Mammoth-Parker Pass Alpine Ski Tour, Inyo Forest, Sierra—April 11-17. Leader, Bob Paul, 13017 Caminito Mar Villa, Del Mar, CA 92014. Cost: \$175.

We will tour at 10,000- to 12,000-foot

elevations from Mammoth Ski Resort north into Thousand Islands Lakes basin and beyond, snow-camp in the shadows of majestic Mt. Ritter and Banner Peak, and climb to the summits of Donohue Peak and Mt. Lewis. All equipment and supplies will be carried, except for a mid-trip food cache. Layover days will allow exploratory skiing without packs. For intermediate skiers with snow-camping experience, the 33-mile trip will be rated moderate to strenuous.

(33) Spring Wildflower Week Base Camp, Tweedsmuir Park, British Columbia—May 10-16. Leaders, Katie Hayhurst and Dennis Kuch, Box 108, Hagensborg, BC, Canada V0T 1H0. Cost: \$300.

The Sierra Club's Talchako Lodge lies deep in the coast range of mountains inland from Bella Coola, BC. While surrounding peaks are blanketed in snow, the valley will be covered with orchards. Bald eagles will be reclaiming their nests. We will make daily forays to trails in the valley and surrounding Tweedsmuir Park, then return to the lodge for home-cooked meals and leisurely evenings.

(34) North Kaibab Trail Crew Service Trip, Kaibab Forest, Arizona—May 21-31. Leader, Teresa Balboni, c/o K. Runyon, 475 Crofton Ave., Oakland, CA 94610. Cost: \$75.

We go to the desert country just north of Grand Canyon for a trail reconstruction project in a remote area. This trip is particularly planned for women, offering the chance to work and play in a situation of independence. The desert and its forest offer unusual challenges and breathtaking beauty. Come meet them both!

BACKPACK TRIPS

BACKPACK TRIPS offer the greatest freedom for exploring wilderness because everything you need is on your back. Young and old are today showing an eagerness for the adventure, solitude and personal challenge of backpacking. Sierra Club trips provide all these rewards as well as the example of how to backpack knowledgeably and comfortably. Backpacking is a strenuous activity, however. For a trip of a week, the starting load may weigh from 35 to 40 pounds, but the exhilaration and extra physical effort make you feel more a part of the wilderness. With today's new designs in backpacking equipment, almost anyone in good health and physical condition can enjoy backpacking.

All trips require members to help with the cooking and camp chores, although the lead-

ers provide commissary equipment and food. Trip members bring their own packs, sleeping bags, shelter and clothing.

Trips are rated as leisurely (L), moderate (M), or strenuous (S), or levels in between, by the individual leader. The ratings are made as accurately as possible on the basis of total trip miles, cross-country miles, the aggregate climb, the difficulty of the terrain and its elevation.

Strenuousness is measured also in less obvious ways. On desert trips members are often required to carry liquids that significantly increase their pack loads. Canyon trips entail steep descents and climbs, and temperatures may vary considerably from top to bottom.

The demands of backpacking require that the leader approve each trip member based on responses to questions about previous backpacking experience and equipment. If you lack experience or have never backpacked at high elevations for any length of time, you may qualify for one of the less strenuous trips by going on weekend backpack outings prior to the trip. Unless otherwise stated, minimum age on backpack trips is 16, although qualified youngsters of 15 are welcome if accompanied by a parent.

(36) Desert Spring, Superstition Wilderness Area, Arizona—March 7-13. Leader, John Peck, 4145 East Fourth St., Tucson, AZ 85711. Cost: \$135.

We will hike through photogenic high-desert canyons (3000) at an enjoyable pace—up to eight miles per day—at the peak of the flower season. The trip features good food and simple access by air. There are moderate elevation gains, but trails and routes are rocky. Age limit is 16 years solo. (Rated M)

(37) Galiuro Wilderness, Coronado Forest, Arizona—March 21-27. Leader, Sid Hirsh, 4322 E. 7th St., Tucson, AZ 85711. Cost: \$145.

From the outside, this remote southeastern Arizona mountain range appears as long, brushy, rocky ridges, with a few high knobs on top. There is no hint that inside is a series of beautiful canyons running almost the length of the range. We will travel both on the ridge with its magnificent vistas and in the densely vegetated canyons, dropping down through steep slopes of brightly colored soils and rocks. Elevations range from 7671 feet at Bassett Peak to 5000 feet at Rattlesnake Canyon. (Rated M-S)

(38) Grand Canyon, Arizona—April 3-10. Leader, Jim Hart, 5375 Duke St., Apt. 1212, Alexandria, VA 22304. Cost: \$200.

The week preceding Easter we will backpack over unmaintained trail and cross-

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country to remote areas of Grand Canyon National Park. Unreliable water sources, hot days, cold nights, rough terrain and heavy packs are offset by displays of spring flowers, the desert wildlife and unsurpassed grandeur. This trip is for well-conditioned and experienced hikers. Some use of rope for descents may be required. (Rated S)

(39) Ventana Desert to Redwood Forest, Coast Range, California—April 3-10. Leader, Bob Berges, 974 Post St., Alameda, CA 94501. Cost: \$140.

Spring is the time to get your boots moving on the pleasant trails of the upper Big Sur drainage. Camps will be on 4000-foot ridges and in river canyons. Our layover day will be spent at Redwood Creek. A short walk from there will let us enjoy a soak in a hot spring. On a short side-trip, we will walk to the top of South Ventana Cone (4965) the highest summit in the wilderness. Wildflowers will be blooming and all required hiking is on trails. (Rated L-M)

(40) Bandelier Monument Backpack, New Mexico—April 5-9. Leaders, Louise and Calvin French, 1690 N. Second Ave., Upland, CA 91786. Cost: \$155.

Hundreds of Indian ruins dot the 23,000 acres of wilderness sampled in five days in

the Santa Fe area. Although geologically, archeologically, and historically fascinating, Bandelier has never before been visited by a Sierra Club Outing. Each day we'll hike five to nine miles, mostly on trail, at about 7500 feet. Some of the archeological sites we'll visit are virtually uninvestigated, and the geology features one of the world's largest calderas, a huge collapsed volcano. (Rated M)

(41-E) Cone Peak, Ventana Wilderness Natural History, Coast Range, California—April 17-25. Leader-Instructors, David Reneau, 410½ Pacific Ave., Paso Robles, CA 93446; Frances Cave, 278 Whitney St., San Francisco, CA 94131. Cost: \$145.

The Santa Lucia Mountains offer high ridges with ocean views, colorful wildflower displays, and rugged, forested canyons. From the coast we will climb through groves of the rare Santa Lucia fir to the open vistas atop Cone Peak (5155). Hiking along the Coast Ridge and adjacent valleys will take us to the redwood forests of Big Sur. The varied natural history and geology of the Ventana Wilderness will be discussed by the leaders en route and on a layover day in Indian Valley. (Rated M)

(42) Kanab Canyon/Thunder River, Grand

Canyon, Arizona—May 1-8. Leader, Peter Curia, 1334 W. Willetta, Phoenix, AZ 85007. Cost: \$185.

Look down from Sowats Point at the Esplanade, Kwagunt Hollow and Jumpup Canyon and let the quietness envelop you. Then comes a sandwich of rock layers, waterfalls, Scotty's Hollow, Whispering Falls, the Colorado, Fishtail Rapids, Deer Creek Falls and the explosiveness of Thunder River. The terrain is difficult and there will be no layover days, but the memories that go with you are forever. (Rated S)

(43) Kilmer-Slickrock Wilderness, Nantahala and Cherokee Forests, North Carolina, Tennessee—May 22-29. Leader, Dave Bennie, 2405 Churchill Dr., Wilmington, NC 28403. Cost: \$210.

Adjacent to Smoky Mountain National Park, this area provides wilderness experience without the crowds of the park. Ranging from 1300 to 5400 feet, our trails follow icy trout streams and high narrow ridges, and pass through laurel and rhododendron tunnels. Highlights include a swim at Wildcat Falls, camping on high Bob Stratton Bald, and hiking through the virgin Joyce Kilmer Memorial Forest. A cache will lighten our load. Elementary backpacking experience is acceptable. (Rated L-M)

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(44) Rainbow Bridge-Navajo Mountain, Navajo Reservation, Utah—May 23-29. Leader, Nancy Wahl, 325 Oro Valley Dr., Tucson, AZ 85704. Cost: \$190.

Navajo Mountain, sacred to the Indian, stands mostly in Utah just north of the Arizona border. The trail is contoured down the west side, dropping 2000 feet into sculptured sandrock canyons. Spectacular views daily as we circle the mountain. (Rated M-S)

WATER TRIPS

(45) Whale Watch Beach Camp, Magdalena Bay, Baja California—February 13-20. Leader, Ruth Dyche, 2747 Kring Dr., San Jose, CA 95125. Cost: \$815.

Magdalena Bay is one of the largest and most protected grey whale mating grounds. From both shore and skiff we will observe them breaching, fluking and sky-hopping. Our camp will be on a picturesque beach; tents will be provided. We will also have an opportunity to participate in a research project to study the habits of the grey whale. The cost is roundtrip from La Paz, Baja. The group will meet before the trip in San Diego. A reduced group airfare will be available from San Diego.

(46) Rio Usumacinta (River of Ruins) Raft—March 10-19. Leader, Victor Monke, 414 N. Camden Dr., #602, Beverly Hills, CA 90210. Cost: \$1090.

We will float down the river and camp on its sandy beaches. A short walk through the jungle will often bring us to remote Mayan ruins in various stages of excavation, as the Yaxchilan, once a thriving city-state. Our route is home to many interesting creatures,

and there is much to interest plant lovers. Trip cost is round trip from Villahermosa, Mexico. A pretrip meeting may be arranged in Mexico City to include a lecture tour at the Anthropological Museum.

(47) Scenic Suwannee River Canoe Trip, Georgia/Florida—March 21-27. Leader, Rick Egedi, 117 Hawkins Ave., Somerset, KY 42501. Cost: \$275.

Enjoy warm sunny days, cool nights, spectacular scenery and good companions while canoeing on the Suwannee River. Paddle through the headwaters of the Suwannee to White Springs, Florida. This river system is fed by more first-magnitude springs than any other in the world. We will paddle ten to fifteen miles a day through class one rapids and slow currents with a stopover day for relaxing. The scenery on the upper stretches alone makes the trip worthwhile. Suitable for beginners through advanced.

(48) Dismal Swamp Canoe Trip, Norfolk, Virginia—April 11-17. Leader, Herb Schwartz, 2203 St. James Place, Philadelphia, PA 19103. Cost: \$150.

From Norfolk south into North Carolina lies the Dismal Swamp, an area of lowlands, lakes and the Northwest River, fed by tributaries of swamp origin. Early spring is ideal

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for observing the abundance of snakes, birds, and budding flora, yet is prior to mosquito season. We'll be meeting local residents to hear about the swamp's history and future. Two stops are layover days, and day and night hiking are available. Several car portages are necessary to explore this diverse area, but the canoeing is easy.

(49) Grand Canyon Oar Trip, Arizona—April 16-29. Leader, Tris Coffin, 2010 Yampana Dr., Prescott, AZ 86301. Cost: \$1200.

(50) Grand Canyon Oar Trip, Arizona—May 18-29. Leader, Bill Bricca, P.O. Box 159, Ross, CA 94957. Cost: \$1080.

The Colorado River is one of the greatest whitewater rivers in the world, and provides an unforgettable experience for those who travel its 225 miles, particularly by oarpower. Each of our rafts will carry four to five passengers and a professional oarsman. The quietness and natural flow of the rafts will allow us to fully appreciate the character of this river and the solitude of the canyons. We will stop frequently to study and explore things and places often missed on commercial trips. Minimum age 15 (18 solo). Cost includes round-trip transportation from Flagstaff, Arizona.

(51) Gila River Boat Trip, New Mexico—April 25-May 1. Leader, John Ricker, 2610 N. 3rd St., Phoenix, AZ 85004. Cost: \$230.

We will take advantage of the spring runoff to experience the white water of the upper Gila River. The trip will start at Forks of the Gila, run through Gila Canyon and end just below the proposed site of Hooker Dam. This section of the river is in the Gila Wilderness Area. Rubber rafts will be provided. Those with experience are encouraged to bring kayaks or inflatable boats. No open canoes will be permitted. In case of low water level, the trip will be changed to the Salt River in Arizona or to a backpack in the Gila Wilderness.

(52-E) Birds of Prey, Snake River, Idaho—May 2-6. Leader, Harry Neal, 25018 Mt. Charlie Rd., Los Gatos, CA 95030. Cost: \$525.

Bird lovers, don't miss this one! This 81-mile stretch of the Snake River in southwestern Idaho is a unique ecosystem that hosts the world's densest known population of raptors. Each year more than 1000 birds, including golden and bald eagles, kestrels, hawks, owls and falcons, nest here. This leisurely float trip down a calm reach of the Snake River is designed primarily for spotting and photographing these birds. An ornithologist will accompany the trip. Trip cost includes round-trip transportation from Boise.

FOREIGN TRIPS

For fuller descriptions of all 1982 Foreign Trips, please see the July/August issue of *Sierra*. Listed below are winter trips and two new spring trips.

(905) Tanzania Wildlife Safari, Africa—February 5-19. Leader, Betty Osborn, 515 Shasta Way, Mill Valley, CA 94941. Cost: \$1760.

Follow little-known trails and roads to observe, study and photograph the magnificent wildlife of Africa.

(915) Langtang Trek, Nepal—March 20-April 12. Leader, Peter Owens, 117 E. Santa Inez, San Mateo, CA 94401. Cost: \$770.

A moderate trek into Langtang National Park takes you to see high Himalayan peaks above rhododendron forests and alpine pastures in bloom.

(920) Ski Touring in Norway—March 14-27. Leaders, Mad and Jim Watters, Jr., 281 E. Third St., Chico, CA 95926. Cost: \$1315.

For winter beauty and excellent skiing, we will visit three of Norway's most scenic ski touring areas. Suitable for novice or expert.

(925) Mountain Climbing and Ocean-Front Camping, Jamaica—March 20-28. Leader, Carl Denison, 88 N. Lake Shore Dr., Brookfield, CT 06804. Cost: \$760.

Hike, climb and camp in beautiful eastern Jamaica, the "Hawaii of the Caribbean."

(940) The Northeast and Outback, Australia—May 29-June 19. Leader, Mary-Ed Bol, 6619 Ocotillo Rd., Scottsdale, AZ 85253. Cost: TBA.

From the tropical beaches and virgin rain forests of the northeast, we fly to the "Red Center," the great Outback. There four-wheel drive vehicles take us to the Olgas and the MacDonnells, areas rarely penetrated by tourists, and to Ayers Rock. The Great Barrier Reef, aborigines and their ancient cave art, Lamington National Park and Sydney are other highlights of this varied trip. Anyone in good health should enjoy the several hikes and camp outs that will give us the feel for the land of diggery-doos, kangaroos and koalas.

(625) Trek in Tibet/China. Leader, Wayne R. Woodruff, P.O. Box 614, Livermore, CA 94550. Cost: TBA.

The Sierra Club has been invited by the Chinese Mountaineering Association to send a trekking group to Tibet in 1982. The trek may occur in the spring, but more likely it will be in the fall. Definite itinerary, dates and cost will be negotiated in early December. To receive information as it becomes available, write the leader, not the Outing Department.

For More Details On Outings

Outings are described more fully in trip supplements which are available from the Outing Department. For more detailed information on a trip, request the specific supplement for that outing. Trips vary in size and cost, and in the physical stamina and experience required. New members may have difficulty judging which trip is best suited to their own abilities or interests. Don't be lured onto the wrong one! Ask for the trip supplement before you make your reservations, saving yourself the cost and inconvenience of changing or cancelling a reservation. The first five supplements are free. Please enclose 50 cents apiece for the extras. Write or phone the trip leader if any further questions remain.

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Enclosed is \$ _____ for each supplement requested over 5, at 50 cents apiece. Allow 2 to 4 weeks for delivery.

Sierra Club Outing Reservation Form



Sierra Club Outing Reservation Form

MEMBERSHIP NO.			Trip number		Trip name		Departure date		
Print Name: FIRST LAST Mr. Mrs. Ms.			DEPOSIT ENCLOSED \$		(Leave blank)		No. of reservations requested		
Mailing Address			If you have already received the trip supplement, please check. <input type="checkbox"/>						
City		State	Zip Code		Residence telephone (area code)		Business telephone (area code)		
PLEASE PRINT <u>YOUR</u> NAME AND THE NAMES OF ALL FAMILY MEMBERS GOING ON THIS OUTING				Age	Relationship	Membership No.		How many trips have you gone on? Chapter National	
1.									
2.									
3.									
4.									
5.									

MAIL TO: SIERRA CLUB OUTING DEPT.—P. O. BOX 7959, SAN FRANCISCO, CA 94120

MEMBERSHIP NO.			Trip number		Trip name		Departure date		
Print Name: FIRST LAST Mr. Mrs. Ms.			DEPOSIT ENCLOSED \$		(Leave blank)		No. of reservations requested		
Mailing Address			If you have already received the trip supplement, please check. <input type="checkbox"/>						
City		State	Zip Code		Residence telephone (area code)		Business telephone (area code)		
PLEASE PRINT <u>YOUR</u> NAME AND THE NAMES OF ALL FAMILY MEMBERS GOING ON THIS OUTING				Age	Relationship	Membership No.		How many trips have you gone on? Chapter National	
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5.									

MAIL TO: SIERRA CLUB OUTING DEPT.—P. O. BOX 7959, SAN FRANCISCO, CA 94120

Sierra Club Trips Reservation/Cancellation Policy

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

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

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

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

Reservations are confirmed on a first-come, first-served basis. However, when acceptance by the leader is required (based on applicant's experience, physical condition, etc.), reservations will be confirmed upon acceptance; such conditions will be noted. When a trip is full, later applicants are put on a waiting list.

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

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

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

Deposits: The deposit is applied to the total trip price and is NONREFUNDABLE unless (1) a vacancy does not occur or you cancel from a waiting list, (2) you are not accepted by the leader, (3) the Sierra Club must cancel the trip.

Trips priced to \$499 per person	\$35 per individual or family application
Trips priced \$500 and more per person (except trips listed as "FOREIGN")	\$70 per person
Trips listed under "FOREIGN" section	\$100 per person.

Payments: Generally, adults and children pay the same price; some exceptions for family outings are noted. You will be billed upon receipt of your application. Full payment of trip fees is due 90 days prior to trip departure. Trips listed under "FOREIGN" section require payment of \$200 per person 6 months before departure. Payments for trips requiring the leader's acceptance are also due at the above times, regardless of your status. If payment is not received on time, the reservation may be cancelled and the deposit forfeited.

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

The trip price does not include travel to and from the roadhead nor specialized transportation on some trips. Hawaii, Alaska, Foreign and Boat trip prices are all exclusive of air fare.

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

Cancellations: Notify the Outing Department by letter or by phone if you must cancel from a trip. Any refund will be based on date this notice is received. Refunds less the nonrefundable deposit will be made as follows*

1.	60 days or more prior to trip	full amount of remaining balance
2.	14-59 days prior to trip	90% of remaining balance
3.	4-13 days prior to trip	90% of remaining balance if replacement is available from a waiting list. 75% of remaining balance if no replacement is available from a waiting list.
4.	0-3 days prior to trip	no refund.
5.	"No-show" at roadhead, or if you leave during a trip	no refund.

*Note: The above policy does not apply to most Raft & Boat trips. See page 23 for Raft & Boat cancellation policy.

The Outing Program regrets that it cannot make exceptions to the cancellation policy for any reason, including personal emergencies. Cancellation for medical reasons is often covered by traveler's insurance, and trip applicants will receive a brochure describing this coverage. You can also obtain information from your local travel and/or insurance agent.

Transfers: A \$35 fee is charged for transfer of any confirmed reservation on a trip priced up to \$499. Transfer of a confirmed reservation from a trip priced \$500 and more per person or a transfer 0-3 days prior to trip departure is treated as a cancellation. No transfer fee is charged if your application is pending the leader's acceptance, or if you transfer from a waiting list.

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

Emergency Care: In case of accident, illness or a missing trip member, the Sierra Club, through its leaders, will attempt to provide aid and arrange search and evacuation assistance when the leader determines it is necessary or desirable. Cost of specialized means of evacuation or search (helicopter, etc.) and of medical care beyond first aid are the financial responsibility of the ill or injured person. Medical and evacuation insurance is advised, as the Club does not provide this coverage. Professional medical assistance is not ordinarily available on trips.

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

Please Don't Bring These: Radios, sound equipment, firearms and pets are not allowed on trips.

Mail Checks and Applications to:

Sierra Club Outing Department
P.O. Box 7959, Rincon Annex
San Francisco, CA 94120

Mail All Other Correspondence to:

Sierra Club Outing Department
530 Bush Street
San Francisco, CA 94108 (415) 981-8634

THE DEADLY IRONY OF ENDRIN

Promoting Better Wheat Harvests Is Poisoning the Food Chain

Jim Robbins

IN JUNE 1972, the pesticide DDT was banned in the United States because of the serious health hazards it posed to both humans and wildlife. But other members of DDT's chemical family, the chlorinated hydrocarbons, are far more toxic yet are still in use with a minimal amount of regulation.

Endrin, for example, has a slightly different twist in its molecular structure and is far more deadly than DDT. Despite endrin's toxicity, it is easier to buy than fireworks in many states.

In April this year, an outbreak of army cutworms and pale western cutworms, insects that attack the roots of wheat, was discovered in eastern Montana. Farmers, fearing a devastation of their crop, sprayed somewhere between 120,000 and 200,000 acres of wheat with endrin and toxaphene, another chlorinated hydrocarbon.

Several months later high levels of endrin began to appear in wildlife in eastern Montana, posing what the Montana Department of Health and Environmental Sciences deemed "a hazard to human health."

In late August, testing by Montana's Department of Fish, Wildlife and Parks showed endrin levels as high as .53 parts per million (ppm) in the fatty tissue of chukar partridge and sharptail grouse, a count well over the EPA's "action" level of .3 ppm for domestic fowl. ("Action" levels are levels at which the agency will begin enforcement procedures; they are used when no tolerances for a residue have been established but the presence of the residue poses a regulatory problem. They are not safety levels.)

Montana's Fish and Game Commission then met to decide on whether to open the season as planned on September 12. Against the recommendation of Dr. John Drynan, the director of the Department of Health, the commission voted to open the season. To mitigate the hazards, they suggested that

hunters trim off the birds' fat, which is where endrin concentrates, and consume no more than one bird per person every other day.

On September 3, the Fish, Wildlife and Parks Department announced that endrin had been found in the ducks. Later it was discovered the initial calculations of levels were incorrect, and the endrin concentrations were as much as four times the EPA's action level. One duck was found with a concentration of 1.35 ppm, another with 1.2 ppm. Only 91 waterfowl were tested, a sampling size akin to taking a single grain of sand as representative of a beach.

In the midst of serious concern expressed by people in Montana when endrin levels in geese and ducks were discovered to be four times the action level, the Environmental Protection Agency announced that no one was going to die from eating an endrin-contaminated duck. An EPA spokesman said, "A 60-pound child could eat a whole teal and still be five times below the 'no effect' level for this chemical." He said that while concentrations of endrin in the birds may be above the "allowable daily intake" level set for the pesticide to protect human health, these levels are set to provide a "margin of safety" in the daily intake, not as a danger level for one-time ingestion.

George Manring, a toxicologist with the National Wildlife Federation in Washington, D.C., disagreed. He called that type of statement a "poor argument."

