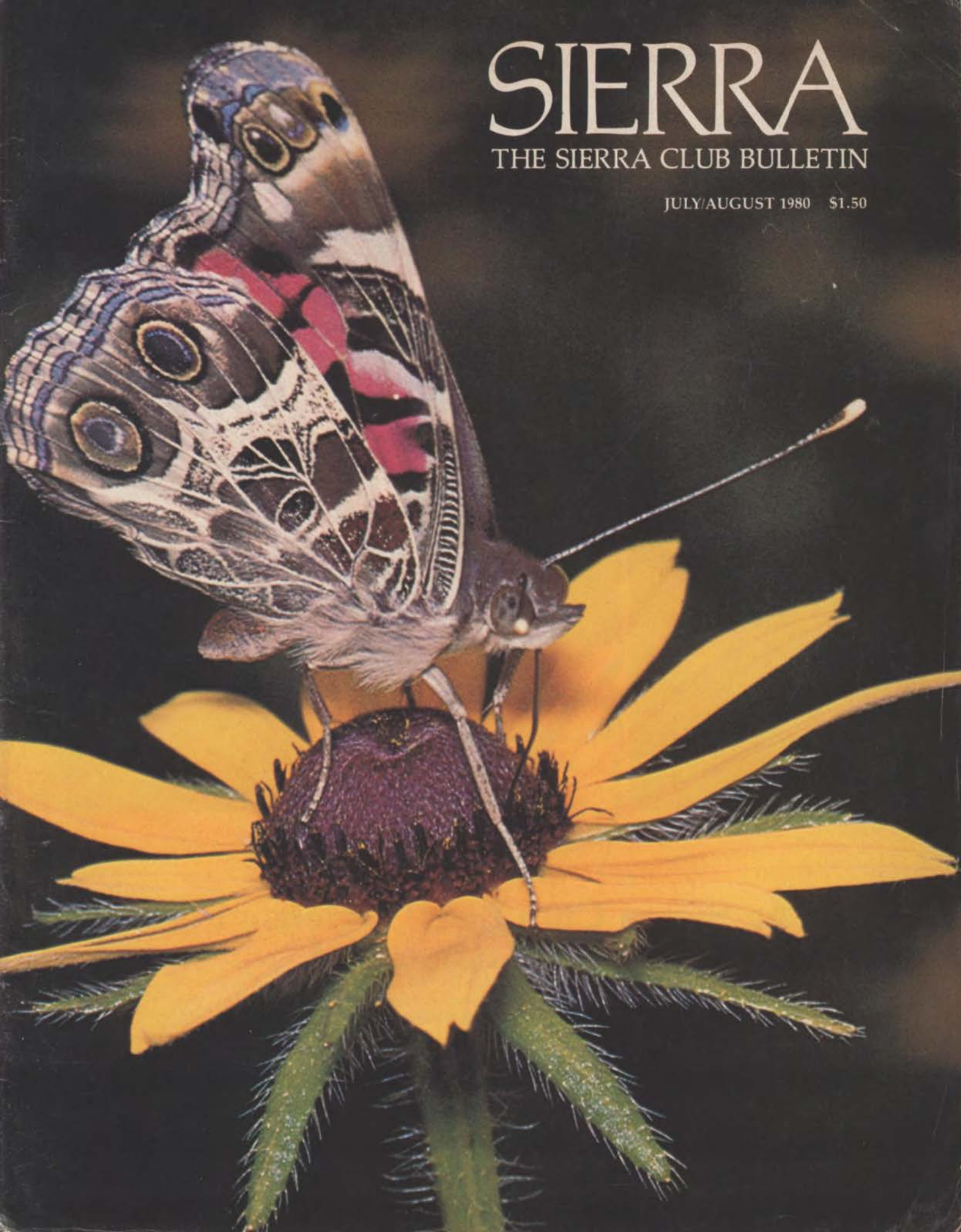

SIERRA

THE SIERRA CLUB BULLETIN

JULY/AUGUST 1980 $1.50

SOME FOLKS CAN'T AFFORD A GOOD LAWYER.

Folks who often need one. . .like deer and eagles and wolves, and the wilderness they need to live in.

Places like forests and swamps, rivers and plains and seacoasts. . .wild places and things that so benefit humankind in their natural state. But they need an assist from us.

The Sierra Club's Legal Defense Fund provides it. . .lawyers and scientists to defend nature's rights and advance her needs. But we must have your help if we are to give nature all the help it must have. Your generous contribution to the Sierra Club Legal Defense Fund will be tax-deductible. And effective.

The Sierra Club Legal Defense Fund

The Sierra Club Legal Defense Fund
c/o The Sierra Club
P. O. Box 7959, Rincon Annex
San Francisco, CA 94120

I want to help. My contribution of $_____ is enclosed. Make checks payable to The Sierra Club Legal Defense Fund.

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☐ I would like information on the Sierra Club.

Change of address should be sent to Sierra Club Member Services, 530 Bush St., San Francisco, CA 94108. Along with your old and new addresses, please include an address label from a recent issue, if possible.

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SIERRA

THE SIERRA CLUB BULLETIN

JULY/AUGUST 1980 **VOLUME 65/NUMBER 4**

Cover: Painted Lady butterfly alights on a Blackeyed Susan; photographed by Jon R. Nickles of Anchorage, Alaska. This photograph was awarded first prize in the wildlife category of the first Sierra Photo Contest. (For the other contest winners, see page 15.)

On Cycling Safety

I was most interested in Peter Harnik's article (March/April), "Cycles in Cities." I am an urban cyclist with similar concerns. One day last summer, after a particularly harrowing ride downtown, I wrote the mayor about the lack of support the city, the state and the news media give cycling. Sure, there's a "bicycle lane" on some roads, but it is spotted with parked cars and impossible to use. Sure, there's a city ordinance against opening car doors into a traffic lane, but this happens every single day. There's a bike path in Lincoln Park that is not open to cars. Instead, we get to share it with walkers, joggers, baby carriages, roller skaters and horses! The city officials responded to this effect:

1. Let's be honest, they suggested, cycling is a recreation and cannot be seriously considered a form of transportation in a cold climate. (They stated that it is possible to ride during only four months of the year—I ride during nine months.)
2. Driver awareness? What we need, they said, is bicycle awareness—and went on to cite statistics on how cyclists cause accidents.
3. They concluded by saying that Chicago is already far in front of the pack, so to speak, in bicycle planning—wasn't I proud?

Diana Speh
Chicago, Illinois

I was disappointed to read in "Cycles in Cities" such a distorted view of bicycle commuting.

If I had not already done some riding in traffic, I'd conclude from Peter Harnik's hair-raising presentation that it isn't safe to travel in anything less than a Mack truck.

He says, "a pang of panic shoots through my stomach . . . In terror . . . a blood-curdling yell . . . In order to survive . . . nerves of steel . . . reservoir of adrenalin." He also knows "which red lights to run—and which ones to stop for"!

Nowhere did Harnik mention riding in a straight line or hand-signaling so that auto drivers could predict his movements. Rather than determining the correct lane to be in and staying in it, he appears to weave wildly from lane to lane as suits him each moment. To top it off, the only photo shows a rider without a helmet, which is considered a necessity by all serious cyclists.

He deplores an "appalling lack of information about cycling," but he seems to be just as ignorant of the methods of effective cycling.

Herbert G. Susmann
Palo Alto, California

As a year-round bicycle commuter, I was happy to see the article in *Sierra* on bike commuting, and I found many of the points in the article well put.

However, I found one very unfortunate oversight: the cyclist in the photograph accompanying the article does not wear a helmet, in contradiction to the article's headline, "Let's Trade Thrills for Safety." (Also, the opening description of the author's passage through traffic, though closely akin to my own riding habits, is far from a model of safety, and it describes bicycle antics that must antagonize other travelers on the road.) With the publication of numerous articles on bicycle safety in cycling magazines and newsletters during the past several years, it's rare that when I mount my bike I don't automatically don my helmet. I have read that 75% of bicycle fatalities involve brain damage; you can always, in one way or another, mend an arm or a leg, but the head often can't be fixed.

A picture of a cyclist with a helmet might have saved lives.

Fred M. Pajerski
New York, New York

The Editors reply:
The unfortunate selection of a photograph depicting a cyclist without a helmet was not Mr. Harnik's doing. *Sierra*'s editors are to blame for that mistake.

Nongame Error

In "A New Problem in the Old West," (May/June 1980), Mr. Fischer is in error when he says raccoons and rabbits are nongame species. Raccoons and rabbits are game species in every state that I know of, except maybe Alaska and Hawaii.

Tim Johnson
Searcy, Arkansas

Hank Fischer replies:
In Montana, raccoons, badgers and jackrabbits are all nongame species. This means they can be hunted at any time of the year, with no limits on the number taken. Hunting and trapping of game species is regulated by state agencies.

Documenting Development

John Ashbaugh's letter to the editor [November/December] about Judith Kunofsky's review of Bernard Frieden's book, *The Environmental Protection Hustle* [July-August], proposes a very worthwhile project that I hope will be carried to fruition: the documentation of residential developments built to sound environmental standards. Publication of such documentation would not only defend the intentions of the Club and other environmentalists, it could serve as a guide to builders, developers and public officials seeking to improve the quality of our residential areas. I hope we will find low-cost or moderate-cost as well as expensive housing. Now that hillside locations are becoming more attractive to developers because flatter land already has been used or is too expensive, intelligent leadership is more important than ever.

But there is another side to the issue that ought to be emphasized—the serious troubles and even disasters that occur in many developments because sound standards were not followed. Whether due to ignorance or the desire to build cheaply and more profitably, there are many cases of yards, swimming pools and streets ruined and of homes lost that should be documented. It would be helpful to spell out what happened at Bluebird Canyon in Laguna Beach, California, and in other disastrous situations in Los Angeles and in Walnut, California. There must be many others throughout the nation. These are the events that generated the environmental concern and resulting legislation in the first place. Until developers can be relied upon to be fully responsible in their site choices and earth moving, we must rely on the use of both vigilance and effective legal controls to protect ourselves and the unwary buyer.

I hope readers of *Sierra* will inform John or me of cases of either type. We are interested in developing an appropriate publication and would welcome help from all sources.

Stephen A. Kaufman
743 Silvertree St.
Claremont, California 93420

A Problem of Distance

I'd like to call your attention to an error in "All About Islands," in the May/June *Sierra*. Surtsey emerged off the southern coast of Iceland only 22 miles, not 250 miles off the northwest coast.

Eugene R. Caprio
Basking Ridge, New Jersey

Room for Optimism

"The New Decade-Dawn or Dusk?" by Brock Evans (January/February) was a most welcome boost to my environmental confidence. Recently I had run across a lot of bad news about environmental issues (synfuels, the Energy Mobilization Board, Tellico Dam) and had wondered if this was the shape of things to come. After reading Brock Evans' article, I have a clearer understanding of the future—and our chances of changing what is to what ought to be. There is room for optimism.

Earl C. Henderson
Newtown, Connecticut

Thank you, Brock Evans, for your encouraging words in "The New Decade —Dawn or Dusk?" Indeed we environmentalists have done pretty well. Here in Minnesota we particularly need to hear these words. Having achieved a compromise on protection of the Boundary Waters Canoe Area Wilderness after a three-year, highly politicized battle, we're now in a backlash period: Locals have launched a lawsuit to reclaim the lost right to use motorized vehicles in the BWCA; the state government has joined them in a suit of its own; the U.S. Forest Service has refused to designate any further wilderness here through the RARE II process. We've discovered that acid rain is sterilizing the lakes we fought for, and copper-nickel mining at the edge of this area is roaring down upon us.

That's the dark side. The bright side is that new defenders have emerged to join with the "old hands," adding new vitality to the cause. As one of our real old-timers said at a rally last year, "Fight on!" We are.

Herbert C. Johnson
Edina, Minnesota

This election year presents us with a paradox: On the one hand our representatives want to pass legislation so they can return to their constituents with accomplishments; on the other hand they are very cautious in passing legislation for fear of alienating voters. The Sierra Club can capitalize on this by convincing our elected officials that the passage of favorable legislation and the failure of unfavorable bills will influence votes on election day. To accomplish this, we must inundate our senators and representatives with mail expressing our positions. Quantity is more important than quality; five brief postcards can often do more than one well-thought-out letter.

It is important, too, never to give up, never to say no—whenever defeat is handed to us, we must devise a new strategy. And we must keep plugging away at our goals with all the energy we can muster, regardless of who is in power. The eighties can be a great decade if we don't give up.

Ron Kilcoyne
San Francisco, California

Hunt the Ingredient

The "Hunt the Dump" campaign ("A Brief and Appalling Look at Hazardous Wastes," May/June) should have a parallel: "Hunt the Ingredients." Consumers have the responsibility to learn the nature of the substances and processes involved in bringing products to market, and to decide that use of products with unacceptable toxic by-products should be curtailed.

"Hunting the ingredients" could forestall the production of such toxic materials. For example, a list of the ingredients in and by-products of paper, synthetic plastics and fibers would help the consumer decide if an item's manufacture is worth the jobs it creates.

David Torney
Woodside, California

Street Crime and Hot Water

I would like to comment on two articles in the January-February *Sierra*. First, after reading Richard Albert's "Oaklandtopia," I realized that one person's idea of a cheery future may not be what is best for a community. I refer to his comments on street-watch schedules: "By night the streets were brightly lit," and residents had the "knowledge of a watching eye." It all sounds like 1984 twenty-five years late, and it shows a basic failure to understand that juveniles who are loved and made a useful part of a family and a community don't become delinquents. A threat of that "watching eye" is the typical sledgehammer ap-

proach to a problem whose best solution is a human approach.

Granted, destroying the beauty of a star-filled night sky with banks of energy-wasting outdoor lighting is a lot easier than helping solve human problems at home and in the community, but outdoor lighting has consistently failed to end crime. I suggest that the solution to Oakland's juvenile delinquency would come about naturally if the article's clean-offs, community gardens, fish farms and neighborhood school systems came into being, and if the belief that "I can do it myself" became widespread.

Second, I would like to correct part of your "Winter Energy Maze"—it actually is better not "to fill a kettle with hot water before boiling." Most people have to run their tap a while before the water becomes hot. Let's say one gallon of cold and warm water goes down the drain; more than four times the energy needed to heat a quart of water on the stove has been used. This is because the water heater in the basement heated up the gallon of water that went down the drain.

Also, hot water that stands in a pipe system for a while tends to have a higher concentration of heavy metals which dissolve out of the system.

I enjoy *Sierra* and am proud to be a member. Keep up your invaluable work.

Peter Talmadge
Kennebunkport, Maine

Goal for the Eighties

"Conservation—America's Salvation" read the postage meter imprint on an envelope I received not long ago. That message should be every citizen's creed for survival through the end of this century and into the next.

Earth Day '80 was not a celebration. Rather, it was a commemoration of a day when people concerned about pollution forged a concerted attack on environmental degradation. The celebration comes every time a decision is made in accordance with an environmental ethic. The celebration comes every time a decision is made to provide cleaner air, purer water, more naturally productive land, and a safer workplace for our children and theirs.

So, what is our goal for the 1980's? It must be to create an enduring environmental ethic for everyone in the eighties.

Dave Levy
Joseph LeConte Chapter
Durham, North Carolina

Utah's Treasures and the BLM

Congratulations on the excellent November/December *Sierra*. The articles on destruction of archaeological sites are most praiseworthy.

In Utah, we are fortunate to have numerous archaeological treasures. Though a few of these resources are given adequate protection in Utah's national parks and monuments, the majority are being mismanaged by the state office of the BLM. The "checkerboard" state lands throughout Utah are also receiving poor management.

Having considerable experience in dealing with the various land-management agencies in Utah, I've seen the wide disparity in their management practices. The Park Service manages the land well and is cooperative with local conservation concerns. The BLM, on the other hand, is only a pawn in the hands of local interests who dig, bulldoze and ride over the fantastic resources of this choice area. The BLM will do nothing to control off-road-vehicle damage and this does little to protect the archaeological resources. Employees in the field are frustrated with the higher-ups, and attrition is high.

There is much we can learn from the BLM's management to date. The agency's leadership in Utah is weak; we can expect only one fight from the Utah BLM—and that is the fight to get to the front of the unemployment line when public lands are turned over to the state.

Brian Beard
President, Utah Chapter

Epitaph for a Village

After 50 years I returned to visit my boyhood home in the village of Ide, Devon, England. Where it had been was a six-lane highway. In a field nearby I found a memorial stone, and I thought the inscription might interest you:

Remember that for many hundreds of years this was a beautiful valley where people could make their way to Ide through green fields and by the side of a running brook.

It was destroyed in 1974 by the Department of Environment.

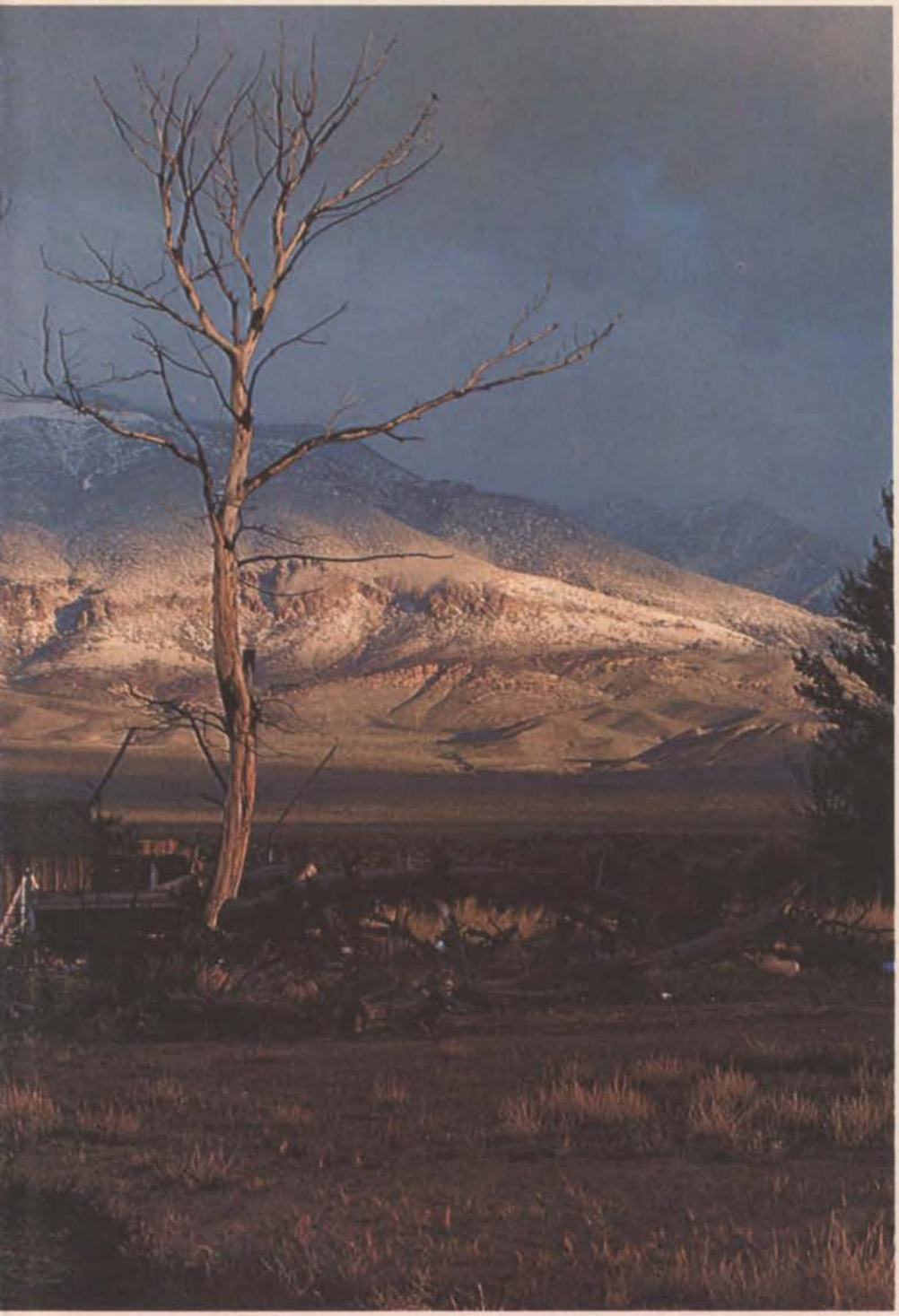
Resolve that your generation shall leave England a more beautiful place than they found it and undo the vandalism of ours.

Q. G. Whishaw
Gulfport, Florida

MX

A Weapon System as Large as the State of Pennsylvania Comes to the Old West

SUSAN MARSH and RUSS SHAY



Photographs by Jim Balog

EASTERNERS and westerners alike treasure the American West, the land of wide-open spaces, of big skies, of wilderness and wildlife and the desert. Americans have chipped away at the West over the years, piece by piece: building roads, subdivisions and cities; flooding valleys behind tall dams; digging stripmines, and erecting powerlines. But the West has never before faced anything as immense as the MX missile system—missile experimental—an Air Force project that would drastically transform an area the size of the state of Pennsylvania.

The sheer statistics are overwhelming: the MX would require 12,000 miles of new roads. By comparison, in the last 24 years, only 48,000 miles of U.S. interstate highways were constructed. Construction would require in one year half as much water as Las Vegas uses in a year. The MX would require twice the amount of concrete used to build Hoover Dam.

The supposed purpose of the MX system is to protect American land-based intercontinental ballistic missiles (ICBMs) from new and more accurate Soviet missiles and their nuclear warheads. The Air Force proposes to do this with 200 MX missiles hidden among 4600 launch sites located within 23 shelters. The Air Force claims that the Soviet Union would need to destroy all 4600 launch sites to successfully destroy the MX force and that the Soviets would not have sufficient nuclear warheads to accomplish this.

The MX system is a variation of the familiar shell game. Real and dummy missiles would be moved around among different shelters to keep the Russians from knowing exactly where among the many launch sites the real missiles are.

To prevent one Soviet warhead from destroying more than one MX launch

A rural scene in MX territory, near Callao, Utah. A remote community of several dozen people, Callao is typical of a way of life that would be overrun by the MX project.

site, each site would have to be separated from neighboring sites by approximately 7000 feet. The Air Force bills the resulting network of roads, railroads, missile sites and supporting facilities as "the largest construction project ever undertaken by man."

The Air Force estimates the cost of the project at $33 billion (in 1980 dollars). But this is an official and absurd estimate. The General Accounting Office—the investigative arm of Congress—put the cost at "at least $56 billion." Senator William Proxmire of Wisconsin, a longtime budget watcher, has said the system will cost $100 billion. (In comparison, the trans-Alaska pipeline cost approximately $8 billion; its official initial cost-estimate for construction was less than $1 billion.) What national debate there has been on the MX system has focused almost entirely on issues of "national security." Military experts do not, however, universally agree that the MX is a good idea. Still, the Air Force prefers to restrict discussion to military considerations. This is, after all, the only possible context in which the MX can be justified as having even theoretical benefits. But just as important ought to be a careful scrutiny of the costs of the MX—not only in dollars, but in its impact on the environment and on people.

The huge MX project would be built in a vast region of still-wild lands in Nevada and Utah. This is Great Basin country, a land of isolated mountain ranges standing starkly above desert rangelands and alkali flats.

The Utah and Toiyabe (Nevada) chapters of the Sierra Club have been working hard to make people aware of the environmental impacts the MX would have. They point out that the Great Basin is a fragile desert ecosystem, easily scarred and slow to heal.

It is also an area of scarce resources, where all life forms—plant, animal and human—have had to adapt by stretching their ability in using and conserving those resources to the utmost.

The most important of these resources is water. The Great Basin is the driest region of the country, and water is the limiting factor of everything that exists here, from sagebrush to pronghorn antelope to humans. The Air Force projects 10 billion gallons of water per year would be needed for ten years of construction; an additional 2 to 4 billion gallons annually to serve the needs of construction workers, their families and others of the cast of more than 100,000 people who would be brought in by the MX, and some lesser amount each year for the system's continued operation, which would require 15,000 military personnel.

The MX would be a major new competitor for the region's scarce water resources and raises questions of conflict not only with wildlife and ranching but also with other long-planned regional energy projects.

The MX would require great quantities of other resources. The Air Force estimates the project would require 8.9 million cubic yards of concrete—more than the West's existing plants could produce without greatly restricting other demands. Vast quantities of reinforcing steel, gravel for roads and aggregates, and many other materials will be needed. Not the least of these resource demands will be the energy requirements of the system, its construction, operation and personnel. The Air Force has not said where it intends to get that power, but the coal fields of southern Utah, where already-planned powerplant construction threatens the air quality in adjacent national parks, seems to be the logical place.

No impact will be so irreversible as that on the present residents of the area. Communities in the Great Basin are small, isolated and tightly knit. Their economies are based on mining and ranching, economic returns are low, but the traditional lifestyle of the area is highly valued by the residents. An integral part of that lifestyle is ready access to the wide-open spaces of the area's largely undeveloped public lands. Large tracts of this land are being considered as nominees for wilderness designation by the federal agencies that manage them, and the National Park Service has been studying some acreage for protection as a Great Basin National Park.