"People may not drop dead from eating one bird," Manring explained, "but endrin bioaccumulates; it is stored in body fat. So people can concentrate endrin in their bodies over several hunting seasons and from different sources." Manring also said there could be synergistic effects if endrin combines with another pollutant in the body. This would produce a total effect greater than those of the pollutants individually. He added that because endrin is

stored in fat, it can remain in the body for years. If someone does accumulate endrin and experiences rapid weight loss several years later, the endrin can be released into the system as body fat is metabolized.

Dr. John Drynan, of Montana's Department of Health, also refuted the EPA statement, claiming that endrin has never been tested on humans; thus, its effects are unknown.

On September 16, Governor Ted Schwinden sent a letter to the Environmental Protection Agency, implying that because endrin was a registered pesticide Montana was now in trouble. Schwinden asked for technical and financial assistance in dealing with this "grave problem."

"The bottom line is that endrin is an EPA-registered pesticide that is supposed to have no significant impact on the environment when used on small grains in recommended levels," Schwinden said. "I am asking that the EPA reconsider its position in approving endrin, based on our experience."

The Montana Wildlife Federation, after it learned of the spraying, charged that the director of Montana's Department of Agriculture knew of the spraying, but didn't notify the public for several weeks. Wilbur Rehmann, executive director of the federation, said the Department of Agriculture did not adequately inform Montanans about "possible birth defects to humans, livestock and mammals; possible chromosome damage, or the extreme toxicity or persistence of endrin." Rehmann said both Agriculture and Fish, Wildlife and Parks knew of the spraying but ignored it.

But Department of Agriculture Director Gordon McOmber said he believes "there was no need to notify the public." He defended the pesticide, claiming that "it got the job done." McOmber noted that the problem of birth defects was previously brought up in connection with 2,4-D, a widely used herbicide, "and they [anti-pesticide/herbicide people] couldn't prove it. They raise that flag every time they have the opportunity."

McOmber said endrin spraying should not be looked at in terms of what "it might do to a fish." He said there were "30 to 40 cutworms per linear foot of soil in the affected areas and each female lays 1000 eggs. If we hadn't sprayed, it could have

Endrin is the most toxic of all the chlorinated hydrocarbons. Although chemically rather closely related to dieldrin, a little twist in its molecular structure makes it five times as poisonous. It makes the progenitor of all this group of insecticides, DDT, seem by comparison almost harmless. It is 15 times as poisonous as DDT to mammals, 30 times as poisonous to fish and about 300 times as poisonous to some birds.

RACHEL CARSON, *SILENT SPRING*, 1962

done serious damage to Montana's agricultural economy."

Because endrin bioconcentrates—the levels become higher as it moves up the food chain—there is concern over the effects of the pesticide on predators, particularly the peregrine falcon and the bald eagle. Both species are indigenous to Montana and normally feed on animals in which endrin has been found.

The National Audubon Society is concerned about impacts on the bald eagle and the peregrine, but Bob Turner, western regional representative for the society in Boulder, said he is particularly worried about the whooping crane, which uses eastern Montana as a flyway. There are approximately 85 whooping cranes left in the world, and they fly each year from their winter nesting ground in Texas to Wood Buffalo Provincial Park in northern Saskatchewan.

"This spraying was done just as the cranes were migrating north in April," Turner said. "They feed on small animals and mice, which are extremely affected by endrin. To be spraying with something so toxic is unnecessary." The birds will head back to Texas this fall, possibly again risking exposure to endrin.

Turner's point that a less toxic alternative should have been used has been brought up again and again by critics of the spraying. But according to the Department of Agriculture endrin is approximately \$1.00 an acre cheaper than alternatives such as Lorsban 4-E. That may be the reason it was used.

Critics have also blasted the agricultural community for the way the pesticide was applied. The spray was applied aerially, primarily by commercial applicators. Dr. Lowell McEwen, a biologist for the U.S. Fish and Wildlife Service in Ft. Collins, Col-

orado, and an expert on endrin, said, "The idea of releasing endrin into the environment over large areas is something called Stone Age pest control. There are alternative materials that are not nearly as poisonous and are more selective. They are poisoning everything under the sun down there."

Since 1967 endrin has been involved in 52 wildlife and fish kills, with an estimated loss of more than 31 million fish of differing species. It has also been implicated in 80 episodes involving the poisoning of domestic animals.

The most dramatic endrin incident happened in southern Kansas and northern Oklahoma in 1976. Battling the cutworm and the green bug, applicators sprayed 6 million acres. The result was nearly 1 million fish killed and widespread death of wildlife and livestock. Financial losses from the contamination were estimated at more than \$5 million.

An internal memo of the Montana Department of Fish, Wildlife and Parks reveals that there are "documented human and large mammal deaths from direct contact with endrin."

The EPA found that hamsters dosed with sublethal levels of endrin had a high rate of birth defects and chromosome damage. When fed to mice, the substance caused malignant tumors. According to the Montana Department of Agriculture, if a 170-pound man were to ingest a quarter of an ounce of endrin, he would "probably die."

Officials in Montana are worried about the long-term ramifications of endrin, which can persist in the soil for up to 14 years. Dr. Drynan of the Department of Health said, "This is mind-boggling. One of the things I am most concerned about is the leaching process. If we wait a year or two, will endrin

end up in our groundwater supplies or well water?" Drynan said he would have his agency begin testing water supplies in the affected areas immediately and continue monitoring for several years.

Cattle and other livestock may be affected, but as of October only six cows had been tested and no endrin was found. According to EPA restrictions for endrin, "Livestock may not graze on endrin-treated fields, nor can straw or crop residues from treated fields be utilized for feed. Grazing restrictions should remain in force for at least one year. Animals grazing in endrin-treated fields or inadvertently fed treated feed may require as much as one year before their milk, cream or meat can be sold."

It was reported that farmers were feeding their cows the sprayed wheat because it was not growing correctly. The Department of Agriculture issued a statement warning farmers not to do this. But unless all cattle in the affected area are tested, some with high levels of endrin may make their way to the supermarkets.

The endrin debacle in Montana has focused nationwide attention on pesticides and how they're used and monitored, as well as their effects on human health.

These questions have uncovered a system of pesticide registering and monitoring that is extremely lenient.

In order for an insecticide to be sold in Montana, the manufacturer, in this case Velsicol Chemical Corp. of Chicago and Platte Chemical Company of Nebraska, must register the product with the EPA. This consists of providing the EPA with information on the product's effectiveness and potential health effects. After the substance is registered, the companies submit a copy of the label, which contains pertinent warnings and information, to the state Department of Agriculture along with a \$15 registration fee. According to state law, Montana must accept any product the EPA has registered.

Once the product has been registered with the state, anyone with a permit may buy it. To obtain a permit in Montana an applicator must attend a six-hour training course given by the state Cooperative Extension Service. Everyone who attends is given a permit. The course completed, a farmer or commercial applicator may go to any store and buy as much endrin as he feels necessary. The only restriction is that he sign his name and record the amount purchased. And that is where the safeguards for endrin, such as they are, end. There is no enforcement of recommendations on how much endrin can be used, or how it can be applied. Governor Ted

Schwinden, commenting at a public meeting about the attitude of farmers toward pesticide application, said that the logic is often, "If three coffee cans of this stuff is good, then four coffee cans must be great." State officials still do not know exactly how much endrin was applied, or exactly where.

Along with questions about the lack of safeguards on a product such as endrin, there are also questions about why something as toxic as endrin was never banned. During the late 1970s the EPA held hearings on endrin, and while it was banned in the eastern United States, it was allowed to be used in the West.

Jay Feldman, a spokesman for the National Coalition Against the Misuse of Pesticides, in Washington, D.C., suggested the reason it wasn't banned; after the 1972 Pesticide Act was passed there were many prod-

ucts already on the market. As the EPA proposed the elimination of the most objectionable products such as endrin, Feldman said, it ran into resistance from agricultural and chemical companies who had grown dependent on them. "When restrictions were proposed for these substances, chemical companies and agriculture lobbied effectively against them," he said. Thus, endrin escaped an outright nationwide ban.

Even if endrin were banned, the problem with pesticides would not disappear. Other procedures are needed to insure the proper use of toxic substances. One proposal from wildlife and environmental groups in Montana is to form a citizens' advisory council to meet with state agencies and discuss the use of pesticides before they are applied—in order to head off future disasters. This idea was flatly rejected by Governor Schwinden,

who said nothing would be accomplished because board members would probably be "polarized."

But in light of the widespread problem that misuse of this pesticide has caused, Montana and other states will have to initiate a system that builds-in responsibility for using toxic substances. Montana is not the only state that will suffer the consequences; Montana's ill-planned decision has caused problems throughout the western portion of North America and may endanger the health and well-being of hundreds of thousands of people. Because officials don't know where all of this deadly pesticide ended up, they can never know which health effects have been caused by endrin. □

Jim Robbins is a columnist for the Montana Eagle, and is a freelance environmental writer.

Montana Explains How to Cook a Poisoned Goose

SEVENTEEN STATES, as well as Canada and Mexico, are on the flyway—the aerial route—used by waterfowl that have been contaminated by endrin sprayed in Montana. Consequently, all these states have contemplated closing the 1981 hunting season for waterfowl.

On September 25, Montana's Department of Fish, Wildlife and Parks held a hearing to decide whether to keep the hunting season open. Colorado and Wyoming had already decided to open theirs, as had Louisiana; Canada issued warnings about ducks in the south near the Montana border. But many other states were expected to follow Montana's lead.

At the hearing, the director of the Department of Health recommended against eating waterfowl and said the safest thing to do would be to close the season. He said, "We're dealing with a poison, and we don't know everything we would like to know about it." He noted that endrin has a broad range of effects that vary widely among species of animals.

But the department decided to let the duck season go ahead; it postponed the sea-

son for Canada geese until November 15, but in only the eight counties most seriously affected by the pesticide. Its reasoning in the case of geese was a variation on the idea that "dilution is the solution to pollution," although in this instance the point appears to be to reduce the risk by increasing the percentage of uncontaminated birds and by letting the contaminated geese go to other states. The department's statement said, "Dilution from migratory patterns provides for lower risks for the following reasons:

"Research on geese banded in Montana and harvested in Colorado indicates that the southward migration for Montana geese starts about November 15.

"Short-grass prairie geese which stage in Alberta and Saskatchewan start moving through Montana in early November; some years as many as 2000 stay for several weeks. Dilution from these birds should reduce risks."

The department's spokespeople said that the agency was aware there might be some risk to public health, but it was willing to take that risk. It reminded hunters that they are bound by state law to eat everything they kill, and it made recommendations that will, it says, be enforced. It instructs hunters as follows:

1. Trim all fat from killed fowl and discard the skin and internal organs. These items should be discarded in a manner which will assure that they will not be consumed by humans or domestic or wild animals.

2. Fully cook the skinned bird on a rack and discard the drippings in the same manner as the fat, skin and organs.

3. Do not stuff the bird.

4. Pregnant women, nursing women and women who are contemplating pregnancy should not consume waterfowl.

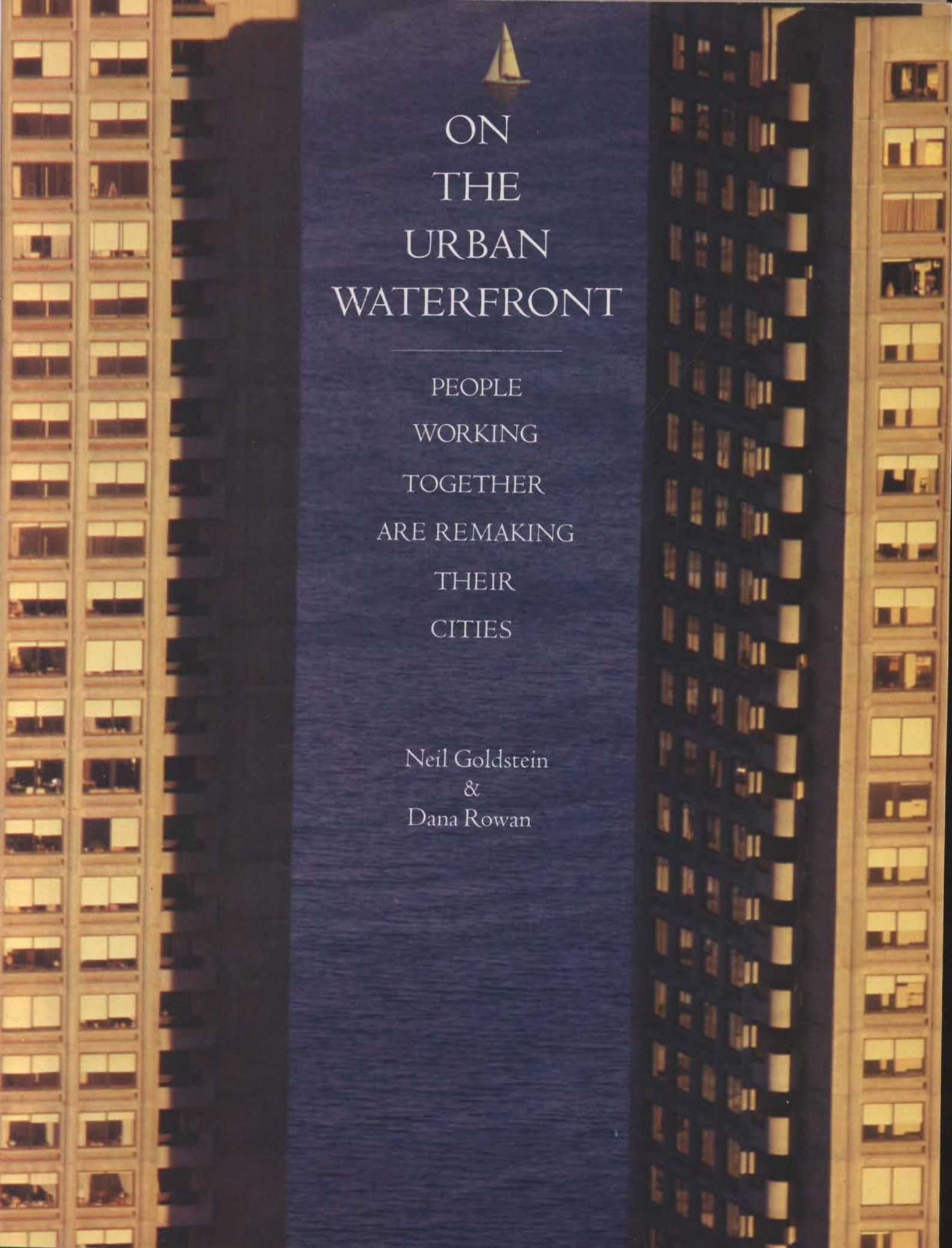
5. No more than one duck or one pound of goose meat per week nor more than six ducks per year or six pounds of goose meat per year should be consumed by adults.

6. Children's consumption should be limited to a half-pound or less of meat, at the same intervals as for adults.

An interesting note on the hearing is the contrast between the Environmental Protection Agency's (EPA) recommendation with one it made at a similar hearing on September 4, when the Department of Fish, Wildlife and Parks was investigating whether to close the season on sharptail grouse. At that time, the EPA's chief toxicologist said the grouse were lean, and their fat was on the exterior of the muscles, so the pesticide in the fat should not be too much trouble to eliminate during cooking. He noted, however, that there would be more concern with ducks and geese, which are fatter and which have fat marbled in the muscles.

But by September 25, the EPA had decided there would be no health hazard from the ducks and geese, even though the Montana Department of Health thought the duck and goose season should be closed.

In any event, the recommendation not to eat more than six ducks a year is a curious one to make in Montana, where many people regard hunting not as a sport, but as a way of providing meat for the table. Many people eat up to 30 ducks a year, normally. Whether they will restrain themselves as recommended remains to be seen. □



ON
THE
URBAN
WATERFRONT

PEOPLE
WORKING
TOGETHER
ARE REMAKING
THEIR
CITIES

Neil Goldstein
&
Dana Rowan

TWENTY MILLION cubic feet of water flow past New Orleans each second as the mighty Mississippi plows through the Delta on its way to the sea. Long ago the river's silt deposits formed the natural levees that protect the city, whose dry land is several feet below the level of the nearby Gulf of Mexico. New Orleans' cultural and economic heritages could be called products of the river, so it is ironic that until very recently most citizens of the Crescent City were cut off from the waterfront.

Access to the waterfront was, and to some extent still is, denied to the citizens in New Orleans and elsewhere. But now people in cities on rivers, lakes and oceans have begun to rediscover their waterfronts and are revitalizing decaying areas, preserving or establishing open space and public access, or taking steps to assure controlled development and to accommodate water-dependent activities.

In New Orleans, Moon Walk—a pathway along a stretch of the Mississippi—now provides the public access that had previously been denied. It's a charming place, where one night recently a band played on the walk as tourists and residents of the adjacent Vieux Carré (the Old Quarter or French Quarter) strolled past. A few feet west, the paddlewheeler *Natchez* sounded its whistle, signaling its imminent departure.

Now the city plans to extend public access to the area adjoining Moon Walk in an ambitious design that will, the city hopes, be a part of its development for the next world's fair. This more ambitious concept for the waterfront will be likely to stir considerable debate as competing projects vie for the limited space. Developing the riverfront will require capital and also provide opportunities for substantial profit. The development will therefore require substantial participation, cooperation and scrutiny by citizens to make sure that while private profitability is maintained, the public's needs are satisfied, too.

The joint efforts of environmentalists, businesspeople, civic leaders and politicians have transformed abandoned, derelict port landscapes in cities throughout America into exciting commercial and recreational centers. Examples are the Cannery in San Francisco, the Riverfront Walk in San Antonio, Faneuil Hall Market in Boston and Harborplace in Baltimore.

It's easy to understand why the port areas were neglected. While many cities were growing up along rivers, lakes and natural

A sailboat (previous page) peeks between Boston's Harbor Towers Apartments. Photo by Ellis Herwig/Stock, Boston.

Boston's initial plan called for demolition of historic buildings and construction of highrise buildings, apartments and hotels.

harbors, depending on water-borne commerce, waterfronts thrived. After World War II, however, technological changes in transportation—improved planes and airports, the interstate highway system, larger tracks for freight trains and containerized shipping—rendered many old port facilities obsolete. Waterfront areas became peripheral to the life of the city. Piers were abandoned, and the waterfronts lay idle in many older cities, paralleling the more general urban decay.

With the 1970s came a period of reflection on this condition and a resurgence of urban pride. Urban renewal stopped being a license for large-scale demolition; politicians and planners took a hard look at their available resources and began to experiment with new development techniques. Waterfronts became one focus of the large urban revitalization effort.

So far the waterfront work has been an example of grassroots planning at its best. It has succeeded without a specific federal program or mandate. (Federal waterfront legislation was finally passed in 1980 as an amendment to the Coastal Zone Management Act, but the program it created is not currently funded.)

The successes have not come easily, nor does everyone agree on how successful all the projects are. Some created new problems by increasing property values in the surrounding area, forcing former residents out of their homes. Others balanced profitability, open space and public access in ways that some participants in the process still disagree with.

In many cases, waterfront projects' sites have been owned by the city, and the public looked to city hall to protect their interests and ensure open space, public access to water, and preservation of the local culture and heritage. But developers wanted maximum profits to balance financial risks, so they pressured local officials to convert as much of a site as feasible to commercial use. During the planning period, this difference in goals naturally led to controversies and debates about reasonable profit, public trust and appropriate development.

In other cases city administrators had to

attract capital by providing incentives. Sometimes they used scarce public money from the Economic Development Fund, the Urban Development Fund, the Community Development Fund or housing funds, or they promised to forgive taxes. Understandably, the public applied pressure to make sure both the government and businesses would be held accountable for the way the money was spent.

In addition to the usual dynamic tension of trying to design simultaneously for profits and for the public's satisfaction, there are other planning decisions that must be made. Some are:

- Whether to restore buildings for historical accuracy or renovate them for active use, perhaps as boutiques and specialty shops.
- Whether to sacrifice some open space to ensure commercial success.
- Whether to emphasize public access at the risk of subjecting the biological environment to overuse.
- Whether to require that the project be in complete harmony with its surroundings, or to let it add some distinctive treatment that would give it a strong identity.

Because there are many problems to be solved, and because the goals of the public and the developers are different, it is not always easy to reach agreement on a waterfront revitalization plan. Still, everyone must reach some solution or consensus or there will be legal delays, community opposition or withdrawal of financing. What the consensus will be can vary widely, depending on the physical and cultural landscapes, the development, the environmental attitudes of the public and the financial risks of the project. "Urban Waterfront Revitalization: The Role of Recreation and Heritage," a study published in 1980 by the Heritage Conservation and Recreation Service (HCRS, now abolished by President Reagan), points out that there is little financial assistance available to a community for the planning process. The report considers front-end technical support and planning assistance as one of the most critical needs if local areas are to be more successful in revitalizing waterfront areas.

A perfect example of a project that en-



In Boston (top), Baltimore (middle) and Savannah (bottom), new developments invite people to the waterfront instead of keeping them away. They also provide profitable, appealing office and commercial spaces that add to the cities' charm even at dawn, with only pigeons around.



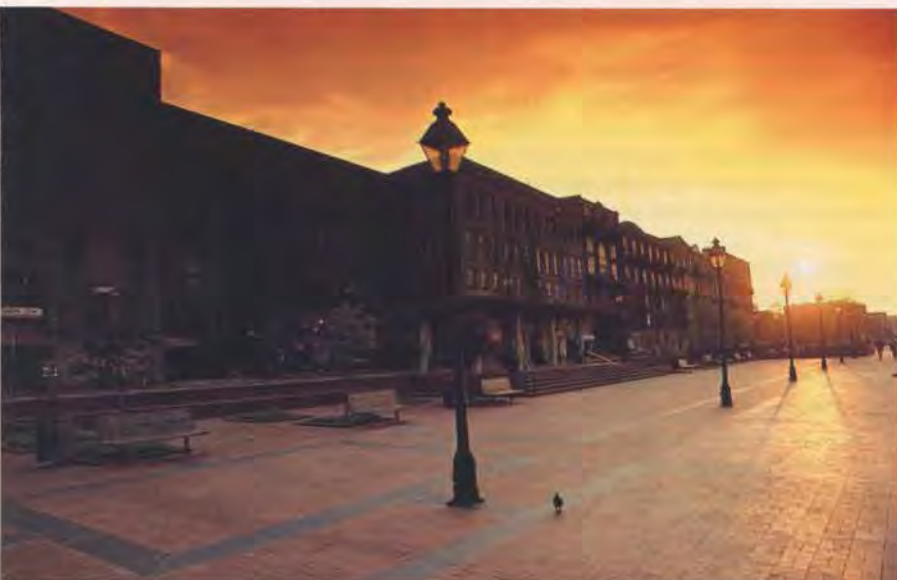
countered considerable difficulties in the planning process is Boston's Faneuil Hall Market/Waterfront Park project, a commercial and recreational center. Many people consider it one of the most successful projects in the country; more than 14 million people are expected to have visited it in 1981, and it has become a symbol of the rebirth of historic Boston.

The marketplace is made up of three Greek-revival buildings each 535 feet long, built in 1824 to let as merchants' offices and larger spaces. When they were renovated in 1975, they became 400,000 square feet filled with 63 specialty shops, bars and restaurants. Trees and benches around the buildings provide a pleasant atmosphere for eating outside or just walking around. In 1976, its first year of operation, sales tax alone netted the state \$2 million and the city \$225,000.

The waterfront park, only a cobblestone walkway away and surrounded by renovated nineteenth-century wharf buildings, marinas and Boston's aquarium, was built at the same time as the market so its open space would complement the commercial area. Many people go to the park to eat lunch and sit in the sun. Most of the site is covered with grass and cobblestone walkways, but there are also trees and other plantings, benches and a children's park.