All of this—rural setting and economy, traditional lifestyle and the open spaces on which they depend—would be irretrievably lost if the MX system were built.

Estimates of the number of people who will move into the area if the MX is constructed range from 105,000 (the Air Force estimate) to 141,000 (an estimate by the Environmental Protection Agency). The current population of the area is about 60,000. Whichever figure is more accurate, the demands on housing, schools, utilities and other social services would be enormous. Though the Air Force has promised money and manpower to help alleviate the problems of such "boom town" development, residents worry that they will be run over by

the flood of activity and their way of life will be destroyed.

When the Great Basin region was first being studied by the Air Force as a site for the MX system, residents and local government supported the idea, hoping it would bring jobs and prosperity. But as months passed, and their questions about the size, scope and consequences of the MX were evaded rather than answered by the Air Force, it became apparent to many citizens that their interests were not uppermost in the plans of the Department of Defense.

"People are getting a little nervous," Utah Governor Scott Matheson said last December, "because decisions are being made so fast by thousands of faceless federal persons in planning for the MX without the states being wholly included."

Since that time, as the enormity of the project has become more apparent, nervousness has turned to opposition. In March, Governor Matheson told a congressional subcommittee that the MX "will destroy the chosen way of life as it is now known in those communities [in eastern Nevada and western Utah] —forever." Governor Matheson described the Air Force's proposed site as "one of the most fragile ecosystems to be found anywhere" and warned the subcommittee that "this portion of our environmental heritage will cease to exist if the MX is deployed." The governor went on to bluntly state that both he and Nevada Governor List did not accept the Administration's plan for the MX.

Utah Senator Jake Garn told Defense Secretary Harold Brown that public opinion had turned against the MX in Utah and Nevada. "You have serious problems in my state and Nevada," Garn said. "You have problems with me. And you could never accuse me of being anti-defense." (Garn, a Republican, was given a 100% voting-record rating by the American Security Council.)

Is the MX missile system proposed by the Air Force necessary for national defense? The Air Force is proceeding as though there were no question of this, but in fact there are many dissenters—within and outside the defense community.

Some, like Naval War College lecturer Henry E. Eccles, formerly a rear admiral in the Navy, believe that a new missile system is unneccessary. Others, like retired Admiral Thomas Moorer, former chairman of the Joint Chiefs of Staff, and Sidney Drell of Stanford University, a consultant to the National Security Council, believe that a new missile system should be built; however, it should be based not on land but in small submarines cruising in U.S. coastal waters.

Some defense experts are concerned that the MX system, as currently proposed, is too small to protect an ICBM force in the absence of a SALT treaty that would limit the number of Soviet missiles. In order to be safe from increased numbers of Soviet missiles in the next 20 years, the MX system would have to be expanded to an even greater number of launchers that would occupy additional thousands of square miles.

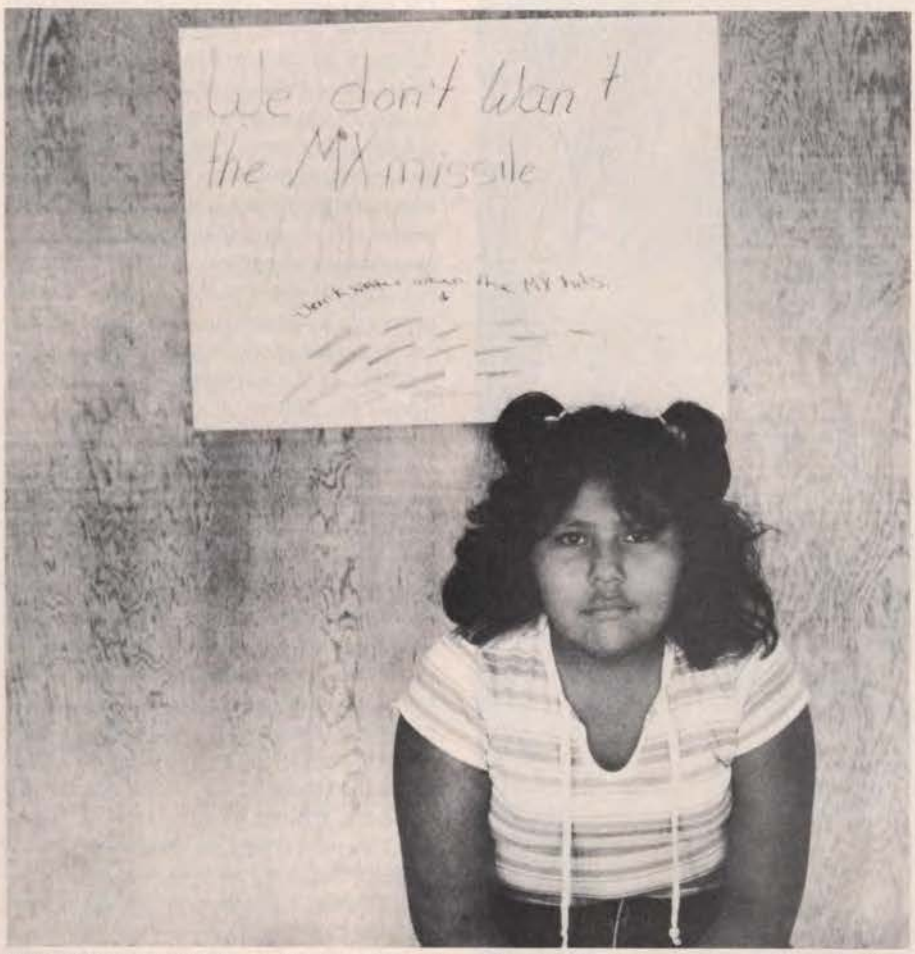
Other people oppose the MX simply because it represents an escalation in the arms race—yet another set of deadly and dangerous nuclear weapons.

The people of Nevada and Utah have had to stare the MX in the face. They have found that its effectiveness in enhancing national security cannot be convincingly demonstrated; that the Air Force has not fully explored defense alternatives; that the cost to taxpayers will be enormous; and that its cost in terms of the physical environment and in terms of their lives will be enormous as well.

But the question of whether or not to build the MX will be a national decision and not a local one. The Carter Administration supports building the MX in the Great Basin, and has put well over a billion dollars into the 1981 budget to start it on its way.

In May, the Air Force announced its plans to release the draft environmental impact statement on the MX system early this summer and to have dealt with all public comment and released a final EIS by fall. The EIS will, at best, quantify some of the problems associated with the MX. Some design changes may be made—the Pentagon has already changed the exact plans several times. The most recent change was moving the missiles on road loops to moving them on straight road grids. But the enormity of the impacts of the MX system cannot be mitigated or avoided by some sleight-of-hand: they are an inherent part of the price of a project designed to be so big that all the nuclear weapons of the Soviet Union could not destroy it.

The price is too high. □

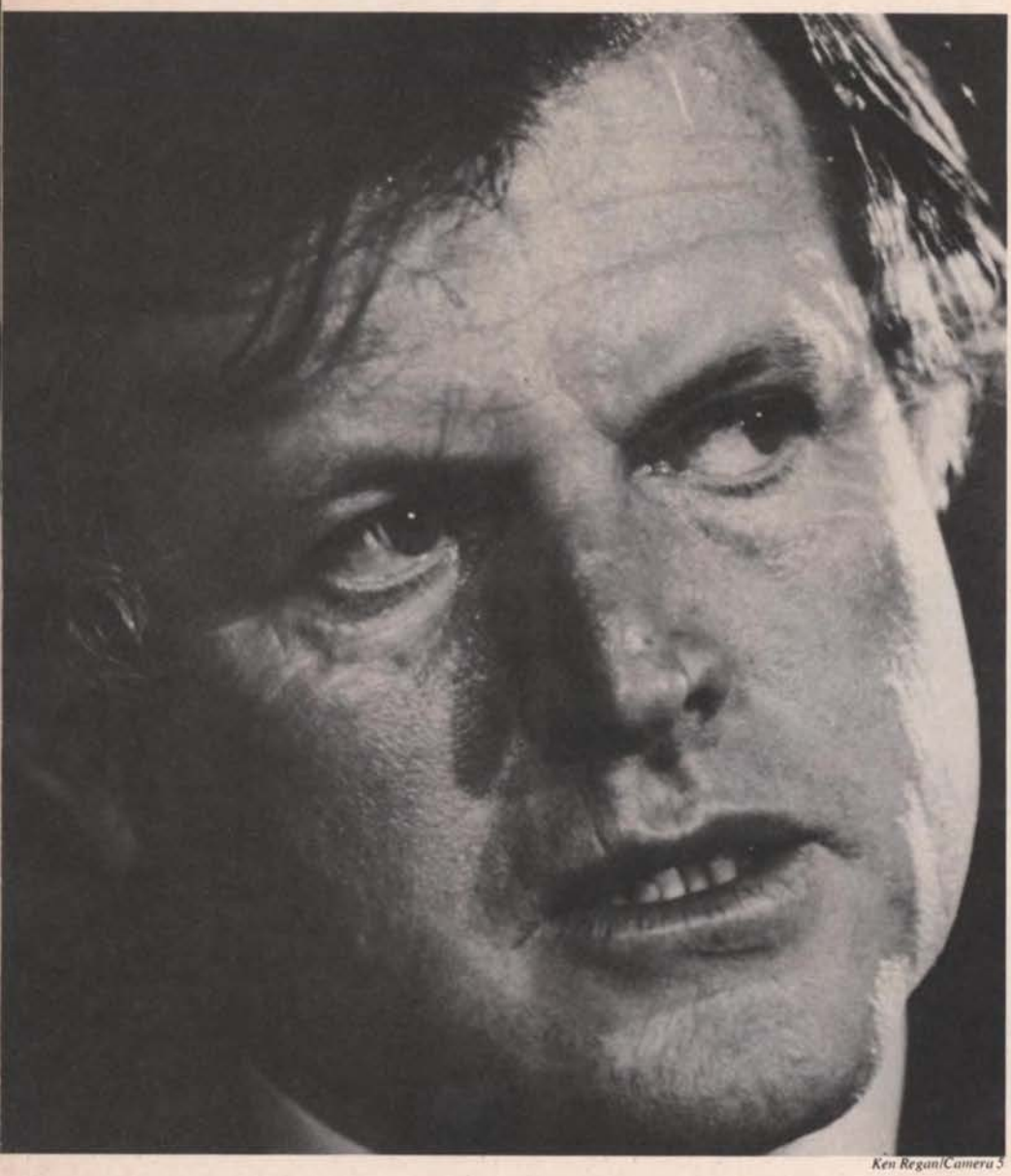


Most residents of the Duckwater Shoshone Reservation in Nevada, like Native Americans all over the West, oppose the MX project; it would threaten their traditional way of life.

Susan Marsh is a writer and activist in Logan, Utah; Russ Shay is the Sierra Club's California-Nevada field representative.

A Conversation with
Ted Kennedy

BY FRANCES GENDLIN



Ken Regan/Camera 5

Frances Gendlin: *The League of Conservation Voters gives you the highest environmental voting record in the Senate in 1977–78, and only two senators have ranked higher than you during the past decade. Yet it is our perception that you don't take a leadership role in environmental issues. Why is that?*

Edward M. Kennedy: I like to believe that I *have* taken a leadership role in a variety of environmental matters; not all, but in many areas that are fundamental and very important. I am not on the committees in the Senate that have the prime jurisdiction and responsibility for environmental matters. Though I am active and involved in the issues, I cannot be nearly as deeply involved as if I were on the committees that have direct jurisdiction. That's a matter of the organization of the Senate.

I think the Committee on Labor and Human Resources has done more in regard to environmental health than any other committee of the Congress. We held the first hearing on pesticides and herbicides, trying to help develop a policy that makes sense. We issued two Government Accounting Office reports that are highly critical of the EPA pesticide program. I'm also strongly committed to mass transit, and I led the fight to break up the Highway Trust Fund. And I was the leader in the Senate against the offshore drilling on the Georges Bank, and I've held strong on that issue. So I do believe that I've been very much in the forefront of environmental matters in a wide variety of areas.

FG: *As you do give a high priority to*

environmental protection, how important would you say the conservation community is to you? How do you feel that this community would fit into your Administration?

EMK: As you have pointed out, conservation is an issue I consider to be extremely important. I'm very proud of my record in the Senate. As President I would certainly continue that strong commitment, and I'd look for men and women who could give those issues the kind of primacy and legitimacy they richly deserve—and have not received during the past four years.

FG: *President Carter's record on the environment has been pretty good, and he's been outstanding on the Alaska lands issue. How do you think your conservation stands differ from his?*

EMK: I've taken strong exception to the Carter Administration on a number of different issues that run very clearly against environmental interests. The Energy Mobilization Board is one; the powers that were granted to that panel run roughshod over environmental considerations and state laws. I deplored the support the Administration has given to the EMB, and also the emphasis it has given to nuclear power, which I think poses significant environmental hazards. And I deplore the emphasis the Administration has given to conservation by price rather than by real energy conservation, which would involve incentives to homeowners and to industries to increase productivity and efficiency.

There are a number of other areas where the Administration has been extremely slow in moving—legislation involving hazardous substances, getting out rules and regulations promptly, and the general fact that the EPA has not been nearly as aggressive in protecting the environment as it should be. There are a number of basic and fundamental areas in which we've taken strong exception to the Administration.

As to Alaska, my votes on and sponsorship of the legislation speak for themselves. I believe it is extraordinarily important to have a policy that will protect the natural heritage of this nation for future generations. I've expressed those views with regard to the Alaska lands issue, and I will continue my commitment on it.

FG: *You mentioned incentives for homeowners. What role do you see the utilities playing in energy conservation? I'm asking particularly in reference to your 1977 vote to prohibit utilities from instituting programs such as making zero-interest loans to homeowners for retrofitting homes.*

EMK: I agree with the objective of that type of program. But as someone who has been very much involved in antitrust work, I'd rather have industries and smaller businesses do that—rather than depending on the utilities. I am open-minded and interested in energy conservation, but I am concerned about the antitrust implications.

FG: *I have two questions that have to do with states' rights, one about land and the other about water. A major issue in the West is the struggle between producer interests and people who want to see a broader approach to public-lands management. I'm talking about what's called the Sagebrush Rebellion. Generally, conservationists believe that the public lands of the West should be managed for long-term benefits rather than for short-term economic gains. What is your position on the Sagebrush Rebellion?*

EMK: I think your position also reflects my fundamental view, and I've expressed that view. I do think there may be circumstances where there should be some accommodation of interests within a given community, but as a general policy, I believe that public resources should be managed and preserved for long-range interests.

FG: *And in the same frame of reference, concerning reserved water rights. In June 1979, the Interior Department decided that certain flows of water in streams on federal lands would be reserved and maintained in order to protect natural values. You've called this a violation of states' rights and have said so in a letter to Utah Governor Matheson.*

EMK: I'm concerned, quite frankly, that reserving those waters would commit them to being used in a massive, highly inflated, untried synthetic-fuels program, resulting in the destruction of those water resources. I know what the commitment of the Carter Administration has been to developing synthetic fuels. I have also felt strongly that the EMB should not have the power to override state agencies charged with the protection of the environment and public health.

Now I am aware that, in some states, development interests have been more powerful than those who want to preserve the environment. But there are circumstances that do concern me, with an Administration strongly committed to a synfuel program; waters on federal lands should not be used in that endeavor.

FG: *It's our belief that the synthetic-fuel industry will buy the water from farmers, from agriculture, rather than trying to take it from federal lands.*

EMK: Well, I hope you're right about that.

FG: *Concerning the EMB itself, what role did you play in the fight over the establishment of that board?*

EMK: My votes and the statements I made on the floor of the Senate I think give a very clear idea of my strong opposition to granting extraordinary powers to a federal agency that could ride roughshod over environmental and health considerations already established in the states.

FG: *As President, would you propose legislation to reform the EMB's most dangerous provisions?*

EMK: Yes.

FG: *Conservationists have been advocating a soft energy path, with emphasis on solar energy and on conservation rather than on synfuels or a fast-track energy program. What direction do you wish to give energy development and use?*

EMK: I offered the amendment for the first solar research in this country more than a decade ago. It was for the National Science Foundation, $10 million for solar

Ken Regan/Camera 5

energy research. I was a strong sponsor of the SERI [Solar Energy Research Institute] program, strongly committed to solar energy, and I have deplored the fact that this Administration, in its energy cuts, made the greatest cuts in the budget for solar energy. That is the inexhaustible source of power in this country, and I'm a strong supporter of it and would be as President of the United States.

In my energy program, there is no role for nuclear power.

FG: *You've said that President Carter treats energy conservation as an "unwanted stepchild." The President also seems to think that people must sacrifice in order to conserve energy, and that somehow implies that the standard of living would decrease. Conservationists don't believe that the standard of living or the quality of life would need to decrease with a strong conservation policy. Do you think an energy policy should emphasize increasing supply or reducing demand, and do you think we can have a healthy economy and lifestyle with zero energy growth?*
EMK: I think it's clear that we can strengthen the quality of life with energy conservation, and with energy efficiency and productivity. It's been demonstrated so many times. Germany has a higher virtual standard of living than the U.S. and uses 40% less energy. It's going to take adjustments, changes and greater emphasis on solar energy, on energy conservation and efficiency.

FG: *You've come out against nuclear power and the deregulation of oil prices, and you still insist that it's possible to reduce our dependence on imported oil. Some of the media have criticized you for these positions. How do you answer them?*
EMK: I think, first of all, that decontrol was bad energy policy and also bad economic policy. We're going to have to face an allocation of resources, either through pricing or through direct allocation, and allocation seems to me to be a more equitable way to do it.

FG: *You've advocated coupon rationing.*
EMK: Right, and that would mean a 25% reduction in gasoline use within a three-year period. Fuel efficiency in most of the new cars should be able to cut the need for rationing in half.

FG: *Some people have advocated mandatory standards of 40 mpg for cars in the 1990s, and others favor a gasoline tax of from 50¢ to $2.00. What's your position on these options?*
EMK: Gasoline taxes are notoriously ineffective. Reporting on gasoline use in Europe, an article in the *Wall Street Journal* just destroys the idea that raising the price would bring a significant reduction in use. We've had more than a 50¢-per-gallon increase in the last year, and the reduction has been exceedingly mild. Plus, it adds five points to the rate of inflation.

On the other part of the question, I'm for mileage standards and have supported them.

FG: *You have favored closing the tax loopholes for the oil companies, and also advocated horizontal divestiture. Conservationists are generally in favor of letting energy prices reflect the real cost of replacing finite supplies. If you were elected, would you seek to re-impose controls on domestic oil?*
EMK: I would. I favor competition among alternative energy systems. The fact of the matter is that prices today have no relevance whatsoever to production costs. They're just arbitrary prices, fixed by the Middle East sheiks. I do think we need competition among alternative energy systems, and as part of that we ought to have energy conservation competing for whatever investments we're going to provide with taxpayers' resources.

FG: *Next year Congress will reconsider the Clean Air Act. On March 15 you said that under your administration there would "be no weakening of critical air-quality standards." Are there any changes in the act that you would favor?*
EMK: That represents my best position, and I'd certainly be open-minded to suggestions. My voting record over the years shows a strong commitment to clean-air standards.

FG: *What do you think is the proper role of coal in our energy future?*
EMK: I think there's an important role for coal in our energy future, but I deplore the fact that this Administration has cut back on research for developing technologies that would make it environmentally safe. We have seen the Carter Administration relax air pollution standards. I strongly supported the requirement to require scrubbers. And I'm very much concerned about acid rain. I supported the Moynihan amendment that provided the resources to study it. I'm mindful of the fact that many streams and lakes in the upper Adirondacks have been destroyed because of acid rain, and I'm very much concerned about it.

FG: *I want to ask you about the Building Energy Performance Standards, called BEPS. Congress asked the Department of Energy to write regulations that would guarantee that the next generation of buildings—both residential and commercial—be energy efficient. However, homebuilders have objected, and apparently there's a rider now on both the Senate and House appropriations bills that would prohibit the standards from going into effect for two years.*
EMK: No, I think the standards make sense, and I support them.

FG: *There have been efforts to increase the enforceability of environmental laws by having the Senate Judiciary Committee designate the breaking of them as felonies, rather than as misdemeanors, when they considered the revision of the criminal code.*
EMK: Yes, we made changes, and we have strengthened the laws with my strong support.

FG: *Do you see other mechanisms appropriate to ensure corporate accountability?*
EMK: I think the President sets the tone. The President and his staff choose the significance and the importance of our national goals.

FG: *Would you please comment on the MX missile?*
EMK: I've been opposed to the accelerated research on it. In a Kennedy administration, I would work strongly toward seeing if we couldn't work out with the Soviet Union a kind of nuclear arms control that would make it unnecessary.

FG: *Our readers are vitally interested in your positions on energy and the environment. Do you have anything you'd like to say to them that we haven't covered?*
EMK: I'd like to believe that my voting record over seventeen years in the United States Senate is unsurpassed and that there is no one more deeply committed to environmental issues. It's true that I've been able to provide leadership in a number of these areas, but not in all.

The environment will be in the forefront of a Kennedy administration. I'm strongly committed to it, I believe in it very deeply, and I would certainly have individuals in responsible positions in my administration, both in the cabinet and on the domestic council, who share my view. I would draw upon the men and women all over this country who have a strong, fundamental commitment to those issues and who would continue to work closely with me to assure that we protect our environment. □

FIRST PLACE, ABSTRACT: *Gordon J. Swenson, Salt Lake City, Utah. Navaho reservation, Arizona.*

I M A G E S

Proudly presenting the winners of the first *Sierra* Photo Contest

LITTLE DID WE KNOW the amount of work we were making for ourselves when we decided to hold *Sierra's* first photo contest. Or the amount of fun. First came the work: 702 people entered the contest, and the total number of photographs came to 3973. Leslie Allison, our staff assistant, had to log in each of them and send an acknowledgment; then she had to keep all 702 envelopes safely until the judging began. Storing an extra postage stamp in our small offices isn't easy, but Leslie managed to do it all—and without even a grumble.

Then came the judging. Jerry Klein, David Gancher and I looked through every one of the thousands of photographs, separating and marking those we thought should make the finals from those we were sending back immediately. (Yes, Leslie then had to send each one back, with a note, and she had to mark off that they'd been returned!)

The judging was where the fun came in. Among the nearly 4000 entries there were quite a few really spectacular photographs, and it was difficult to decide among them. Many were so beautiful they made us wonder why we were inside judging photos, instead of being in those lovely places. The collection also included some pretty funny shots, with more than our fair share of naked people in the wilderness, insects mating, out-of-focus mysteries and years of sunsets. We were surprised at the number of shots of the St. Louis Arch we saw, also of the Seattle Needle. But mostly, we were pleased by the excellent quality of the work we saw from those who won and those who didn't. Hardly any of the entries were by professionals.

We were also surprised, however, by the way in which the slides were packaged. Some were wrapped well, with each slide protected. Indeed, some were over-protected, and we had to tear apart cardboard packages to find Scotch-taped baggies, holding foil-wrapped slides, each one folded in toilet paper. But some slides were sent loose in envelopes, and we wondered—especially in the case of

FIRST PLACE, WILDERNESS: *Dotte Larsen, Pittsford, New York. Iceberg at Arthur Harbor, Antarctica.*

some very beautiful work—why the photographers didn't care for their slides better. (Perhaps we ought to publish an article on the care and keeping of 35mm slides?) At first we thought that those who had registered or insured their slides, and who had put each one in a glassine sleeve, would have the best entries, but this wasn't always the case. There was just no telling which envelope—big or little, handwritten or typed, certified or not—would have the best work.

Several entries had to be disqualified, unfortunately, because the photographers submitted prints or duplicates; a few sent in more than the maximum number specified.

After we had looked through all the eligible photos and selected those we thought the best in each category, then Jerry Klein and I examined them all again, together, comparing the work, looking carefully at the quality, and narrowing each category down to six finalists. And last, the entire staff present voted secretly for their top three selections.

And here you see the results. We hope you're as pleased as we are.

—Frances Gendlin

SECOND PLACE, ABSTRACT: *Kathleen Barrow, Pacifica, California. Kelp, Monterey, California.*

THE SIERRA CLUB ON VACATION?

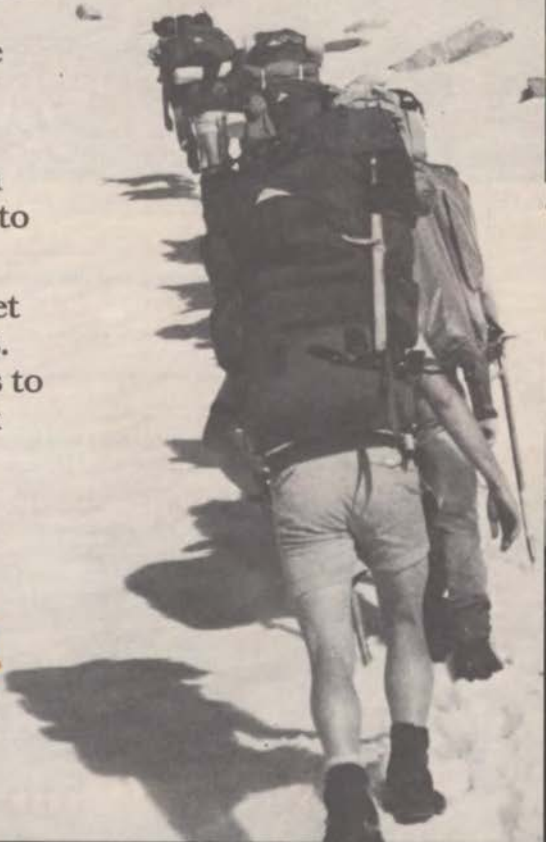
Never! As an organization we are fighting conservation battles every day of the year.