Although the project has turned out successfully, it had major problems in the beginning. The Boston Redevelopment Authority (BRA) started conceptual work on the project in the 1960s, and the initial plan reflected the times; it called for demolition of historic buildings and construction of new highrise office buildings, apartments and hotels, and it included an 80-foot-wide road that would cut off the waterfront. But the Sierra Club and civic groups fought the plan, which finally died in 1973. City hall formed a review committee, which led later to modification of the plan to reduce the size of the road, provide more open space and decrease the number of new buildings.

But the new plan, which required about \$20 million in private money, had trouble finding financing. Investors lacked confidence that the concept would work out to be



profitable, and the first development team the BRA chose couldn't find enough support from banks. Then in 1973 architect Benjamin Thompson convinced developer James Rouse to become part of the team.

Rouse was optimistic about the project's potential because of other development projects in the neighborhood, but he had a hard time convincing banks, which were accustomed to financing shopping malls where the rent and drawing power of two or three big stores would practically guarantee success. The unusual concept for Faneuil Hall supposed that 150 small, independent shops would occupy the market. Fortunately, Rouse—who had previously developed several traditional shopping malls—was able to convince Chase Manhattan Bank to lend \$10 million to the project, but with the requirement that Boston banks match the figure. It took aggressive selling of the idea to raise the funds, but finally the project team combined \$20 million in private financing

with \$10 million in federal, state and local grants. Now the market and park complex draws nearly as many people as Florida's Disney World.

New York City used a similar approach to finance the South Street Seaport, which is now under construction. The first \$28 million, 30% of the required money, came from a federal Urban Development Action Grant. This is another of James Rouse's projects, and Rouse found \$60 million in private funds to complete the financing.

When it is finished, it will be the new home of the Fulton Street Fish Market, which is currently the principal distributor of the Atlantic Ocean catch from Rhode Island to Pennsylvania. The plan is to straddle two old piers—which will be reinforced—with a platform that supports a 110,000-square-foot, two-story pavilion. The now-ramshackle Fulton Street Fish Market will be replaced with modern facilities, and the other commercial space in the market will be sur-

rounded by walkways on several levels that offer views of the river and of the Brooklyn Bridge.

This is another controversial project. Local businesses and residents who have gradually restored the historic neighborhood are afraid the big commercial project, which they say will dominate the waterfront, will displace them and destroy the special character of the area. They are also concerned about the noise and congestion associated with the 12 million tourists expected to visit the market every year. The harshest critics say the federal grant is too generous an incentive and is a giveaway that the city cannot afford to accept.

In response, the project's supporters say aspects of the development offset these legitimate concerns. For one thing, they say, Rouse creates a tasteful commercial environment and avoids the "plastic" atmosphere of suburban malls by selecting locally representative craftspeople, restaurants and

Renovating the Chicago River

ALLAN HEYDORN



Photograph by Phyllis Dwyer Tom, Snick & Associates

THE CHICAGO RIVER, Chicago's most neglected resource, has worked for Chicago since Fort Dearborn was built in 1803, but until recently the city relegated the river to unsavory household chores like taking out the garbage.

As a result, the river's water quality is poor. During virtually every rain, untreated sewage spews into the river from an antiquated sewer network. Years of abuse have allowed a poisonous muck of industrial chemicals such as lead, PCB and cyanide to form along the river's bottom. A \$2.3-billion tunnel and reservoir project, now under construction, was intended to solve the problem by storing sewer overflows underground until the polluted water could be pumped to the surface and treated. But cost overruns, federal cutbacks and general skepticism threaten the project's completion.

Originally the river flowed east into Lake Michigan, but that changed after a cholera and typhoid epidemic in 1885 killed 90,000 people, 12% of the city's population. Health officials determined that the epidemic occurred because the river, the city's sewer, ran directly into the lake, the source of the city's drinking water. In 1900 sanitary engineers reversed the river's flow with

a series of locks and canals.

This "multiple use" river has several faces. The Chicago River proper is only two miles long, flowing west from Lake Michigan between tall concrete banks, offering unusual views of Chicago's architecture and small riverside parks. At Wolf Point the river forks into two branches. The North Branch runs west and south along golf courses, behind single-family homes, through six forest preserves and many neighborhood parks before it turns abruptly into a harsh industrial stretch. The North Branch and the main arm of the river merge into the South Branch at Wolf Point and continue south. The South Branch is lined with major industries, though there are some large open spaces, until it joins the Ship and Sanitary Canal. Eventually the sewage-laden water empties into the Desplains River and eventually into the Mississippi.

Previous attempts to upgrade the river have fizzled, and the tunnel and reservoir project is only part of the solution. In August 1980, however, after concerted pressure from local citizens' groups, Mayor Jane Byrne directed the year-old Friends of the Chicago River, to draw up a "bold new plan" for waterfront renovation. These slow, steady efforts have borne fruit, not because the various interests involved have compromised their goals, but because the groups have a more complete and realistic

Plans for the Chicago River (left) include jogging trails and waterfront parks.

specialty shops. For another thing, they say, he successfully integrates open space and commercial development, and his approach has worked well in Boston and Baltimore.

Less controversial is Liberty State Park in New Jersey. In its first of four phases, completed in 1976, it is a flat 30-acre piece of bulkheaded and ripped New Jersey shoreline across the Hudson River from Lower Manhattan. The Erie Lackawanna Railroad used to own the land, but when the company went broke it gave the parcel to Jersey City, which in turn sold the land to the state for a park. The site and the water around it were so heavily littered with rotten piers, timbers, abandoned ships and flotsam that the Army Corps of Engineers spent \$2 million just to clean up the area.

When its second phase is finished, the park will contain more than 800 acres, making it one of the largest urban parks in the nation. Planned features include a curving walkway along the banks of the Hudson, a

450-boat marina and a public fishing pier.

Despite the park's popularity, however, there have already been several efforts to threaten the project or dramatically alter it. In 1976, only two months after Governor Byrne had dedicated the park, a New Jersey chemical company tried to use part of the surrounding land for a proposed \$35-million, 242-tank oil and chemical storage facility. Environmentalists blocked the attempt. Then in 1977 an amusement park developer tried to secure a 99-year lease on the property from the state to turn the site into a \$600-million entertainment center. The idea made substantial headway in the legislature until the governor blocked it.

At the moment, Circle Line boats ferry visitors to Ellis Island and the Statue of Liberty from the park. Work is continuing to enhance the landscape, and the public continues to support the state's efforts to acquire the remaining several hundred acres.

A more controversial development far-

ther south is Baltimore's Harborplace. In *Chesapeake*, James Michener portrayed the Baltimore waterfront as a place where desperate oystermen shanghaied drunken bar patrons to supplement their dwindling crews. Although Baltimore's inner harbor of the 1960s was not as treacherous as it was in the 19th century, the area still critically needed rehabilitation and commercial revitalization.

By the 1970s Baltimore had already had considerable experience with redevelopment. Charles Center, a new complex of skyscraper offices and apartment buildings, was the first of the downtown revitalizations in the 1960s. The Charles Center management group, a coalition of business people and civic leaders, was the principal driving force and served as liaison between the developers and Baltimore's government officials.

The group rode the wave of its success. It negotiated a contract with the city to plan

understanding of the river's uses and responsibilities.

"We've gone through a two-year process of learning about the river," said Robert Cassidy, chairman of the Friends of the Chicago River. "It's not strictly a recreational river. It started out as a trading resource, then became a shipping resource. It's very much a working river."

The river's many uses have made the revitalization project—and the cooperation needed—that much more difficult and, if successful, more spectacular. The Friends of the Chicago River have met with representatives from the city and the business community for almost a year. From these meetings emerged a three-part planning process designed to involve local government, businesses and citizens in upgrading the river for public use.

The first step in the process is making a broad policy statement recognizing the river as a unique resource of Chicago. Historical records show no official recognition that the river is important to the city. Chicago's city council should receive the statement in January 1982 and will act on it shortly thereafter.

The second step is writing an ordinance aimed at preventing further abuse of the river. "We want the ordinance to be a red flag so that when someone's doing something along the river or to the river, it gets them to stop, step back, and evaluate the

impact," said Sheila Leahy of the North River Commission, a nonprofit neighborhood business and citizens' group. Because the river is used so many ways along its banks, such an ordinance would have to divide the river into zones, with appropriate regulations for different zones.

The ordinance would reaffirm various agencies' responsibilities to the river and would try to avoid duplicating their efforts. It would cover only unique situations or special concerns not under any other agency's jurisdiction, such as public access to the river.

The final step is for the citizens' group to weave a long-range development plan into the city's comprehensive plan, which is being reviewed this year. Beautification projects, biking and jogging paths and increased access to the riverfront are likely parts of the package, as well as improved commercial and industrial activities. Formal cost projections aren't available yet because the plans are not final, but the price may be high—the already existing riverfront parks cost several hundred thousand dollars per city block to build. Most of the revitalization plans will not require direct public expenditure.

The Metropolitan Sanitary District, main keeper of the river and owner of much of the land along the banks, has agreed to renegotiate its leases with the Chicago Park District to allow parks more visual and, per-

haps, physical access to the riverfront. Representatives of industry, who have been consulted as many as ten times, are impressed with how the renovation project is being handled.

"What we're moving toward here is a master plan of the river. But it's being done in an atmosphere of cooperation, not confrontation," said Bill Cormack, divisional vice president of Commonwealth Edison. Commonwealth Edison, with a 20-foot-tall seawall abutting the river, cannot do much about public access through its property. Instead the company plans to put timbering, planters and shrubbery along the wall to make it more appealing to canoers, hikers and bikers along the river's far side.

Involving the business community in the proposals from the beginning has improved the plan's political acceptability, Robert Cassidy said. He credits business leaders with the idea of not duplicating regulatory responsibilities of other agencies and with the idea of applying different regulations to different parts of the river.

"We're trying, in a kind of politically savvy way, to defuse some opposition," he said. "But we're also trying, in a very sincere way, to get their support and ideas. If we've got 80% of the business community behind us when we present it, we've got it licked." □

Allan Heydorn is a Chicago-based freelance writer.

and manage new waterfront development projects, changed its name to Charles Center Inner Harbor Management, Inc. (CCIHM), and began working closely with Mayor William Schaefer to attract new projects to the harbor.

Today the once-rundown, horseshoe-shaped inner harbor waterfront holds the 33-floor World Trade Center designed by I. M. Pei, a 500-room Hyatt Regency hotel, a convention center, a science center designed by Edward Durell Stone, the wharfside sailing ship *Constellation*, several other corporate office buildings and a brand new aquarium. Features in its open space are a waterfront promenade, playing fields, parks, playgrounds and a marina. The two most recent additions are James Rouse's Harborplace pavilion and an 8½-mile sub-

way (now under construction, scheduled to open in 1982) that runs from the northwest section of the city right to the harbor's edge.

The two-story pavilion has been the source of both excitement and controversy. Its large tentlike structures contain a cluster of hundreds of restaurants, crepe stands, oyster bars, bookstalls, craft shops and kiosks. The businesses are heavily patronized, but the complex is built on land that many people had presumed would remain open space. The planning process was filled with scenes of people talking about blocked views, restricted public access and an unreasonable sacrifice of parkland. Most of the opposing voices are now quiet, since the project is operating, but the issue of sacrificed open space reminds park enthusiasts to keep a constant vigil.

Farther south on the coast, Savannah, Georgia, has a waterfront that has been significantly changed recently. Savannah's port is one of the busiest on the East Coast, but only a mile downriver is a waterfront of historic 18th-century warehouses for cotton and a few active businesses. When civic leaders in the 1950s and 1960s were preoccupied with restoring famous homes, inns, parks and taverns, this waterfront was passed over. But erosion on the riverbank and an acute parking problem downtown spurred the city into action.

Even though controversy during the planning process was minimal, tough obstacles had to be overcome. One of the major challenges was that the narrow waterfront by the warehouses did not leave much room for open space. The solution was to fill along the

Sierra Club Shapes Cities' Waterfronts in New York State

DANA ROWAN

MOST PEOPLE think of South Street Seaport as New York City's big waterfront revitalization project. However, Lincoln West, which borders on the Hudson River from 59th to 72nd Street, dwarfs the Rouse project in both acreage and capital investment. The proposal includes construction of 4850 apartments, an office tower, a 500-room hotel and a public waterfront promenade on 63 acres of abandoned railyards. Costs for this private construction are projected at over \$1 billion, with \$63 million earmarked for public amenities and improvements.

The Sierra Club, a key participant in the project review, is providing a unified voice for community concerns and economic needs. Under the direction of Field Representative Neil Goldstein, N.Y.C. Group Chair Stephen Wilder and planner Dimitri Balamotis, the Club outlined four goals for the project design:

- To ensure sensible and convenient neighborhood access through the site to the waterfront.
- To encourage mixed use of new buildings.
- To develop a distinctive park design that emphasizes its waterfront features.
- To accommodate the garment industry's need for transportation by converting the obsolete railyards to a new freight-forwarding facility.

Adherence to these goals has compelled Club planner Balamotis to reject the developer's original plan and promote a modified project design. The major changes

include lower highrise buildings, an underground transportation center, improved public access, more functional commercial space and better park design. The big challenge is to achieve broad public support for the new plan and then prod the developer to incorporate the changes. Building a consensus in the Big Apple is a monumental task; the Club has contacted or met with members of the New York legislature, local community groups, Mayor Koch's office, the New York Chamber of Commerce and Industry, the State Department of Transportation, the Federal Economic Development Agency, representatives of the rail and garment industries and public interest groups. The reaction seems favorable so far.

The Buffalo project, by contrast, covers miles of waterfront instead of blocks. The city is located on Lake Erie, approximately twelve miles south of Niagara Falls. At the turn of the century, Buffalo achieved fame as a great rail and shipping center, but today many of the grain elevators, coal-storage lots, piers and railyards along the waterfront are abandoned. The Sierra Club saw great potential for commercial and recreational reuse of the frontage and embarked on an ambitious promotional and planning campaign in the 1970s. Under the leadership of Dick Lippes, Sam Sage and Steve Galek, the Club is working with government agencies and civic leaders to identify public needs and appropriate commercial and industrial uses.

So far the Club's effort has paid off. Buffalo now has a greenstrip several miles long

along the lakefront for biking and jogging, with additional segments waiting to be completed. But a comprehensive development plan is needed, or piecemeal development could block completion of the greenstrip and lead to conflicting waterfront uses.

Working with the Army Corps of Engineers, Erie County officials and the City of Buffalo, the Club has been an important moderator in building a consensus. Most of the work has been done by volunteers until this year, when summer intern Andy Lalonde provided intensive technical assistance to the Club's leadership on the project.

Now enthusiasm for the project is growing, as several projects approach completion. Most notable is Waterfront Village, a large project that includes a public marina, a restaurant, more than 500 condominiums, a hotel, and office and retail space.

The Buffalo and New York City projects are two examples in which Sierra Club technical assistance has provided the necessary catalyst to promote and improve waterfront redevelopment. Neil Goldstein sees a real opportunity for the Club to get involved in planning waterfronts in other parts of the country. Increased public use of the waterfront, particularly in the cities, is a great way to encourage outdoor recreation—and that's what the Sierra Club is all about.

Chapters and groups that want to get involved or to give or receive technical assistance should contact Neil Goldstein at the New York office of the Sierra Club, 800 Second Avenue, New York 10017. □



The Riverfront Walk in San Antonio (above) lures strollers to sidewalk cafes along the once-barren concrete riverfront.

edge and install bulkheads to solidify the shore, creating a 30-foot-wide, nine-block-long waterfront esplanade. In conjunction with building the strip, nearby warehouses were converted from lifeless structures into more than 60 specialty shops, taverns, craft shops, art galleries and a museum. The esplanade, financed with federal urban funds and private capital and completed in 1977, is paved with brick and slate, landscaped with trees and flowers and lit with reproductions of antique lamps. There are also fountains, play areas for small children and benches for visitors to sit on while watching the river.

Because the park is linear, it seems appropriate that a bike path runs its length, then links up with the larger Savannah bike-way system. It also is not too surprising that the riverfront is still an active freight corridor for the Central of Georgia Railroad. On the park's opening day, the mayor remarked, "Where else in the world can you see such beautifully restored buildings in a setting like this and have a freight train come down River Street playing Dixieland while a Russian ship sails by?"

But civic pride in a beautiful completed project does not change the fact that controversy or difficult technical obstacles could have been fatal to the proposal. According to the 1980 HCRS study, there are seven factors typically associated with successful waterfront projects:

- Determination to succeed.
- Building of good support.
- Development done by private sector.

- Coordination with other waterfront programs and projects.
- Wise planning.
- Reduction of land acquisition costs.
- A visible accomplishment within one year.

Although anyone can be determined, the last six factors also require skill and sophistication. As the cases in this article have shown, getting private-sector people involved, especially in financial investment, can require great skill. Building support among the citizens at the same time can require even greater ingenuity at resolving conflict and achieving consensus. Planning wisely and coordinating the plan with other programs often goes more smoothly if planners are both experienced in the planning process and are familiar with local leaders, including developers, civic leaders, community activists and politicians. Finally, by using such methods as transfer of development rights and by phasing the project, planners can ease the process of land acquisition and can provide accomplishments that can be seen in a year.

HCRS also indicated seven critical areas of planning that need to be improved to generate more national success in waterfront projects. Three of these areas are closely related to the seven factors above: improved design of the projects' plans; adequate technical assistance; and development of ways to overcome funding problems.

Several organizations are now trying to respond to HCRS's suggestions. The

League of Cities has established two programs, one that provides technical assistance to cities for innovative urban design, and one that helps them adapt abandoned or underused railyards. In another program, several federal agencies have collaborated to establish a national Urban Waterfront Action Group (UWAG) to coordinate federal plans and to help cities cut through bureaucratic mazes. Local versions of the program have been established in Washington, D. C., and Buffalo, New York.

The Sierra Club has also established a program to help cities with all the major factors identified by the HCRS. The idea is to provide technical assistance and training to cities, working in cooperation with local governments, community groups, businesses, labor groups, civic associations, social-equity organizations and environmentalists. The program will provide such training materials as workbooks and general design guidelines for successful waterfront revitalization. Citizens' planning committees will be established in New York City and Buffalo; the Sierra Club, with the help of the Sierra Club Foundation, will serve as an advocate-planner for the committees and will help fund technical assistance, communications within the community, conflict-resolution efforts, and analysis of project financing and phasing plans.

In Buffalo, the project will spend its first year determining the scope of the effort required and developing a framework for the planning. The project in New York City will prepare a full conceptual plan for a site in its first year.

In the future, the Club plans to expand its program to other cities, and Club leaders have already visited new sites and explored other potential projects. The chair of the coastal committee, Shirley Taylor, says the Club's program is unique because it provides assistance directly to community leaders, who are often the strongest supporters of local improvements. She said plans imposed on a community from outside, as in the cases mentioned here, have often engendered hostility and controversy. She added, "The Club's pilot project will test whether our approach of citizen-based, 'bottom-up' planning can avoid the problems that have confronted many waterfront and other economic development projects. We hope we can pass that test." □

Neil Goldstein is the Sierra Club's New York representative. Dana Rowan, an environmental planner in Boston, is a member of the Sierra Club's National Coastal Committee.



Cuts on Austrian forests are visible but not obtrusive; beauty is a goal, and the forests are managed by small landowners.

FORESTRY IN AUSTRIA

SMALL CUTS AND GRAND VISTAS

E. M. STERLING

THE FORESTED MOUNTAINS of the Pacific Northwest ought to be as spectacular as any in the world. The ragged peaks of the Cascade and Olympic ranges with their towering volcanoes certainly should be as overwhelmingly beautiful as Europe's alpine forests.

But, tragically, they are not. For unlike those of Europe, the great mountain forests of the Northwest are being scarred by ever-increasing clearcut logging on both private and public lands.

Checkerboards of burned-over clearcuts, some covering hundreds of acres and visible from 50 miles and more, mar every vista. Except in parks, or where forests have been

legally protected as wilderness, the ubiquitous clearcutting leaves few slopes undamaged.

Many residents of the West seem not to notice the growing ugliness. In fact, some have come to accept the logging blotches as necessary, unavoidable and even essential to the landscape.

The reasons seem logical enough. Logging is vitally important to the Northwest economy. The log-supported wood-products industry sustains one of the largest payrolls in the entire region. Further, the nation needs new housing, which involves wood. And the industry claims clearcut logging of large blocks of forest is economical

and efficient, even good, management.

Even the enormous amounts of waste that are burned after logging seem essential. Western loggers leave on the ground to be burned more than a quarter of all the usable wood they cut (that's equivalent to half of all the raw wood consumed by the pulp, paper and paperboard industries in the region) because removal is too costly. The unsightly burning is justified as an essential step in preparing a seedbed for the new forests that will replace the one cut — in another 80 to 100 years or more.

Europeans log alpine forests too. Although they leave little waste and do no burning at all, they log their forests as heav-

ily as forests are logged in the Pacific Northwest. What happens in Austria is a good example.

Austrians manage about 7.7 million acres of public and private forest lands with a timber inventory of about 153 billion board feet. They cut about 1.5%, or some 2.3 billion board feet, every year.

In the Pacific Northwest, the U.S. Forest Service manages only a portion of the vast forests west of the Cascade range. But the size of the commercial forest it does manage and its logging levels are very similar to those in Austria: some 7.1 million acres, with a timber inventory of about 223 billion board feet. The Forest Service logs about 1.2% of its inventory, or about 2.6 billion board feet, every year.

Similarities between Western and Austrian forests, however, end with the statistics. The visual impacts of the logging on the beauty of the mountains in the two countries are not alike at all.

Evidence of logging certainly abounds in Austria. Trucks and trains everywhere strain under great loads of logs and lumber for export. Heaps of logs surround every mountain sawmill, and piles of wood can be seen along almost any forest trail.

Yet the Austrian scenery remains largely unscarred, and the physical ugliness of logging, so common in both public and private forests of the American West, is largely absent. Austrian mountains are beautiful, everywhere, and one does not have to avoid the marks of commercial logging to enjoy their grace.

How do Austrians log their forests so intensely without ruining the visual beauty or ecological integrity? How are they able to preserve scenic mountain vistas (as well as soil quality and fertility) where we fail?

The answer is not simple. A desire to protect the spectacular scenery and the tourist economy from logging isn't the main reason the country remains beautiful. Logging is seldom restrained, even in prime tourist areas, for scenic reasons alone.

The main reason is forest-management law and practices. More than half of all the forests in Tirol province around Innsbruck, for example, have been classified as "protection forests," which preserve mountain slopes from erosion, avalanche damage, rockfalls, floods and so on.

Logging is banned completely on more than half of the protection forests. On the rest, it must be confined to removing individual trees or to clearcuts so small that the logging will have no impact at all on mountain soils or the scenery.

Austrian forest law rigidly limits the size of clearcuts in all private and government forests. Generally, the law permits no clearcuts larger than about five acres. A land-

owner may cut as much as one and a half acres without permission, but must obtain a permit to log more than that and a special permit to exceed the five-acre ceiling. Such "large" clearcuts seldom exceed about fifteen acres.

In addition, most Austrian clearcuts, as a matter of forestry practice, are laid out in narrow, vertical strips often no wider than bordering trees are high. Such strip logging, under Austrian forestry theory, shelters exposed border trees from possible wind damage, shades new growth in the clearcut and increases the opportunity for natural reseedling from surrounding forests.