But as members we do take a break to enjoy what we work to protect and preserve.

As you vacation, you will meet people and make new friends. When the conversation turns to environmental concerns, ask them to join us.

Don't forget to "pack" an application.

Sierra Club



Photograph by John Gerty

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Supporting	☐ 40	☐ 44
Contributing	☐ 100	☐ 104
Senior	☐ 12	☐ 16
Student	☐ 12	☐ 16
Junior	☐ 12	—

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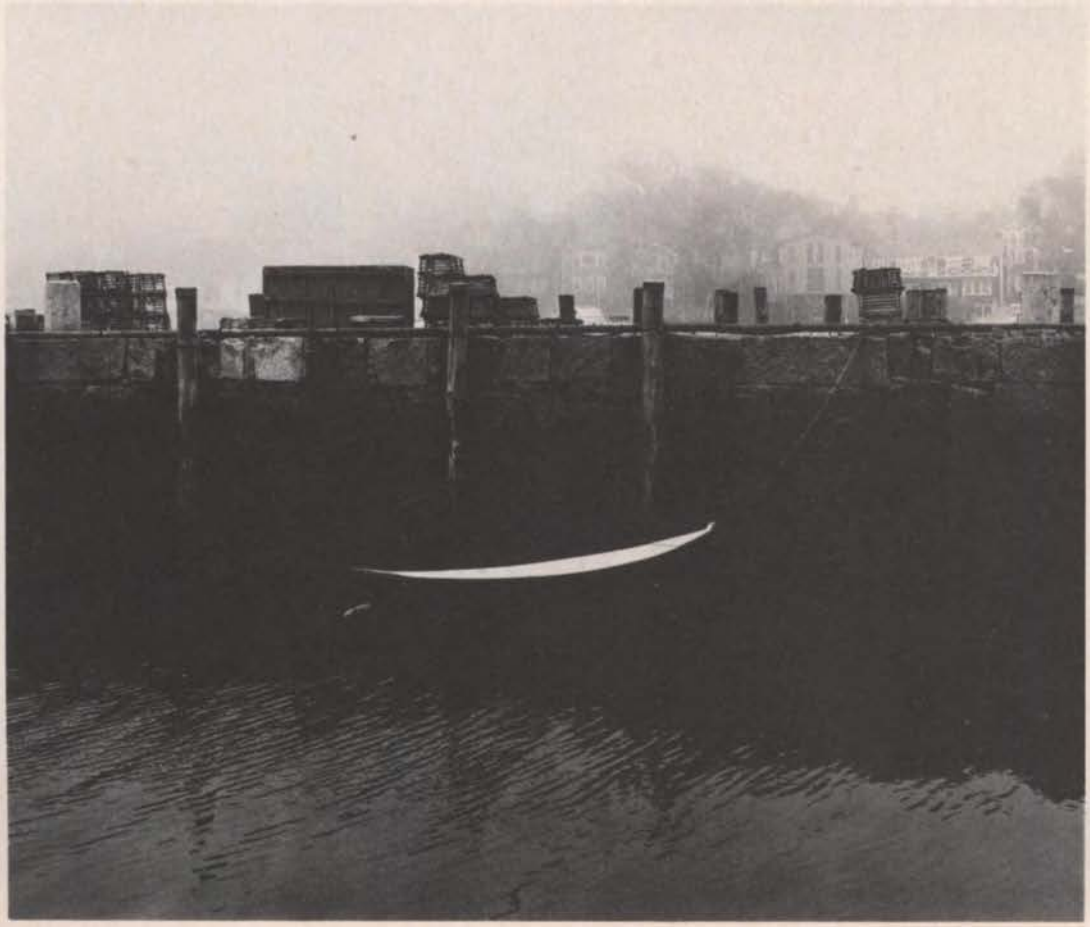
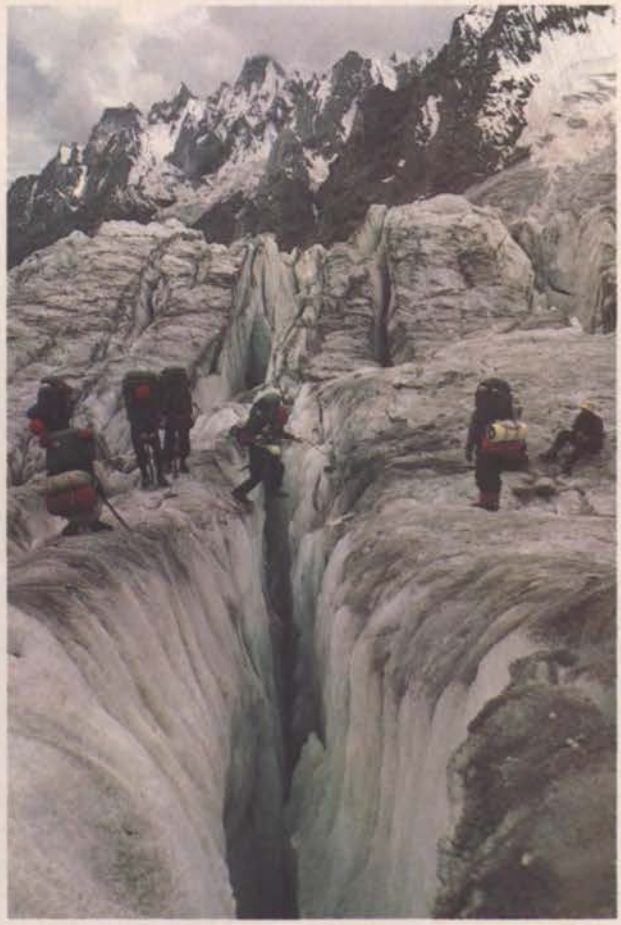
THIRD PLACE, WILDLIFE: *Chuck Cotter, Brown Summit, North Carolina. Roosevelt elk, Yellowstone National Park.*



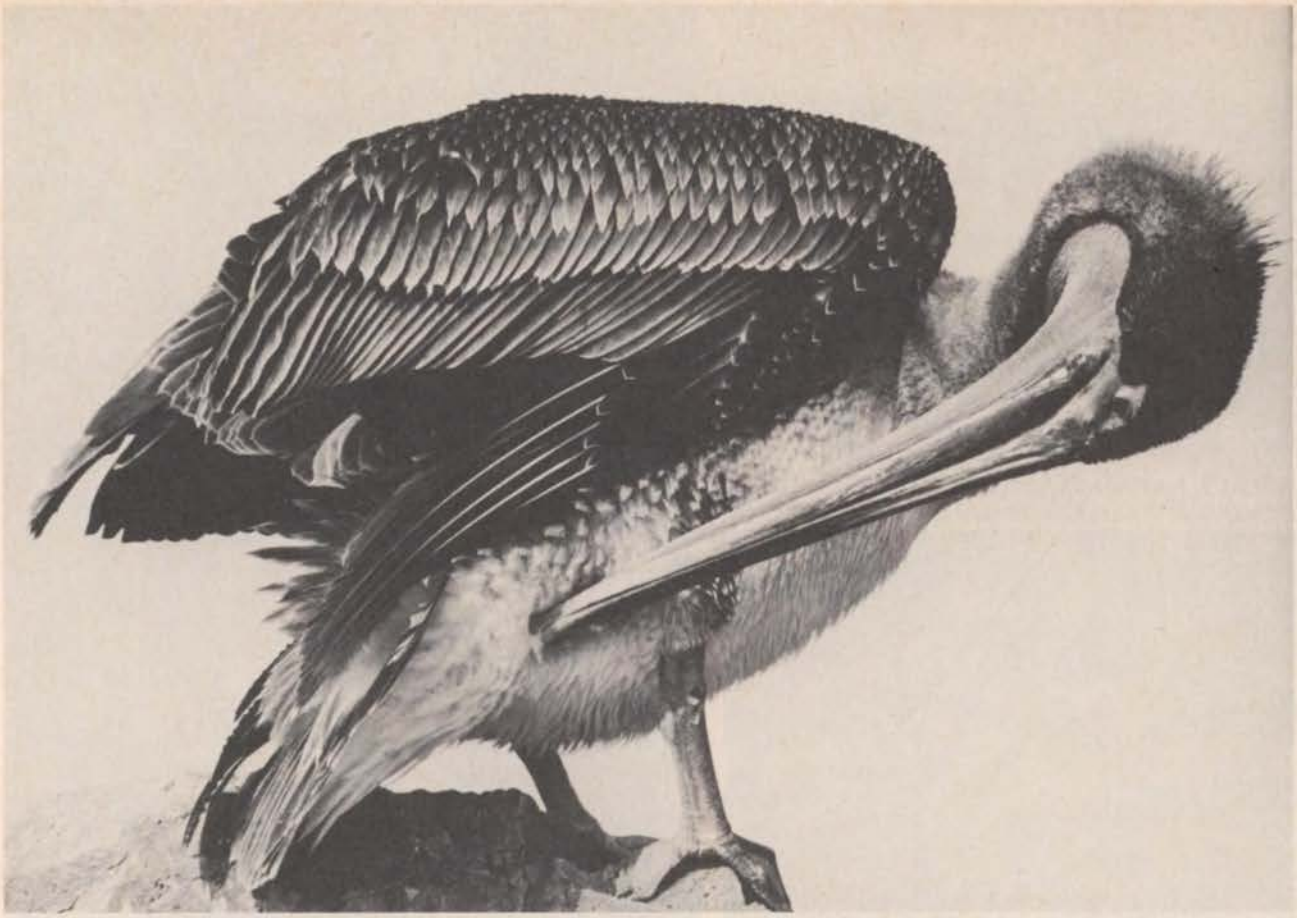
FIRST PLACE, URBAN ENVIRONMENT: *Jack Wasserbach, Berkeley, California. Rockport, Massachusetts.*

SECOND PLACE, URBAN ENVIRONMENT: *Lou Palma, Omaha, Nebraska. Electrical storm, Omaha.*

FIRST PLACE, OUTDOOR RECREATION: *Leslie Emerson, Boulder, Colorado. Crevasse jumpers, Karakorams, India.*



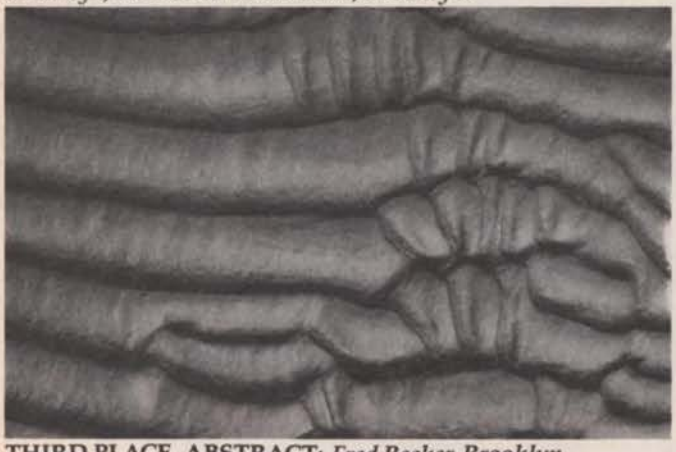
THIRD PLACE, WILDERNESS: *Margaret Malm, Santa Monica, California. Zion National Park, Utah.*



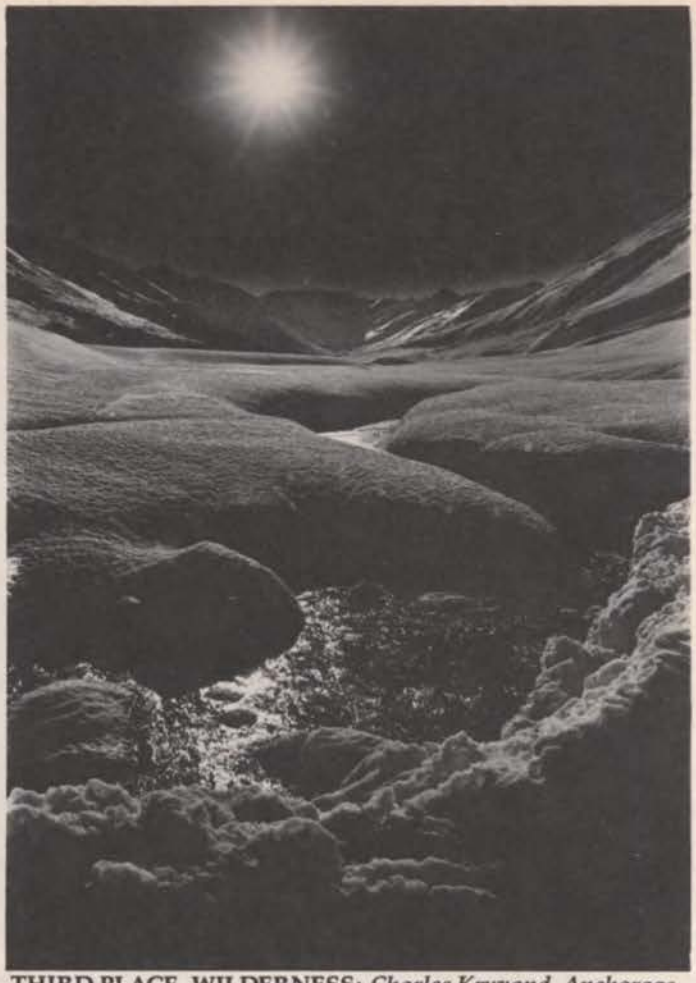
FIRST PLACE, WILDLIFE: *Keith Axelson, Los Angeles, California. Marina del Rey, California.*

THIRD PLACE, OUTDOOR RECREATION: *Manuel Berman, North Bellmore, New York. Fisherman, Jones Beach, New York.*

SECOND PLACE, URBAN ENVIRONMENT: *Fred Becker, Brooklyn, New York. Street scene, Brooklyn.*



THIRD PLACE, ABSTRACT: *Fred Becker, Brooklyn, New York. Sand pattern, Prince Edward Island, Canada.*

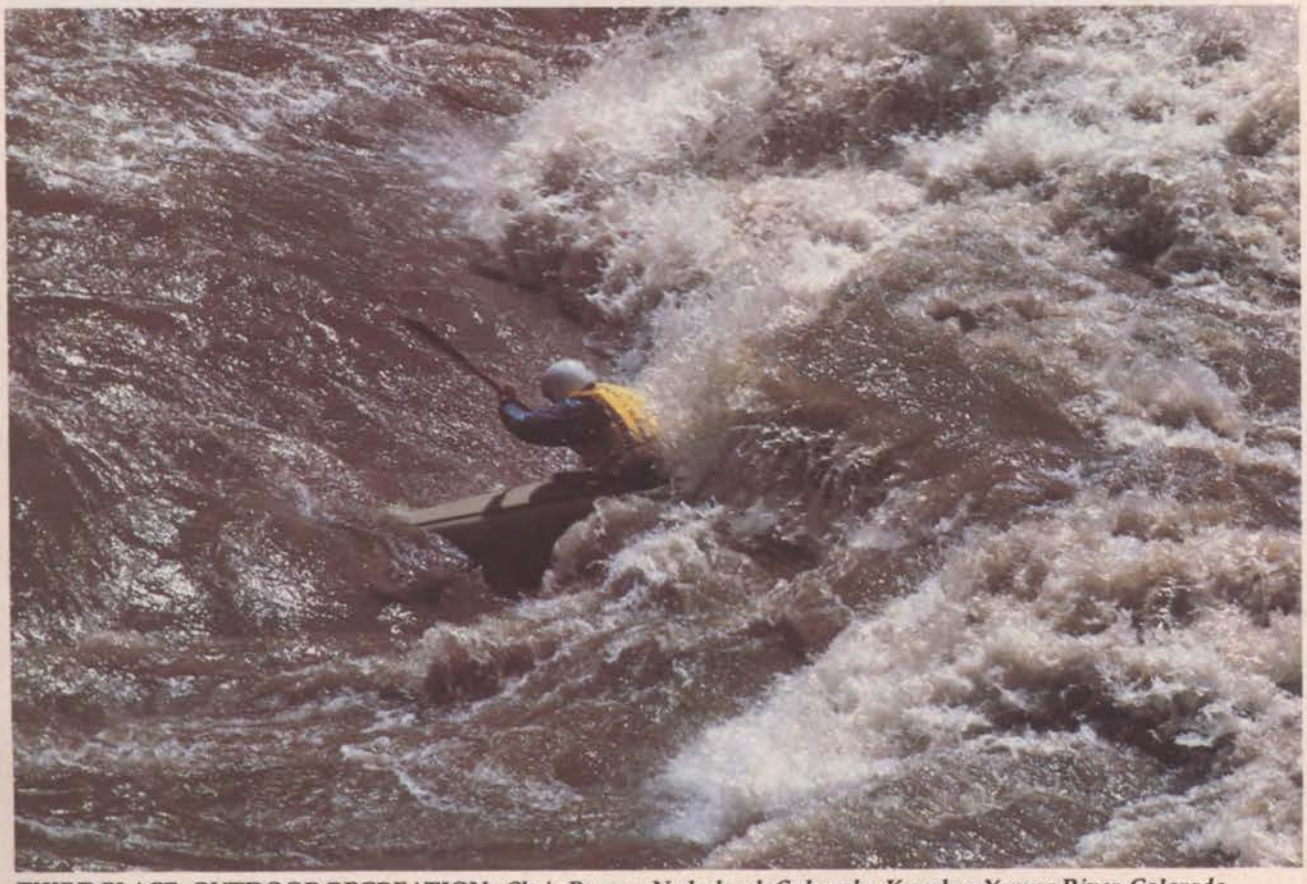


THIRD PLACE, WILDERNESS: *Charles Kruvand, Anchorage, Alaska. Turnagin Pass, Alaska.*

SECOND PLACE, OUTDOOR RECREATION: *Roderick Barr, Fulton, Maryland. Olympic National Park, Washington.*

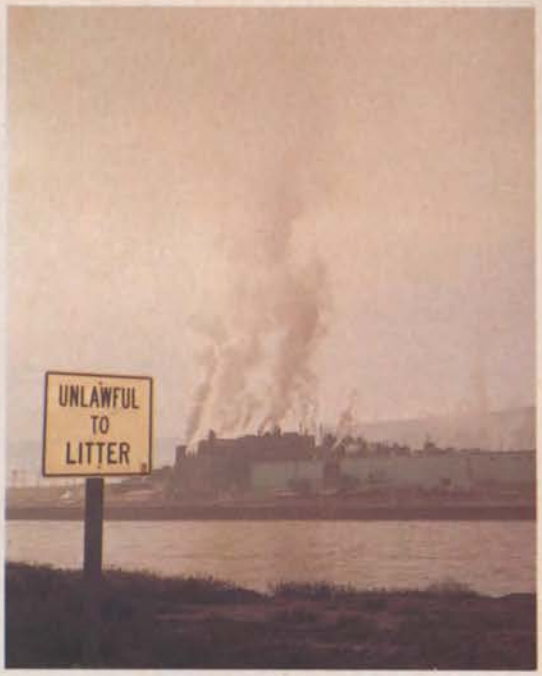
FIRST PLACE, ABSTRACT: *Michael Zide, West Tisbury, Massachusetts. Frozen stream, Martha's Vineyard.*

FIRST PLACE, URBAN ENVIRONMENT: *Elizabeth Howard, New York, New York. Thirteenth Street, off Fifth Avenue, New York City.*



THIRD PLACE, OUTDOOR RECREATION: *Chris Brown, Nederland, Colorado. Kayaker, Yampa River, Colorado.*

SECOND PLACE, WILDLIFE: *Christopher Norment, Pullman, Washington. Arctic fox with wolf-killed caribou carcass, Northwest Territories, Canada.*



THIRD PLACE, URBAN ENVIRONMENT: *Donald M. Johnson, Clarkston, Washington. Paper mill, Lewiston, Idaho.*

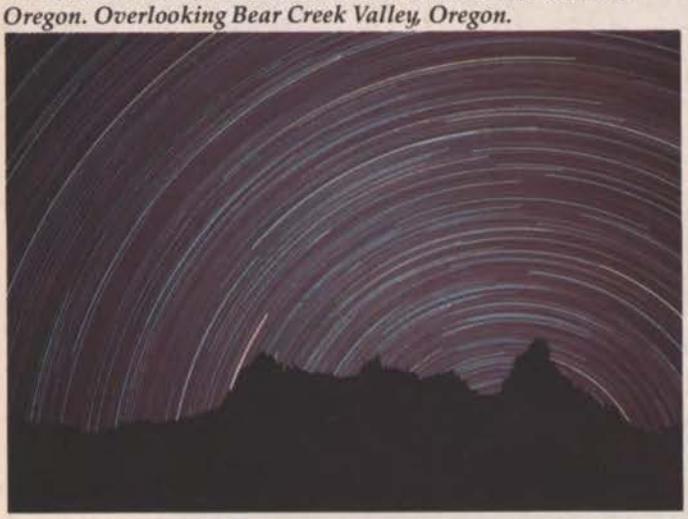
FIRST PLACE, OUTDOOR RECREATION: *Betty Pollock, Daly City, California. Milford Trek, New Zealand.*

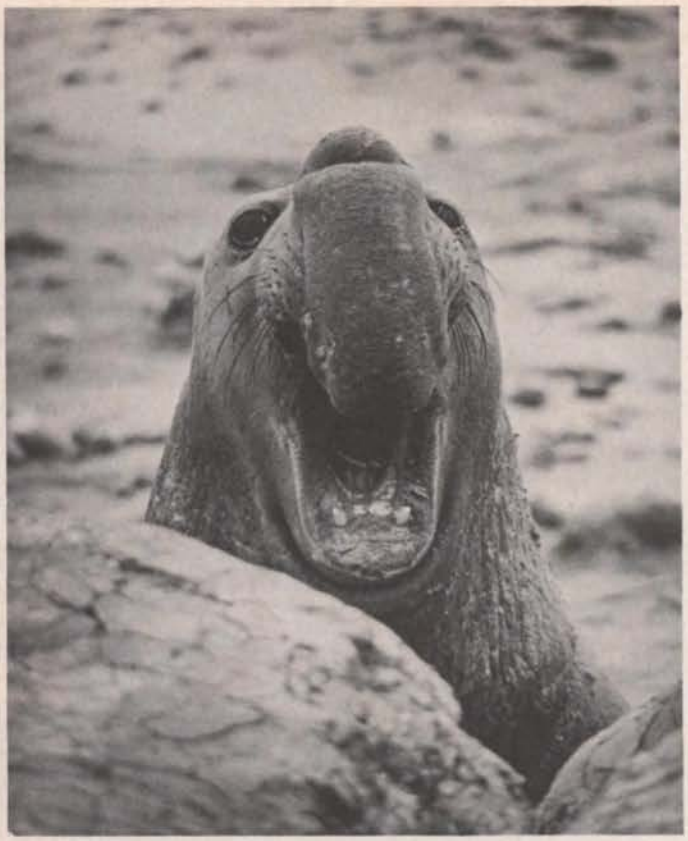
SECOND PLACE, WILDLIFE: *Keith Axelson, Los Angeles, California. Bird and iguanas, Galapagos Islands.*

SECOND PLACE, OUTDOOR RECREATION: *Barb Taubman, Springfield, Oregon. Young divers, Hana, Maui, Hawaii.*

FIRST PLACE, WILDERNESS: *Herman Zittel, Susanville, California. Mount Shasta and moon.*