Very subtly, these small, narrow clearcuts also reduce the visual impact of logging to an absolute minimum. Such narrow patches, often shaded by the surrounding

The Austrian forest system protects forest managers from political pressure exerted by industry.

forests, are sometimes almost impossible to see at any distance. And certainly a five-acre clearing is far less conspicuous than a 100-acre blotch, or even one half that size.

Such small clearcuts also substantially reduce the scale of any forest-management problems. Logging, reforestation and thinning 100 acres requires a major effort involving extensive supplies and dozens of men and machines. But a single farmer can handle all management needs on a small Austrian clearcut, and failures can be much less devastating too. A reforestation failure on a five-acre Austrian clearcut can be tragic for an individual farmer, but a reforestation failure on a huge American clearcut can sometimes turn into a disaster.

The diversity and scale of forest ownership in Austria seems also to play a role in lessening the impact of logging there. Only 15% of Austria's forests are under unified federal management. The rest are spread out in nearly 250,000 separate ownerships with approximately 70% in tracts of less than twelve acres.

Franz Schanl and Franz Hübinger own small farms near the Austrian-Czechoslovakian border in what is known as the Forest Quarter, north of Vienna. Schanl's 42-acre farm near the village of Thures includes eleven acres of woodland divided into ten narrow tracts. Hübinger, with a

96-acre farm, manages 42 acres of forest in fourteen separate patches. The timber acreages of both farms are included in Austria's national forest inventory and normally cannot be converted to any other use.

Both Schanl and Hübinger consider their small forests important farm—and family—assets. The small forests are their "savings banks" to be drawn on only when absolutely necessary.

Hübinger hasn't logged any of his forests for a number of years. He sells only the few trees that his 90-year-old father culls from the forest each fall and winter. His local farm cooperative collects these small cuttings and combines them with timber cut by other farmers for sale to a pulpmill.

Schanl, on the other hand, made a minor "withdrawal" from his forest in order to buy firewood several years ago and plans another more substantial withdrawal this year to build a home for his recently married daughter. He will use some of the logs he cuts to build the house and trade the rest for other building materials.

Although such small harvests from small woodlots might seem unimportant, they still reflect what makes up a substantial portion of all the wood harvested in Austria every year. Of the 2.3 billion board feet cut in Austria each year, almost half of it comes from the hundreds of thousands of owners with less than 500 acres of forest each.

The Austrian government does not tell farmers when they may log their land. Large forests may be managed under approved, formal, individual ten-year plans designed by each landowner to assure long-term forest production. But logging by small farmers such as Schanl and Hübinger is governed almost solely by the traditions of the "savings bank." Small farmers log when they need the money, and the nationwide production from those small forests remains constant solely because the farmers tend not to make "withdrawals" all at the same time.

Austrian logging practices also tend to lessen the visual impacts of logging on the nation's countryside. Austrians, for instance, do not burn their clearcuts and thus avoid the patches of barren blackness so common on clearcuts in the American West's forests.

Nor do the Austrians leave their small clearcuts heaped with waste. Austrian loggers remove every usable piece of wood. Large logs go to sawmills, smaller ones to pulpwood plants, while still smaller pieces are used for firewood. Only twigs and small branches are left on the ground to rot.

Small farmers log most of their forests by hand, using a minimum of machinery. Larger landowners, including the national forests, log much more intensely. They use

machines to strip branches from fallen trees and to cut the stripped logs into proper lengths, and trucks to haul the logs away.

But the huge tractors and winch systems common on the much larger American clearcuts are noticeably absent. In Austria, because the individual logging operations are smaller, machinery is smaller too. Trucks are lighter. Logging roads are much narrower and less obtrusive, and the smaller, rubber-tired tractors are much less destructive.

On American clearcuts, logging damage to the forest floor is nearly always substantial and sometimes intentional. According to some American forestry theorists, the forest floor should be scarified into the mineral soil so that new tree seeds will grow. On most logging sites today, however, regeneration is accomplished almost solely by planting established seedlings in individual holes; general scarification is no longer essential.

On Austrian sites, soil on the forest floor is seldom disturbed at all. Existing vegetation survives logging and the delicate forest cover remains intact.

Intensive reforestation immediately after logging is another important factor in reducing the visibility of Austrian clearcuts. Generally, Austrian foresters plant seedlings more densely than their American counterparts, in part at least because the tree species are different. In times past, Austrian farmers planted as many as 4000 seedlings per acre. Today, the number has been reduced to between 1200 and 1400 trees, but it is much higher than the 500 trees per acre common on reforested Douglas fir clearcuts in the American West.

Tradition has played an equally significant role in preserving the Austrian forests. Austria's present forest laws, for example, date back to imperial regulations adopted in 1852, which were themselves based on an operating tradition already several centuries old. As a result of this long tradition, Austrians, unlike many Americans, realize the limits of their forest resources. They recognize that trees cut must be replaced, that forests must remain forests, that soils must be constantly protected, and that planned, careful and even conservative harvesting is utterly essential to the long-term health of the national resource.

Landowners accept the fact, too, that their forests should always remain open to the public for recreation. Throughout Austria, anyone may walk through any forest, unless it is closed specifically for logging or reforestation. Vehicles may often be banned, even from developed logging roads, but hikers are free to enter the forests at any time. As a result, Austria's mountain forests serve as a recreation as

well as a wood-product resource.

Austrian tradition, of course, has its limitations. Forest managers, for instance, approach change with extreme caution. Where American forest managers seem willing to gamble, Austrian foresters await fully tested results. In the Pacific Northwest, foresters have been urging substantial increases in the allowable harvest based solely on predictions that the forests are about ready to produce more wood.

By using herbicides, pesticides, fertilizers and genetically improved seedlings, these foresters predict that trees in national forests will grow faster tomorrow than they have in the past and, therefore, can be logged at a higher rate now, based on that expectation.

Austrian foresters, like their American



counterparts, expect to increase forest production in the future by using the same variety of new forest-management techniques. But the Austrians do not plan to increase their national logging levels based simply on expectations.

"We cannot," one Austrian forester explained, "spend money we haven't yet got in the bank."

When higher forest growth can be measured—in the forest—higher levels of logging will be permitted. But until then, Austrian harvest levels will remain the same.

Austrian forests gain added protection from the organization of the federal management system itself. In federal forests, one office is responsible for growing trees and another for making certain that proper forestry practices are carried out. The office charged with enforcing regulations also oversees practices on private lands. In the forests surrounding Vienna, for example, officials of the supervisory arm imposed some 256 fines last year for violations of federal regulations.

In the federal forests of the U.S. West, on the other hand, there is no such clear separation of responsibilities. The Forest Service is charged not only with operating the federal forests but also with seeing that the job is done properly. The agency has no responsibility at all for supervising private

or state forest operations.

The Forest Service naturally establishes policies and issues regulations on how its work should be done. But if agency supervisors choose to ignore those policies or directives, or fail to carry them out properly, no one has the clear obligation or power to do anything about it. As a result, breaches of regulations, laws and policies are not at all uncommon.

For example, Congress ordered the Forest Service in 1976 to establish size limits on western clearcuts within two years. Those limits have still not been fixed. The General Accounting Office, in a study conducted for Congress, found that the Forest Service had only sporadic control over its sprawling bureaucracy. In some cases, the GAO found agency directives were being ignored and, in others, had been twisted freely to meet local desires. Often nothing can be done about such conditions unless private organizations or citizens haul the agency into court and demand compliance.

The organization of the Austrian forest system protects forest managers from political pressure that might be exerted by industry. Austrian federal foresters have an overriding responsibility to maintain forest production at a sustained level. They are not expected to adjust production levels to meet some new industrial demand or to overcut a forest in order to keep some community or over-consuming industry alive.

In western forests, on the other hand, the Forest Service has a mandate not only to grow trees, presumably on a sustained-yield basis, but also to respond to the raw-material needs of local industry. Thus, as private forest holdings in the West are consumed, national forest managers are placed under increased pressure to expand local logging opportunities in order to keep these endangered industries alive.

As a result, the service constantly juggles its levels of allowable cut, changes its growth predictions or alters the boundaries of its planning units in often-ridiculous efforts to reconcile conflicting demands.

Certainly, Austrian practices could not be applied to Pacific Northwest forests. Northwest forests are much older. Tree species are different. Logs are much larger. Soils are not the same. Traditions and public attitudes cannot be compared.

But, still, the Austrian experience does demonstrate that mountain forests can be logged intensively without destroying scenic values and that the American way of forestry may not be the only, or necessarily even the best, way of managing forests. □

E. M. Sterling writes regularly on problems in the management of national forests. His book, The South Cascades, discusses such issues in the Gifford Pinchot National Forest.

LAKE TAHOE

A TALE OF TWO STATES

HAL RUBIN

LAKE TAHOE, between the Sierra Nevada and the Carson ranges on the California-Nevada border, is the biggest high-mountain lake in North America. It is 21 miles long and 12 miles wide and rests in a glacial bowl at 6200 feet, surrounded by pine forests and snowy peaks that rise to 10,000 feet. It is 1645 feet deep at its deepest; if spread uniformly over Texas, it would cover the state with eight inches of water.

Tahoe is also one of the world's clearest and most beautiful lakes. In the 1870s Mark Twain said, "As it lay there with the shadows of its great mountains photographed upon its surface, I thought it must surely be the fairest picture the whole earth affords."

But Lake Tahoe is being polluted, its cobalt-blue waters turning green from silt and sewage. Nowhere are the penalties of ecological malfeasance more conspicuous. Development is the problem, but solutions are hard to find. Two states and the federal government have been trying to untangle the issues for nearly a decade, and a state bond act that might have provided some help was defeated at the ballot box in 1980. It may have another chance in 1982, and a National Scenic Area Act may be introduced in the 97th Congress.

Abuse of the lake began about 100 years ago when loggers took trees off the slopes in massive numbers to build the western railroads and Nevada's silver mines during the Comstock boom. Siltation is sure to have increased, and the lake no doubt received an increased amount of nitrogen and phosphorus, but most of the runoff was apparently absorbed by the slopes. At about the turn of the century, Nevada and California began reforesting the hills and produced today's extensive second-growth forests, which reduce the potential for siltation. Then the 1950s brought a stampede of people into the Tahoe basin, and the lake rapidly began to show signs of eutrophication.

People flocked to Tahoe because the basin is a major recreational attraction. In summer it offers boating, fishing, water skiing, camping and hiking. Postwar affluence brought new ski resorts, and today the basin is one of the busiest ski areas in the world. In addition, Nevada's laws allowing gam-

bling made Tahoe, right on the border, a major enticement. Also, of course, the area draws people who simply love the beauty.

Together, those forces have brought the Tahoe basin's permanent population to 60,000, 42,500 on the California side and 17,500 on the Nevada side. In summer the resident population rises to 68,000. Visitors flow in at a rate of from 10,000 to 100,000 a day; the average is 35,000 a day.

Although about 70% of the basin is in public hands, large sections of the private lands have been blanketed with hideous structures, for the most part gambling casinos and parking lots. A highway runs around the lake, and cars pour across the California border headed for the casinos at Stateline, Nevada.

In a nutshell, the situation is this: continued growth, with its increasing numbers of residents, second-home owners, tourists, casino visitors and employees, has covered more land with condominiums, subdivisions, motels, shopping centers and fast-food emporiums. That's on the California side of the lake. On the Nevada side there are more hotels, casinos and parking lots.

Accelerated development has increased erosion and siltation. Added population has taxed water supplies, sewage facilities and energy sources. More traffic, the prime cause of air pollution, has reduced visibility.

To protect water quality, residents changed from septic tanks to sewage systems. At the north end of the lake, sewage is pumped out of the basin to a treatment plant at Truckee, at considerable cost in both dollars and energy. At the south end of the lake, sewage is pumped outside the basin to the specially created Indian Creek Reservoir in Alpine County. The improved sewage system at the south end increased not only tax assessments, but also pressure to allow more subdivisions and condominiums to be built.

Unfortunately, "there probably isn't a lake in the world that is more sensitive to man's influence," says Dr. Charles R. Goldman from the University of California at Davis. Dr. Goldman is a limnologist, or specialist in lakes, who has been recording the deterioration of Lake Tahoe for more than 20 years. He says that between 1970



Rex Butler

As it lay there with the shadows of its great mountains photographed upon its surface, I thought it must surely be the fairest picture the whole world affords.

—MARK TWAIN

This view of Emerald Bay on Lake Tahoe shows the beauty endangered by popularity and population pressure.

and 1978, during which time 28,000 acres of private land around the lake were developed, nutrients entering the lake from erosion increased by 18% to 20%, the mass of algae increased by 150% and the lake's clarity decreased by 6% to 13%.

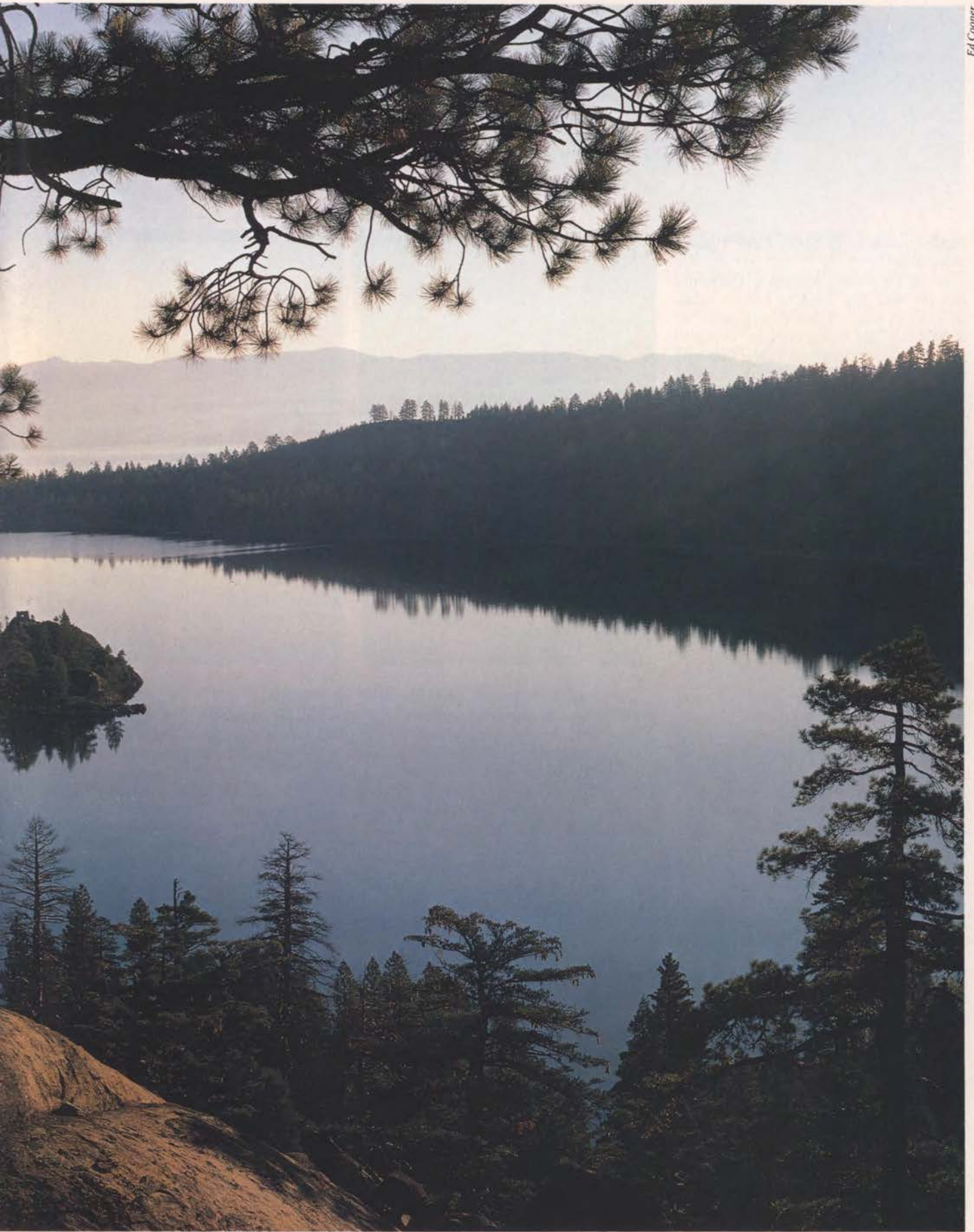
Professor Thomas Cahill, a physicist from the same university who specializes in air-quality problems in the basin, says that at Stateline, Nevada, the levels of carbon monoxide, hydrocarbons and lead are higher than in downtown Los Angeles at the height of smog season. The principal cause is automobile exhaust. Typical air-pollution levels at the lake as a whole are comparable to those in San Francisco.

Although reports similar to these appeared regularly even before 1969, neither state was able to handle the situation alone because there were more than 60 districts, agencies, and city and county jurisdictions involved, with conflicting policies. Federal agencies and bureaus increased the jurisdictional snarl. In 1969, trying for a fresh start, California and Nevada created a bistate compact called the Tahoe Regional Planning Agency (TRPA). Its charge was to control the chaotic growth around the lake and to halt and reverse the environmental damage that had already been done.

At first, environmental groups were confident the worst was behind them, but they were up against the casino owners and land speculators. In Reno or Las Vegas, the "house edge" guarantees that the casino operators never lose in the long run. That same advantage was built into the machinery of the TRPA by stacking membership in favor of the pro-growth contingents on both sides of the lake. For example, the mechanism for approving new projects around the lake was arranged so that if a majority of the voting members did not agree on approval or disapproval of an applicant's project within 60 days, lack of action was tantamount to approval of the plan, and construction could begin.

During the past decade the TRPA approved more than 95% of the development proposals it reviewed. In 1973 and 1974 plans were approved for four new casinos and more than 2000 additional hotel rooms at Stateline, which would add 24,000 per-





Ed Cooper

manent residents to South Lake Tahoe's population.

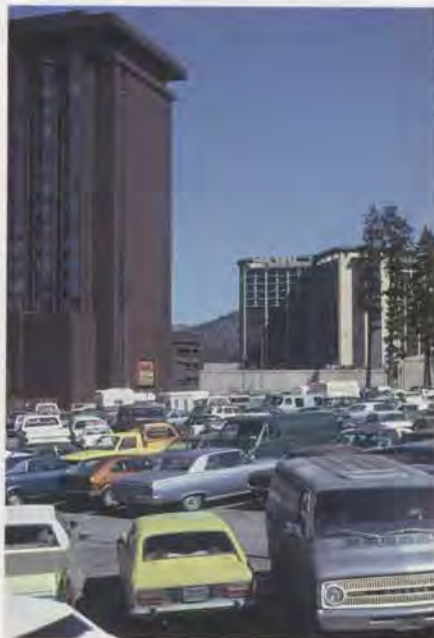
By 1973 it became obvious to California that the time had come to explore other alternatives before Tahoe turned green, so in 1974 the state reorganized and strengthened its in-state California Tahoe Regional Planning Agency (CTRPA) and set about saving the two thirds of the lake and basin that were in its jurisdiction. A few years later, in late 1978 and 1979, California went further and withdrew its funding from the two-state agency.

In a final effort to effect a compromise, California state Senator John Garamendi and Assemblyman Victor Calvo negotiated for months with Nevada state Senator Spike Wilson and Assemblyman Joe Diini and arrived at a new bistate compact. Nevada Governor Robert List called the legislature, which normally meets every two years, into special session for one day to approve the final agreement. California had already approved it.

The new arrangement prohibited most large development at the lake for 2½ years, imposed strict limitations on the expansion of existing casinos and prohibited new casinos. It also increased membership in the agency from ten to fourteen—seven from each state—to limit the power of local representatives, who almost always support growth. New voting procedures required that a majority of members from each state approve a regional plan and all new ordinances and regulations. Also, five of the seven members from each state's delegation must approve all development projects proposed.

The new compact was advertised as a compromise between developers, who want continued unlimited growth, and people who want virtually to halt development. It put a moratorium on large projects until a new plan could be devised for controlling growth: the plan is due out in 1982.

Jarred by California's withdrawal of funding from TRPA and by the growing possibility of federal intervention, and in view of its preference for a relatively weak two-state TRPA rather than California's strong CTRPA, the Nevada legislature approved the agreement.



James Hildinger



James Hildinger

California, frustrated by previous compromises that never turned into real programs, was already going ahead with a strong water-quality plan banning development on 7100 of the 15,600 empty parcels of land on its side of the basin. These lots are so steep or so subject to erosion that development would boost sediment runoff about 1000 times over normal levels.

The state planned to buy the lots in environmentally sensitive areas, at an estimated cost of \$131 million, although it had no funds yet for the purpose. Another \$95 million is needed for additional projects over the next 20 years to stabilize slopes, revegetate bare areas and direct runoff around unstable areas and into drains. The state Water Resources Control Board allocated \$10 million in Clean Water Funds for projects to control erosion, and the state Department of Transportation expected to spend \$7.8 million to control erosion on state highways in the basin.

To provide money to buy the sensitive lands, California put Proposition 2 on the ballot in November 1980. The measure would not have provided powers of condemnation but would have let the state offer a way out of a financial predicament to

people who owned property but were prevented from building. It would have raised \$85 million to buy land and was supported by the Sierra Club, the League to Save Lake Tahoe, the California Association of Realtors and the League of California Cities. But the proposition was defeated by a vote of 3.78 million to 3.6 million. It may be on the ballot again in June 1982.

A month before the vote, President Jimmy Carter announced that the nation had a stake in preserving the Tahoe basin, and he signed an executive order establishing a federal coordinating council with authority over projects that would involve the federal government and encourage further growth.

But in mid-March 1981, with a one-sentence executive order issued in the name of eliminating unnecessary federal interference, President Reagan abolished Carter's coordinating council. California state Senator Leo McCarthy, who had helped engineer the council, charged, "Reagan knuckled under to Nevada's gambling and commercial interests." The *Sacramento Bee* commented, "Politics at its worst is the only way to describe President Reagan's decision. . . . It's a good day for the gamblers but a bad day for planning."



At Lake Tahoe in the past ten years, increasing visitors wanted hotel rooms and roads, a growing population wanted houses, and the results are air pollution, erosion and water pollution.

Still, another encouraging development came at about the same time President Carter signed his order. The House of Representatives passed H.R. 7036, introduced by Representatives Phillip Burton of California and Jim Santini of Nevada. Senators Paul Laxalt of Nevada and Alan Cranston of California introduced a companion bill in the Senate. The measure provided that the Bureau of Land Management sell lands it owned elsewhere in Nevada and use 75% of the proceeds to buy land around Lake Tahoe. The other 25% of the revenue would be split, 20% going to Nevada for education and 5% to the cities or counties where the sales occurred to develop recreational facilities.

The land purchased around Tahoe would be administered by the U.S. Forest Service. On the California side of the lake, the Secretary of Agriculture (the department containing the Forest Service) could purchase private land that was undeveloped or already developed but facing environmental damage. On the Nevada side, only unde-

veloped land could be acquired. Land sales were expected to yield from \$70 million to \$150 million; the bill also provided for a separate \$30 million for land purchases.

In the final days of the lame-duck session of the 96th Congress, Nevada Senators Laxalt and Canon worked with California Senator S.I. Hayakawa and rammed through an amendment that gave the TRPA a veto over land condemnation on both sides of the lake. The change placated Tahoe property owners but not the Sierra Club's regional representative, Mark Palmer. He said, "The Nevada legislature and the Nevada interests have continued to ignore restrictions agreed on by the TRPA. There has been substantial growth and very little slowing down under the regional planning agency. It has been in the habit of indicating something is being done, when in fact nothing is being done."

Jim Bruner, executive director of the League to Save Lake Tahoe, applauds both Santini and Burton for "forging a unique and workable compromise between differing approaches for Tahoe's protection." Still, both Palmer and Bruner consider the Burton-Santini bill a fragile compromise, an interim measure to protect the lake.

Both think the best answer to the problems may lie in California Representative Vic Fazio's Lake Tahoe National Scenic Area Act. It died in the 1980 session but will probably be reintroduced in the second half of the 97th Congress. Both Palmer and Bruner support the bill, as does California Secretary of Resources Huey Johnson. They believe adequate planning, regulation and coordination of programs will happen only when the federal government establishes a strong presence.

The bill would prevent further environmental degradation of the basin, would authorize federal funds for the purchase of lands to prevent further harmful construction and land disturbance, would move forward with plans to control erosion, would stop pollution of the lake and would require local governments to conform to the National Scenic Area code.

The Scenic Area Act goes farther than the Burton-Santini bill because it provides for federal management of the Tahoe basin; the Forest Service, which already owns 63% of the lands in the basin, including several miles of shoreline, would manage the basin as a scenic and recreational area. The Secretary of Agriculture would have authority for management, planning and land acquisition and for forming a new partnership with the states. States would continue managing and expanding state parts, as well as implementing the federal Clean Air and Clean Water acts.

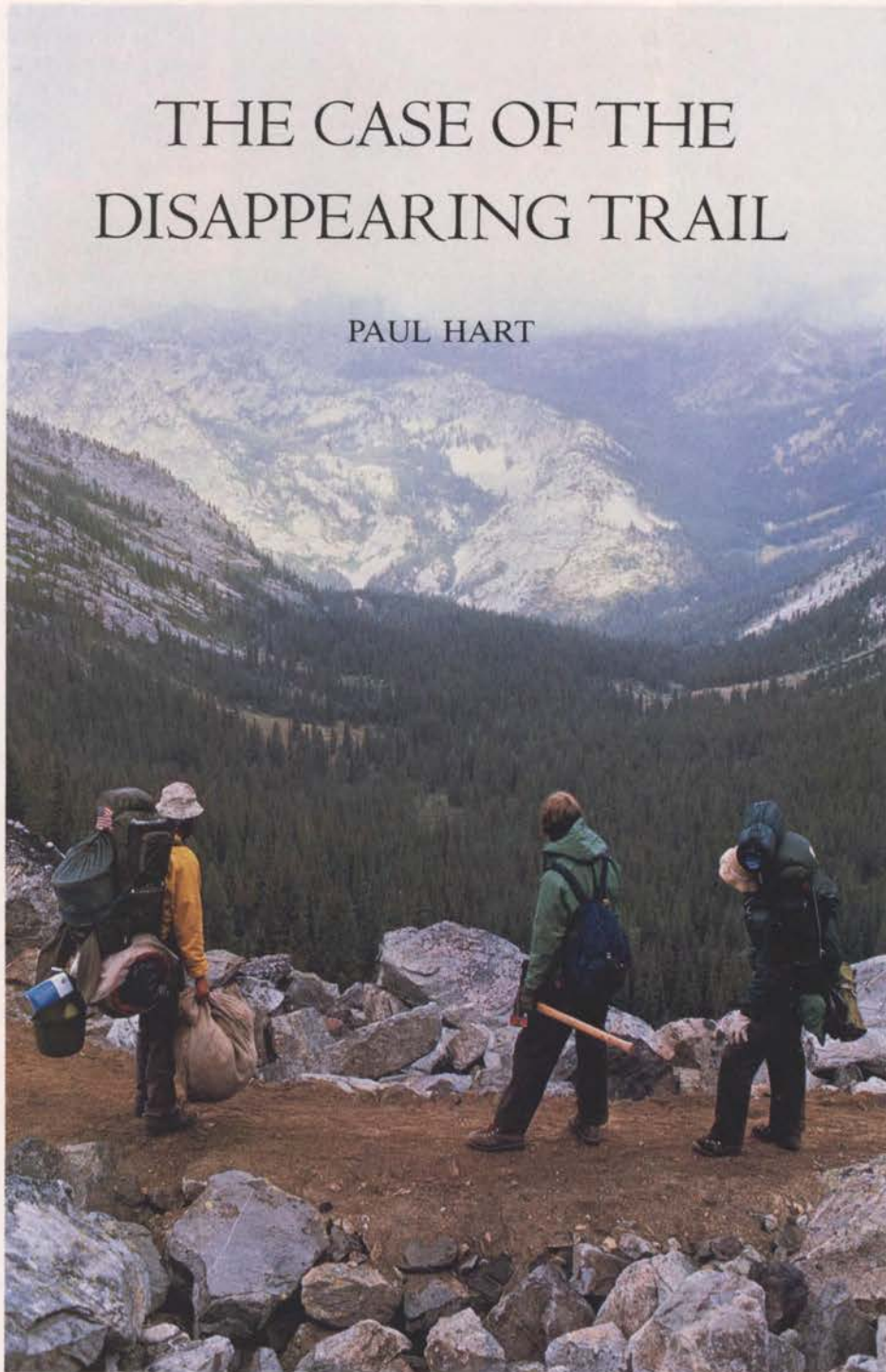
Mark Palmer said, "We will be joining the League to Save Lake Tahoe in trying to make politics work for H.R. 6338 [the National Scenic Area Act], so it can be approved eventually. Tahoe is a spectacular and world-famous natural area that has been tremendously overdeveloped. The situation there has national implications in respect to land use and to problems of recreational development versus protection of the natural scene. What happens will be a precedent for other similar areas that have been overdeveloped and need to be brought under control." □

Hal Rubin, a freelance environmental writer, taught journalism for eleven years at California State University at Sacramento.

THE CASE OF THE DISAPPEARING TRAIL

PAUL HART

Paul Hart U.S. Forest Service



The participants on this service trip look out over Chipmunk Pass, near the trail relocation.

A WELL-USED TRAIL forked from the main trail just beyond Chipmunk Pass and dropped through wildflowers and subalpine timber to the canyon below. Two weeks later, this secondary trail had vanished, leaving an undisturbed view of grasses, wildflowers and trees.

What happened? An enthusiastic group of Sierra Club volunteers on a service outing had been at work with the U.S. Forest Service in the Wenatchee National Forest in Washington state.

The project obliterated and rehabilitated an old trail on a poor location—a trail that had concentrated decades of hikers, horses and trail bikes on steep pitches and in soggy meadows. This was only one of 20 service projects undertaken by nearly 300 Sierra Club volunteers last year.

The Sierra Club service-outings program completed its 24th year this summer. The program began modestly enough with a garbage-cleanup expedition led by Fred Eissler in the Sierra Nevada in 1958. Since then, the annual list of service outings has expanded to include a variety of cleanup, trail-maintenance and ecosystem-restoration projects. In all, there have been more than 250 service trips and 4000 enthusiastic participants.

Tons of litter have been packed out from wilderness areas. Dozens of miles of important trails have been maintained and upgraded. Twenty tons of unsightly airplane wreckage have been removed from wild areas. Puncheons (wooden walkways over boggy areas) and culverts have been installed in trails. The scars from years of misuse have been erased from some of the nation's most scenic natural treasures.

The purpose of the service trips program is the purpose of the Sierra Club itself, says Kelly Runyon, chairperson of the service trips subcommittee: "To explore, enjoy, and preserve the Sierra Nevada and other scenic resources of the United States . . . and to educate the people with regard to national and state forests, parks, monuments, and other natural resources of especial scenic beauty and to enlist public interest and cooperation in protecting them."

Besides the obvious benefits to the natu-

They would
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miles of well-
worn trail.

The first step in erasing the trail is breaking apart the compacted surface to let new plants sprout more easily.



ral areas where the work takes place, the trips have a variety of other worthy results, Runyon said. "The trip members' enjoyment is an important part of any service trip. If they accomplished a conservation objective and had a good time we consider the trip a success."

"The satisfaction of the land agency is also pretty important," he added. One of the major intangible benefits is the interchange that takes place between Sierra Club members and land managers. "For instance, the Forest Service sees us in a different light. It feels good to see that we can work together toward common purposes when we're not nose-to-nose over an issue."

"The Case of the Disappearing Trail" is typical of the ambitious projects undertaken on service outings, and the cast of characters reflects the enthusiasm, exuberance and dedication to protecting wild areas that have made the program successful.

Chipmunk Pass, the setting, is 6000 feet above 55-mile-long Lake Chelan on Sawtooth Ridge, an offshoot of the Cascade Range. Chelan Ranger District personnel were justifiably proud of a new 2.5-mile segment of the Sawtooth summit trail that bypassed an old route originally used by sheepherders straight down steep slopes and through boggy meadow areas. The problem: in a time of minimal budgets for trail construction, managers were lucky to receive funding for the new route. There were no funds to obliterate the old trail, so it remained an enticing siren for travelers of the main trail, promising a shortcut but delivering instead a series of mucky boglets.

District personnel contacted the directors of the Sierra Club's service trips program with a plan to obliterate the old trail on a ten-day service outing. The Forest Service would provide necessary tools, materials and supervision if the Sierra Club would provide the volunteers. The agency was confident of the value of service outings because this would be the fifth consecutive summer that they had been scheduled for the Chelan district. Previous outings had concentrated on trail improvement and recreation-site rehabilitation within the Glacier Peak Wilderness west of Lake Chelan.



After they cover the old trail with jute netting (top right) to shade new growth and check erosion, the crew spreads soil (top left) and plants seedlings (lower left). On a break, they relax with a watermelon seed-spitting contest (lower right), using bemused ranger Gary Paull as target.

The crew, nicknamed Bankston's Rangers, turned out to be an unlikely assortment of fourteen men and women ranging in age from 18 to 67. Their occupations were similarly diverse—college student, professor, public defender, family physician—and their home towns were as far-flung as Florida, Massachusetts, California and British Columbia.

The volunteers responded to a notice in the 1980 Outing Catalogue. They financed their own transportation from their home towns to Chelan, Washington, and paid a project support fee of \$65 besides. The outing was led by Bill Bankston, a young graduate student from Springfield, Oregon, veteran of thirteen previous service trips. This trip began with a nine-mile hike through the highcountry. The crew set up camp beside a grassy meadow among scattered whitebark pine and then considered a difficult task. They would have five working days to unbuild nearly two miles of well-worn trail. It had been rutted by runoff in spots, was solidly compacted in some places, and featured multiple paths in others. The goal was to replace lost soil where possible, to break up the hard-packed earth elsewhere and to give nature a hand in re-establishing vegetation. The workers would attempt to erase all signs of the trail, especially at its junctions with the new trail. Gary Paull, a Forest Service representative, had a detailed rehabilitation plan that emphasized meadow areas and junctions with the new trail.

"It was exciting," Paull remembered later. "People fell into skills they probably didn't know they had." Some became specialists in spading up compacted soil. Others transplanted plugs of native vegetation, and some ran a bucket brigade from nearby springs to water transplants. Dark-green jute netting was laid over much of the trail and staked into place to help prevent erosion and to provide shade for seedling vegetation in the heat of the following summer. In time, the netting will rot away and, with luck, leave new vegetation. Dead logs and branches were placed on portions of the old trail to break visual lines and further blend it into the natural surroundings. Finally, fertilizer was spread on portions of the rehabilitated area.

By the end of the fifth day the task was nearly complete. Indeed, it was so nearly complete that the old trail was all but invisible to users of the main trail, and the volunteers were exhausted and elated.

"I wanted a chance to go slowly, to get involved in dirt and grass and such," said Judy Whippel, a university arts administrator from Boston. "I've got blisters on my hands and feet, but this is something rewarding and worthwhile. I've thoroughly enjoyed it." Her advice to other would-be volunteers for service outings is basic: "Bring plenty of moleskin for blisters. Be prepared to work."

As is typical of service outings, the trip offered rewards far beyond the value of the project itself. "Work is a cohesive force . . . it seems that service groups are a little closer than groups on other Sierra Club outings," Bankston said. Despite their diverse backgrounds and ages, service group members develop a strong kinship, he noted.

The opportunities for free-time recreation on a trip are equally important. Participants on this trip had a variety of hiking opportunities—through weathered snags on windswept ridges, beside several glistening alpine lakes, and even to the top of 8690-foot Star Peak for a sweeping vista of the rugged North Cascades. Campfire camaraderie was capped by the final night's festivities, a traditional dress-up night where zaniness is expected, and attire may vary from tuxedo to jute netting and pine cones.

Furthermore, the magic of the service trip was felt by the Forest Service hosts as well. "Because of this common goal, there is mutual understanding that develops between our people and the Sierra Club volunteers," said Robert Hetzer, Chelan District Ranger. "The work they have done fills a void and meets a management need. This is work we really wanted to accomplish but couldn't afford."

The successes of the service outing at Chipmunk Pass are typical of most of the other 270 service trips offered since 1958. Unfortunately, the national service outings program has an uncertain future. The program peaked with the heydays of environmental activism in the early 1970s, but the funding has declined in recent years while

inflation costs have grown steadily. It has been necessary to raise the outings program fee several times, and chairperson Runyon fears this may begin to discourage younger Club members from participating.

Besides the participants' fees, the program has been supported by contributions from the national outings committee and by small stipends and logistical support from the government agencies providing the work projects. "Frankly, we are in financial trouble," Runyon said. "Our support has been dwindling, and fees have had to rise." Each year the service outings committee seeks private donations (tax deductible, by the way) to support the program. The committee is asking for \$1000 just to help finance a project that removed remnants of an old bridge and culverts on the East Fork River in McKinley Park this year. A total of \$8000 in donations is sought for 1982. Contributions can be directed to the Service Trips Program through the Sierra Club Foundation.

Ironically, the decline in funding coincides with drastic budget declines for the recreation programs of federal land-management agencies. This means that even though the impacts of use continue to accumulate in the nation's wild areas, the options for rehabilitating the areas are narrowing every year. "We are going to have to rely more and more on volunteer efforts in the future," predicted Ranger Hetzer.

In 1982, up to 25 service outings will take place throughout the United States—from the Kaibab National Forest in Arizona to Colorado's Continental Divide Trail to McKinley Park in Alaska. Volunteers from across the country will pay travel costs and a trip member's fee (\$75 in 1981; 1982 fees are not yet firm) for the opportunity to share the experience of making a positive impact on some of the nation's most beautiful wild areas.

A recent volunteer, Tony Raffo, a college student from San Gabriel, California, summed up a basic reason for the program's popularity. "Wilderness has given me a lot . . . it's nice to put something back in." □

Paul R. Hart is a freelance writer who also works in the Wenatchee National Forest in Washington.

PURPA: A New Law Helps Make Small-Scale Power Production Profitable

PAUL GIPE

NIGHT HAS FALLEN, the sky is clear. December's winds whip the Lake Erie shoreline. Snow swirls about the fence posts and outbuildings of the McClains' small farm. The wind rises in crescendo, then dies away in an unpredictable ebb and flow. A faint whirring can be heard, rhythmic and ever present above the brief calms. Dark, saber-like shapes sweep the starry sky.

"Looks like it's going to be a real cold one tonight," George McClain muses aloud. His two children, scampering around in their flannel pajamas, run from their mother, Arlene, as she readies them for bed. Arlene, a partner in the McClains' dairy, responds, "George, don't you think we ought to turn the heat up? I feel like I'm coming down with something." "Yeah, Daddy," the kids chime in, "turn it up like we used to."

"Now, you kids know better than that," he says. "Christmas will be here soon and we want to get Mommy that dishwasher she's been wanting for so long, now don't we?" he asks, winking at his daughter. "We only get one more check from Pennelec before the new year and I want to sell them just as much power as we can. You know that on a night like this everybody's going to be switching on their electric heaters, and demand's going to be high. We need to save every kilowatt we can. The more we save, the more we can feed to Pennelec. They'll pay a fortune for it. I'll bet we can make \$50 by morning; more, if this weather holds. Those turbines will really turn out the juice in these winds. Just listen to them hum."

A far-fetched scenario? A family that looks forward to winter's winds, and waits for a check from the local electric utility? Not really. The day may be near when



Illustration by Jim La Marche.



Paul Gilpe

This sophisticated 250-kilowatt wind turbine in Pennsylvania uses airfoils for blades.

farmers, such as the fictional McClains, sell a new cash crop: energy. But the McClains will not be alone. People with land, access to the wind and money for a hefty investment in the future could find themselves selling power to their utility for a profit.

This strange state of affairs came about partly because of a natural evolution in attitudes toward generation of electric power and partly because of changes in regulatory policy. Many utilities saw the handwriting on the wall a few years ago and began permitting interconnections with home wind systems as a goodwill gesture to quell public clamor over climbing rates. Utilities in serious need of new power plants even welcomed these small power producers onto their lines, but some fought every inch of the way.

Irate consumers who wished to use their own wind systems bombarded Congress with complaints. In response, Congress inserted several far-reaching provisions in one of the bills that became law as part of the National Energy Act. It chose the Public Utility Regulatory Policies Act (PURPA) as the vehicle to bring electric utilities—willing or unwilling—into a post-embargo world where more and more reliance would be placed on alternate sources of energy.

Though multifaceted, PURPA is most widely known for requiring that utility companies buy excess electricity from small power producers and cogenerators; this is called “buy-back.” It also requires that they pay reasonable rates for the power and provide backup service.

In one step, PURPA eliminates three major barriers to greater use of small wind generators. First, it exempts small power producers from restrictions of the Federal

Power Act. Previously, a home wind system, for example, could have been considered a utility and regulated as such by a state public utility commission. (Paperwork alone would have buried many small power producers.) Second, PURPA assures wind-system users backup power at nondiscriminatory rates. Third, PURPA guarantees small power producers a market for their excess energy, helping to make wind systems economically feasible.

Congress, through PURPA, sought to encourage small-scale power production from small wind systems, unused dams and other alternative sources of electricity by removing the barriers some utilities set up. But PURPA also creates a powerful financial incentive not present before. Utilities not only must allow interconnections between wind generators and their own lines but they also must pay more than they have in the past for the excess power these small producers generate.

The output from a wind turbine, as today’s windmills are called, fluctuates. When the wind is strong the turbine may generate all the power needed by a homeowner or small business. On the other hand, it will be unproductive during calm periods. The turbine’s owner will then have to buy power from the utility or go without.

As the output of the wind turbine varies during the day, so does the use of electricity. Often the two are mismatched. At times the wind generator will produce only a portion of the power needed; the utility then makes up the difference. But at other times the wind turbine will generate more power than can be consumed. If the turbine is connected to the utility grid, it will then feed this excess power into the lines. In effect, the wind turbine’s owner would be selling power to the electric company instead of buying it.

Before PURPA, most utilities that purchased excess power from home wind systems paid only a fraction of the regular retail rate. If a homeowner bought power at five cents a kilowatt-hour (5¢/kwh), the utility would offer roughly one-half that amount, sometimes even less, for the power it bought back.

Utilities argued that the wind generator only offset their need for fuel, it didn’t reduce their need for the equipment it takes to generate and distribute the power. The lines, transformers and “spinning reserve” were all still needed, they said, in case the wind died down and the customer demanded power. The best a homeowner could hope for would be permission to run the utility’s watt-meter backwards. Running the meter in reverse amounts to selling the power to the utility at the same price the utility would charge a consumer for using it.

Both practices ceased when the Federal Energy Regulatory Commission (FERC), the agency implementing PURPA, ruled that the buy-back rate must reflect the costs the utility “avoids” by not having to generate the power itself. This avoided-cost rule radically departs from common utility pricing practice.

A utility provides power from a mix of generating stations, including plants that burn oil, some that burn coal and maybe one or two that use nuclear fuel. These plants vary in age; some may be near retirement, others may have just come on-line. The cost of producing power from all these sources is lumped together and averaged. Tacking on charges for transmission and for the around-the-clock service the utility provides, we end up with the retail rate for electricity.

Conservationists have argued for a decade that a rate structure based on system-wide average costs distorts the true cost of power in today’s dollars. New plants are considerably more expensive than the facilities they replace. Inflation is not the only reason. Environmental and social costs—what the economists call external costs—are now being incorporated into the price of a new facility, whether coal or nuclear, rather than being borne indirectly by society in general.

Conservationists called for “marginal cost pricing” so that the marketplace would better reflect the cost of new power plants and the electricity they generate. Marginal cost is the cost to produce each additional unit of power. When one more kW in demand requires the construction and operation of a new power plant, that one kW becomes very expensive. Marginal cost pricing would raise rates, but it would also deter consumption, reduce load growth and therefore reduce external costs and the need for new plants.

As an example, while the average cost of energy from one utility might be only 2¢/kWh, energy from a newly completed power plant could be 5¢ to 10¢/kWh because of today’s capital costs. Consumers would be discouraged from buying power if they had to pay the cost of power from a new plant, but less so if the new plant’s cost was averaged in with the whole system.

Though not identical to marginal cost, FERC’s avoided-cost criterion follows the same reasoning. Utilities now must pay small power producers the incremental cost of energy the utility avoids generating, and the utilities must compute the avoided energy costs based on their most costly fuel—in most cases, oil. (Each state will rule separately on how to determine avoided cost.) The amount of deferred capacity or deferred new-generation potential attribut-

able to the small power producers must also be determined. No longer will utilities be able to use their average cost of fuel as the standard. In some cases avoided costs will exceed even the retail rate.

The avoided-cost ruling opens the door for small wind systems to sell power profitably to utilities. This is particularly true in areas, such as New England and in California, served by utilities heavily dependent upon older oil-fired power plants. The incentive will be less in areas served by hydro and coal-based utilities. Public power systems that have exhausted the possibilities of further large-scale hydro development (e.g., in the Pacific Northwest) may provide a good market.

As if this weren't enough to create a new class of American entrepreneurs—wind farmers—FERC's regulations go even further. They allow state utility commissions to take into account an estimate of avoided costs over the life of the facility when ruling on a utility's buy-back rate. If the commission chooses to encourage alternative energy, it may establish an optional levelized rate. In the case of a wind system designed to run for 20 years, the levelized rate in the early years of a contract would be much higher than today's avoided cost. For example, assume a buy-back rate of 5¢/kWh today that inflates to 25¢/kWh in the year 2000. The levelized rate might be set at 10¢/kWh or more over 20 years.

Levelized rates offer much greater revenue in the early years than is available from rates based on escalating avoided costs. Because it accelerates payback and increases the immediate return on investment, it appeals to wind-farm developers. But the attractiveness decreases in later years when rates may rise rapidly. No state has allowed levelized rates yet, though several are considering them.

As in the presidential primaries, New Hampshire has set the trend for the nation. The New Hampshire Public Service Commission ruled in 1980 that utilities serving the state avoided generating energy worth 7.8¢/kWh when purchasing energy from small wind turbines and small dams. The ruling caused a stampede of developers to the state with hopes of selling power to New Hampshire utilities.

Investors in New Hampshire projects expressed fear that the avoided cost criterion would produce uncertainty, because of the Seabrook nuclear power station. The two controversial reactors under construction at Seabrook would substantially alter Public Service of New Hampshire's generating mix and could possibly reduce the value of electricity purchased from small power producers after the reactors go on-line. Seabrook advocates claim the energy produced will

be inexpensive in comparison to oil-fired plants. Industry observers speculate, however, that avoided costs will actually go up after Seabrook goes into operation. This kind of debate makes investors nervous.

Would investors be willing to put up, for example, a million dollars for a wind farm containing hundreds of wind generators if they knew that five years down the road the market for their power would collapse? An investment may look good at 8¢/kWh, but what happens if the avoided costs suddenly drop to 5¢/kWh? Payback time—the time it takes for the machine's income to pay back its original costs—is extended, and the return on investment decreases.