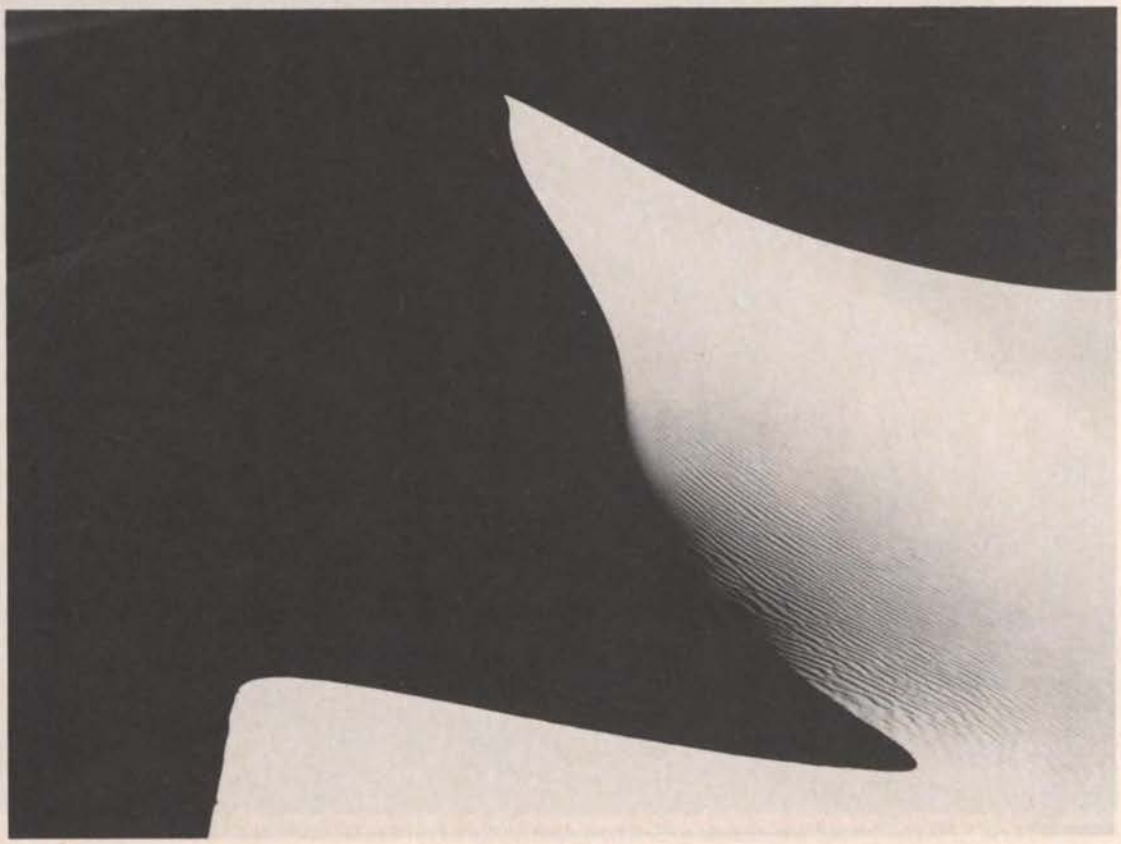
SECOND PLACE, WILDERNESS: *Keith A. Fish, Ashland, Oregon. Overlooking Bear Creek Valley, Oregon.*



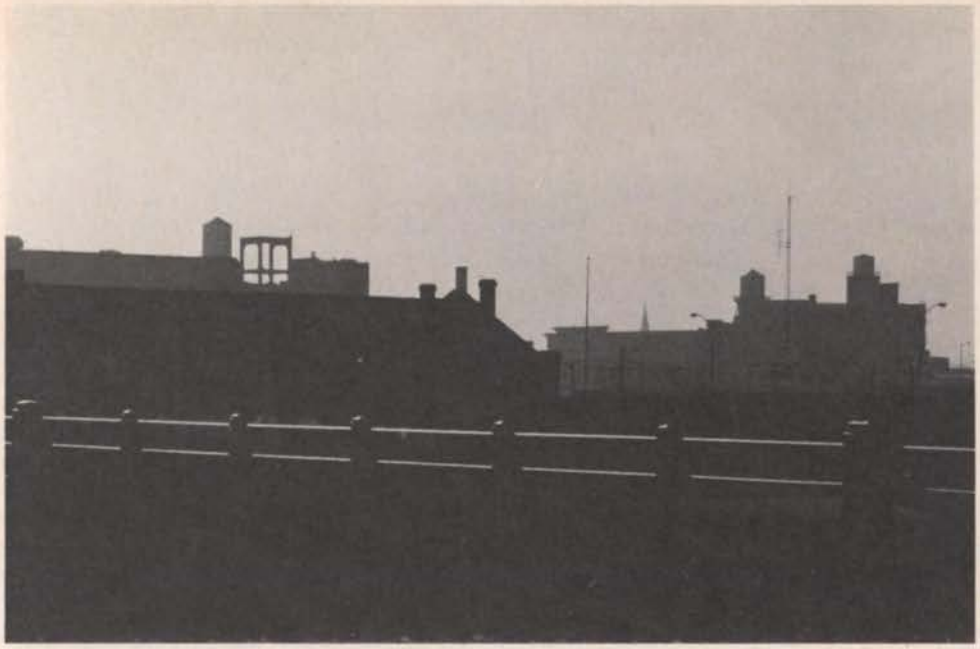


THIRD PLACE, WILDLIFE: *Dick Bascom, El Cerrito, California. Sea elephant, Año Nuevo State Park, California.*

THIRD PLACE, ABSTRACT: *Kenneth Weiss, Beverly Hills, California. Near Whitney Quad, Sierra Nevada, California.*



SECOND PLACE, ABSTRACT: *Jeffrey M. Reynolds, Portland, Oregon. Sand dune, southern Colorado.*



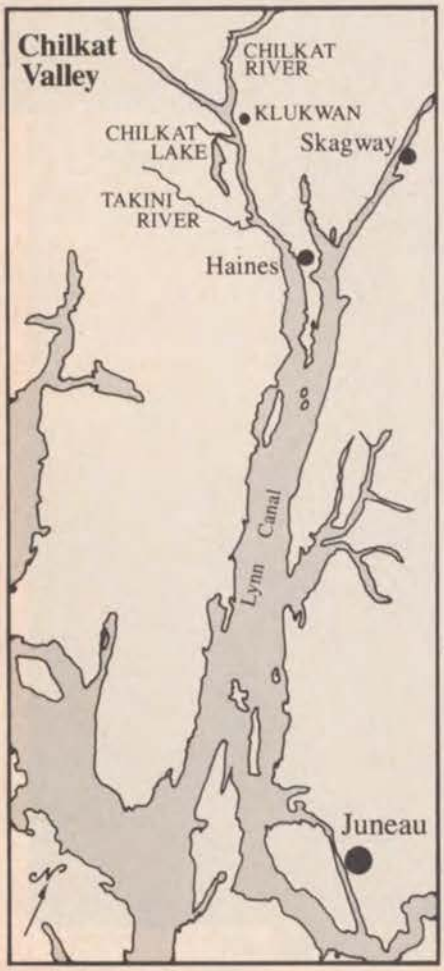
THIRD PLACE, URBAN ENVIRONMENT: *Roger Whitacre, Denver, Colorado. Sixteenth Street Viaduct.*

SECOND PLACE, WILDERNESS: *Kurt Markus, Colorado Springs, Colorado. Garden of the Gods, Colorado.*

A Feast of Eagles

Chainsaws vs. the Food Chain

MIKE MACY and
LEONARD STEINBERG



AT THE CENTER of Alaska's Chilkat Valley, on land surrounded by a state-owned area proposed for logging, 3500 eagles gather each fall to feast on spawned-out chum salmon. Local timber and business interests, citing economic woes and enlisting the cooperation of the state, are about to cut a sizable part of the old-growth forest in the area; but logging there will drastically change the ecosystem that now supports the salmon, the eagles and other Chilkat wildlife.

After a two-year respite, massive clearcut logging has resumed on state-owned lands in the Chilkat Valley, and the logging will continue for at least 15 years and possibly much longer. The valley and the town of Haines lie 80 miles north of Juneau, between Glacier Bay and Skagway. Chilkat Valley has long been on the main route from Southeast Alaska into the Yukon Basin; today, via the Haines Highway, the valley connects the state ferry system with the Alaska Highway. Tourists flock to Haines during the summer. In October when the eagles start arriving in force most tourists have left, and, as a result, the Chilkat eagle gathering remains scarcely known. Nonetheless it constitutes one of the greatest wildlife spectacles in the world —one that can be easily observed even from the roadside. Southeast Alaska's conservationists want a trade arranged: The eagles and other wildlife could be protected (and the local lumber mill kept in operation) if the lower-elevation lands the state is allowing to be logged were traded for federal lands of equal value.

In addition to the eagle gathering, the Haines area features some of the most rugged mountain scenery in Alaska. With its drier climate and more extreme temperatures than the rest of Southeast Alaska, the Chilkat Valley includes ecological communities representative of both the coast and the interior. At the base of glacier-capped ridges lies a narrow band of climax spruce and hemlock forest and grassy riparian marshlands, habitat of a multitude of species. The cottonwood trees that line the river banks support one of the densest concentrations of nesting eagles in Alaska and the associated marshlands are the southernmost nesting area for the trumpeter swan. Moose, mountain goats, wolves, wolverines, coyotes, brown and black bears, marten, lynx, river otters and waterfowl are some of the other valley dwellers—and a variety of marine mammals frequents the river mouth.

Each fall, severe storms lash Southeast Alaska, and cold winds sweep down out of the interior, freezing the mainland rivers and making food-gathering difficult for the Southeast's large population of bald eagles. However, warm upwelling groundwaters keep portions of the Chilkat River system ice-free and provide ideal spawning conditions. In some years, the chum salmon run is so large that it lasts throughout the winter. Tens of thousands of spawned-out salmon carcasses attract the eagles to these ice-free areas.

In November and December it is possible to stand in one spot and count more than 1000 eagles perching, flying and feeding along the Chilkat. As the freeze-up progresses, the eagles gather along the three or four miles of river channels where the upwelling is most active and the spawning most concentrated.

Eagles can be seen everywhere in Southeast Alaska, but nothing prepares one for the Chilkat eagle gathering. Nineteen miles up the highway from Haines, the road crosses an old slide into an open landscape. Here the river runs in braided channels over about a quarter-mile of flats. Eagles perch on cottonwood branches overhead, glide down over the channels and stand on the banks and in the water, pecking at salmon carcasses. Each channel is lined with eagles, each bar speckled with the big birds. On each distant cottonwood tree are perched as many as 50 eagles, and closer inspection reveals gulls, magpies, ravens and ducks among them. Mingled with the cries of eagles are the calls of the other birds. Added to the normal water noises are the sounds of pan-ice and slush scraping and whishing in the current and the flops and splashes of thousands of salmon.

The Chilkat River fishery has remained relatively stable for more than half a century, but large-scale timber harvest in the Haines area has experienced a

Opposite: *Logging would disturb streams in the Chilkat Valley, damaging the fishery on which the eagles depend. Cutting fir and hemlock would also deprive the eagles of roosting places.*

Stephen J. Krasemann/DRK Photo

cycle of boom and bust since its beginning in the early 1960s. The timber is shipped to Japan after the logs are squared into "cants." Improving market conditions in the early 1970s led to excessive logging and expanded mill capacity. But then the market declined and the economy worsened; both of Haines' cant mills closed in 1977, and one of them was dismantled and shipped away.

Conservationists became concerned about the Chilkat Valley in the early 1970s, when massive clearcut logging denuded an alarming amount of acreage annually. Simultaneously, local timber interests succeeded in reducing a 128,000-acre National Wildlife Service refuge proposal to a 4800-acre State Critical Habitat Area consisting of little more than gravel bars and bordering cottonwood trees.

Local conservationists who attempted to protect the Chilkat Valley suffered economic and social sanctions and were repeatedly threatened. In 1978, to protect the Chilkat eagle gathering and the commercial fishery and other natural resources in the area, the Southeast Alaska Conservation Council worked to produce a balanced land-use plan.

The owners of Haines' remaining mill, the Schnabel Lumber Company, had expanded the mill's capacity, incurring a large debt. They set about trying to guarantee their future security and timber supply. In 1978, they were successful in persuading the state legislature to pass a bill providing for negotiated timber sales in areas of high unemployment. And in June 1979, the logging-and mining-oriented Haines Plan was largely incorporated into the state's Haines-Skagway Area Land-Use Plan. Finally, in August 1979, the state signed a long-term timber-sale contract guaranteeing the Schnabel Lumber Company a steady supply of timber for at least fifteen years.

Southeast Alaska's conservationists had hoped to avoid a long-term commitment to massive logging in the Chilkat Valley. Experience in the nearby Tongass National Forest has shown that long-term timber commitments constrain all future resource-management decisions.

The state's inability to resist local development pressures in order to protect the Chilkat eagle gathering is significant. With the signing of the Haines long-term timber-sale contract, the state made logging its management priority for the Chilkat Valley to the detriment of all forest resources. At the current rate of logging, nearly all old-growth spruce and hemlock will be gone in 50 years; it could

take 250 years for the forest to grow back to commercial size and from 300 to 500 years to replace the area's current old-growth ecosystem. Having exhausted all other means to protect the resources of the Chilkat Valley, SEACC filed suit in September 1979 to block the Haines timber sale.

The state owns the lower-elevation lands in the valley, which contain most of the commercial timber in the area; the federal government owns the higher-elevation lands adjacent to both the Chilkat Valley and Glacier Bay National Monument. Southeast Alaska's conservationists have proposed trading some of the state-owned lands to the federal government in order to permanently protect some of the lower-elevation forest lands that support the fish and wildlife of the valley and are part of the ecological unit that supports the eagles. In return for receiving approximately 175,000 acres of state land in the Chilkat Valley, the federal government would cede other lands of equal value to the state of Alaska.

This arrangement would allow the Schnabel Lumber Company to continue logging on the remaining state-owned lands in the valley and on other lands traded to the state by the federal government for the benefit of the lumber company. Meanwhile, the wildlife in the Chilkat Valley, and particularly the salmon so vital to the survival of the eagles, would be protected. State lands traded to the federal government should be managed for the benefit of the eagles; the area would make an excellent National Monument, Wildlife Refuge or National Preserve.

Recently, the state of Alaska has joined with the industry lobbyists in an effort to defeat an adequate Alaska National Interest Lands Bill, claiming that it can protect Alaska's environment better than the federal government can. Yet in its first attempt at land management—in the Chilkat Valley—the state has failed completely. The role the state of Alaska has taken at Chilkat Valley is in fact a compelling argument in favor of a strong Alaska Lands Bill. The federal government deeded the critical lands in the Chilkat Valley to the state only 20 years ago; now, federal intervention and oversight are the only measures that can protect the greatest gathering of our national bird. □

Mike Macy is on the staff of the Southeast Alaska Conservation Council; Leonard Steinberg is the council's executive director.

Nuclear Wastes—The Myths

MARVIN RESNIKOFF

THE SIERRA CLUB frequently receives letters from puzzled readers who are unable to reconcile the conflicting claims of the proponents and the critics of nuclear power. The nuclear-power industry has devoted, over the past few years, an enormous amount of money and effort to developing a series of advertisements that advance a number of pro–nuclear "facts." These ads often sound reasonable and, if their claims were true, would demonstrate that nuclear critics are a group of hysterical, emotional nay-sayers with little appreciation for competent engineering and less regard for truth. However, the claims are not true. Following are a number of these nuclear myths—and point-by-point analyses of the associated arguments.

MYTH 1: A nuclear power plant produces millions of times less waste than an equivalent-sized coal plant. "When the wastes are prepared for disposal, the total volume produced annually by a 1000-megawatt nuclear reactor is about two cubic meters, an amount that would fit comfortably under a dining-room table."[1]

REALITY 1: This myth sounds plausible. Certainly a great deal of coal is burned to produce 1000 megawatts of electricity. A large coal plant burns a 100-car trainload of coal every day; this produces a large quantity of fly ash. But is the amount of nuclear waste millions of times less? Actually, the volumes of both types of waste are within 50% of each other if *all* the nuclear wastes are included.

"Two cubic meters" is termed the amount that "would fit comfortably under a dining-room table," but a room thus equipped would be made extremely uncomfortable by the intense heat and radioactivity generated. Because of this heat, small portions of the high-level waste would have to be spaced apart when disposed of in a deep, underground waste repository (though no such repository has yet been sited or constructed). The actual underground space needed to dispose of this volume of high-level waste would not be two cubic meters, but more like 10,000 times that number. For the amount to fit comfortably under a dining-room table, the table would have to be the size of a football field, with a top at least 10 feet from the ground.[2, 3]

High-level nuclear waste is not the only radioactive waste associated with the operation of a reactor. We must also consider the remains from mining and milling uranium. In order to produce the approximately 30 tons of enriched uranium fuel needed to operate a 1000-megawatt pressurized-water reactor (PWR) for a year, about 272 tons of natural uranium (U_3O_8) are required.[4] Because the ore contains a mere 0.15% uranium, the industry must mine and process 180,000 tons of uranium ore to obtain the 272 tons. Low-level wastes also have to be disposed of, and the radioactive nuclear reactors themselves become additional waste products after their commercial lives are over—about 30 years after each goes on line. Compared to the volume of nuclear wastes from the entire nuclear fuel cycle, the fly-ash pile from a coal-fired plant is about 50% larger, a far cry from the million-times-greater myth.

The intent of this myth about the small volume of nuclear wastes is to divert attention from their toxicity. The volume of the spent fuel pellets (excluding low-level solid wastes, uranium mill tailings, used reactors and the safety space required within an underground waste repository) is, in itself, small—0.01 gallon per year for an average family of four. Yet so toxic is this one-hundredth of a gallon that to dilute it to the level considered by the nuclear-power industry to be safe for disposal (the "maximum permissible concentration," or mpc) requires 1 billion gallons of water.[5] Stated another way, the amount of water to dilute 30 tons of spent fuel to mpc is about ten lakes Ontario.

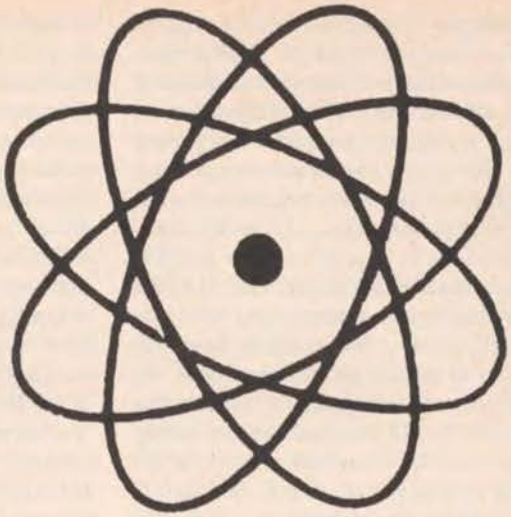
This dilution example is illustrative only and is not a solution to the waste-disposal problem. There is no safe level of radioactivity;[6] each dose received increases the probability that cancer or a genetic defect will occur (see Myth 4). Dilution generally inflicts radioactivity on more people (while lessening the dose to each).

MYTH 2: "There is . . . less radioactivity from nuclear-power plants than from coal-fired plants because coal plants release radioactivity from uranium and thorium when the coal is burned."[7]

REALITY 2: This is not the whole truth. It is true that coal contains radioactivity, but nuclear power plants and the entire nuclear fuel cycle produce much more radioactivity.

The aim of this myth is to convey the impression that not much radioactivity arises from nuclear power plants, certainly not enough to worry about. The prime health concern about coal-fired stations does not arise from the radioactivity in coal, but from the sulfur dioxide, nitrogen oxides and particulates it releases and the acid rain it causes. These are real concerns. But the level of the radioactivity released during the entire nuclear fuel cycle is a major concern—and is considerably higher than from coal. Coal contains, on the average, 1.8 parts per million (ppm) of uranium.[7] In comparison, the average uranium content in uranium ore is 1500 ppm. To produce an

and the Realities



equivalent amount of electricity, about 20 times more coal than uranium ore must be mined. But because, on the average, the uranium content in uranium ore is 1000 times greater than in coal, the mining part of the nuclear fuel cycle brings 50 ($1000 \div 20 = 50$) times as much radioactivity to the earth's surface. Only a small amount of the uranium, about 0.3% of the total radioactivity in the ore,[8] actually undergoes fission; the radioactivity of almost all the rest remains accessible to living beings essentially forever. The small amount of uranium that undergoes fission in a nuclear reactor is converted to shorter-lived radionuclides such as strontium and cesium that are millions of times more radioactive than the original uranium. To sum up, from a long-term perspective (50 times more radioactivity) and a short-term perspective (millions of times more radioactivity), it is the radioactivity from nuclear power plants and the nuclear fuel cycle that should cause more concern.

MYTH 3: Because uranium is so long-lived, and because the fission process converts uranium to radionuclides such as cesium, strontium and many others that have much shorter half-lives, "on any long time scale, nuclear power must be viewed as a means of cleansing the earth of radioactivity"[1] and saving lives.

REALITY 3: As this myth envisions the nuclear fuel cycle, the reactor fissions uranium atoms, thereby converting them to short-lived radionuclides. The high-level waste is then buried again below the earth's surface to decay over some thousands of years. Thus the long-lived uranium is converted to short-lived radionuclides. Sounds good, but will it sell? No, because it is not the whole truth.

The reality is that the uranium is mined from 100 to 450 feet (and sometimes more) below the surface of the earth. When at that depth, the radon gas produced by uranium-ore deposits is shielded from humans. But uranium milling residues (called uranium mill tailings) still contain 85% of the original uranium ore's radioactivity and are disposed of on the earth's surface. The radon gas and radioactive "daughters" (products of uranium decay, in successive stages) are now more accessible to humans.

After the fission process, high-level waste is to be placed below ground in a waste repository, though it would not decay completely for thousands of years (see Myth 7). With luck, this high-level waste would not migrate to underground aquifers. Low-level solid wastes would be "disposed of" in a surface burial ground, at least two of which have already leaked.[9]

Moreover, radioactive materials are released to air and water from all phases and components of the nuclear fuel cycle, both normally and in case of accident.

Reactors themselves become radioactive and must be mothballed for from 100 to 180 years before being dismantled and disposed of in that so-far imaginary underground waste dump. Finally, we should not forget the radiation exposure to workers in the nuclear industry.[7]

MYTH 4: "The fact is that in 22 years of commercial nuclear-power plant operation there has not been a single atom-caused fatality, and nuclear power has compiled a safety record matched nowhere else in industry.[7]"

REALITY 4: This myth, straight from a Mobil ad in the *New York Times*,[7] is my favorite. By most conventions, it is a vulgar lie. Unverified by editors, it has appeared in newspapers throughout the entire country.

Why is it a lie? Because the commercial nuclear industry has released a great deal of radioactivity into the environment and exposed many workers. Just as smoking increases the probability that lung cancer will occur, each increment of radiation exposure increases the probability that health will be affected. The fact that the cause-and-effect relationship is not immediate—that cancers occur after a latency period of from ten to twenty years—is no excuse for the nuclear-power industry to avoid responsibility for the increased numbers of deaths from cancer that have occurred and will occur in the future.

Radiation exposure of nuclear workers and the general public occurs throughout the nuclear fuel cycle. First the uranium is mined and milled, primarily in Utah, Colorado, New Mexico and Wyoming, much of it on Indian land. All uranium ore gives off radon, a radioactive gas that causes lung cancer. The lung-cancer rate among uranium miners is from three to five times higher than the national lung-cancer rate. Do these lung-cancer deaths count as "atom-caused fatalities?"

Radon's half-life is 3.8 days; in that time, the gas from mill tailings can easily travel across the western states to the eastern seaboard. The total exposure of humans to radon is great, and the number of potential lung cancers for each year's operation of a 1000 -megawatt reactor is on the order of 800, from only the thorium and its daughters.[10]

Workers at nuclear reactors, laboratories, commercial reprocessing plants and throughout the nuclear-fuel cycle are particularly exposed to radiation. Exposures at nuclear reactors average one person-rem per megawatt of electricity generated per year. A 1000-megawatt

reactor operating for a full year exposes workers to a total dose of 1000 person-rems (the average exposure multiplied by the number of workers). Is this serious or not? The number of cancers resulting from this much exposure[6, 11] can vary from 0.1 to 8 per 1000-megawatt reactor for each operating year. Over 30 years, this amounts to a range of from 3 to 240 cancer fatalities above the norm. Since the average work force in any year at a nuclear reactor is 300 to 400 people, this number of additional cancer deaths demands urgent action. Mobil's claim that "nuclear power has compiled a safety record matched nowhere else in industry" is ironically true. After coal mining, its record is one of the worst. The Oil, Chemical and Atomic Workers Union and the Sierra Club[12] have called for a tenfold reduction in yearly permissible occupational exposures in the nuclear industry.

Nuclear reactors in general—in normal operation—emit small amounts of radioactivity. Burial grounds for low-level waste also have released small amounts of radioactivity to offsite streams. Major releases of radioactivity (from strontium, cesium, ruthenium, krypton, carbon-14 and tritium) have also occurred and are occurring now at reprocessing plants. The Environmental Protection Agency has estimated the number of health effects[13] that are caused by releases of krypton gas, carbon-14 and tritium. In some cases, dispersed radioactive material reconcentrates and reaches humans.[10a] For example, water-dispersed cesium reconcentrates in clams, and strontium in the air ends up in milk. A recent German study shows that the nuclear industry has been selective in choosing the data upon which its health estimates are based;[14] such findings throw industry figures on health effects into dispute. It may be that exposure of the general population to radiation is greater than previously assumed.

MYTH 5: The quantity of radioactive wastes produced by the military greatly exceeds that from commercial waste.

REALITY 5: The volume of military nuclear wastes is indeed large. In addition to 70 million gallons of high-level waste, the Department of Energy owns 460 buildings and sites[15] that have not yet been decontaminated and disposed of in underground repositories. However, in terms of toxicity—that is, the amounts of radioactivity—from commercial wastes, as compared to defense wastes, the nuclear industry surpassed the defense program in 1977. And the commercial sector is producing radioactive wastes at a much faster rate than the defense industry.[16]

MYTH 6: "The presumption of safety [of spent fuel rods] in transit seems valid. In the case of a major accident, no more than small amounts of radioactivity would be released. Spent fuel, the most dangerous nuclear cargo, is probably no riskier to ship than liquefied natural gas."[17] There is no need for local transportation bans; a patchwork of local laws makes transportation riskier.

REALITY 6: The consequences of a transportation accident would befall localities, not Washington bureaucrats or New York editors. In case of a serious accident, local firefighters, police and sheriffs would be called on; local people would be on the scene first; cancer fatalities in the thousands, both early and latent, could occur.[18] In case of radioactive contamination, local land and property values would be affected, possibly for long periods of time. Is there a real threat involved with transportation of nuclear materials?

First: Does a shipping cask contain much radioactivity? Each pressurized-water reactor (PWR) produces 64 spent-fuel assemblies per year; one truck carries one fuel assembly from a reactor. Each such truck shipment contains ten times the amount of cesium in one Hiroshima atomic bomb.[19] Cesium is a strong gamma-emitter, and it concentrates in shellfish and in human muscle and gonads.

Second: But isn't the cesium that's in spent fuel in solid form? How could it be released to the environment? A cesium release would follow from a loss-of-coolant accident.[20] That is, if an accident causes coolant to escape from the shipping cask, and if the spent-fuel assembly

The Long Death

MARGE PIERCY

Radiation is like oppression,
the average daily kind of subliminal toothache
you get almost used to, the stench
of chlorine in the water, of smog in the wind.

We comprehend the disasters of the moment,
the nursing home fire, the river in flood
pouring over the sandbag levee, the airplane
crash with fragments of burnt bodies
scattered among the hunks of twisted metal,
the grenade in the marketplace, the sinking ship.

But how to grasp a thing that does not
kill you today or tomorrow
but slowly from the inside in twenty years.
How to feel that a corporate or governmental
choice means we bear twisted genes and our
grandchildren will be stillborn if our
children are very lucky.

Slow death can not be photographed for the six
o'clock news. It's all statistical,
the gross national product or the prime
lending rate. Yet if our eyes saw
in the right spectrum, how it would shine,
lurid as magenta neon.

If we could smell radiation like seeping
gas, if we could sense it as heat, if we
could hear it as a low ominous roar
of the earth shifting, then we would not sit
and be poisoned while industry spokesmen
talk of acceptable millirems and .02
cancer per population thousand.

were not sufficiently cooled, the assembly could heat up to the temperature at which cesium becomes volatile and boils off. The regulations allow a spent-fuel assembly to become this "hot." Cesium could then escape the cask, causing human fatalities and contaminating a large land area for long periods of time. If 10% of the cesium in a shipment were released, it would equal the amount of cesium in one atomic bomb. A loss-of-coolant accident resulting in the release of 10% or more of the cesium could occur in several ways: by sabotage, from an unseated pressure-relief valve or in a severe accident.

Third: But isn't it true that the casks "weigh up to 35 tons and are practically impervious to gunfire or small explosions?"[16] Yes, but is the cask impervious to a severe accident involving a chemical fire burning at higher temperatures than the temperature for which the cask has been tested? Or is it possible to have a defective cask? Yes, these are possible. Defective casks have been constructed.[21] Sandia Laboratories conducted a widely-publicized series of tests that involved crashing trucks into concrete walls. But though the test seemed to prove that nuclear shipping casks could survive serious accidents, the results under closer scrutiny were ambiguous. The casks used were, in Sandia's own words, "obsolete"; leakage occurred at the seals in two out of three casks tested;[22] the casks were not sufficiently pressurized, and they did not contain a heat source. Finally, the tests did not represent the worst type of accident possible.

Fourth: Aren't hazardous substances thoroughly regulated by the Department of Transportation? "There are 20,870 container manufacturer/supplier facilities; DOT agencies inspected 261 facilities in 1977 (with 6 inspectors). There are 104,370 shipping facilities; DOT agencies inspected 1,915 in 1977. . . ."[23] "As a result, industry is partly regulating itself. . . ."[23] It is no wonder that local communities have taken on the task of regulating shippers by controlling the routes, the times of day shipping is allowed and the quantities of hazardous materials shipped.

MYTH 7: After 100 years, spent fuel is no more dangerous than uranium ore.

REALITY 7: Myth 7 is true in one sense, but may be a bit misleading. A PWR produces 30 tons of extremely toxic spent fuel each year. After 1000 years, the amount of radioactivity emitted from this 30 tons of spent fuel is equal to that emitted from the original 180,000 tons of uranium ore. If certain radionuclides, such as plutonium, change their chemical state and become soluble, high-level waste will still be more hazardous after 1000 years. Certain agents in fertilizers would make plutonium soluble. This does not mean that *pound for pound* the hazard of uranium ore and spent fuel will be the same in 1000 years. The period of time for the hazard of a pound of spent-fuel pellets to decline to that of a pound of uranium ore is, rather, one million years. So far, waste-disposal technology has not been demonstrated that will isolate high-level wastes from the environment for even a thousand years, much less for a million.

MYTH 8: Though radioactive waste is toxic for long periods of time and transportation of spent fuel is risky, we need the energy. Everything has risks. Our greatest risk is running out of energy and being dependent on OPEC oil. We need nuclear power to replace oil.

REALITY 8: Nuclear power produces little end-use energy, and what it does produce could be made available easily and more cheaply through conservation. In 1979, electricity provided 11.4% of our end-use (i.e., consumed) energy, and nuclear power provided perhaps 12.5% of that, or only 1.4% of our total end-use energy.[19] Several studies have shown[24-26] that it would be possible to save 50% of our energy by using it much more efficiently and more productively; some European countries use half the energy per person that we do. It is much cheaper to save a barrel of oil than to produce a barrel of oil.

"Nuclear power is almost irrelevant to the shortage of liquid fuels in the U.S."[27] Only 10% of American oil is used to produce electricity;[19] most of the rest is used

We acquiesce at murder so long as it is slow,
murder from asbestos dust, from tobacco,
from lead in the water, from sulphur in the air,
and fourteen years later statistics are printed
on the rise in leukemia among children.
We never see their faces. They never stand,
those poisoned children together in a courtyard,
and are gunned down by men in three-piece suits.

The shipyard workers who built nuclear
submarines, the soldiers who were marched
into the Nevada desert to be tested by the H
bomb, the people who work in power plants,
they die quietly years after in hospital
wards and not on the evening news.

The soft spring rain floats down and the air
is perfumed with pine and earth. Seedlings
drink it in, robins sip it in puddles,
you run in it and feel clean and strong,
the spring rain blowing from the irradiated
cloud over the power plant.

Radiation is oppression, the daily average
kind, the kind you're almost used to
and live with as the years abrade you,
high blood pressure, ulcers, cramps, migraine,
a hacking cough: you take it inside
and it becomes pain and you say, not
They are killing me, but *I am sick now.*

Marge Piercy is a novelist and poet. "The Long Death" is reprinted from her most recent book, The Moon Is Always Female, *published in April 1980 by Alfred A. Knopf, Inc.*

in cars and trucks. Clearly nuclear power will not remove our dependence on imported oil. To do that, we need to conserve in such major oil-use sectors as transportation—increased gas mileage for autos; high-speed rails to replace some air travel between urban areas; increased rail freightage; more mass transit and perhaps, dare we say it, less driving.

If there is a land of "cheap, clean and reliable energy," it is in the rosy visions, distorted reality and myths of the nuclear industry. Do you have myths that you need dispelled? Send them to Nuclear Myths, *The Waste Paper*, 3164 Main St., Buffalo, New York 14214. □

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NOTES

1. Bernard Cohen, "The Disposal of Radioactive Wastes from Fission Reactors," *Scientific American*, 236, 6 (1977): p. 21.
2. Marvin Resnikoff, "Is Reprocessing a Waste-Management Solution?" with reference to information in U.S. Department of Energy, "Management of Commercially Generated Radioactive Waste" Report DOE/EIS-0046-D, (April 1979).
3. We might also look at the accuracy of the projected 2-cubic-meter volume of glassified waste. Because reprocessing and solidification of high-level liquid wastes is not taking place in the United States on a commercial basis, this projection is based on idealized-flow charts and nonexistent processes. The volume of liquid high-level waste at West Valley normalized from one year's operation of a 1000-megawatt reactor is 250 times 2 cubic meters (U.S. Nuclear Regulatory Commission, "Alternative Processes for Managing Existing Commercial High-Level Radioactive Wastes," Report NUREG-0043, April 1976). The projected volume of vitrified wastes, assuming that the material can be removed from the West Valley tank and that the process works flawlessly, is 100 times the 2 cubic meters specified (U.S. Department of Energy, "Western New York Nuclear Service Center Study," Companion Report TID-28905-2, November 1979). This estimate does not include the volume of the 750,000-gallon high-level waste tank itself or the vitrification facility. Nor does it include the volumes of cesium and strontium, the heat-producers in the high-level waste, that would be removed before the solidification operation and be stored underwater for 1000 years.
4. U.S. Environmental Protection Agency Office of Radiation Programs, "Radiological Impact Caused by Emissions of Radionuclides into Air in the United States" Preliminary Report EPA-520/7-79-006, (August 1979).
5. Code of Federal Regulations, Title 10, Part 20, Appendix B.
6. National Academy of Sciences, "Biological Effects on Populations of Exposure to Low Level of Ionizing Radiation," BEIR Report, (1972).
7. "No Nukes Is Bad News," advertisement by the Mobil Oil Corporation in the *New York Times*, (December 1979).
8. Fifteen percent of the radioactivity associated with a 1000-megawatt reactor operation for one year is (see ms.) from the 272 tons of uranium re-

quired; 85% of the radioactivity is associated with thorium and its daughters, which remain in the tailings pile. Only 30 of the 272 tons of uranium enter the reactor core, and only 5% of the uranium in the core actually undergoes fission. Thus, the amount of uranium to undergo fission is associated with approximately 0.3% of the radioactivity.

9. Ellen Winchester, "Nuclear Wastes: What Will We Ever Do With Them?" *Sierra*, Vol. 64, No. 4 (1979): p. 46.

10. R. Pohl, testimony in Black Fox proceedings, Docket numbers 50-556, 50-557 (1978). Extension of "Health Effects of Radon-222 from Uranium Mining," *Search*, 1 (1976): p. 345.

11. T. Mancuso, A. Stewart and R. Kneale, "Radiation Exposure of Hanford Workers Dying From Cancer and Other Causes." *Health Physics*, 33 (1977): p. 369.

12. The resolution passed by the Sierra Club board of directors in May 1978 urges that the regulatory authority over the health and safety of atomic workers be transferred from the Nuclear Regulatory Commission (NRC) to the Occupational Safety and Health Administration (OSHA).

13. U.S. Environmental Protection Agency Office of Radiation Programs, "Environmental Radiation Dose Commitment: An Application to the Nuclear Power Industry," EPA-520/4-73-002 (February 1974).

14. *Radiological Report on the Why Nuclear Power Plant*, Environmental Protection Tutorial University of Heidelberg, 2nd edition, (July 1978).

15. U.S. Department of Energy, press release (June 29, 1978).

16. H. Krugman and F. von Hippel, "Radioactive Wastes: A Comparison of U.S. Military and Civilian Inventories," *Science*, 197 (1977): p. 883.

17. *New York Times* editorial, "The United States of Nuclear Shipments," (February 12, 1980).

18. Marvin Resnikoff, "Spent-Fuel Shipping Accident," (November 1979). This article was the basis for a monograph by the Sierra Club Radioactive Waste Campaign in the Sierra Club Atlantic Chapter's *The Waste Paper* (July/August 1979).

19. U.S. Department of Energy, "Monthly Energy Review," DOE/EIA-0035/11 (November 1979).

20. It is assumed that a PWR fuel assembly is designed for a burn up of 33,000 MWD/MT (megawatt days per metric ton) and is cooled 150 days. See reference 18.

21. U.S. Nuclear Regulatory Commission, "Information Report to the Commissioners," from W. J. Dircks, Director, Office of Nuclear Material Safety and Safeguards, SECY-79-264 (April 16, 1979).

22. H. R. Yoshimura, "Full-Scale Simulations of Accidents on Spent-Nuclear-Fuel Shipping Systems," *Proceedings of the Fifth International Symposium on Packaging and Transportation of Radioactive Materials* (Las Vegas, Nevada, May 7-12, 1978). Newer casks, which may or may not work better, were not tested.

23. U.S. Congress, Senate, Committee on Commerce, Science and Transportation, "Hazardous Materials Transportation," 96th Congress, 1st sess., (April 1979), p. 80.

24. M. Ross and R. Williams, "Energy and Economic Growth," a study for the Subcommittee on Energy of the U.S. Congress Joint Economic Committee (August 31, 1977).

25. R. Stobaugh and D. Yergin, eds., *Energy Future: Report of the Energy Project at the Harvard Business School* (New York: Random House, 1979).

26. V. Taylor, "The Easy Path Energy Plan," monograph; available from Union of Concerned Scientists (September 1979).

27. M. Ross, letter to the New York Times (July 1979).

1981 Foreign Trips

Betty Pollock

Nepal

Asia

(703) INDIAN WILDLIFE SANCTUARIES
January 6–31 Cost: $1620
The conservationist and photographer will enjoy this winter tour of seven wildlife sanctuaries that protect India's endangered species—great cats, rhinos, pythons, wild elephants, oxen and myriad waterbirds.
Leaders, Kathy and Robin Brooks.

(720) SPRING TREKKING IN NEPAL
March 21–April 11 Cost: $1120
An ideal introduction to Nepal, this trek takes us into the foothills of Dhaulagiri and Annapurna to views of peaks framed by blooming rhododendron trees.
Leader, Al Schmitz.

(765) LADAKH/KASHMIR TREK
July 1–26
Visit Ladakh, last bastion of Tibetan Buddhism; then trek the glacial peaks and meadows surrounding the fabled Vale of Kashmir.
Leaders, Kathy and Robin Brooks.

(750) ZANSKAR TREK—KULU TO KASHMIR
June 28–July 25 Cost: $1085
In 20 days of trekking, we cross five major passes to explore the Hindu, Buddhist and Moslem cultures of northern India.
Leader, Peter Owens.

(795) INDIA: NANDA DEVI SANCTUARY
September
The remote Himalayan giant Nanda Devi, at 25,645 feet, is the focus of this cross-country trek through splendid old forests and alpine meadows to the headwaters of the Ganges.
Leaders, Lynne and Doug McClellan.

(805) FALL TREKKING IN NEPAL
October
Fall is the best time of year to go trekking in Nepal. This trip is in the early planning stages and details will be published in the 1981 Outing Catalog.
Coordinator, Doug McClellan.

Fred Gooding

Yugoslavia

Europe

(730) SWISS ALPS SKI TOUR
March 29–April 11 Cost: $995
Learn to climb peaks with skis—alpine style. Take day tours from a small hut high above the storybook mountain village of Adelboden in the western Berner Oberland.
Leader, Wayne R. Woodruff.

(740) WALES
June 5–22
Walk in the mountains and national parks of Wales, in the hills of the Brecon Beacons, along the coast of Pembrokeshire to the top of Snowdonia.
Leaders, Lori and Chris Loosley.

(745) HIKE AND BIKE IN IRELAND
June 24–July 7 Cost: $1165
Travel the backroads, islands and wild lands of western Ireland. Sense the magic of this green isle and feel cool air "blown soft from otherwhere."
Leaders, Frances and Patrick Colgan.

(760) TOUR DU MONT BLANC, FRANCE
June 28–July 11 Cost: $1290
Magnificent Mont Blanc stands at the center of this classic alpine tour into France, Switzerland and Italy. A knapsack outing in the somewhat luxurious European mode with meals and lodging at refuges and hotels.
Leaders, Pat Hopson and Richard Williams.

(770) YUGOSLAVIA: KAMNIK AND JULIAN ALPS
July 12–25
The highest point in Yugoslavia, Mount Triglav, is one objective on this popular hut-hopping tour of the Slovenian Alps in northern Yugoslavia.
Leader, Frederic Gooding, Jr.

(790) NORWAY
August 16–30
Hike rocky trails in the mountain home of the giants, the Jotunheimen, with their eternal glaciers and lichen-covered troll crossings, and then go on through the lush, green Sunnmore. Convivial nights in warm huts end each day.
Leader, Jerry South.

(792) SCOTLAND'S HIGHLAND COUNTRYSIDE
August 30–September 24
From Edinburgh to the Highlands and to islands west and north, Scotland's countryside will be showing fall colors and the bloom of mountain heather as we visit the lochs and glens. Walking and hiking can be as moderate or strenuous as desired.
Leaders, Mildred and Tony Look.

(800) BERNESE OBERLAND, SWITZERLAND
September 27–October 14
Picture-postcard scenery, dominated by the Eiger, Jungfrau and Wetterhorn, is the reward of the casual walker and the serious hiker. Transportation is by train, accommodations are at local inns.
Leaders, Mildred and Tony Look.

Switzerland

Baja

BAJA TO THE TIP, MEXICO
(700) December 29, 1980–January 9
(701) January 10–21 Cost each: $875
Two one-way trips explore the length of Baja, the isolated bays, inlets, beaches and villages along the coast, with side excursions into the central mountains and plateau country.
Leader, Betty Osborn.

(735) CAVE PAINTING EXPEDITION, BAJA
April 11–25 Cost: $865
Riding gentle mules through the springtime beauty of the high desert, we visit caves adorned with ancient, heroic-dimension paintings in remote Sierra de San Francisco.
Leader, Martin Friedman.

Wayne Woodruff

Swiss Alps

Israel

(725) ISRAEL, FROM YESTERDAY TO TODAY
March and April Cost: $1760
Contrasts are dramatic—spring wildflowers abloom in Galilee, rugged desert mountains in the Sinai, nature reserves and urban development. The sense of history is overwhelming on this new trip to an ancient land.
Leaders, Lila Kramer and Ray Des Camp.

New Zealand/Australia

(705) HIKING IN NEW ZEALAND
January 12–February 1 Cost: $1390
Glacier-capped mountains, dense rain forests, waterfalls everywhere, active volcanoes, penguins and millions of sheep. See it all hiking through beautiful New Zealand.
Leaders, Kathe and John Hendrickson.

(715) AUSTRALIA AND TASMANIA
February 9–March 1 Cost: $1475
See cuddly koalas, kangaroos and fairy penguins. Hop over to Fraser Island, go to the mountains and rain forests of Tasmania and then into the outback to fantastic Ayres Rock.
Leader, Ann Dwyer.

Israel

Lila Kramer

Africa

(710) KENYA'S MOUNTAINS TO THE SEA
February 1–22 Cost: $2500
Trip of a lifetime for photographers. From mountain rain forests and scenic Mt. Kenya, we game drive, walk and camp in famous game parks, then journey by train to warm beaches along the Indian Ocean.
Leader, Betty Osborn.

(755) LAKES AND SAVANNAS OF KENYA
July 1–26 Cost: $2140
Game drives and hikes take our Sierra Club group through the fine lake country of the Central Rift of Kenya and into its richest game areas.
Leader, Al Schmitz.

(775) WILDLIFE SAFARI, ZAMBIA AND KENYA
August 9–28 Cost: $2730
Observe animals unafraid in their natural habitat or watch the thundering great migration of wildebeest and zebra—a walking, camping, game-viewing adventure.
Leader, Pete Nelson.

Masai Mara, Africa

Al Schmitz

Important Notice!

RESERVATIONS for Sierra Club outings are subject to the reservation/cancellation policy and other conditions printed in the 1980 Sierra Club Outing Catalog. Please see page 48 of the catalog for this information and trip applications. The deposit for all foreign trips is $100 per person. Please include the deposit(s) with your application(s). Trip prices (where listed) are approximate and do not include air fare. Further price information will be listed in the 1981 Outing Catalog. The November/December issue of SIERRA will include a preview of winter and spring trips.

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OUTDOOR EQUIPMENT 1980

How to Buy the Best

KENNETH DYLESKI

REMEMBER WHEN a pair of good leather hiking boots cost $35, and less than $50 bought your choice of a premium backpack or down parka? The market is rapidly changing—to both the benefit and the detriment of the consumer. Like other consumer goods, outdoor equipment's prices have been climbing faster than most incomes, making careful shopping imperative if there is to be enough money left over to pay for the drive to the trailhead. Wholesale manufacturers and retail businesses, too, are experiencing hard times. Gone are the fad days, when 50 million Americans were trying out backpacking. Today, the market has "matured"—growth rates have dropped—and money is tight, yet consumer demand for quality at a reasonable price has never been greater. It's a tough marketplace, and many of the farsighted business-school grads who in the 1970s eagerly acquired an interest in the leisure-time industry are looking now for new businesses. Despite this industry-wide flux and uncertainty, however, the quality of materials and workmanship has never been better. Technological breakthroughs in materials, partly due to research financed in the 1970s, has made outdoor adventure safer and more comfortable than ever. And considerable talent has emerged—the equipment industry has acquired business, sewing and design skills that were notably lacking a decade ago.

The equipment available in 1980 is improved both in function and appearance. Clothing has undergone some of the most vivid changes. Software sales have, over the past several years, accounted for a large proportion of the industry's total growth. Because of this growth, much effort has gone into developing new markets and better materials; the better-looking clothing, including alpine ski wear, kids' and women's outdoor wear, appeals to a wider market.

Ripstop nylon will continue to lose its dominance in the market. In its place, designers are turning to slightly stronger, heavier taffetas, such as Hi-Count, for two major reasons. In function, taffeta's higher thread count results in more protection against losing the down through the material. Cosmetically, garments with taffeta shells, unlike ripstop, aren't associated with a "backwoods look," and therefore are acceptable as around-town wear by more people. Another taffeta, Antron, is being widely used this season

Illustrations by Rik Olson

in an array of bright colors. Because it's lighter than Hi-Count, with a soft, luxurious "hand," Antron is usually found in women's and more fashionable men's down and Thinsulate vests and jackets.

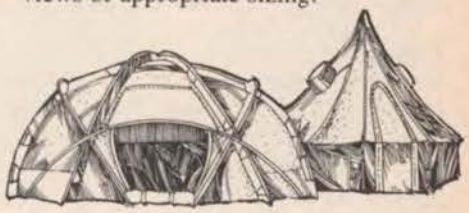
Storming the public with advertising, the 3-M Company continues to heavily promote the latest synthetic insulator, Thinsulate. Undoubtedly it's a significant breakthrough both technologically and visually. People seem to believe that the degree of an insulator's warmth is in proportion to its thickness; Thinsulate, however, is the anomaly in this timeless paradigm. Numerous field and laboratory tests show this insulator nearly twice as effective in stopping convective heat loss as any other known insulator of equivalent thickness, including down. With Thinsulate, it's now possible to stay warm without looking bulky or inflated. Composed mostly of micro-thin polyolefin fibers, this fabric provides a greater surface area to which air molecules can cling. It's available in two weights, 150 and 200 grams per square meter, but almost all garment manufacturers currently use the thinner, more flexible 150-gram variety. Because Thinsulate acts most effectively by stabilizing the skin's boundary layer of air, garments made of it need to be rather close-fitting, probably its only significant drawback for physically active people. Are Thinsulate garments as warm as average down or fiberfill ones? As many owners have testified, the answer is a qualified no. No, they don't have the absolute warmth of parkas filled with high-quality down or synthetic material, but they are a close second, giving adequate protection for their intended use with much less bulk.

Will synthetic fillers make down-insulated garments obsolete? Probably not in the foreseeable future. Each type of synthetic—Thinsulate, Sontique, fiberfills and pile—has its strong and weak points, but down still has the best warmth-to-weight ratio, drapes well and has a respected name. High-quality down also bounces back from a greater number of compressions than synthetics. With only reasonable care, down-filled products can outlast synthetics, mitigating their somewhat higher initial cost. Those concerned about down's vulnerability to moisture but disliking the bulk and weight of the synthetics should take a serious look at either down garments covered with Gore-Tex or at a versatile Gore-Tex shell parka. About a year ago, after prolonged research, W. T. Gore Associates quietly introduced a second-generation Gore-Tex to solve the problem of the original—it suffered localized leakage if not kept clean. Gore-Tex's price is significantly higher, but remember that Gore-Tex won't crack or peel, as does the cheaper urethane-coated fabrics. Its long life span, coupled with the previously unobtainable combination of breathability and waterproofness, qualifies Gore-Tex for serious consideration.

If high-technology, high-priced garments don't appeal to you, you can take advantage of the bargains to be had in fiberfill and pile. Fiberfill has lost some of its share of the market to Thinsulate but doesn't cost as much. Keep an eye out for sales; good buys can still be found. Pile jackets, the least expensive of any premium insulators, are a "best buy" in outdoor wardrobes. Developed for use by fishermen, pile, like other synthetics, absorbs little water, dries fast and otherwise functions much like a very warm, though light, sweater. Its open knit does require a separate shell for windy cold weather. Combining a shell and pile, however, results in an outfit more adaptable and versatile than a heavier parka alone, and the stretchiness of pile fabrics allows greater freedom of movement. One initial cosmetic drawback of pile was its tendency to develop fuzzy "pills" on its outer surface. Some recent pile products feature an anti-pill outer knit, but this finish is not as good looking as the original pile. Nylon pile is slightly more durable than polyester versions, but what really matters most is the fit. Manufacturers seem to use different patterns, so try on prospective purchases carefully for proper fit before buying.