We should note, however, that this is not genuine avoided cost. Avoided cost is the price of the most expensive kilowatt-hour in the system. The Seabrook plants might reduce the *average* value of electricity in the system, but New Hampshire's avoided costs would still be determined by its most expensive power source.

New Hampshire headed off the question by including a grandfather clause in its PURPA regulations. Small power producers and cogenerators are assured that the buy-back rate set when their facilities begin operation will not be lowered. The rates may go up, but not down.

PURPA fundamentally changes the way we look at power generation, energy conservation and supplemental power sources. It is downright revolutionary. It encourages decentralization by offering opportunities for decentralized energy investment—anyone who can afford a wind generator and has a good site can get into the business of generating electricity. It alters our view of energy conservation from one of conserving to save money to conserving to make money, two similar ideas with very different effects on how much we conserve. The profit motive produces by far the greatest response. It unleashes the entrepreneurial spirit that we hear so much about today.

PURPA also affects the size of the wind systems homeowners or farmers may choose. As a supplemental power source, wind systems were originally looked upon as a means of reducing utility bills and were sized accordingly.

The typical home uses 7000 kWh annually. All-electric homes use considerably more (from 20,000 to 40,000 kWh, depending on the climate). Most small wind turbines were designed to generate from half to all the power needed by homes without electric heat. Turbines for this application use rotors thirteen to sixteen feet in diameter. In this size, the cost of power from the machine is relatively high, but costs go down as the machine's size increases. The small machines, as a result, are not neces-



Under PURPA's provisions, many people can profitably sell small amounts of power they produce at home.

sarily the best buy for the dollar.

Wind turbines were not built larger because, among other reasons, the bigger machines produced excess power more frequently. That excess power earned little revenue from the utilities because of low buy-back rates. The overall economics, consequently, still pointed toward wind turbines thirteen to sixteen feet in diameter.

Sales to the utility at more than the retail rate, however, encourage the potential user of wind energy to seek the most economical wind system on the market without regard to its size. Today the optimal size for a wind turbine in terms of cost seems to be about 33 feet in diameter. Thus, a homeowner may choose to install a turbine of this size even though it may produce two to four times as much energy as needed.

It's only a short step from buying one turbine larger than required to buying two, three or even more. Space, the level of risk one is willing to take and the availability of financing are the only limits. Like the McClains, some farmers who began looking at the wind as a way of cutting their utility bills have now recognized it as another resource that can be tilled.

Installing several machines offers a number of advantages. Buyers can obtain discounts on quantity purchases, for example, and can economize by performing all the site work for multiple units at one time. In all, thousands of dollars could be saved.

Let's return to the McClains, our hypothetical wind farmers. The electric bills from George's milking operation began to cut into the family's revenue even though it was a business expense and deductible. George knew he had good wind potential; he could almost see Lake Erie from his farm. Nevertheless, he also knew that his

PURPA requires that utility companies buy excess electricity from small power producers and cogenerators, and that they pay reasonable rates.

bank wouldn't be convinced by mere conjecture. So he installed a recording anemometer, a device used to measure wind speed, at his site. From the information he gathered, he could estimate how much energy various wind turbines would produce.

George needed about 30,000 kWh annually for the farm. He selected a ten-meter turbine that would generate 45,000 kWh. He planned to sell the excess 15,000 kWh to Pennelec.

The utility was in dire straits. A part of the GPU (General Public Utility) system, Pennelec was saddled with Metropolitan Edison's damaged reactor at Three Mile Island. Pennelec was purchasing power from other utilities at the highest rates possible, which pushed up its avoided cost.

George found that he could make almost as much money from the sale of excess electricity to Pennelec as he could save by not buying the 30,000 kWh. He estimated that the wind generator would pay for itself in five years—a return of almost 20% on his investment. His conclusion? Install as many wind generators as the family could afford.

He decided to buy three \$25,000 turbines instead of one. To his pleasant surprise he found that by buying and installing three units at once, he could save several thousand dollars. He was even able to reduce the payback to only four years. By the fifth year, he figured, the McClain wind farm could earn over \$10,000 annually.

Though such a profitable venture has yet to be demonstrated, the prospect is enough to give even a hardened urbanite a dream of farming the wind. And many are expecting to do just that by investing in wind-farm development corporations.

Spurred on by PURPA, entrepreneurs are quickly tying up available wind-farm

sites and unused dams. Another PURPA provision will aid developers by allowing the small power producer to transfer or "wheel" power from a small facility over his utility's lines to a distant but higher paying utility. Thus situations will arise that are similar to mine-mouth power plants: electricity is generated where the resource is abundant and then transported to urban load centers.

In a similar vein, though homeowners or small businesses wishing to install wind machines might lack wind at their sites, nearby windy hilltops might be available. Potential small power producers could opt to install wind turbines atop the hill instead. The turbine then could be most easily used by connecting it directly to the utility's lines and selling all the power produced. Meanwhile, the owners simultaneously purchase electricity from the utility as before. Revenues from the sale of wind-generated electricity to the utility offset their monthly billings, and the remainder can be banked.

Simultaneous purchase and sale of power greatly expands the ranks of potential wind farmers. Wherever the buy-back rate exceeds the retail rate, it is the best method of interconnection because it maximizes wind-generated revenues.

To advocates of alternate energy, PURPA sounds almost too good to be true. In fact, there is a slight catch. The utility is permitted to charge the small power producer for the costs of interconnection. Depending upon the utility and the location, the costs could be substantial.

To measure the power sold back to the utility, at least one more meter must be added. (FERC ruled against simply running the customer's present watt meter backwards.) One meter will measure power the customer consumes, the other, excess power flowing into the grid. Some utilities may wish to install a third or even a fourth meter as well. Meters aren't prohibitively expensive, but the costs will begin to add up.

If the utility decides that another transformer is needed for the safety and reliability of interconnection between a wind- or hydro-powered homestead and the company's lines, the expense will quickly mount. Fortunately, it's not often necessary.

The costs of interconnection could range from \$50 up to several thousand dollars. If you envision becoming a wind farmer, the figure may be substantially higher. On the whole, however, costs of interconnection should not present a major barrier to small-scale alternate energy development, particularly where state utility commissions take their oversight role seriously.

But utilities haven't just thrown up their hands and surrendered to the coming hordes of PURPA-bred small power pro-

ducers. They are fighting back, and they have powerful allies on several state utility commissions, notably in Georgia and Mississippi.

Last February U.S. District Judge Harold Cox declared major portions of PURPA unconstitutional in a suit brought by the state of Mississippi. FERC is appealing the decision to the Supreme Court. The Reagan administration tentatively supports the appeal, not based on their support of PURPA itself, but on the grounds that the ruling infringes on federal prerogatives.

Observers speculate that the court will overturn Cox's decision in part because of his judgment that:

"the state of Mississippi is not a robot, or lackey which may be shuttled back and forth to suit the whim and caprice of the federal government but was and is the prime benefactor of the power and authority designated by the Constitution"

In the meantime, FERC asserts that PURPA is still in effect, although it acknowledges that it will not enforce the provisions. (The Mississippi decision itself has no jurisdiction beyond the state.)

FERC has left the supervision and oversight of implementing PURPA to the states—with not-unexpected results. Nearly half the states haven't met the March 1981 date for implementation and are in violation of the act. In these states the utility commissions have apparently adopted a go-slow policy. They are implementing the provisions only if pressured to do so by alternative-energy enthusiasts and public-interest groups.

If PURPA hasn't been implemented in your state, you can spur action by filing a petition with FERC under the self-help clause of its regulations. If FERC hasn't acted in 60 days, you can then file a legal action against your state utility commission demanding that it obey the law.

For a detailed look at PURPA, you can review an extensive article in the November-December 1980 issue of the *Solar Law Reporter* (obtainable from the Solar Energy Research Institute), or you can contact Don Bain at the Oregon Department of Energy in Corvallis. General questions should be directed to the author at the Center for Alternative Resources, P. O. Box 539, Harrisburg, Pennsylvania 17108.

If you live in a city, you may not see much effect from PURPA, but if you live in the country, keep your eyes peeled and listen carefully. Soon you may see those saber-like shapes sweeping the sky and hear their whirring generators yourself. □

Paul Gipe is the director of the Center for Alternative Resources in Pennsylvania and is a principal in the consulting firm of Paul Gipe and Associates.

Tents are not the only possibility for shelter while ski camping. This adventurer (below) carved a snow cave with a ledge for sleeping and cooking.

Phil Schofield



SKI CAMPING FOR BEGINNERS

RON WATTERS

A pit, shelf and windbreak become an outdoor kitchen (left), while the final snow block completes an igloo (right).



Phil Schofield



Phil Schofield

AFTER SEARCHING most of the day for the pass that would lead us into the Middle Fork country of central Idaho, we finally decided to camp. Our campsite was high on a ridge, shrouded by the snow-laden clouds that had hampered our efforts to find a pass.

With skis on, we stamped out a platform in the strange white world of the ridge crest where both ground and sky were white, staked out the tent with skis and ski poles, and slipped into the familiar comfort of our sleeping bags. The reassuring 111-B stove was spitting and sputtering as the light began to dim. Then suddenly the tent brightened and, through the opened door, we watched as wisps of shredding clouds unveiled the snow- and ice-encrusted ridge across from us. The dying reddish glow of the sun filtered through the swirling, broken clouds, tinting the Big Horn Crag and spotlighting an ancient and twisted whitebark pine that stood near our tent. The old weathered pine

must have withstood many years of high-altitude winds, but tonight only the snowy pinnacled summits of the Crag stretched before us, framed by our tent door.

Memories of scenes like our campsite on the ridge in the Big Horn Crag are things that make ski camping such a special, rewarding outdoor activity. The ski camper works harder than the summer backpacker, but the enchantment of the winter landscape and the excitement of skiing down an untracked powder slope in the midst of the backcountry make it worth the extra effort.

To get started ski camping requires some basic skills from two prerequisite activities: backpacking and cross-country skiing. If you're involved in both those activities, and can find your way in a storm using a map and compass, then ski camping is simply an extension of their horizons. With the right kind of equipment and a careful choice of place and time of year to ski camp, you can easily get started.

CAREFUL CHOICES

Careful choices of location and time are an important part of the preparatory stage of ski camping. Many people think of ski camping only in terms of early and middle winter, but actually for your first few trips, these are probably the worst times. During this period, especially in December or January, most snowy areas will experience some of the coldest winter temperatures. It takes a few initial experiences with winter camping to learn all the little tricks to help keep yourself warm and comfortable in the cold environment. Experimenting with it during the coldest time of year may often lead to unpleasant experiences: cold hands, cold feet and chilly, damp nights. One bad early experience may just end right there the will to experiment.

Instead, start out with some late-winter trips, say around March. What you're trying to do is to go during a relatively warm part of the winter. As a guideline, nighttime tem-

With proper preparation, ski camping need not be uncomfortable. A tent (below) provides a snug retreat in a vast wintry landscape.



Phil Schofield

peratures in the upper teens or warmer are comfortable with proper equipment and ideal for the first few trips. One factor to keep in mind, however, is dampness. It is possible to keep drier and warmer at 10°F than at 28°F if the warmer temperature means you will get wetter.

Careful choice of the location of your trip is another important consideration. It's best to go where you cannot get lost. In the winter, even with the benefit of skis, mountainous backcountry becomes far more difficult to travel through than it is in the summer. Perfectly pleasant summer backpack areas can turn into nightmarish, backbreaking climbs and descents in winter, all attended by the overriding fear of avalanches; these conditions take much of the fun out of the trip. Ski camping trips are best taken in gentle mountainous areas rather than in the midst of rugged country. Perhaps lacking appeal for backpacking in summer, these areas are transformed into beautiful

and appealing locations in the winter.

EQUIPMENT AND CLOTHING

No matter what area is chosen for ski camping, equipment and clothing will play an important role in the success of the journey. When you're warm and comfortable, you'll be happy; that's what ski camping is about.

For clothing, all the basic principles apply—dress in layers so body temperature can be kept at a comfortable level by adding or subtracting clothing. Stay away from cotton, stick to wool or the synthetics. Some items I've found particularly good for ski camping are made with fiberpile, a synthetic replacement for wool, commonly used in shirts and jackets. Fiberpile clothing is light and dries more rapidly than wool. It is so comfortable that once you try it, you'll never go without it. When I put on a fiberpile shirt on a frosty morning, it feels like a kitten.

Fiberpile jackets and shirts must be protected from the wind by some type of wind

shell. Lined Gore-Tex® jackets provide excellent protection from wind as well as keep you dry on wet, snowy days. But before you take your Gore-Tex® jacket on a trip, try it out in a shower. I've had some very wet experiences with the stuff. For long expeditionary trips, where it's impossible to clean the material to the manufacturer's specifications, you're better off with traditional forms of snow and rain protection (i.e., wind parkas and waterproof nylon jackets).

You can use various types of skis for ski camping. The types of nordic skis made for backcountry touring are ideal (approximately 55 mm wide at the midpoint and 65 mm at the tip), but it is not necessary to go out and buy a new pair if you don't have this kind. Some skiers have successfully made extensive trips in narrow, light touring skis (approximately 50 mm at the waist). Waxless skis are the most convenient type for backcountry use. On a number of trips I've constantly struggled with one wax combination

A ground pad and insulating shirt keep the body warm and sleeping bag dry for maximum comfort inside (left). Warm, dry campers will sleep better (right) and greet a new day ready for adventure.



Galen Rowell



Galen Rowell

after another while those with waxless skis kept plodding along at a steady pace. If you use wax skis, take along hard waxes, a selection of klisters, wax remover, and a rag. A trick for removing sticky klisters from skis is to use white gas from your stove, saving the extra weight of carrying wax remover.

Most important of your skiing equipment is a good pair of sturdy boots that fit properly. Unfortunately most light touring boots are not built for ski camping. The best kind are as thick and sturdy as hiking boots and are made for cross-country three-pin bindings. The extra thickness of the boot provides better warmth, and the extra rigidity helps to make uphill and downhill skiing much easier. Sadly, they cost more than \$100 for a good pair. If you can't afford a pair now, a cheaper way of getting started is to slip large wool socks over your regular cross-country boots in cold temperatures. You'll be surprised how much extra warmth they give. A heel locator, a device that holds the

heel laterally when the heel is down, will add some rigidity to an otherwise soft boot.

A good sleeping bag is one of the most important pieces of camping equipment. Generally, synthetic fiberfill bags are good in the winter since they absorb little water. Water may condense in bags from frost forming in tents during the night and from the large amount of moisture the body gives off when sleeping. Consequently, it is important to use a bag and tent that do not absorb moisture.

A slick way of keeping your bag dry from body moisture as well as increasing its warmth is to place a waterproof liner *inside* the bag. I've used this so-called vapor barrier and agree with such people as Yvon Chouinard, a well-known mountaineer and ice climber in the United States, that it can increase the warmth of your bag by 15° to 20°F. The important thing is not to get so hot that you sweat. If you get too warm, open your bag and ventilate it.

Another hint about keeping warm at night: use a thick pad underneath the bag. Air mattresses work badly, and nylon-covered urethane foam pads compress greatly and you lose the advantage of their insulation. Some of the best pads I've found are made of ensolite, which stays flexible no matter how cold the weather is. I'll glue or use double-backed carpet tape to laminate two half-inch-thick pads under my back, giving me a full inch of insulation that really keeps the cold away.

When you pull into a campsite after a day of skiing, take care of all the energy-intensive camp chores first, to keep your body heat up. To begin with, a kitchen can be dug for cooking. Dig a square hole three feet deep or more, and along one edge of the hole carve out a shelf to set pots, stoves, fuel and water on. With a shelf, the chef doesn't have to bend over while cooking; it also provides a windbreak for the stove.

While someone is digging the kitchen.

These travellers (left) set up camp before changing clothes and relaxing. Hot drinks (right) help maintain body heat and prevent dehydration.



Phil Schofield



Galen Rowell

other members of the party can set up the tent. Begin by stamping out a platform in the snow with skis. Keep the skis on to prevent making holes in the snow while you lay out and stake down the tent. Special snow stakes are available commercially, or you can use skis and ski poles to stake out the ends of the tent. When the tent is up, lay sleeping pads on the floor. This will help prevent depressions and holes caused by knees and feet when tent mates go in and out. Outside the entrance dig a porch one or two feet deep, a place to sit and brush snow off boots and clothing before getting into the tent. Within 20 minutes or so the disturbed snow on the tent platform will begin to harden into a secure base for sleeping.

After the kitchen is dug, the cook can immediately start the stove and melt snow for water and hot drinks. When the camp is set up and the activity level drops off, you'll begin to cool off. Now is the time to change out of wet clothing and add layers to main-

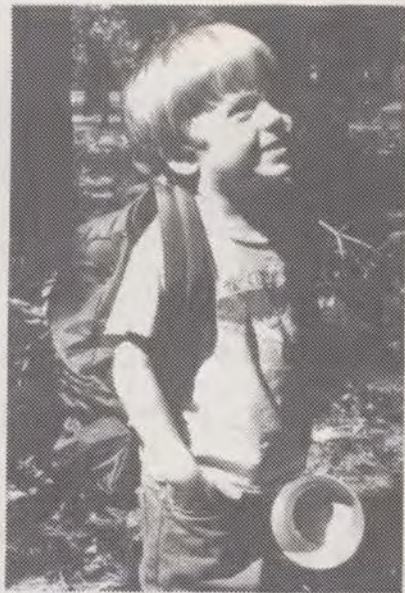
tain a comfortable body temperature. One of the nicest pieces of equipment for use in camp is a pair of down or fiberfill booties. Over the booties pull on a pair of overboots, available at mountaineering stores or easily made by sewing together pieces of pack cloth with a drawstring on top. The overboots keep snow from wetting the booties and enable you to walk all around your campsite while your feet stay comfortable and toasty. The down bootie-overboot combination is a key to enjoyable winter camping. Cross-country ski boots are moist at the end of the day, and when your activity level drops, your feet get cold. Not so when you have booties—or even simply dry socks—to change into.

While the food is being prepared, keep drinking hot liquids. Not only do they help keep you warm but also help replace body fluids lost during the day. Liquids are somewhat limited to the contents of your water bottle if you don't pass any open streams

while skiing during the day, and loading up on water at night is essential to prevent dehydration.

Before you climb into your sleeping bag for the night, put your ski boots in a stuff bag and keep them in the sleeping bag with you to prevent them from freezing. In the morning, when you first get up, tie the shoestrings of the boots together and place them around your neck and underneath your outside jacket. Still wearing your down booties and overboots, cook breakfast, clean up the campsite, take down the tents and pack your pack. The very last thing to do is remove your down booties and put on the ski boots, which have been in the sleeping bag all night and inside your jacket in the morning. They will still be warm even if they're damp—and you'll begin another day of your trip with warm boots and feet. □

Ron Watters, author of *Ski Camping and Ski Trails* and *Old-timers' Tales*, coordinates Idaho State University's outdoor program.



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“No Holier Temple Has Ever Been Consecrated...”

John Muir



THE BATTLE FOR
HETCH HETCHY

ERIC SEABORG

“Hetch Hetchy Valley, far from being a plain, common, rock-bound meadow . . . is a grand landscape garden, one of Nature’s rarest and most precious mountain temples.”

“Yosemite is so wonderful that we are apt to regard it as an exceptional creation, the only valley of its kind in the world; but Nature is not so poor as to have only one of anything.”

JOHN MUIR’S COMMENTS on these pages refer to the Hetch Hetchy Valley, just 20 miles north of Yosemite. Like Yosemite, Hetch Hetchy was a massive relic of the glaciers, and early visitors often compared the two. It was Yosemite on a slightly smaller scale, with similar straight granite walls, and streams cascading from hanging valleys carved by the walls of ice. Some travelers felt that the valley floor’s great oaks and luxurious meadows outshone even Yosemite’s.

“If there were no Yosemite, the Hetch Hetchy would be fairly entitled to worldwide fame,” said a director of the California Geological Survey. But there was a Yosemite, and Hetch Hetchy could never rival its fame. Yosemite was opened to tourists early. By 1907 travelers could take a train most of the way, then switch to a stage, while they could reach Hetch Hetchy only on long, rough trails.

But the question of whether the valley could have gained recognition in its own right will never be answered. It now lies largely ignored by the 1½ million people who travel to Yosemite National Park each year, and visitors no longer compare the two because, ironically, the same features that made Hetch Hetchy so beautiful—the sheer granite walls, the narrow gorge at its outlet, the flat floor—made it ideal for other uses as well. “There is no engineer alive,” wrote an early visitor, “when he dreams of paradise, who would not think he was building a dam at the foot of the Hetch Hetchy Valley.”

Near the turn of the century, Hetch Hetchy did gain a certain renown as the focal point of a great struggle—the first fight of its kind. When San Francisco chose Hetch Hetchy as the site for a reservoir, wilderness enthusiasts for the first time raised a national protest against a dam. When the nature lovers, led by John Muir and his Sierra Club, flexed their political muscle and demonstrated that their movement was becoming a power to be reckoned

with, they forced the country to decide just how much a national treasure was worth. The ensuing battle split the fledgling conservation movement into two parts that have never reconciled.

San Francisco had always had problems obtaining an adequate supply of potable water for the residents of its peninsula. As the city grew, the procurement of a reliable long-term supply became imperative. City officials began to look farther and farther from town until, 150 miles to the east, the Sierra Nevada inevitably grabbed their attention. In the mountains, winter snowmelt provided bountiful water supplies to keep streams flowing in a climate without summer rain.

As engineers studied possible sources and reservoir sites, one spot, the Hetch Hetchy Valley on the Tuolumne River, captured their imaginations. The site, on one of the Sierra’s largest rivers, seemed ideal but for one drawback. It was within the boundaries of Yosemite National Park.

Yet this government protection could work to the city’s advantage, because it would make the site cheaper. Water had always been valuable in California. As demands for municipal supplies and irrigation grew, water became as important as gold had been 50 years before. Most rivers were entangled by conflicting claims over rights to their use. But the Tuolumne, under federal control, remained relatively free of such claims. San Francisco could avoid endless litigation and much of the cost of purchasing water rights by obtaining a grant from the federal government.

Getting the grant proved to be an arduous process. For ten years the city made little progress. It managed to obtain a limited, conditional permit for developing the site during Theodore Roosevelt’s administration, but Roosevelt was not enthusiastic about the project. The permit was revocable by any future secretary of the interior. To make it permanent, the city needed the assent of Congress, and its first attempt in that area was essentially ignored.

While the city’s hopes seemed dim at first, opponents of the dam organized themselves well. Much of the work of opposing the dam was carried out by Sierra Club

members, but the Club did not officially join the fight. The Club was founded in San Francisco, after all, so it’s not surprising that many members did not oppose the dam project (in fact, the city engineer was a member). When the Club’s directors would not spend funds for the fight, Muir, at age 70 ready for the last great battle of his life, worked with William Colby, the Club’s secretary, to set up the Society for the Preservation of National Parks, with California and eastern branches, to lead the opposition to the project.

Robert Underwood Johnson, the editor of *Century*, one of the most popular and prestigious magazines of the day, joined Muir to put together an editorial and pamphleteering campaign. During the early 1890s the two had worked together in a campaign that they felt was responsible for the creation of Yosemite National Park. During the Roosevelt and Taft administrations, they kept San Francisco on the defensive. When the city approached Congress, the dam’s opponents managed to fill 150 pages of the printed hearings with telegrams and letters of protest. The basic argument was simple: they would be willing, even happy, to sacrifice a part of the park if the dam were essential. But San Francisco never said that Hetch Hetchy was its only possible supply, only that it was the cheapest.