Many young backpackers of the 60s and 70s now have families, and their needs now include children's outdoor gear and family-size "portable shelter." Suppliers' catalogs display wide selections of kids' sweaters, vests, parkas, wind shells, boots and sleeping bags. Check around—no single supplier has everything; price, quality and features vary greatly. The sizing systems can be confusing; some are coded by age, some by number, some are simply small, medium or large. Either take your child along or go prepared carrying a conversion chart.

A lot of advertising and development of new products this year are aimed at the woman's dollar. Capitalizing on increased female participation in sports, ads proclaim concern for everything from fit to feminism. While products adapted to women's needs are past due, don't lose sight of getting your money's worth. Inspect materials and workmanship carefully, and check the fit! Designers of clothes, like shoemakers, have varying views of appropriate sizing.



TENTS

Probably no other product shows the results of backpacking's "comfort revolution" as clearly as tents. Strong but cramped "A" frames, which once dominated the field, now account for only a small percentage of tent sales. Spacious, airy and beautiful geodesics, arch-bows and other dome-like designs are by far today's preferred choice. Domes offer a maximum useable internal volume for the floor space and so allow campers to sit up and move around comfortably, without contortions or stiff necks. Some even allow campers to lean against end panels, like a chair back, without upsetting the tent. Every American backpacking tent manufacturer now offers at least one of these luxurious, portable shelters. On the other hand, both weight and cost are up. Poles and seams abound, increasing both the complexity of the tent and the likelihood of failures. Be sure you understand set-up procedures; actually rehearse putting it up before leaving town. There's nothing like a cold, windy night to test even veteran tent experts. Aluminum tent poles are anodized to resist corrosion; segmented and strung with shock cord, they store handily and assemble easily. No-see-um netting, though nice in the North Woods, decreases ventilation in bug-free areas. Check seam construction; flat-felled seams sewn with double-needle machines give an extra measure of strength and reliability. Chain-stitched or serged seams become less reliable as they age and fray. Whichever seam construction you find on your tent, don't forget to use seam seal to coat stitch lines on the rain fly and the floor; those areas are in frequent contact with moisture.

Tents without rain flies provide cheap protection from moderate winds and occasional rain. Since water condenses inside them more than in double-walled tents, and since they don't have the best seam strength, limit their use to forest areas protected from high winds, heavy rain or winter snow.

PACKS

Specialty backpacking stores report that frame-pack sales have been declining for some time. In their place, sales of internal-frame packs have increased greatly, especially of travel-pack types. Easier to handle and less prone to breakage by baggage handlers, these suitcases-with-pack-straps meet the practical needs of a wider variety of travelers. Cross-country skiers, rough-country hikers and mountaineers should investigate slimmer designs that offer more sophisticated suspension systems and thicker padding. Soft luggage with pack straps may be more convenient on the road, but external-frame backpacks are still preferred by many hikers for heavy loads—35 pounds or more. Internal-frame packs designed for load hauling generally do not come equipped with such features as hideaway back panels to store straps out of the way; instead, they have shoulder harnesses and sternum straps to improve comfort and stability.

Back-loading zippered packs open like suitcases, so that items in the pack's deepest recesses are readily accessible. Heavy loads in these packs may stress coil zippers enough to separate them. Choose heavy-duty #10 size "self-repairing" coil zippers, and use compression straps around the pack to minimize zipper separations.

Virtually every pack available is built from one of three waterproof nylon fabrics. Parapack, usually simply called pack cloth, is the lightest and most waterproof. Oxford cloth, a textured fabric resembling canvas, built to resist abrasion, is the most frequently used material. Unfortunately it has the least waterproof or durable coating available. Ballistic's cloth, a relative newcomer, is used to reinforce high-stress sections wherever high strength or tear resistance are needed, such as on packs used in rock climbing.

Even though these coated fabrics repel water, don't expect pack contents to remain dry during hard rains. Seams, zippers and stuffsacks leak sooner or later. Either stow everything in plastic bags inside your pack or carry a separate rain cover. Large plastic garbage bags work fine (pack them out!), or use a nylon cover designed for frame packs.

When shopping for internal-frame packs, always load them up to see how easy they are to pack—and walk around the showroom floor—to judge how the load feels. Check pack-strap attachment points and leather accessory patches for reinforced sewing. Be sure of fitting and comfort. If a salesperson can't adjust it properly, it's unlikely you can improve on it at home.

SLEEPING BAGS

Noticeable changes in materials dominate the sleeping bag market. Some manufacturers are replacing nylon interiors with Trinyl, a blend of Dacron, cotton and nylon that offers a textured, warm feeling similar to cotton flannel sheets. This fabric weighs slightly more than ripstop, and its lifespan may be somewhat less because of Trinyl's cotton content. Nylsilk, a soft, silky nylon taffeta weighing 1.6 ounce per square yard, has been gaining in popularity for both shells and linings. Lighter than ripstop, it allows downfilled bags to loft a little better, has a nicer texture and does not let down escape, thanks to a high thread count.

How about synthetic-filled bags? Celanese will no longer be processing Polarguard. Another company has begun to process and distribute this fiber but at a higher price. Prices of down, too, will rise this fall, so now is the time to act. Before purchasing, think about your needs. No single bag will be suitable for both Florida summers and Yukon winters. Don't buy equipment just for one exceptional circumstance, but rather for what you anticipate doing most of the time. Carrying additional clothing can add several degrees in warmth to a marginal sleeping bag and could get you through in a pinch.

Decide between down or synthetic fillers. Part of the sales pitch prospective buyers often hear concerns how the synthetics maintain warmth when wet, their easy care and their lower cost. While this is partially true, it's wise to consider the whole picture. Fiberfills absorb less than 1% moisture by weight, principally because they are not cellular. Water does get caught between the fibers, however, and must be wrung out so that the fiberfill can dry quickly. Neglecting to do so means both a soaking and a dangerously chilling effect. If a synthetic bag gets wet and then freezes, the combined result could easily be fatal. The important point is: Don't rely on a bag alone to keep you safely warm and dry in extreme or adverse conditions.

Gore-Tex–covered down bags are a good alternative when lightest weight, maximum compressibility and protection from moisture are needed. But don't expect to pay less than the highest prices.

Over the past few years experience has shown fiberfills to be a little more vulnerable than was once believed. Dry cleaning is now advised against. Also, temperatures above 140°F in either a washer or a dryer may result in significant loss of loft. Synthetics, while cheaper initially, are less resilient to successive compressions; they wear out sooner than down. Dividing cost by lifespan gives almost equal long-term expenses for down and synthetics at today's prices. Stitching and zippers, two other points of heavy wear, ought to be carefully inspected. Tuck stitching protects seams from wear and adds a real value to your investment. Once baffle seams wear out it's almost impossible to open up a down bag and repair it so the down won't shift. Zipper reliability depends partly on type and partly on size. Coil zippers open and close more smoothly but wear out sooner than the Delrin "toothed" zippers. Larger #7 to #10 zippers handle loads and wear better than #5 zippers; they should be considered a necessity.

Will Thinsulate sleeping bags soon be available? After testing prototypes and talking to the producers I think it's very unlikely. Greatly lacking in "drape," they don't work well unless cut to cocoon dimensions. Warmth-to-weight ratios are about the same as for fiberfill. Bulk is slightly less but still not as good as down-filled products. Designers currently appear to be at the limit of available synthetic technology.

BOOTS

Slow steps are being taken toward improving boot design. European cobblers, accustomed to their traditional lasts and procedures, are reluctant to change for the U.S. market. The great difference between Europe and the U.S. in style of outdoor experiences adds to the gulf in understanding. A highly developed public transportation system delivers hikers

far into the European mountain areas. Americans walk more miles just getting there. European boots often seem to lack durability. Last design has long been a sore point; wide heels and narrow toes cause everything from heel blisters to nerve damage behind the toes. Things may be changing, however. At least two bootmakers offer new lasts with narrower heels and wider toes this season. With luck, tear-prone scree collars and exposed heel stitching will be next to go. Huge increases in world leather prices have made boots a long-term purchase, and many people either are not buying or are searching for alternatives. If you foresee buying soon, you should purchase the best boot you can afford that fits properly. A comfortable fit takes precedence over everything. Far too many hikers waste their money on expensive, stiff, heavy footwear designed for mountaineering, not for walking. Inflexible soles with thick midsoles and ¾-inch shanks are fine for cramponing up Mt. Rainier but miserable for hiking the Appalachian Trail. Patronize stores that specialize in outdoor equipment, are willing to take time to fit you, and will allow you a no-risk trial period to break in your boots at home.

Be sure boots pass the toe-clearance and flex tests. Slide your foot forward in an unlaced boot until it reaches the end. Keeping your foot flat, stoop down and insert an index finger behind your heel. It should fit easily but without a lot of slack. Then lace up the boots and walk around for at least ten minutes. The boots should flex in the right place, not on toe tops or back too far.

Resolve to give your boots proper care. If they get wet, dry them with newspapers stuffed inside, away from heat. Use a boot tree between trips, and keep them clean. Given proper care, boots will last many seasons with only occasional resoling. Before treating new boots with a leather dressing, get out a piece of fine sandpaper. Fold it in half and use the edge to slightly roughen the leather areas along exposed seams. The roughened area need be only about 1/16-inch wide. Cover threads with a thin, protective coating of Boot Patch or Shoe Goo. Dry overnight, sand lightly, then repeat the process. Cuts in stitching are a common problem on rocky trails, often causing leaking. Repairing cuts involves sewing through the boot, creating a thread line that might cause blisters.

Boot linings, made of what is known in the trade as "glove leather," break in easily, feel soft and commonly rot or wear

out before either soles or uppers. Inner heels usually suffer this degradation first. Treat these areas with a light dressing such as Biwell or Lexol whenever they appear to be drying out. Avoid using too heavy or too much waterproofing compound. Otherwise excess perspiration will accelerate lining rot. In milder weather, just touch up dry spots on the upper as needed instead of soaking the leather in boot dressing. Your feet will sweat less, feel cooler. Also, blisters form much easier on wet, wrinkled skin than on dry, smooth skin.

Hikers needing a light shoe or unable to afford leather may want to try a canvas boot. Available with a lug sole and a protective rubber toe cap, they work fine as light-duty foot protection. Persons with weak ankles, poor arches or travelling on rocky terrain with heavy loads, should be aware of their limitations. Without stiffness and heel counters, their canvas uppers give minimal ankle support. Inside, the arch support is far less than in most running shoes. Nonetheless, those soles do give protection from slips and wear amazingly well. Uppers don't protect ankles from rock encounters very well, and granite will wear canvas rapidly; so cross-country hikers should consider something more substantial. River rafters and canoers will probably find these just the thing; they are cool and dry quickly.

As a last-minute development, boot companies are now offering hiking boots with uppers constructed partly of the ubiquitous Gore-Tex. Dealers quizzed on this development uniformly expressed skepticism. Whether the mixed materials boots will prove durable and waterproof in the long term was uppermost in dealers' concern. An interesting experiment, these light, airy boots could become a wave of the future if successful.

Due primarily to recent improvements in Gore-Tex film, long-awaited running-shoe technology is now available for hiking boots. Two models from two separate companies have made their debuts, and more will undoubtedly follow. Besides offering impressive weight savings and freedom from leather-care tedium, these boots actually cost less than most leather boots.

One model uses Gore-Tex bonded to Oxford cloth nylon uppers protected by pieces of top-grain leather and *montagna bloc* Vibram soles. It weighs in at a trifle over three pounds. Another model has Gore-Tex bonded to 420-denier pack-cloth uppers protected by split-grain leather and a *roccia bloc* Vibram sole. This boot is also a pound lighter and $20 cheaper. The weight saving is the result of a special new shock-absorbing mid-sole material and the lighter Vibram.

Functionally, both models give adequate support and padding for hiking and moderate backpacking. Leather protective pieces have been positioned at points of maximum wear to enhance durability. Whatever feature—weight, price or load-carrying ability—seems best, remember that fit should be the primary consideration.

A BUYING STRATEGY

These days, defining value in outdoor sports equipment is almost as hard as finding it. With today's economic situation, buying strategy seems to revolve around finding sales, bargains and lower-priced equipment. If an item offered on sale meets your needs and is of reasonably durable construction, the purchase indeed is a bargain. Buying something impulsively because it's too cheap to resist usually results in wasting money when the "bargain" ends up collecting dust on the closet floor. Times are changing, and bitter pill or not, both corporate and family buying will have to learn to live with less turnover. It's no accident that equipment manufacturers have started moving to new markets with multi-purpose goods. Flip through a few catalogs—they all seem to say, "you don't have to go to the mountains to wear our clothes." It's one good way to live with less and waste less. Purchasing durable, long-lasting goods creates a market for them and in the long run saves money. Shop carefully. Get on mailing lists. You'll know of sales in advance and what's available. Get to know retail store personnel. They often are willing to pass on the latest information on their own and competitors' equipment if you show you've done a little homework by asking informed questions. Good buys in used equipment, found on store bulletin boards or in newspapers, can keep costs down, but know what you're buying. Used-clothing stores often have garments that function well enough when used properly. Making your own from sewing kits or patterns can also save money if you have sufficient time and sewing skills. Perhaps the best thing about 1980 is the opportunity to gain more perspective on what we're out there for. Making do with less should be a turning point at which we all get closer to nature, and instead of feeling equipment-poor we'll feel spiritually richer. □

Kenneth Dyleski is a mountaineer and writer in Berkeley, California.

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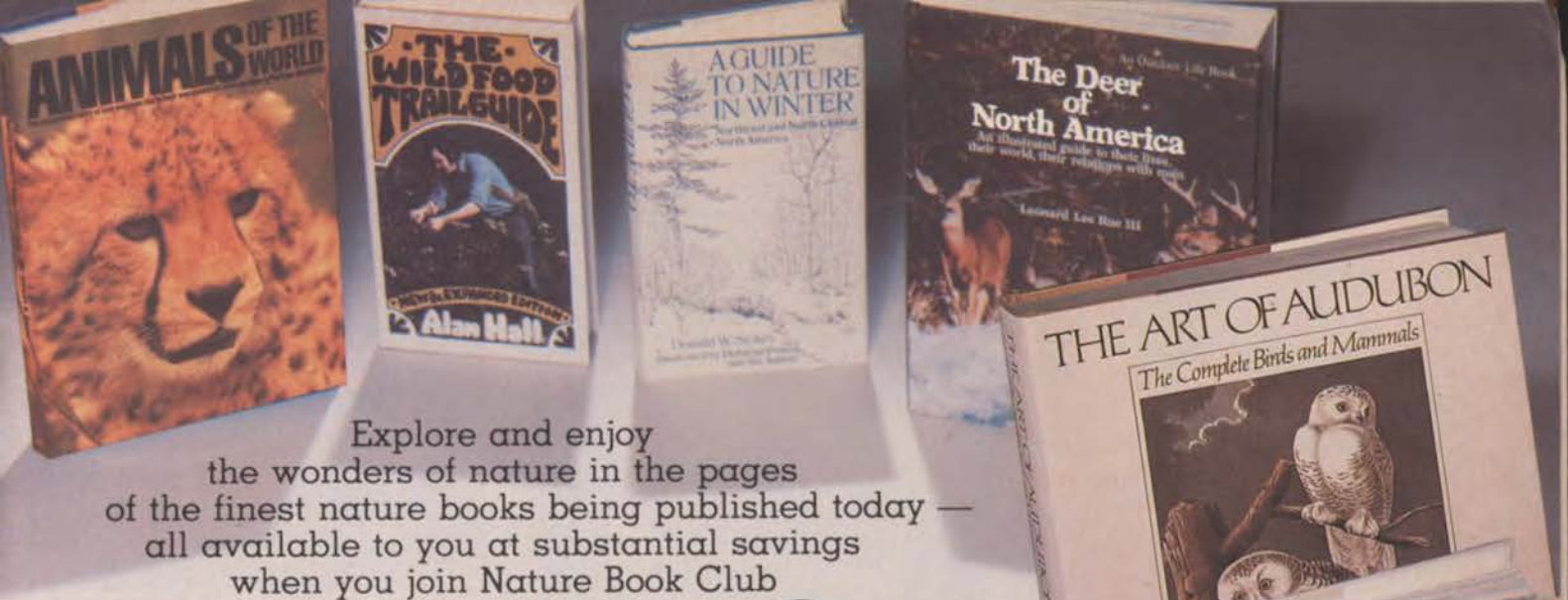

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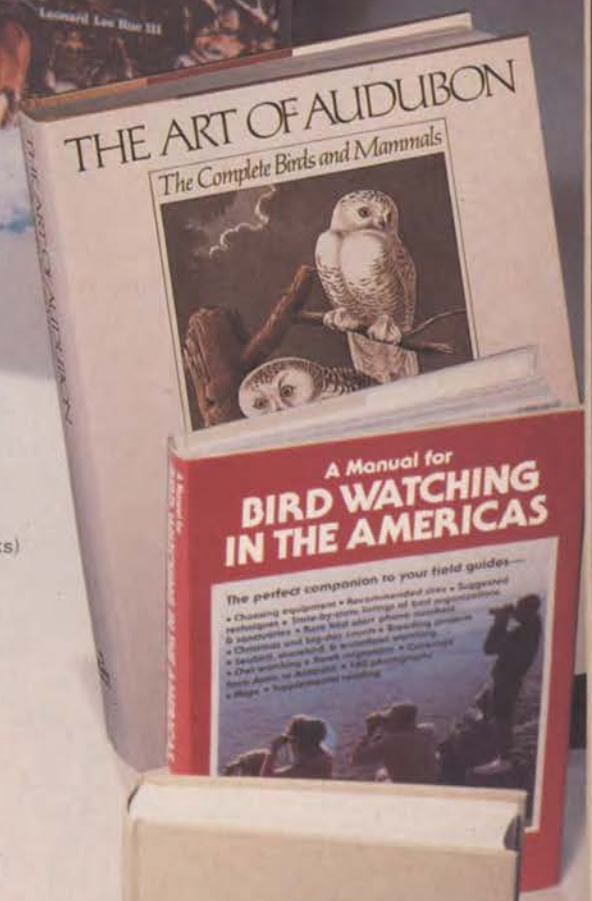

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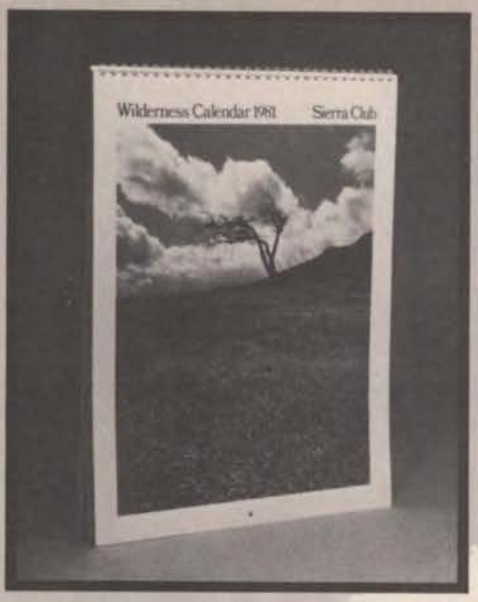

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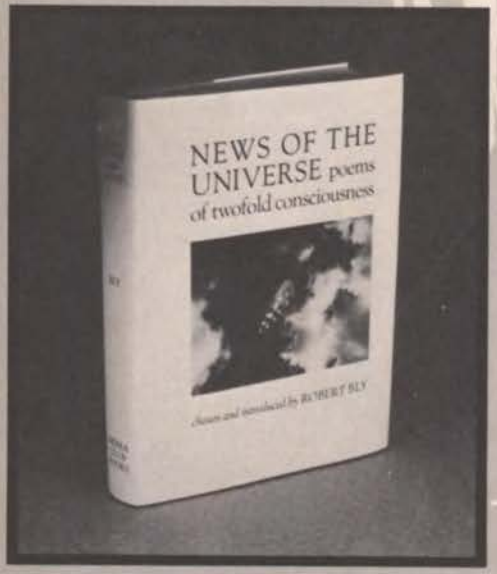

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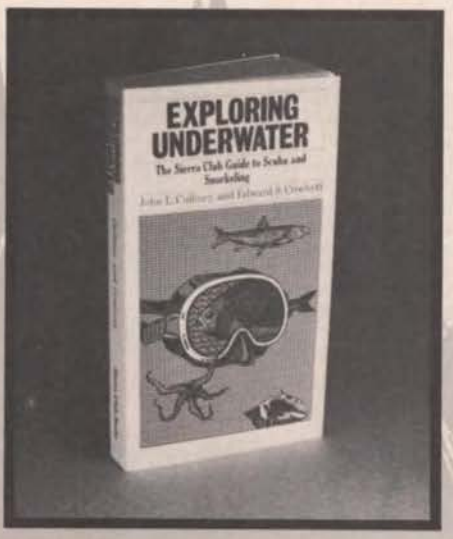

EXPLORING UNDERWATER: The Sierra Club Guide to Scuba and Snorkeling: By John Culliney and Edward S. Crockett. The last word on technique, equipment, and diving physiology and psychology by a marine biologist and a professional scuba instructor. Describes tropical, temperate, and cold water diving environments. Special chapters on underwater photography, wreck and cave diving, and marine wildlife. 384 pages. Paper. 4½ × 8. 8 color plates, 32 line drawings, charts, diagrams, appendices, bibliography, index. Retail price $8.95. Member price $7.15.

A SIERRA CLUB NATURALIST'S GUIDE TO THE PIEDMONT: By Michael Godfrey. A comprehensive field guide to the complex ecosystem—plants, animals, landforms and climate—between Appalachia and the coastal plain from New Jersey to Alabama. 432 pages. 4½ × 8. 100 drawings, 8 color plates, photos, maps, diagrams, tables, bibliography, glossary, index. Cloth: Retail price $19.95, Member Price $15.95. Paper: Retail price $9.95, Member price $7.95.

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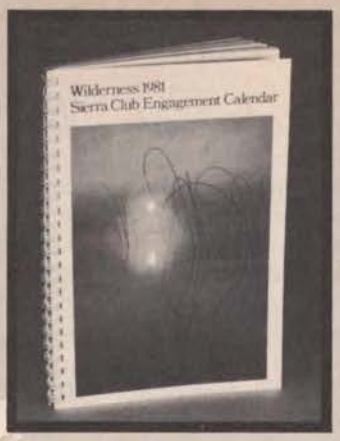

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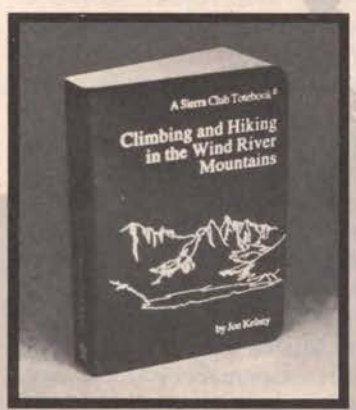

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TOS:

Sly as a Goose

JONATHAN ELA

A MAJOR PROBLEM in Mid-America —at least for those with a shortage of other major problems—is the fact that Canada goose populations have changed in recent years, so that only scant numbers winter in the deep South while huge flocks hole up in such seemingly less hospitable areas as southern Illinois. Largely in order to please hunters in Louisiana, the U.S. Fish and Wildlife Service (FWS) is attempting to move surplus northern geese south in two ways.

First, the service is hazing geese to chase them out of their chosen habitat. Where possible, water levels are manipulated to make habitat less desirable, and airboats disrupt flocks that try to stay. The theory is that the geese will continue south until they reach areas the federal government considers to be suitable vacation lands, and then the tormentors will leave the birds alone.

A second approach has also been tried. In one recent year, geese were trucked to Louisiana in the hope that in future years they would return south with their friends and relations. Upon their release the geese turned around and flew back north. The following year geese with clipped wings were trucked south; FWS expected they would breed, and that their offspring would establish a regular migration pattern. Alas, the determined geese started walking north; while no actual hitchhiking was observed, there were a number of sightings of pedestrian geese strung out along major north-south highways.

As not even the most determined of geese can match the obsession that drives game managers, we can expect this battle of wits to be prolonged for some years, with ever-increasing levels of ingenuity shown on both sides. The Midwest office of the Sierra Club decided to contribute to the national pastime of forecasting the events of the eighties by commissioning a panel of experts to predict the "Goose War" skirmishes we are likely to see in the new decade. The major conclusions of the panel follow.