Just when the city was ready to give up hope and look for another site, its fortunes changed with the election of Woodrow Wilson. Wilson brought a new mood to Washington and hope to San Francisco by appointing Franklin Lane his secretary of the interior. Lane had been city attorney when San Francisco decided to pursue the Hetch Hetchy project so many years before.

With Lane’s backing, San Francisco went to work immediately. City officials convinced Representative John Raker, whose district included the valley, to introduce a bill granting the city the privileges it sought. Claiming a critical water shortage, they pressed the measure in a special session of Congress in the summer of 1913.

The move caught the dam’s opponents completely off guard. The special session had been called to consider tariff and currency matters. It had never occurred to

“Everybody needs beauty as well as bread, places to play in and pray in, where Nature may heal and cheer and give strength to body and soul.”

them that the city might try to railroad the bill through on the basis of an emergency of which they could see no evidence.

From the beginning of the House hearing on the Raker bill, it was clear that San Francisco had done a good deal of homework. California's delegation to the House supported the bill. At the hearing, the secretaries of the interior and agriculture, the chief forester, and the directors of the Bureau of Reclamation and the Geological Survey all appeared to testify in its favor.

Perhaps surprisingly, supporters endorsed the bill as a conservation measure. The concept of conservation—the view that resources are limited and must be shepherded wisely—was just being accepted in America at that time. Before the frontier closed, America was seen as a land of infinite resources, and the wilderness as a place that must be tamed. The ideas that Muir and his cohorts propounded, that the earth can have intrinsic value in and of itself, that natural areas and wilderness might be worth preserving, were still pretty radical, despite their philosophical antecedents in Emerson and Thoreau half a century before the dam was thought of.

While both sides, the utilitarianists and the preservationists, as they are sometimes called, considered themselves conservationists and worked as allies at times, a rift between the two camps inevitably widened. Hetch Hetchy finally cracked the split open—it was an issue on which one had to choose one side or the other.

So at the House hearing some of the most influential testimony came from Gifford Pinchot, the founder of the U.S. Forest Service, who claimed to have invented conservation.

Pinchot told the committee that “the delight of the few men and women who would yearly go into the Hetch Hetchy Valley” should not outweigh the national conservation policy “to take every part of the land and its resources and put it to that use in which it will best serve the most people.”

A special advisory board of Army engineers assigned to study the site and its alternatives also threw its weight behind the city. “The necessity of preserving all available water in the Valley of California will sooner

or later make the demand for the use of Hetch Hetchy as a reservoir practically irresistible,” read its report. The board found that Hetch Hetchy's low cost was what made it most attractive. At \$77 million, it was priced \$20 million cheaper than any other source.

The city presented as its final design of the project a greatly expanded version to meet the needs of the entire Bay Area through the year 2000. The new design brought San Francisco the support of other cities in the area and made the use of the Tuolumne, one of the few rivers in the Sierra that could produce the entire amount without the expense of using combinations of rivers, even more attractive.

The city published a report with pictures doctored to show how the beautiful mirror effects of a lake would enhance the scenery, and offered to build roads in to make the valley accessible to the public.

Against these odds and on short notice, only one preservationist, a member of the Appalachian Mountain Club and president of the eastern branch of the Society for the Preservation of National Parks, could make it to the hearing to testify. The preservationists flooded the committee with telegrams requesting that the bill not be considered in the special session, but an unsympathetic committee passed the bill unanimously. In September the House approved the measure as well.

The preservationists redoubled their efforts. Recognizing that public pressure would be the only force that could stop the bill, Muir, Johnson and the Society for the Preservation of National Parks set to work immediately to take their case to the people. They blanketed the country with pamphlets and circulars with such stirring titles as “Let Everyone Help to Save the Famous Hetch Hetchy Valley and Stop the Commercial Destruction which Threatens our National Parks.”

The leaflets, sent to influential organizations, individuals and newspapers across the country, pointed out, “It is doubtful whether any other city in the world the size of San Francisco has so many available water supplies.” As for the city's inducements for building the dam, if the area was inac-

cessible, the government could build a road to open it as well as the city could. And a dam would not improve the scenery—drawing the water out of a reservoir periodically leaves an ugly, unvegetated strip around it, not beautiful mirror effects.

The controversy boiled down to a question of values, of how much a unique natural area was worth. San Francisco never tried to hide the fact that it was fundamentally a question of money, and of using as many Sierra reservoir sites as possible; Hetch Hetchy was by far the cheapest, and in many ways the best.

Of course, to a purist like Muir, it boiled down to no question at all. “These temple destroyers, devotees of ravaging commercialism, seem to have a perfect contempt for Nature, and instead of lifting their eyes to the God of the Mountains, lift them to the Almighty Dollar,” he concluded his popular volume *The Yosemite*. “Dam Hetch Hetchy! As well dam for water tanks the people's cathedrals and temples, for no holier temple has ever been consecrated by the heart of man.”

The Senate would be hard to convince, but Muir's exhortations to drive the money changers from the temple struck a responsive chord. People across the country applied pressure to a surprised Senate. One senator received “hundreds of letters” opposing the dam, making him wonder “what the source of all the agitation was.” Another estimated he received 5000 letters against the bill.

In the few months between the House and Senate votes, the major magazines—*Outlook*, *Nation*, *Independent* and *Collier's*—as well as many newspapers, led by *The New York Times*, featured articles and editorials protesting a single city's use of a national park dedicated to all the people. “While the Yosemite National Park might very properly be sacrificed to save the lives and health of the citizens of San Francisco, it ought not to be sacrificed to save their dollars,” wrote *Outlook*. Women's clubs, outing and conservation organizations and scientific societies registered their protests.

Despite the uproar, the cause fared little better in the Senate committee. The committee did not want to hold hearings, claim-

“That anyone would try to destroy such a place seemed impossible, but sad experience shows that there are people good enough and bad enough to do anything.”

ing that the House committee—with one preservationist present—had threshed out the arguments. They did finally hold a hearing, but merely as a courtesy. Johnson complained that the preservationists “were criminals in the box, and that the committee, with the exception of two or three members, had assumed the attitude of prosecuting attorneys.” The committee passed the bill unanimously.

Now the last hope was the full Senate, which began a six-day debate over Hetch Hetchy on December 1, running far into the evening on several days. It was the first time the Senate had debated anything of this kind, and it left many participants dumbfounded. They could not understand why normally reasonable people opposed the dam, which seemed to promote only the

public good by bringing water.

By the sixth day of the debate it became too much for Senator Reed of Missouri. He took the floor to express his disbelief: “The Senate of the United States has devoted a full week of time to discussing the disposition of about two square miles of land, located at a point remote from civilization, in the heart of the Sierra Nevada mountains, and possessing an intrinsic value of probably not to exceed four or five hundred dollars. . . . It is merely proposed to put water on these two square miles. Over that trivial matter, the business of the country is halted, the Senate goes into profound debate, the country is thrown into a condition of hysteria, and one would imagine that chaos and old night were about to descend upon the land.”

Shortly after midnight that night, the Senate approved the grant of Hetch Hetchy.

The battle for Hetch Hetchy was over; the war for wilderness preservation had just begun. Never before had a protest of this nature been attempted, and the near-success astounded everyone. Scattered support for preservation suddenly became a national movement, a challenge to the thinking of Senator Reed and others like him.

The momentum continued, and the fortunes changed for the better with the passage of the National Park Service Act three years later.

John Muir, grief stricken, his health failing, found solace in knowing that “the conscience of the whole country has been aroused from sleep.” He turned his waning



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“These temple destroyers, devotees of ravaging commercialism, seem to have a perfect contempt for Nature, and instead of lifting their eyes to the mountains, lift them to dams and town skyscrapers.”

energy to finishing a book on his travels in Alaska, and died within a year—of a broken heart, the story goes.

The “Hetch Hetchy steal” became a rallying cry in later battles for wilderness, and with good reason. San Francisco, intentionally or not, had clearly misled Congress.

Although the Raker Act allowing the dam was pushed through as an emergency measure during a special session of Congress, no Sierra water reached San Francisco for more than 20 years. Engineering difficulties raised the cost to about \$100 million, way above what its promoters had advertised. The city violated the Raker Act for years by selling the power generated at Hetch Hetchy to a private power company for resale and reneged on its obligations to build roads and trails around the reservoir.

A road does snake its way to the reservoir now, but it is little used. Although 1½ million people each year visit a Yosemite as overcrowded as most national parks, only a few thousand take the trouble to drive to Hetch Hetchy. They see little reason to visit a reservoir where fishing and swimming are prohibited.

As the battles continue for wilderness preservation, attention will focus on the Tuolumne River. A study released in 1979 by the National Park Service and the U.S. Forest Service recommended the Tuolumne be protected as a wild and scenic river. Because of the recommendation, the river is protected from development for three years; but this Congress must act or the time will run out. Meanwhile, a local irrigation district has applied to dam the river at two

points below Hetch Hetchy (and out of the park). The Federal Energy Regulatory Commission has been very close “for a couple of years now” to granting the dam a permit, according to Howard Brown, director of the American Rivers Conservation Council. The agency must hold off, however, because of the 1979 report. Unfortunately, Brown thinks there is no strong congressional support for protection. When the issue comes up, the water interests, as before, will put up a tough fight. But the preservationists will be there, too.

“The Tuolumne’s high on our list of priorities,” Brown said. “It’s one of the premier rivers in the country.” □

Eric Seaborg is assistant editor of the World Future Society’s magazine, The Futurist.



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NONSUSTAINABLE IDEAS ON INFINITE RESOURCES

ROBERT CAHN

The Ultimate Resource by Julian L. Simon,
Princeton University Press, 1981. \$14.50.

SOMEBODY MUST BE pulling my leg, I thought as I looked at the publisher's brochure plugging this book. The flyer started off with a little quiz you're supposed to answer.

Can the supply of natural resources be infinite? (a) No (b) Yes

Are there ultimate limits to food production? (a) Yes (b) No

Should we conserve resources for our children's sake? (a) Yes (b) No

Not prolonging the suspense, the brochure said: "The correct answer to each of these questions is (b). Surprised?"

You bet I was. Appalled might better describe my reaction as I read on. For instance, to the question about conserving resources for our children's sake the Simon answer is: "Conservation is not needed to protect future generations in ordinary situations. Market forces and present prices take into account expected future developments, and thereby automatically 'conserve' scarce resources for future consumption."

The publisher's brochure explains that "in *The Ultimate Resource* you will find a foundation of economic theory that makes sense of these startling conclusions." The blurb continues: "Perhaps you remember that Julian Simon, Professor of Economics and Business Administration at the University of Illinois, Urbana-Champaign, was quoted in *The New York Times*, the *Washington Post*, the *Wall Street Journal* and the *Los Angeles Times* as a result of his article 'Resources, Population, Environment: An Oversupply of False Bad News.'"

Yep, I remember. The same guy who

wrote an article: "Global Confusion, 1980: A Hard Look at the Global 2000 Report," and who was quoted in *The New York Times* as saying, "For most or all of the relevant matters I have checked, the trends are positive, rather than negative." He must not have checked very many.

The premise of his book is that the ultimate resource is knowledge or, rather, people using knowledge. It is too bad he does not follow through in the right way on the premise, but Simon either misconceives or deliberately misleads in his theory that more knowledge is dependent upon more people. When he states that "the ultimate resource is people—skilled, spirited, and hopeful people who will exert their wills and imaginations for their own benefit, and so, inevitably, for the benefit of us all," who could disagree? But when he twists that hortatory statement to claim that "more people implies more knowledge and greater productivity," and uses it to justify unlimited population growth, I cannot agree. He devotes about one fifth of the book to a polemic against population control and implies that to prevent birth is to prevent the increase of knowledge, while to add a child can only be a benefit to the world in the long run, although it may cause some short-term inconveniences. (Such as starvation in the Sahel, no doubt.)

The danger in Simon's theories and selective assemblage of statistics is that they can be used to persuade the unwary that it is not necessary to pay attention to unbridled population growth, or loss of agricultural land, or pollution, or wasteful uses of energy, or possible harmful effects from growthmania. For Simon argues that resources and energy are becoming less scarce, that pollution is decreasing, that the world's food supply is improving, and that we have nothing to fear from overpopulation. In other writings, Simon has singled out for scathing criticism people who believe in paying attention to global trends such as those set forth in the *Global 2000 Report* that shows the dangers of high population growth, loss of tropical forests, drains on agricultural land, potential atmospheric impacts on climate, and loss of endangered species. He dismisses such trend watchers as doomsdayers who are sapping the national will and reducing efforts to improve the situation—practically labeling them as subversives.

Unfortunately for a reader interested in the impacts of population growth on resources and the environment, and the interrelationships of those three factors, Simon does not deign to discuss such matters in his book. "*The Global 2000 Study Report*, done for the Council on Environmental Quality and the Department of State, was published too late for discussion in this book," he

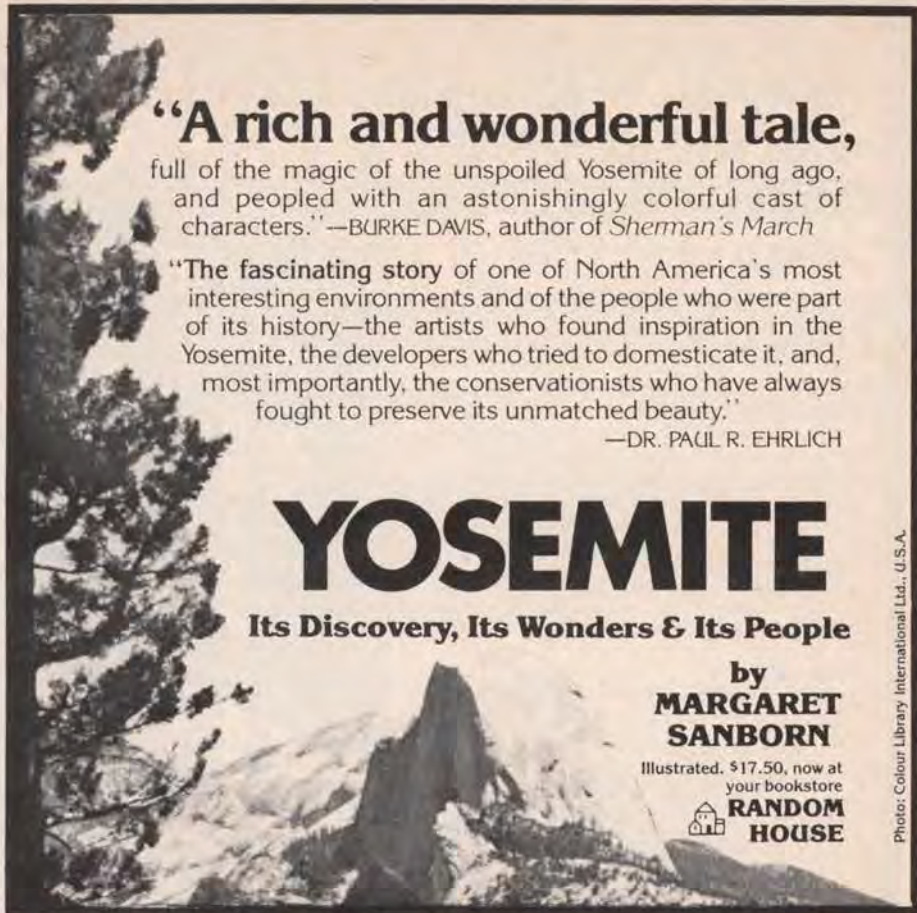
writes, getting the title wrong (it's actually *The Global 2000 Report to the President*) and missing the point that it was not done for CEO and State, but by them and eleven other federal departments or agencies. And it was published fourteen months before Simon's book appeared—hardly "too late for discussion." Simon goes on in his one paragraph about *Global 2000* to write: "Here I shall say only that I find the conclusions of *Global 2000* almost wholly without merit and the method shoddy. . . ."

In an earlier magazine article Simon wrote attacking *Global 2000*, he distorted what he called the "report's own thumbnail summary," which he quoted selectively: "Barring revolutionary advances in technology, life for most people on earth in 2000 will be more precarious than it is now." Simon, however, placed a period where the *Global 2000 Report* has a dash, thus he ended the sentence without its significant clause: "—unless the nations of the world act decisively to alter current trends."

Global 2000, as its authors explained in the text, had many shortcomings as to data base and collection process. Yet it drew upon the most up-to-date national and global data ever assembled, and integrated many work-years of computer-based mathematical modeling. Its projections (not predictions) indicated that if nations did not change policies and actions, the gap between the richest and the poorest nations would increase by the year 2000 with fewer resources to go around; that 40% of the remaining forests in less-developed countries would be razed, that arable land is being lost at a high rate, and therefore there may be limitations on expecting production to increase automatically in the future as it has in the past; and that 500,000 species of plants and animals would become extinct. "Serious stresses involving population, resources and environment are clearly visible ahead."

Simon's book paints exactly the opposite picture. Resources must be infinite, he theorizes, because the term *finite* is not meaningful: "We cannot say with any practical surety where the bounds of a relevant resource system lie, or even if there are any bounds. . . . A conceptual quantity is not finite or infinite in itself. Rather, it is finite or infinite if you make it so by your own definitions." That may be good metaphysics. But when he attempts to support the theory with an analogy to energy and oil, he may leave some readers—as he did this one—highly skeptical. "Our energy supply is non-finite, and oil is an important example . . . the number of wells that will eventually produce oil, and in what quantities, is not known or measurable at present and probably never will be, and hence is not meaningfully finite," he writes.

While his reasoning might be accepted by



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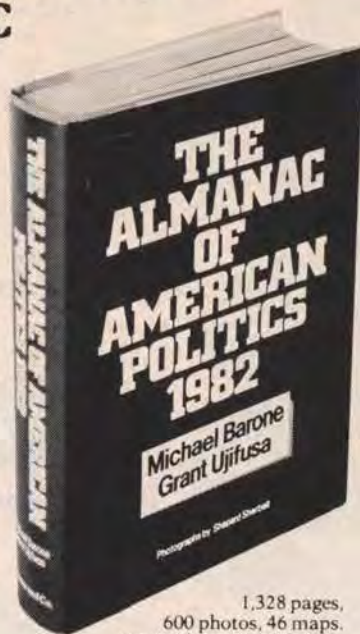
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BACK IN KEITH COUNTY

John Janovy, Jr.



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Philosophy I students, I would prefer to rely on expert geologists to project the amount of oil that reasonably can be expected to be available by the year 2000, and then plan accordingly—either by developing alternative energy sources or by reducing demand through conservation. Simon's economic theory, however, envisions infinite substitutability of resources as a result of marketplace constraints, and no need for the capability of long-range global foresight to guide government decisionmakers.

Simon ignores totally global factors such as acid rain, ozone depletion, possible warming of the earth or melting of polar ice from carbon dioxide buildup, which could affect the habitability of the planet. His ignorance of ecological values or the interdependence of humankind with nature is nearly total. For instance, whereas *Global 2000* shows evidence that 3 million acres of U.S. cropland are being lost to development each year, Simon blithely writes that cropland in the United States is being created at the rate of either 1.25 or 1.7 million acres per year (he gives no source). How is Simon's cropland created? By irrigation, swamp drainage, and other techniques. Okay, say we drain the swamplands because that is the economical way to create land. Then what happens to the food chain affecting both humans and wildlife when all wetlands are drained and converted to wheat crops or shopping centers, not to mention the recreational and esthetic values of keeping wetlands intact?

In Simon's world it is only material costs and prices and the marketplace that matter. Let's look at what he has to say about conservation: "A public policy of conservation implicitly assumes that the true value of the raw material, or other product to be conserved, is greater than its price to consumers. . . . Saving old newspapers when their market value is far below the cost of your time



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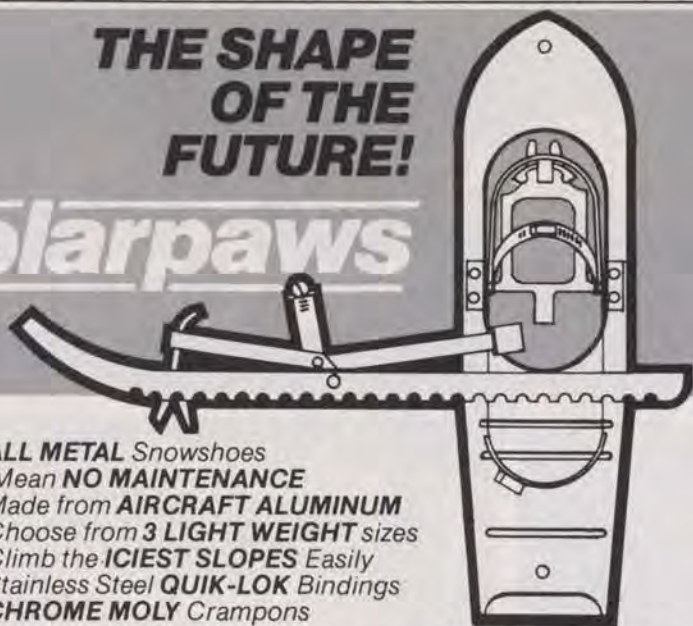
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and trouble to do so may make you feel good, but it lowers the overall productivity of the economy without any long-run benefit to the supply of timber. Nor is conservation needed to protect future generations in ordinary situations. Market forces and present prices take into account expected future developments, and thereby automatically 'conserve' scarce resources for future consumption. . . . Nor is conservation by the rich good for the poor, domestically or internationally. What the poor need is economic growth. And economic growth means using the world's resources of minerals, fuels, capital, manpower and land. There can be no return to Walden Pond without mass poverty."

And what about us environmentalists? Simon says: "Associating oneself with environmental causes is one of the quickest and easiest ways to get a wide reputation for high-minded concern; it requires no deep thinking and steps on almost no one's toes."

Simon's optimism knows no bounds. "There is no physical or economic reason why human resourcefulness and enterprise cannot forever continue to respond to impending shortages and existing problems with new expedients that, after an adjustment period, leave us better off than before the problem arose. Adding more people will cause us more such problems, but at the same time there will be more people to solve these problems."

How simple, Professor Simon! Yet what assurance can he give us that those additional billions of people will have a habitable planet to live on?

If you want to spend \$14.50 on *The Ultimate Resource*, go ahead, but don't say I didn't warn you. You might more profitably use your money to purchase *The Global 2000 Report to the President of the United States: Entering the 21st Century*, Pergamon Press, Elmsford, New York, 1980 (softback \$9.50). This edition has the complete text of Volume One (the summary) plus the key 222-page chapter, "The Environmental Projections," from Volume Two. Or you can get the complete Volumes One and Two in another edition, *The Global 2000 Report to the President: Entering the 21st Century*, Blue Angel, 1981, Charlottesville, Virginia (cloth \$14.00).

Or if you want a balanced, readable book on economics and growth, I can recommend: *Managing Growth in the 1980s: Toward a New Economics*, Robert D. Hamrin, Praeger, 1980, New York (cloth \$26.50, paperback \$11.95). □

Robert Cahn won the Pulitzer Prize for national reporting in 1969. He recently wrote the text for the book American Photographers and the National Parks, excerpted in the Sept/Oct '81 issue of Sierra.

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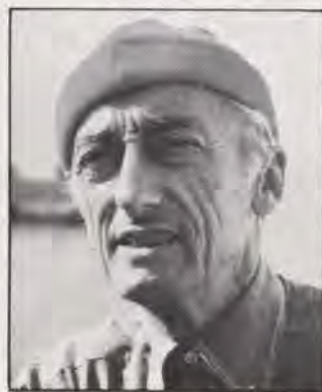
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Answers on page 84.