1981. The U.S. Fish and Wildlife Service contracts with the Air Force for the use of nine Huey helicopters. The machines are decorated to resemble geese, and loudspeakers emit low honking sounds. As the first geese arrive in southern Illinois, Air Force pilots overfly the Crab Orchard Refuge in a V formation in order to lure confused birds south. About 200 geese do in fact follow the helicopters. Unfortunately, only the most myopic and astigmatic individuals are fooled, and all destroy themselves by flying into the transparent glass skyscrapers of Memphis. The extraordinary experience of being rained upon by *pâté de foie gras* on the hoof is henceforth commemorated in that city by reference to "the day of the Great Nor'geester."

1982. The FWS renews its trucking program. This time, however, all the geese are fitted with leg-irons, and cyclone fences contain them in an abandoned Louisiana penal labor camp. The program receives national attention when 300 captive geese riot, hold six wardens hostage, and send a mailgram to the governor threatening to peck the helpless biologists' eyes out unless the birds are given freedom and the chance to return north within 48 hours. As geese are nasty creatures in even the best of circumstances, the governor takes the threat seriously; a midnight sneak attack by the National Guard liberates the wardens, but nearly all the geese are shot. The few survivors are jailed, tried, executed and eaten.

1983. Fish and Wildlife concludes that the helicopter trick could succeed if myopic geese could be fitted with contact lenses strong enough for detection of buildings, but weak enough to leave the precise configuration of the machines blurry. The program is an unqualified success, with more than 100 geese lured to the chosen Louisiana habitat. But the FWS blows it. The helicopters have been so cunningly disguised that they completely take in the Louisiana wildlife biologists. While FWS employees desperately try to feed corn to the helicopters, which are perceived to be on a hunger strike, in another part of the compound the geese exhaust themselves trying to find and refit contact lenses that have fallen on the pebbly ground. Severely weakened, they soon die of starvation, as do, somewhat later, the helicopters.

1984. The Fish and Wildlife Service abandons its high-technology solutions and devises a seemingly fool-proof scheme that it terms "ultimate hazing." The Illinois legislature schedules the state's presidential primary for early January. The agency hopes that the incessant blather from the thirteen Republican and eighteen Democratic candidates will establish a condition of "unendurability,"

and that the geese will leave of their own accord. The geese respond much as the rest of us do. They cover their ears with their wings, grit their gizzards and take it. Most end up voting for third-party candidates.

1985. While FWS retrenches and considers future plans, the geese take the offensive. A delegation is sent to the International Union for Conservation of Nature and Natural Resources (IUCN) in Switzerland to gain global support. Gaggles of Save Our Geese Action Committees spring up as a result, and resolutions of protest swamp the White House and the Department of the Interior. Publically, agency officials express concern and understanding, and they establish 702 distinct public-participation programs, a new record. Privately they get a good chuckle and vow that 1986 will be their year of triumph.

1986. Apparently the public protest has had some effect, for early in the year the agency announces that it will rely on the carrot rather than the stick. It is felt that perhaps some geese are deterred from moving south because they have no equity investment in the lands they are expected to inhabit. Accordingly, a major Louisiana refuge is subdivided, and homesteading geese are offered ownership of lots without charge. As a bonus, each lot will contain an A-frame residence, complete with Betamax and Cuisinart. An old warehouse is renovated for use as a restaurant and community center, complete with rough wood floors, exposed brick walls, skylights, and hanging ivy and spider plants.

Several goose families make the move. Upon their arrival they insist that the local parish government provide them with such services as paved roads, a domed stadium, parish-wide zoning with three-acre minimums and special facilities for educating the physically and visually disabled. Local officials indignantly refuse and chase the geese out of the state: naturally, they fly back to Illinois, and spread horrible stories about southern hospitality.

1987. Litigation stalls all activity this year. Environmental organizations deplore the lack of an EIS (Environmental Impact Statement), the Fish and Wildlife Service having declared that a simple FONSI (Finding of No Significant Impact) would suffice. The Sierra Club ups the ante and insists in court that a FUFI (Finding of Unusually Foolish Intent) is needed. A federal judge finally issues a compromise opinion, ordering the agency to prepare a FOPSO (Flatulent Obfuscation with Paper and Social Oratory). Both litigants issue press releases proclaiming victory, and appear content.

1988. On the basis of its 640-page FOPSO, the FWS drains and fills all wetland areas in southern Illinois, declaring that "great increases in upland terrestrial habitat are urgently needed for the protection of coal." Thwarted from enjoying their traditional lifestyles, the geese negotiate with the nearby Southern Illinois University Ecology Club for geodesic domes. In spite of the agency's warning that geese and coal share very similar ecological niches, and that an abundant population of the former could lead to extirpation of the latter, the students provide the domes. The geese survive the winter happily and wonder why they never thought of the cozy, dry domes before.

1989. In a major policy shift, the Fish and Wildlife Service declares an end to the Goose War. Using the precedent of the taxonomic merger of the snow goose and the blue goose—which some years before had been declared to be anatomically identical, and hence simply variants of the same species—the FWS finds that the Canada goose is in fact simply a corpulent form of starling. As starlings in their smaller phase (speckled geese, as they are now termed) are plentiful in Louisiana, there is no longer any reason to move the larger cousins south.

The Goose War ends, but FWS remains active in planning for the nineties. First, an interbreeding program between the speckled and Canadian subspecies is being established, though neither strain shows much enthusiasm or technical competence. Also, there are rumblings about a "Pest Bird Eradication Program" in the 1990s. Service Director Marvin Gardens has been heard to grumble, "We'll see who gets the last laugh!"

The geese, for their part, are no fools. Amid the crackling strains of "Follow the Drinking Gourd," a steering committee meets to plan an underground gooseway for the nineties. □

Jonathan Ela is the Club's regional representative in the Midwest.

Fire Island

At Last, a Wilderness for New York?

SARAH OAKES

If environmentalists' current efforts are successful, New York state will soon have its first designated wilderness area. In early April, the National Park Service (NPS) proposed that 1347 acres on Fire Island be designated as wilderness. The land is now a "primitive area," located within Fire Island National Seashore. Recent hearings held on Long Island demonstrated the overwhelming strength of local support for the more protective, wilderness designation.

Soon the NPS will make its final recommendation; if it is favorable, Congress will vote on the proposed wilderness.

Fire Island measures no more than 1700 feet at its broadest reach, narrows to 550 feet at one location and runs parallel to Long Island's South Shore for fully 32 miles. The island is separated from the mainland by Great South Bay, a shallow lagoon of supreme importance to both Long Island's shellfish industry and the abundant avian population.

Protected from the sea by a natural system of large sand dunes, Fire Island's interior expanse of rolling hills is resplendent with sparkling stalks of beach grass. Clumps of beach heather and other pioneer upland plants help secure the sandy soil on curving knolls. In September the ubiquitous poison ivy—from which some say Fire Island gets its name—turns crimson and glistens against the sand. Here and there appears the startling white depression of a "blowout." Totally denuded of all vegetation, a blowout's eroding sands occasionally display the delicate traces of rodents' ramblings. Cottontails dart among dark aggregations of the tangled, low-bush thickets that encircle the stubby branches of beach plum, bayberry and black cherry shrubs. Farther north, toward the bay, woodlands of twisted pitch-pine are set on the beach-grass plains. Small groups of deer and an occasional buck bound between the thickets, and a lucky visitor will encounter a red fox ambling along the trail. Out of sight in their lairs are weasels and mink.

Some 300 acres of tidal marsh border the bay side of "the swale," a less-frequented portion of the barrier beach that extends across the interior of the island. The extraordinary profusion of interdependent life-forms that spreads between the inland-marsh, high-marsh

Above: *The dunes of fire Island. Legislation has recently been introduced in the House of Representatives by William Carney (Republican-Conservative-New York) and Thomas J. Downey (D-New York) to designate part of Fire Island as wilderness. New York state residents should write Senators Jacob Javits (R) and Daniel Moynihan (D), urging them to sponsor similar legislation in the Senate.*

Photograph by Earl Albright

and low-marsh zones makes the tidal wetlands as compelling in their diversity as the adjacent swale area. In the Great South Bay area, the salt-marsh community is exceedingly productive of fish, shellfish and other wildlife. A broad assortment of shellfish—oysters, blue mussels, bay scallops, blue crabs and soft-shell and hard-shell clams are the region's principal industry. (According to NPS reports, approximately 40% of the world's supply of hard-shell clams is harvested in the bay region.) In addition to such mammalian visitors from the upland swale as the raccoon and muskrat, which feed among the tidal wetlands, several species of turtle dwell in the marsh. Much of the diamondback terrapin's habitat has been destroyed as wetlands have been filled; but, though almost endangered along coastal areas, the terrapin is still prevalent on one of Fire Island's uninhabited satellite islands.

To date, through the 1964 Wilderness Act, some 19 million acres have been placed under the Wilderness Protection System. Existing wilderness units range in size from more than a million acres to the 6 acres of Pelican Island, off the east coast of Florida. In all, the federal wilderness system has 10 land units with fewer than 100 acres and 20 units with fewer than 1000 acres. Most of this protected land, however, lies west of the Mississippi; even today there is very little acreage designated as wilderness in the eastern coastal states. Of the five remaining states that have no federal wilderness lands—New York, Connecticut, Rhode Island, Iowa and Kansas—three are on the East Coast.

The proposed Fire Island wilderness is the last pristine stretch of barrier island in the state. With few exceptions, New York's once-glorious island beaches, which extend almost the full length of Long Island's south shore, have fallen victim to urban sprawl and resort development. In fact, Fire Island's natural area encompasses the last expanse of unspoiled barrier beach between Cape Cod, Massachusetts, and Assateague, Maryland—a distance of 500 miles.

Fifty years ago, when the concept of a wilderness system was still in its infancy, Aldo Leopold made the prescient observation that "wilderness exists in all degrees, from the little accidental wild spot at the head of a ravine in a cornbelt woodlot to vast expanses of virgin countryside." Fire Island's wilderness is just such a "little accidental wild spot."

Arthur Swoger

THE BIRDS OF FIRE ISLAND

The most spectacular sights in Fire Island's natural area are its birds. The island claims some of the best estuarine habitat in the Long Island area and it is a major rest stop along the Atlantic flyway during fall and spring migrations. While intensive recreational use of Fire Island's beach areas has drastically reduced suitable habitat for the colonial nesting birds, the artificial spoil islands created by the U.S. Corps of Engineers, which dredges local navigation channels, have fortuitously replaced their lost habitat.

In 1975, the National Park Service recorded 2200 pairs of gulls, terns, skimmers and wading birds nesting in the Fire Island National Seashore area. Migrant shorebirds on the mud and sand flats surrounding Fire Island number in the hundreds of thousands annually; waterfowl especially favor the shallow bay waters immediately behind the island's undeveloped eastern end. The NPS reports that a total of 352 bird species have been reported in the Fire Island area—and an estimated 270 of these species are thought to return each year.

Because of the island's natural features and its location fewer than 60 miles from the nation's largest metropolitan region, the island has long been a popular summer playground. Limited ferry service provides the principal access to points along the island—auto access is restricted to the boundaries of the Robert Moses State Park at the island's western end and to Suffolk's Smith Point County Park, located a few miles from the eastern end. Yet in 1979 more than 1.7 million people visited the Robert Moses State Park; more than 221,000 people used the Smith Point County Park and lands eastward; and more than 670,000 people reached the island by ferry. These figures do not include the vast numbers who travel to the island on private boats.

Fire Island was originally formed from materials deposited some 12,000 years ago, after the last glacier retreated from its southernmost terminus at Long Island. Constantly shifting its configuration in response to natural geomorphic processes, the island coexisted (like all barrier beaches) in a state of dynamic equilibrium with the mainland—until 50 years ago. Since then, the impact of increasingly disruptive human activities on and around the island has jeopardized this crucial natural process, posing the disturbing and ironic possibility that sometime in the future the island may drown.

During the past half-century, Fire Island has experienced many threats to its preservation; the first, an attempt to construct a road the length of the island in the 1920s, was forestalled by a single landowner. Citizen resistance to yet another road plan led in 1964 to the establishment of Fire Island National Seashore. Fire Island thus became the country's fifth shore area to be placed under the management of the National Park Service. (Cape Cod, Cape Hatteras, Point Reyes and Padre Island preceded it; five more areas have been added subsequently.)

Following creation of the Fire Island National Seashore, the Park Service

struggled with the complicated management issues posed by the variety of land-use patterns in effect on the island. Today, the service directly manages only 51% of it, or 2692 of the island's 5278 acres. Excluded from NPS management are the island's 17 private residential communities, the Smith Point County Park and adjacent lands extending east to Moriches Inlet, 6 small municipal parks, the island's primary dune line, some 1000 acres of tidal wetlands, and shorefront lands up to the mean high-water line. Fire Island National Seashore encompasses a total of 19,356 acres, but its boundary extends far beyond Fire Island itself to include numerous small satellite islands and their surrounding waters, as well as a mainland property added to the national seashore in 1968.

When the NPS finally issued a Draft Management Plan for the national seashore in 1975, critical attention focused particularly on the agency's proposed policies for the 1200-acre parcel of natural lands. Recognizing the special, wild character of this area, Congress had specified in the enabling act that:

> No development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the flora and fauna or the physiographic conditions now prevailing, and every effort shall be exerted to maintain and preserve this section of the seashore . . . in [a state] as near . . . [its] present state and condition as possible.

As Aldo Leopold noted years ago when he spoke of degrees of wilderness, the value of a natural area can vary enormously according to its location. Within a 100-mile radius of Fire Island live an estimated 20 million people. No longer is the island a uniformly natural barrier-island system. The NPS reports that "in many places the island has been degraded by human activities, although in others the natural environment remains relatively undisturbed." The 6.9-mile stretch proposed for wilderness designation remains miraculously unharmed by human proximity: Its inclusion in the National Wilderness Preservation System will assure the sensitive management required for perpetual preservation in a natural state. This small area still offers visitors an experience that is the more desired for being less available. Here, as Thoreau once remarked of his beloved New England coast, "a man may stand . . . and put all America behind him." □

Sarah Oakes is co-director of the Peconic Environmental Resources Center (PERC), located on the east end of Long Island.

On a Wildlife Safari in Alaska

Text and Photographs by GALEN ROWELL

AT THE END of the first week, the total sightings of our "Alaska Wildlife Safari" consisted of one moose, one caribou, one wolf pup and six trillion mosquitoes. We had hoped to see the Porcupine caribou herd, 50,000 strong, make its annual migration through the Arctic National Wildlife Range (now the William O. Douglas Wildlife Range) across the north slope of the Brooks Range. The 1979 season had come early, and we arrived after the tide of mammalian life had ebbed from the tundra. It was an unlucky break, but our spirits stayed high because the refuge was only the first stop on a three-week, 3500-mile itinerary that would take us by scheduled airline, railroad, bus, bush plane, Boston whaler and on foot from the Arctic Ocean to Mount McKinley to the Kenai and Alaska peninsulas, and finally west of the tip of Siberia to the Pribilof Islands in the Bering Sea.

I was the leader of the first Alaskan wildlife tour of this kind, sponsored by Mountain Travel, an agency based in California. Few of the dozen participants were confirmed wildlife enthusiasts; some wanted a short tour of a lot of Alaska, others came for an adventurous vacation.

Even without the caribou, we found the tundra full of life. We had arrived at the height of the arctic bloom, and it was heartening to discover that the brown, treeless hillside in the distance actually was carpeted with twenty species of wildflowers. Conversations most often focused, however, on the form of life that made its presence known most insistently. Mosquitoes followed each of us like miniature thunderheads, and we engaged our minds to solve a problem that would have delighted medieval theologians: how many mosquitoes would it take to consume all of a person's blood? Even our highest estimate seemed far lower than the number of mosquitoes visible at every moment, justifying the self-defense provision of the federal regulation against killing wildlife of any kind. The Blue Max award went to a man with large hands whose record for a single swipe was 26 dead, 1 wounded.

I put the group on a nocturnal schedule in order to experience the special environment of the Arctic. We slept by day and walked through long hours of alpenglow by night. Soon we felt like part of the vast, empty horizons toward which we walked. Instead of the intricacy of national-park scenes in the lower 48, with their trees, rock forms and waterfalls, we were part of a great quilt of solid colors. The tundra formed a constant green matrix for the brown of ancient erosion surfaces, the white of the snowfields and the blue of the sky. A person could walk miles and imagine not having moved at all.

A bush plane plucked us from the bank of the Hulahula River and took us to Barter Island, which was surrounded by the pack ice of the Arctic Ocean. From there we flew to Fairbanks and extreme culture shock. Though a blurb from the Chamber of Commerce claimed that "the expansion of the visitor industry and construction of the trans-Alaska pipeline centering in Fairbanks have all contributed to the present growth of the area," locals told us of 20% unemployment and a dying city. Our visit to the pipeline—100 feet off the highway in an unmarked area—was cut short by an armed pipeline-security officer who dropped out of the sky in a jet helicopter. Perpetual air surveillance was needed, he said, because the vandalism rate is one attempt every four hours. As we drove back to town we passed a church with a fresh "for sale" sign.

A day later, we took the Alaska Railroad 120 miles to the edge of Mount McKinley National Park, America's finest wildlife-viewing area accessible by vehicle. Its open vistas above timberline combine with 24-hour summer light to allow visitors glimpses of 37 species of mammals and 132 of birds. Visitors can ride free shuttle buses; the 90-mile dirt road through the park is closed to through traffic so the animals won't be disturbed. Our schedule called for three nights at Camp Denali, a privately owned group of rustic cabins just outside the park's boundary. As we drove through the park, the clouds lowered until we were in them. A light drizzle became a torrential downpour. North of the mountain the weather is so bad that in summer the mountain is visible only one day in five. This year, however, at the beginning of July, Mount McKinley had been clearly visible only once since the end of May. As we plowed through the mud we saw caribou grazing next to the road.

Our hoped-for clearing came sooner than we ever imagined. The edge of the black clouds seemed to conform precisely to the park border, where the rain

A tent camp in a field of fireweed near Chenik Lagoon.

A horned puffin.

ceased and the greatest vertical rise in North America, peaking at 20,320 feet, sparkled in the evening sun. So immense is the mountain that entire, separate life zones ring its base.

Camp Denali was paradise. A full double rainbow greeted us, and I gobbled down a wonderful dinner to return to the spectacle. A slight breeze kept the mosquitoes at bay, and most of the group stayed up past midnight to watch the changing light on the peaks.

By morning the mountain had disappeared in the clouds. While some of us went fishing, and others took a walk with a botanist, I returned to the park and chatted with the shuttle-bus drivers to learn the whereabouts of unusual wildlife-viewing opportunities. By evening I had seen numerous caribou, moose and grizzlies plus an eagle on its nest, a fox with its kits by its den, and an ailing Dall sheep being stalked by a grizzly. The next day I brought about half the group back into the park, where, en route to the trailhead of a short hike, we saw many of the same species.

All too soon we were moving again. A day that began among bears and moose ended, after a long train ride, in downtown Anchorage. To my horror, I discovered that the airline on which we were to fly to Homer the next morning had just been grounded by the FAA for falsifying maintenance records. We chartered a 14-passenger Twin Otter from another air service and arrived on time, only to find the weather too poor for us to continue by float plane across 100 miles of open sea to Chenik Lagoon Brown Bear Camp, on the Alaska Peninsula. But we found a sauna, a home-cooked meal and warm beds at nearby Kachemak Bay to cure our ills, and before we left for the bear camp in the morning we had time to visit an eagle blind high on a cliff.

Some of the group were flown directly to the bear camp, where they stayed in tent cabins surrounded by dazzling purple fireweed. The rest of us were landed eight miles south, at the edge of the McNeil River Bear Sanctuary. So many wildlife enthusiasts want to see the world's largest concentration of bears, at McNeil Falls, that the state now holds a lottery each April to choose the five people a day allowed into the sanctuary, accompanied by an armed warden, during the few weeks when the salmon run. The odds were about ten to one against being chosen: All in our group had submitted their names. Only mine was chosen, and I learned that the permit was nontransferable. I considered not going to the falls because the others would not have like opportunities, but the sighting by six of our group of seventeen bears on the tidal flats convinced me that any disappointment would be relative.

On the morning of the appointed day I saw a mere eight bears, but as the tide increased the salmon run, bears seemed to come out of the woodwork. Soon I counted 31 animals within 200 feet of me, a sheer biomass of predator unequalled in any other natural situation. The observation area just above the water was unfenced, but the bears seemed unbothered by our presence. The warden was armed, although not a single bear has been killed to protect a visitor in the dozen years the Alaska Department of Fish and Game has managed the sanctuary.

On the fringes of the falls, where the fishing was mediocre, I watched smallish 700-pound "youngsters" trying to claw occasional salmon. When a youngster was successful, it rarely had a chance to eat more than the skin before a bigger bear plundered the catch. The prime fishing spots in the rapids, like real estate on the hilltops of great cities, were controlled by those who wielded the most power. These great animals, weighing as much as 1200 pounds, sat placidly on their hard-won turf, scarred faces and bodies mute witness to its value.

Cubs never ventured into these high-rent districts, but stuck with their mothers on the fringes, staying behind when a mother charged into a fracas to plunder for her family's dinner. A mother with cubs is the exception to the "bigger is badder" bear rule. Her position in the hierarchy rises according to the number and youth of her young offspring. Violent physical contact between adults is rare; researchers have found that only one in several hundred encounters actually involves the use of tooth or claw. I found, however, that the roars emitted during these challenges were loud enough to terrify at least one human soul in a sleeping bag two miles away.

Using my motor-driven cameras, I took more than 1000 photographs that day. I photographed mothers nursing cubs, old males squabbling, sub-adults standing on their hind legs in something

between a waltz and a wrestling match. In my readings about wildlife I had learned the dangers of anthropomorphism—imparting human characteristics to animals—yet I found myself unable to think about these bears without making such comparisons. I felt a sense of closeness to them that was much more than physical proximity, and when I returned to camp that night I mused about what I had seen and what I had read in scientific treatises.

Here were beings with an evolutionary development that paralleled my own in many ways. According to current datings, the ancestors of brown bears split from the dog family during the same era when my progenitors separated from the ancestors of modern apes. Later, during the Pleistocene ice ages, a wave of gigantism swept the circumpolar realm, and massive mammals proliferated; there followed a wake of extinction that took with it such creatures as the saber-toothed tiger and the mammoth. Brown bears survived as the world's largest land predators, while my stock emerged from the same evolutionary current with a greatly enlarged brain.

My Neanderthal cousins, creatures with minds already capable of Harvard studies, lived with, evolved with and worshipped the cave bear, the cousin of the modern brown bears I had just seen. Cave art and fossil evidence show that primitive humans were continuously fascinated by bears over a period of at least 40,000 years. I wondered if remnants of this long association still influenced my own reactions.

Our ancestors didn't only worship and respect bears, they killed them. Yet food and fur would not have been sufficient reward for confronting such a dangerous creature when other prey was more easily available. To hunt a bear with primitive weapons must have been a supreme challenge, and that in itself—the act of risk and self-discipline—may have been the primary motive for killing bears. I have a comparable need for activity requiring level-headed calculation of moves inches from possible death, but I express it through my hobby of climbing mountains—a pursuit too useless and wasteful of energy for earlier man.

Fewer than 1000 grizzlies now survive in the entire lower 48; in Alaska more than 12,000 brown bears roam the sparsely inhabited coastal areas of a land where the full conflict of bear/human coexistence has not yet fully developed.

The bears of the McNeil live in a region with no permanent human residents, but the wildlife of our final trip destination was not so lucky. The Pribilof Islands are the breeding grounds for 1.5 million of the world's 1.7 million northern fur seals. Walt Disney's first nature film, *Seal Island*, was photographed in the Pribilofs in 1948. The setting we saw was considerably different from that of the movie, for our visit coincided with the largest seal harvest of the season by the 700 Aleut Indians who depend on it for their livelihood.

As a conservationist, I felt my blood surge at the very idea of thousands of seals being clubbed over the head, but I soon learned that the issue is complex and I was surprised to find myself taking the Aleut side. These seals are neither rare nor endangered. Baby seals, females and breeding males are never touched. Only nonbreeding young males with no chance of establishing a harem are sorted out, thus guaranteeing a minimal effect on the population.

The northern fur seal, with its pelt of unexcelled warmth, experiences discomfort from the heat when it spends any time on land. Thus seals seek the coldest, wettest, most sunless beaches for breeding grounds. The sun shines for only seven days in the average spring-to-fall season on the Pribilofs; the highest recorded temperature is 66 degrees, and the average year-round wind is 17 mph. On a day shortly before we arrived, the sun shone, the temperature soared to 61°—and 200 seals died from the heat.

Our group was unhappy with the arrangements in the Pribilofs. One company has the exclusive right to market tours; without taking one, accommodations cannot be obtained. Camping is forbidden. We became part of a large tour group that stayed in bleak rooms, ate together in a dreary restaurant and toured the island in an old school bus. Only the most dedicated wildlife enthusiasts enjoyed themselves. The roar that went up at dinner when someone quipped, "They should put a penal colony here," voiced the universal opinion.