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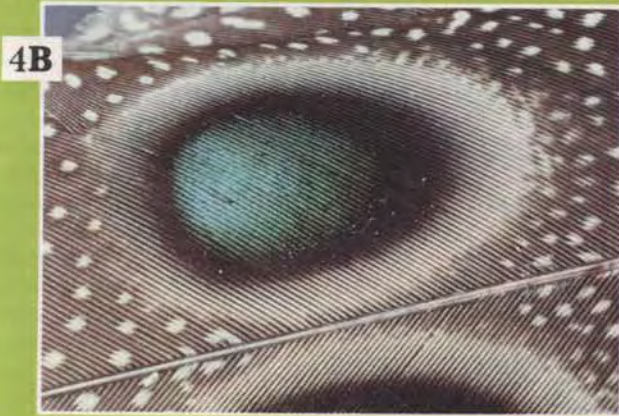




4A



6A



4B



6B



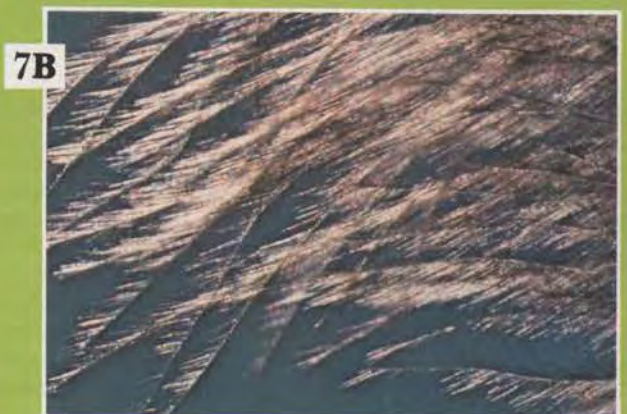
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7A



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NUCLEAR WAR AS AN ENVIRONMENTAL ISSUE

ROBERT IRWIN

"Every issue that Sierra Club people are worried about will cease to exist if they do not do something about the environmental threat of nuclear war." —Dr. Helen M. Caldicott

SHOULD "Sierra Club people" heed Dr. Caldicott's warning and do something about it? Over the years the Sierra Club has taken stands against a number of specific military projects. Examples are the siting of a naval hospital in San Diego's Balboa Park, the proposed Seafarer/Sanguine underground radar grid in northern Wisconsin, the plan to use the Hawaiian Islands Wildlife Refuge as a bombing range and, lately, the huge MX missile "shell game" proposed for the Great Basin. The Club has always acted on a case-by-case basis and has not adopted an overall policy on the environmental impacts of military activities—impacts that range from that hospital in a park to the ultimate impact—global nuclear holocaust.

Some Sierra people have not ignored Helen Caldicott's cautionary words. The quote above was taken from a conversation with her published in the San Francisco Bay Chapter's January 1981 *Yodeler*. That fifteen-column-long interview with the president of Physicians for Social Responsibility (PSR) was picked up and reprinted in other chapter newsletters. The Australian-born physician was asked what the PSR hoped to accomplish at its San Francisco symposium, "The Medical Consequences of Nuclear Weapons and Nuclear War." The goal, she said, was to educate their medical colleagues and the general public on what the medical effects of a nuclear war would be and "to

break through their psychic numbing to penetrate their souls so that they will cease to want to live their comfortable lives and will want to do something that's worthwhile for themselves and the rest of humanity. . . ." After ticking off all of the major devastating consequences of a nuclear war—one that would be all over in 20 minutes and within 30 days would leave 90% of all Americans (and Russians) dead—she turned to the effects on the planet itself. Much of the earth's protective ozone layer would be destroyed. All mammals and birds would die. And, she added, we're not sure what the effect would be on the climate. Caldicott, an environmental activist since 1971, went on to say that her concern transcended any gut fear for her own life; that she had "come to terms with my own death . . . for me I just worship this earth. . . . So I really care immensely if this earth is to be destroyed. And that's where the Sierra Club comes in."

In January 1980, exactly one year before the Caldicott interview, the *Yodeler* ran a similarly thoughtful piece, "A Conversation with Daniel Ellsberg," the controversial *Pentagon Papers* anti-war activist of the early 1970s and one of the most severe critics of U.S. nuclear policy. Steve Rauh, editor of the *Yodeler*, concludes his introduction to the Ellsberg conversation by noting:

It might be a controversial [interview] for a Sierra Club publication because defense policy is considered an issue outside of our traditional environmental concerns. But now that weapons of total environmental destruction have become so widespread and society is facing a vast increase in their numbers and distribution, the issue is not one that can be safely ignored.

Most of the conversation with Ellsberg, former systems analyst for the Rand Corporation, covered the tremendous U.S. nuclear-arms buildup of the 1960s and 1970s. He mentioned that part of his work dealt with control of nuclear weapons, including provisions to prevent accidents and against their unauthorized use—"An enormous problem that has been overlooked by environmentalists," he added. Toward the end of his long interview, Ellsberg cautioned that "the world of unrestrained warring national states is not a world that can continue to exist." It was compatible for thousands of years, he said, but not now, not in this age of nuclear weapons. What to do? He suggested that instead of dealing with how to base MX missiles, we should be working to promote "a sense of a broad community with other life, with other humans and with the environment as a whole." That sense of community, he believes, is felt much more by the public than it is by "that relatively small number of middle-aged men who manage all

societies; men who have fought for and achieved positions of immense coercive power that distances their concerns from the concerns of most people."

The unabridged texts of both the Caldicott and the Ellsberg interviews are available from The Conservation Press, Box 201, 2526 Shattuck Ave., Berkeley, CA 94704, at \$1 each; less per copy for larger quantities.

BAY CHAPTER CALLS FOR CLUB TO TAKE A STAND

The response to the Ellsberg interview from the *Yodeler's* 23,000 readers was immediate and overwhelmingly supportive. Some 45 letters to the editor appeared in the next issue, more than two thirds of them favorable. Chapter members began getting in touch with the four interviewers—Andrea Entwistle, Robin Freeman, Robbie Brandwynne and Rauh. Impromptu discussion sessions were held. At its February meeting the chapter's executive committee adopted a resolution urging the national Sierra Club to establish a program "to include lending support for worldwide disarmament and to express alarm over the increasingly dangerous arms race and its potential impact on the global environment." At the same meeting the chapter formed its Subcommittee on the Environmental Consequences of Nuclear War and Nuclear Weapons Production, asking interested members to join. In the following months, other Club members held a number of informal get-togethers. Late in the summer the subcommittee approached Club president Joe Fontaine with its concerns. A few days later, at the Club's September 1980 meeting, he took the matter up with the directors' executive committee. Fontaine reported that he had appointed an ad hoc committee to draft a letter to Club members taking their pulse on the issue, which he called "clearly an environmental impact issue." He said he would review the draft and confer with other board members before the next meeting.

In November, after lengthy discussion of the ad hoc group's report, the board's executive committee authorized "a Task Force to survey the views of Club entities and leaders as to whether the Club should consider or adopt additional policies concerning environmental effects of military projects."

The task force sent out its first mailing on April 9th. In it the 300 or so national and chapter-level volunteer leaders as well as Club staff were told of the Club's broad charge to the task force and encouraged to share information on actual and proposed environment-threatening military projects in their areas. Several days later, on April 21, former Club president (1969-1971) and



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long-time Club director Phil Berry acted to give the issue more exposure—to both members and the public at large. He wrote to all chapter newsletter editors inviting them to reprint the two interviews from the copies of the *Yodelers* that he had enclosed. In his letter Berry asked why environmental organizations have not mobilized against the threat of nuclear war. "Perhaps," he continued, "we fear being misinterpreted, of standing for naive solutions, or of speaking on issues where others know more and no one listens anyway. I don't know why, but I suspect the threat is so overwhelming and the solutions so unclear that we ignore the problem by burying our emotions." He concluded his letter with these words: "Where Club thinking will take us remains to be seen, but informing ourselves within the Club is the clear first step."

THE PROPOSED RESOLUTION

The task force has received formal replies from eight chapters and one group, as well as from many individual Club leaders. It has completed its report to the board and drafted a proposed resolution. Briefly, the draft asks the Sierra Club to:

- Express grave concern over the lack of progress in reaching nuclear arms-reduction agreements;
- Express alarm at the increasing number of nations possessing nuclear arms and at the growing stockpiles of them;
- Urge all nuclear powers to agree to halt further development, testing or deployment of nuclear weapons;
- Urge all those nations to seek long-term solutions to reduce nuclear stockpiles and improve world stability;
- Authorize a standing committee to implement Sierra Club policies, provide educational materials for Club leaders and members and review significant environmental effects of military projects on a case-by-case basis, in cooperation with local Sierra Club entities.

The proposed resolution closes with the following statement:

The Sierra Club also recognizes its own deep commitment to environmental quality and the protection of the earth's wild places as our contribution to world peace. Other organizations have pursued the goals of nuclear disarmament. The Sierra Club is supportive of these organizations' mutual disarmament goals and will provide resources to them as our priorities allow.

COMMUNITY ENERGY UPDATE

It is always encouraging when a writer learns that someone out there is getting his mes-

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sage, especially when people *do* something about it. They did. In the first few weeks after the July/August "Observer" column appeared, 35 activist volunteers joined the Sierra Club's Community Energy Campaign. Yes, encouraging.

There have been other upbeat developments as well: first, a \$25,000 grant has been received from the Cudahy Foundation. It will help fund a one-year citizens' energy-planning effort in a number of selected communities around the country. The original funding goal for the project was just under \$70,000, enough to target eight to twelve communities. The Club is prepared to go ahead with the project on a limited basis. Funds from the grant will help pay the salary and expenses of a full-time field representative, meet the costs of publishing a project newsletter and provide start-up seed money to the target communities. Of course, Club volunteers, local and national, will be involved heavily in the project.

The campaign's community energy workshops, held in conjunction with meetings of the Club's Regional Conservation Committees (RCCs), got off to a strong start. The first, in St. Louis last May, was run by Scott Gutting of the Utah Chapter, and 28 of the 49 Midwest RCC energy activists participated. Since then workshops have been hosted by five other RCCs—Southern Plains, Southwest, Northeast, Northern Plains and jointly by Northern and Southern California—and also by the Connecticut Chapter. The Gulf Coast and Appalachian RCCs plan to host workshops soon, but dates have not yet been firmed.

A surprise discovery right in my own backyard! For more than two years a fellow member of the Redwood Chapter, Bob Berman, had been quietly working away on a task force that was drawing up an energy plan for Solano County, California. It wasn't until late last July, after getting his *Sierra*, that he knew about the Community Energy Campaign and got involved. His office was handy to Club headquarters, so he was able to share his experience with the campaign staff. The Solano County task force had been set up by the county's board of supervisors in May 1979. Its thirteen members were drawn from all segments of the community. Berman was the environmentalist. As former chair of the Solano Group, he was well known from his testimony at hearings on land use and wetlands issues. Thus, he was the natural choice.

The task force's first year, says Berman, was chiefly one of study and getting the facts on the county's energy uses and needs up to the year 1995. In the summer of 1980 work began on a draft of the energy plan that, when finally approved, will be part of the county's general plan. The 94-page draft

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report is finished. After public hearings this fall, it will go to the county planning commission and finally to the county board. The plan seeks to increase the amount of available energy in the years ahead in two ways: (1) through conservation, to reduce present use of energy by 10% for each of the six major categories of users, and (2) through developing renewable sources, to increase the present supply of energy by 10% also. Because the county is predominantly agricultural, the plan calls for conversion of biomass from farm waste and for production of alcohol fuel from crops. Because Solano County also serves as a wind tunnel between the hot Central Valley of California and the cool Pacific, wind power already is in practical use and will be greatly expanded under the plan.

Berman is glad he had the chance to serve on the task force. Because he saw to it that he was one of the five or six regulars at the meetings, the conservationist point of view was always represented. He is looking forward now to the public hearings as an opportunity to involve the whole community in energy conservation and to put it on the soft-energy path.

Action Note: Winky Miller, the staff contact for the Club's Community Energy Campaign, stands ready to plug activists into the campaign network any time. You can contact her for help in getting your community going on an energy plan, or for information on any other phase of its program. Also, don't forget to use The Grassroots Connection (see page 73 of the November/December 1980 *Sierra* for details) when solution-defying problems arise in dealing with other, nonenergy conservation issues. Contact that service at the Conservation Department in Club headquarters.

NEW DIVISION OF THE CLUB

In July the Club made final some administrative arrangements and additions it had been working on for a long time, and the result is an entirely new division, the Office of Development. The office is responsible for all deductible and nondeductible income from gifts or grants, and for all membership activity.

The new Director of Development is Audrey Berkovitz, who came to the Club from her former position as Associate Director for Development for Yale University; she had been responsible for Yale's development program for all states west of Colorado. For the Club, she is overseeing the smooth—and massive—formation of the new division, as well as paying close attention to the planned-giving program and to personal contacts with foundations, corpo-

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The Associate Director of Development is Peggy Hynd, who was previously the Club's Membership Director for 4½ years. She has now assumed responsibility not only for membership activity, including membership acquisition, renewal and service programs, but also for all annual funding including large-scale appeals and gifts under \$10,000.

Assisting Berkovitz and Hynd are 27 staff members, many of whom are already experienced in making the Club's fundraising and membership programs run smoothly.

MEMBERSHIP CONTEST SUCCESSFUL

In the May/June *Sierra* the Office of Development announced its chapter membership contest, which ended September 30. At press time, with the count not entirely in, the contest had brought in approximately 5000 new members. Many Sierrans rolled up their sleeves to recruit large numbers of new members, and their efforts have strengthened the Club substantially. As of August 31, the three leaders in the race were:

- Fred Oswald of the Ohio Chapter with 55 new members.

- Gloria Shone of the Lone Star Chapter with 52 new members.

- Allison Marks of the New England Chapter with 48 new members.

At the same time the contest was running, the Office of Development's other programs swelled our ranks by 40,000, to bring the membership number at press time to 233,986. From October 1980 through August 31, 1981, the Club gained a total of about 86,000 new members.

Congratulations should go not only to the Office of Development for handling membership recruitment so effectively, but even more to Sierra Club members, who have demonstrated their active support for the Club and its goals.

BATTLING WATT TO THE END

Long-time Los Padres Chapter activist Dorothy Sharman Plack slowed down a bit in the last few years, but she worked until the end. In the 1960s and early 1970s she served in a number of her chapter's offices. A couple of years ago she discovered she had cancer and battled it valiantly for a year and a half. Last summer she entered a Santa Barbara hospital knowing she had no chance of recovery. Undaunted, activist Plack started circulating dump-Watt petitions from her

hospital bed. Late in her stay, fellow chapter member Anne Van Tyne paid her a visit. Though heavily sedated, she asked to have another petition; she had filled the three she had. Two days later Dorothy Plack died.

RAY SHERWIN REMEMBERED

On September 4, long-time Club leader Ray Sherwin died. He had been president of the Club from 1971 to 1973, international vice-president from 1973 to 1975 and honorary vice-president since 1979. At the board of directors meeting on September 14, several board members spoke fondly in remembrance of him, and the board as a whole said:

"Judge Sherwin's presidency was marked by an outspoken advocacy of the protection of the earth's wild places. He was a leader in the expansion of the Club's efforts toward international environmental cooperation and served on the first U.S. governmental delegation to Moscow that opened cooperation on environmental protection with the government of the Union of Soviet Socialist Republics.

"Ray loved and worked diligently for many years for the protection of the wilderness of the Sierra Nevada, where he spent his childhood and as much time as he could throughout his life. He also served the Club

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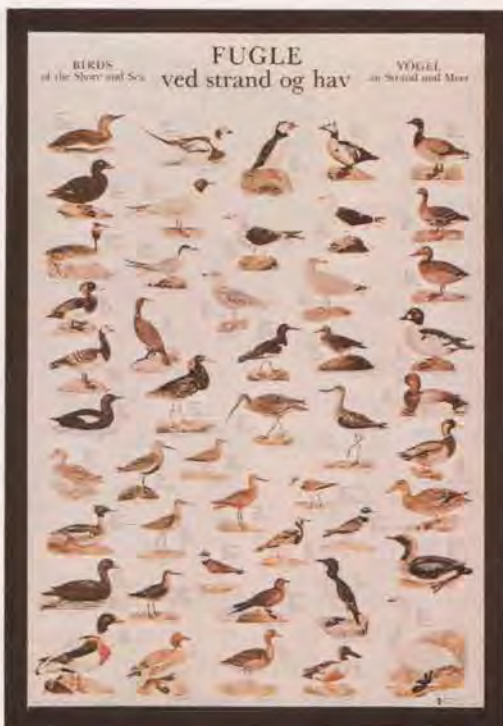
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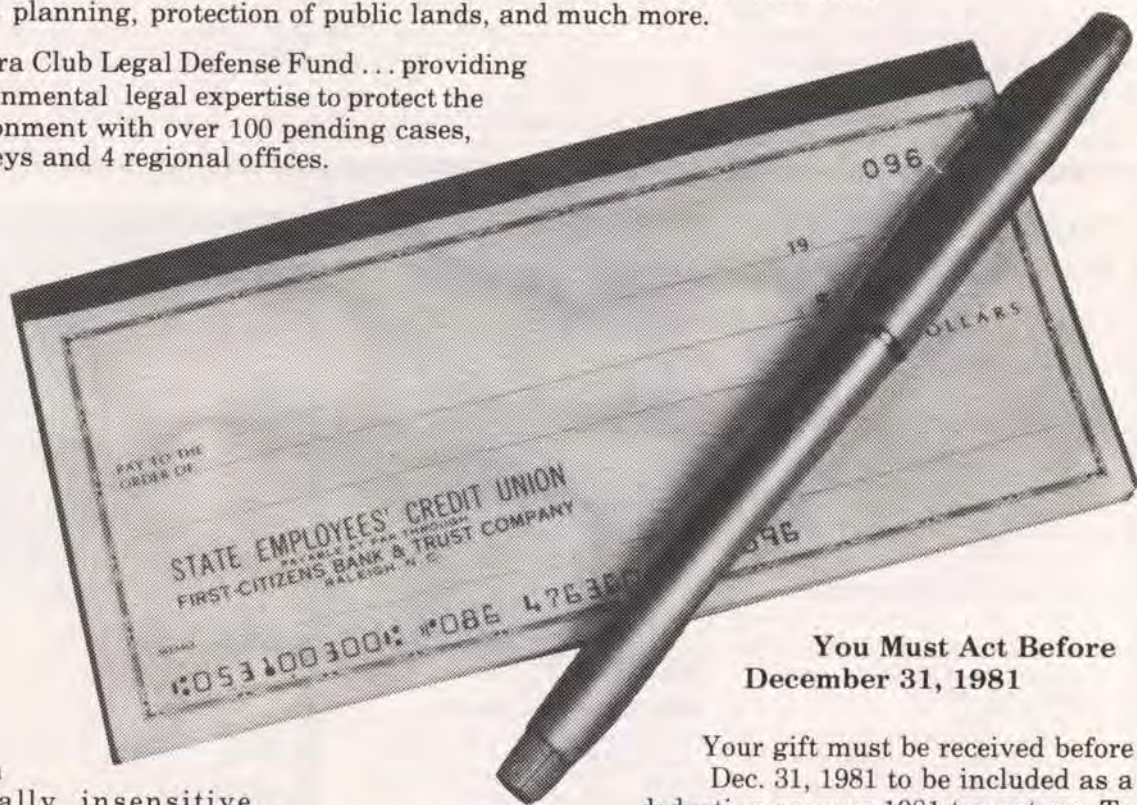
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as chairman of important conferences and committees, including the 14th 'Earthcare' Wilderness Conference. His ready smile, his articulate and forceful conservation advocacy and his staunch support of our principles earned him many friends.

"The board of directors extends its condolences and deepest sympathy to his wife, Janet, his sons and other members of his family. We all shall miss his wise counsel, his wit and his warm human spirit."

SIERRA HAS A NEW DESIGN

By now you've probably noticed that *Sierra* has a new look; we've got a new logo on the cover, a different sequence of articles, an innovative approach to designing and presenting features. *Sierra* has been steadily growing over the past few years. We've been increasing the number of articles we print because so much is happening our readers should know about. During this process, the magazine became more interesting and lively, and as our readers became more involved with *Sierra*, advertisers also began to take real notice of us, and the number of ads increased dramatically. Soon *Sierra* was bigger and better, a real success, but without a well-thought-out plan for presentation. Now we feel we are ready to look as good as we are.

This new format makes the magazine more readable, more appealing. We're grouping our color stories together to allow for a more coherent design, and we've done the same with the advertising, to make it easier to concentrate on the products our advertisers hope you'll find interesting. We've shifted our important news to the front, and we're starting a regular column called "Politics," which will include updates on current environmental issues in the news. We'll be making refinements in the design over the course of the coming year, but we're pleased with this new beginning.

For this one year we'll be working with the West's most outstanding graphic designer, Dugald Stermer, who (along with our new in-house designer, Bill Prochnow) is responsible for this pleasant change. It was interesting how Stermer came to work with us. For years we had been asking him to redesign *Sierra*, but his commitments to other magazines, some of them environmental, kept him from us. Then when James Watt became Secretary of the Interior, Stermer understood the need for all environmental publications to be as effective as possible; working with *Sierra* became one way Stermer could fight Watt's threat to our natural resources. So Mr. Watt brought us Mr. Stermer and this new design. Our thanks to them both. —Frances Gendlin

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Modern Photography, March 1980 pp.182-4.

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GUEST OPINION



CLEAN AIR VIA THE TRICKLE-DOWN THEORY

ART BUCHWALD

THE GOOD NEWS from Washington is that the Reagan administration is going to relax existing emissions standards for automobiles and coal-fired power plants, as well as ease the current health-based standards for air quality. In an all-out effort to clean up the Clean Air Act, the administration has indicated it's going to scrap the present system for preventing the significant deterioration of air in areas already meeting the present standards.

No one knows exactly what this means, but administration officials have assured the public that while the quality of air might get worse, the benefits to industry would more than make up for it.

In fact, some economists in the Reagan camp predict that by eliminating many of the costly clean air regulations, there will be twice as much money available for medical care to treat lung problems contracted from dirty air. For example, a family of four could take the \$100 savings from a much cheaper automobile emissions system and use it for an oxygen tent or a mask to filter out impurities.

By not forcing a coal-powered electric plant to install expensive scrubbers in its stacks, the public's electric bills will be reduced to the point where they will be able to buy imported fish to substitute for the fresh fish no longer available in their own lakes because of acid rain.

"This administration," a friend in the White House assured me, "has nothing against clean air. But we don't buy the

proposition that all pollution is bad just because it's pollution, and all fresh air is good just because it's fresh."

"What do you buy?"

"It isn't the government's job to tell people what kind of air they should breathe. Each person should decide for himself. I may like carbon monoxide, you may prefer coal dust, your next-door neighbor might prefer to inhale sulphur fumes. By making clean air standards the same for everyone, we are only giving aid and comfort to the environmentalists."

"Then you believe the best thing to do is turn back the clock on the Clean Air Act, and let every man breathe for himself?"

"If we needed a Clean Air Act," he said, "the Founding Fathers would have put it in the Constitution. When you limit air pollution, you take away one of man's most precious rights—the individual's ability to burn anything he wants in his car or furnace.

"We can no longer afford the luxury of guaranteeing everyone a mouthful of fresh air, when our first priority has to be fiscal relief to industry, which provides everything one needs to fulfill the American dream."

"The environmentalists tend to get their priorities mixed up," I agreed. "How do you intend to mollify them with the new rules?"

"By pointing out the only way to really have clean air in this country is to let it trickle down from the top." □

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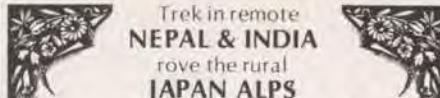
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