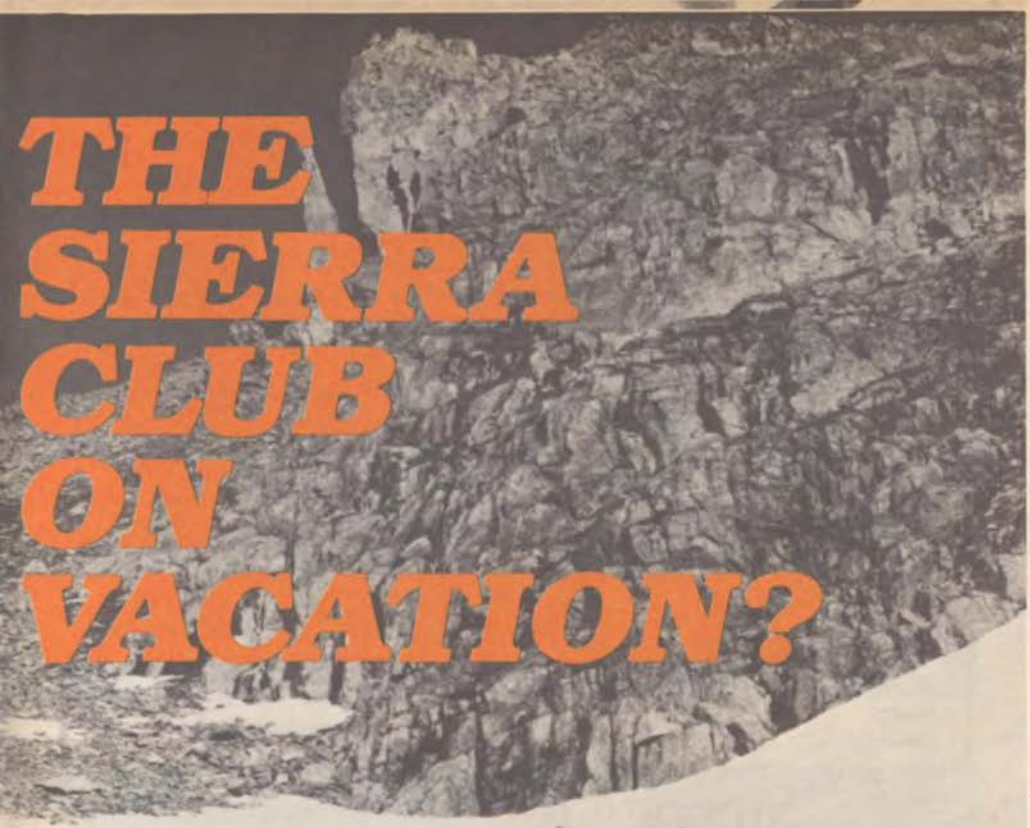
Yet one can hardly blame the Aleut people for not giving tourists the red carpet. The Aleuts were native to the Aleutian Islands, to the south; they came to the Pribilofs in the early 1800s as slaves of the Russians, to harvest the seals. Their lot did not improve when the United States purchased Alaska. In 1916 they petitioned the government through a local

A bull seal on the Pribilof Islands.

agent of the Bureau of Commercial Fisheries, who said in the cover letter, "The fact cannot be denied that the people . . . are living in actual slavery, and that this condition exists and is maintained under the immediate control and direction of the United States Government." Mismanagement of the seal harvest had reduced the herd to a mere 130,000. The Aleuts were not allowed to leave the islands without permission of the government agent, and they were given "subsistence" rations with fewer calories than the government provided to German prisoners of war. In 1951 an Aleut named Iliodor Merculieff (all their names remain Russian) filed suit against the government on behalf of his community. It took 27 years for the Indian Claims Commission to award them $11,239,604. A few months later the Justice Department challenged the figure, and in 1979 the Aleuts agreed to a compromise award of $8 million.

The Aleuts remain devout members of the Russian Orthodox Church, but on the island was another church, the Assembly of God, with a white minister from the mainland. Although the church had almost no native converts, it did have a stable of 17 Honda minibikes that the minister rented for $2.25 an hour.

THE SIERRA CLUB ON VACATION?



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Sierra Club

Photograph by John Gerty

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A caribou bull, shoulder-deep in summer vegetation, Mt. McKinley National Park.

An Alaskan brown bear with salmon, McNeil River Bear Sanctuary.

In small groups we toured the island's dirt roads that were within walking distance of the finest wildlife-viewing areas. One twenty-mile loop ended at Southwest Point, where birds packed the high cliffs like bleachers during a bowl game. The *Audubon Field Guide* says "the Pribilof Islands gullery is perhaps the most spectacular seabird colony in the world; every ledge is packed with tens of thousands of kittiwakes, murres, fulmars and other seabirds." Access to the bird cliffs was easy, and frequently I could photograph them on their nests from a few feet away. The seal rookeries, however, are rigidly controlled by the Department of the Interior, and all observers and photographers are restricted to blinds behind the beaches, except for access to the inland "killing fields" where the seals are driven in the early morning for harvesting. Tour groups are not taken to the harvest, but we were told that independent visits were optional. More than half our group braved the 4 A.M. wind and drizzle to watch the Aleuts skillfully herd the seals across the tundra until each could be examined, separated, killed and skinned, all in less than a minute.

For every nonbreeding seal taken to the killing ground, 75 remained in the rookery, protected not only there, but for their entire yearly migratory journey to the southern seas.

As we enter the 1980s, it is nearly impossible to find a wildlife population anywhere in the world that is not affected by humans—killed directly, poisoned by pesticides, their habitats destroyed, or disturbed by too-intense observation. Our group saw some of these effects in Alaska, but our overall impression, beyond our expectations, was one of healthy, well-managed populations. Just three weeks in "The Great Land" had yielded views of the world's largest concentrations of land predators, sea birds and sea mammals. The oil and tourism industries, often incompatible with wildlife, are bringing sudden new pressures to these Alaskan wildlands. As Adolph Murie has written, "Our task is to perpetuate this freedom and purity of nature, this ebb and flow of life—first, by insuring ample park boundaries so that the region is large enough to maintain the natural relationships, and secondly, to hold man's intrusions to the minimum." □

Galen Rowell's most recent book is High and Wild *(Sierra Club, 1979). A group of bear photos from this trip will illustrate a calendar, "Bears 1981," to be published by the Golden Turtle Press.*

Losing the Diversity of our Genetic Heritage —The Ultimate Cost

RICHARD TUCKER

The Sinking Ark: A New Look at the Problem of Disappearing Species, by Norman Myers, Pergamon Press, New York, 1979. Cloth, $8.95.

BIOLOGISTS ESTIMATE that our planet supports between 5 and 10 million species of plants and animals. They also estimate that 100 or more species are becoming extinct every day, and that by the end of the century we may impoverish ourselves by the loss of one fourth of our total species inheritance. Most of the loss is caused by human actions that destroy the very habitats we rely on even for our own survival. As the continents reel under humanity's accelerating impact, the rate of species extinction will also be accelerating, making our daily losses in the year 2000 much greater than they are now.

Is such a prediction merely an abstract numbers game, with little significance for human life? After all, most of the endangered species are creatures such as insects and tropical plants—far less lovable than whales, rhinos and cranes. Moreover, they are far less noticeable; the estimate of 100 extinctions per day is only a rough guess. Many of them are confined to microhabitats that have never been studied carefully, perhaps never even identified. And most of them are in tropical forests far from the United States. In what way does any of this matter to us? Should anyone but an entomologist lose any sleep over 99 of those daily vanishings?

Norman Myers, a distinguished British conservationist, knows and cares about our ark. He gives us one of the most eloquent and informative accounts yet published of why the declining diversity of species matters very concretely to us all. And he interweaves with this account a detailed prescription for preventive action. Now based in Nairobi, Myers has worked throughout the world on wildlife conservation. One of his projects was a study tour of China several years ago, which resulted in our most informative report on China's environmental management policies.

Myers warns starkly about the dangers of species depletion, reminding us with precise details about the importance in our daily lives of many that are increasingly rare. Of the planet's 80,000 edible plants, only about 150 are used in a major way for food, and this small number of crops could not be sustained without new genetic infusions from their wild and primitively cultivated cousins. In fragile, semi-arid environments, wild varieties of grasses, fruits and roots promise to produce new edible hybrids that will flourish where some of the world's poorest and most undernourished people struggle to survive. If cultivated crops are to withstand heat, desiccation, disease and gradual genetic decline, they must be strengthened regularly by genetic stock from wild strains. Moreover, many wild grasses are nearing extinction from overgrazing by sheep and cattle, which also struggle to survive. Yet as experiments in Ethiopia and India are showing, if these grasses are not allowed to vanish entirely, they could produce hybrids offering lush forage for the grazers.

Dependency on wild stock is nowhere greater than in the United States, where our highly specialized agriculture depends critically on seeds whose genetic material originates largely in other parts of the world. The U.S. Department of Agriculture estimates that genetic improvement increases crop values by $500 million each year. That figure in itself seems large, but insects devour one tenth of American crops to the tune of some $5 billion annually; these losses would mount rapidly without the constant infusion of insect-resistant strains. Steady genetic improvement is the key, also, to keeping our crops adaptable to changes of climate and temperature. Without that capacity, the future would bring us crop failures far worse than the potato famine that permanently changed Ireland's history.

Drugs and pharmaceuticals are at least as critically dependent on imported species, including many found only in tropical forests; the market value of American medicines based on natural products approaches $6 billion annually. Bees and snakes, blowfly larvae, European blister beetles, the Ethopian endod plant, purple foxglove and rosy periwinkle: Myers' list of plants and animals on which our lives depend is rich and exotic. But he is not merely entertaining us; he is setting logic traps, leading us into the heart of his argument.

Easily a majority of these species are found only in tropical forests, and often only in niches of single forests. Many of these forests supported very small human populations until recently, but within the past twenty years tropical forests have become the world's most rapidly and irrevocably remodeled ecosystems. Vast areas of Brazil, central Africa and Southeast Asia that were hardly touched by the saw until recently are now deforested or slated for timber harvesting.

Economically speaking, these forests are by no means remote from American households; the deforestation of the tropics reflects our living habits far more directly than most of us acknowledge or might care to know about.

In the Amazon basin, American industrialist Daniel Ludwig has purchased vast forest tracts and is now fashioning cattle ranches for his workers and his customers. Tropical ranches like his depend on grazing crops that are unlikely to survive more than a handful of years in the delicate laterite soil, which was never intended to support cattle. But whatever conservationists may think of such use of fragile lands, these forests will be exploited in one way or another.

As the pace of the exploitation accelerates, many grim mistakes are being made and, increasingly, time is against us. "The Philippines' Ambubkao Dam is expected to have a life span only half as long as planned. During the past 25 years, Haiti's forests have declined from 80% of the country to 9%. All Colom-

bia's major cities suffer electricity and water rationing due to massive destruction of forests." Examples of unwise land use abound.

Myers has no intention, though, of leading us into passive hopelessness. Tropical forests are generating vast profits for both corporations and local governments, profits that if wisely used could assure sustained growth into the future. "The Indonesian government de-

Wolfgang Bayer

The survival of such rare animals as the tree sloth depends on the preservation of crucial habitat.

rives from its timber trade over $320 million per year in royalties, levies and taxes, yet devotes only $92 million to forestry funding. Indonesia also spends around $1 billion a year on food imports, an outlay that could be reduced through increased investment in improved forestry for watersheds and thereby for irrigation systems." Funds are available, in other words, and the hopeful fact is that "funds for conservation can achieve many times more in developing countries of the tropics than in affluent lands of the temperate zones."

Myers is a pragmatist, searching for what can be accomplished through enlightened cooperation between developing countries and their foreign collaborators, either corporate or governmental. He is aware of, but diplomatically muted in speaking about, the many unenlightened interest groups at work, from government officials in some countries who are connected to illegal timber and mining operations, to local entrepreneurs who poach in forests using roads built by foreign companies. There are difficulties with those companies, as well: "Certain [timber] corporations seem to devote a good deal of ingenuity, not to say money, to cutting every last corner" in their dealings with tropic zone governments.

It may alarm some to read Myers' argument that the more enlightened corporations provide the best hope for careful development of the rain forest. In his longest example in the book, an extended analysis of the Weyerhaeuser Company's timber operations in Indonesia, he reminds us that tropical governments will continue to work with multinational corporations, whatever conservationists in the Western world may wish. Of the many timber companies now working in Indonesia, mostly Japanese and American, Weyerhaeuser is the largest and, in Myers' estimation, the most effective. It controls 8400 square kilometers of rain forest in Southeast Asia—an area two-thirds the size of Connecticut. Most of this is in a vast parcel in Indonesia that Weyerhaeuser has been working since 1971, mostly with a local partner.

It is difficult to learn just how much profit a company like Weyerhaeuser makes. Myers estimates that profits can easily run to 25% annually. But, he argues, the corporations face many difficulties. Market-price fluctuations can wipe out profit rates in timber suddenly, as happened in 1976. Local circumstances can make operations very difficult: poachers on foreign concessions are often a major problem in forest management, and land-hungry peasants are penetrating ever faster onto once-virgin hills to practice shifting cultivation where forests have been cut. Indonesia is steadily raising the royalty rate for exported timber and, by Indonesian law, after 1985 Weyerhaeuser must no longer be the majority partner in the consortium. Yet without the foreign corporations' competence in the highly complex technicalities of tropical forest management, and without their laboratories' capacity to develop new products (such as fiberboard) using what is otherwise wasted from the rain forest's wide variety of trees, forest management in Indonesia and elsewhere would unquestionably deteriorate rapidly from even today's inadequate standards. So conservationists must be willing to work with the pace-setting corporations, Myers concludes.

A major burden of responsibility also lies with governments of developed coun-

tries. In his most startling proposal, Myers suggests that because all nations are interrelated in their need to preserve the tropics, developed nations should consider making compensation payments to developing nations to finance better management practices. With our government's intervention or with United Nations action, the many corporations that depend on tropical resources for their raw materials and profits—products from pharmaceuticals to food to lumber—could be taxed so as to provide for one-way payments to the developing countries. On points like this one, skeptics will call Myers so impractical as to compromise the credibility of the rest of the book. His response is that one-way transfers of funds within our own economy have become commonplace; we must only stretch our imaginations internationally now, in the name of long-term self-interest.

In an accompanying chapter, Myers summarizes the present and possible roles of international aid agencies in the fight to preserve forests and the diversity of species. To support his contention that our worldwide effort has been almost entirely for development, at the expense of the environment, he points out that overall foreign aid is running about $27 billion each year; in contrast, all United Nations environmental spending is less than $100 million annually. In the tropical forestry sector the picture has begun to change, and it could change much more rapidly still. The World Bank has recently expanded its total annual budget; increasingly its emphasis is on forestry projects designed to stabilize ecosystems and to meet the basic needs of local communities.

The record of American aid agencies on funding for the environment has been dismal so far, though here, too, the picture is beginning to change. The Agency for International Development (AID) now analyzes its aid projects for their environmental impact, though not as systematically as some environmentalists would like. Other powerful agencies, such as the Export/Import Bank and the Overseas Private Investors Corporation, do virtually no environmental planning.

Because of the urgent need for better planning in the tropics, and the intricate involvements of Americans in the fate of the rain forests, we can hardly avoid concluding from *The Sinking Ark* that it is time for the environmental movement to strengthen its lobby for expanded public and international investment in forest maintenance. President Carter recently urged all U.S. government agencies involved in international transactions to place the world's forests high on their list of priorities. And the United Nations has just begun a ten-year program for improving the world's water supplies, its highest priority for the 1980s. If we take Myers' plea at all seriously, we can hardly do less. *The Sinking Ark* is a splendid primer for that effort; it makes clear both the nature of the crisis and the many possible lines of action for confronting it. □

Richard Tucker teaches environmental history at Oakland University in Rochester, Michigan, and chairs the Club's Detroit Group.

Open Space for the Few?

JOSEPH T. HENKE

Creative Land Development, Bridge to the Future, by Robert A. Lemire: Houghton Mifflin Company, Boston, 1979. Cloth, 8.95.

LINCOLN, MASSACHUSETTS, is calendar-picture New England: 9500 acres of fields, stone walls, woods and ponds. It shares with Concord Township the shoreline of Walden Pond—reason enough for special consideration. The British captured Paul Revere in Lincoln on the night of his famous ride, and handsome village and farm buildings from that period remain.

Travelers through this historic country have discovered with delight that, despite the spread of suburban population from Boston, Lincoln's nineteenth-century landscape has not been obliterated. In *Creative Land Development*, Robert A. Lemire tells us how the residents of Lincoln went about preserving the rural character of their township. Lemire, who has served for seventeen years on the Lincoln Conservation Commission, narrates in a detailed, practical way—parcel by parcel—the townspeople's moves to parry unwanted development.

For those who would like to do the same in their own communities, the book has many useful ideas and techniques. Sometimes Lincoln acquired threatened land by outright purchase, using state and federal grants, private donations or their own tax dollars. Other land was acquired by private organizations, such as the Audubon Society and The Nature Conserv-

ancy. A nonprofit corporation was used effectively to buy important tracts with borrowed money later repaid through resale for controlled development of portions of the land. Developers were induced to dedicate some of their land for open space in exchange for permission to construct high-density housing on the remainder. In the course of his story Lemire gives fine advice about studying such things as soil types and groundwater sources as a foundation for intelligent planning. And he is particularly at ease explaining the economic benefits cluster developments can provide for both developers and property taxpayers.

Unfortunately, Lemire attempts to prove too much by this worthwhile account of the Lincoln experience. The early chapters of the book survey the entire national land-use situation. Briefly stated, the author accepts as inevitable a U.S. population increase of 40 to 85 million over the next 20 years, as projected by the U.S. Census Bureau. He observes that we have been losing roughly 1.2 million acres of farmland per year to development. He asserts that zoning cannot do the job of protecting cropland because of political resistance and the inclination of courts to award compensation to landowners when regulations reduce the market value of land. He states the obvious fact that we cannot purchase rights to all the hundreds of millions of acres of agricultural land in the country and concludes that the best solution is to follow the example of Lincoln: finance the purchase of open space by allowing limited high-density development on appropriate portions of threatened parcels.

There is a lilliputian presumptuousness in this reasoning. Lincoln is a very small and unusual place. It has a population of fewer than 6000 people who are, for the most part, wealthy and highly educated. (The median household income is one of the highest in the country, and the *average* level of education exceeds four years of college.) Lemire's descriptions of Lincoln's political process sound idyllic compared to that of larger, more diverse urban areas. The people of Lincoln know each other. When "Miss Codman's trustees" or "the Winchell family" decide to sell, mere persuasion is sufficient to obtain delays. A nonprofit Rural Land Foundation quickly obtains a bank loan for a purchase. Legislative decisions are made in old-fashioned town meetings, where an enlightened citizenry votes with near unanimity to increase their taxes to purchase land. These conditions are to be envied and possibly admired, but readers must question how readily techniques that work in Lincoln will succeed in their own hometowns.

The obvious social issues raised by Lincoln's successful limitation on growth are treated in a fleeting and ingenuous way. For example, while acknowledging that Lincoln is a wealthy town, Lemire suggests, "The fact that Lincoln's tax rate on an equalized basis is lower than any of its abutting or neighboring communities . . . argues that it was caring and knowledge more than money that made Lincoln's creative development possible." Perhaps so, but a well-heeled citizenry certainly made it easier, and the low tax rate will be seen by many as evidence that Lincoln residents have escaped their share of poor families and other high-cost inhabitants. At one point the author tells of addressing a class of Lincoln children, among whom were some visiting black children from Roxbury. Lemire introduced himself as "the richest man in town" and said he owned 800 acres. He meant to dramatize the benefits every resident of Lincoln can derive from the town's public land by grandly claiming it as his own. Some of the Lincoln children caught on and said that they each owned 800 acres as well, but there is no evidence that the Roxbury children were convinced of their similar proprietary good fortune.

There is an unsatisfying incompleteness to Lemire's exposition of the national land-use problem for which Lincoln's solution is offered. There is no question that we have a population-growth problem. However, Lemire accepts as inevitable the projected minimum population increase of 40 million by the year 2000 and the U.S. Forest Service projections for large numbers of new single-family houses. And in his eagerness to put forward his technique for development control, Lemire uncritically accepts accommodation of this high growth as a necessity—albeit his enlightened form of accommodation—as the only solution. But won't accommodation generate growth? Isn't it possible that we could achieve a much lower rate of growth? These questions are neither recognized nor addressed, and the resulting tone is promotional.

In the same vein, Lemire questions exclusive farm-use zoning as an alternative to his controlled-development ap-

proach and speculates that paying compensation to owners of restrictively zoned land will be required for constitutional as well as political reasons. In support of this position, he offers a series of short commentaries on land-use problems in other places—Boston, Portland (Maine), Portland (Oregon), Cape Cod, Denver, Des Moines and San Francisco—but he does not demonstrate enough factual knowledge in these reports to make his conclusions convincing. ("Frankly, I suspect that it will not be an easy matter to reverse California's growth dynamics without compensating farmland owners. . . .")

The federal and state constitutions require that government make "just compensation" when private property is taken for public use. However, most courts have rejected owners' claims that their property has in effect been "taken" merely because land regulations have diminished market values. For example, severe restrictions on development of fragile coastal land and productive farmland without compensation have been upheld. Courts have recognized that some private loss is inevitable when regulatory laws are enacted and that government could not function if every adversely affected property owner must be paid when a worthwhile law is adopted. In fact, the California Supreme Court clearly affirmed this position in 1979 in *Agins* v. *City of Tiburon*, a case involving one-acre zoning on extremely valuable surburban residential land. The United States Supreme Court has recently agreed to hear the *Agins* case. It seems unlikely that a majority of the justices will depart from their long-established rule of no compensation, but if they do, Lemire's alternative of limited development may take on new significance. Ironically, the power of a locale to zone reliably is an important factor when a conservation organization wants a developer to cooperate in preserving land. If nothing else, zoning restrictions can delay development while alternatives are explored. Furthermore, it is often the existence of very restrictive regulations that makes the alternative of partial preservation combined with dense cluster development attractive to a developer. For example, in the case of Lincoln, an owner of 25 acres or more can subdivide into two-acre lots without otherwise preserving open space, but the same owner can subdivide into twice the number of much smaller lots if 70% of the entire tract is

protected as open space.

Zoning without compensation will probably survive most legal tests, yet Lemire is correct in asserting that zoning has not, by itself, been a dependable way to preserve permanently open land that is under development pressure. The possibility of variance or amendment constantly threatens the permanence of zoning schemes. In wealthy towns such as Lincoln, builders and promoters of lower-income housing are attacking large-lot zones as exclusionary and contrary to the welfare of the regional population. Even so, where public resolve is strong, regulation has effectively preserved farmland and other valuable open space without conceding the necessity of partial development as solace to the restricted owner. In the future, state and regional review agencies such as the Oregon Land Conservation and Development Commission and the California Coastal Commission may make it more difficult to undo protective restrictions on areas of particular concern. The Federal Coastal Zone Management Act has induced coastal states to form such watchdog agencies for their coastal regions.

As the trend continues toward regional and national land-use policies and regulations, *Creative Land Development* is interesting as an implicit defense of local control. Lemire pays lip service to regional planning, but in fact he is skeptical of regional agencies. He takes to task the Boston MDC (Metropolitan District Commission) for promoting large-scale schemes to import water and for pressuring member towns to allow developments that will pay the water bills. The author takes pride in the fact that Lincoln has protected its groundwater supplies through land conservation and is not dependent on the MDC. At one point, some residents of Lincoln actually questioned the town's acceptance of land acquisition grants from state and federal conservation agencies—for fear of losing local control over the purchased land. The author and others argued for accepting the funds, not out of confidence in state or federal planning, but because involvement of the conservation agencies would help ward off other government intrusions, such as a later Massachusetts Department of Public Works proposal to build a freeway bordering Walden Pond!

Lincoln is a small place, small enough to legislate in town meetings. News travels easily there. With a fair amount of agreement as to what they want, the townspeople have been able to respond quickly and effectively to preserve their beautiful countryside. Their success does not solve the problems of children in Roxbury or farmers in California, but there is a lesson here worth studying. □

Joseph T. Henke teaches courses in land-use and property law at the University of San Francisco and is a member of the Club's Land-Use Committee.

Going Where Whales Go

MARK PALMER

Wake of the Whale, by Kenneth Brower and William R. Curtsinger, Friends of the Earth Books/E.P. Dutton, New York, 1979. Cloth, $35.00.

The opening sequence of *Wake of the Whale* chronicles, in word and photo, how a diver sees a right whale swim by. It is a stunning sequence, an impressive blend of art and nature. William Curtsinger has traveled the world photographing marine mammals. He brought to Friends of the Earth his portfolio of seals from Antarctica and Newfoundland; whales from Hawaii, Patagonia and Baja California. Kenneth Brower accompanied Curtsinger on several expeditions and pieced together a remarkable narrative on the process of Curtsinger's photography. Brower's text is spare; insightful without pretension. Curtsinger's photographs are incomparable.

The frustrations, fears and obsessions of one man working in the sea are all documented by Brower, whose powers of observation build up quite a rare portrait of a fellow human. As a contract photographer for *National Geographic* Curtsinger's specialty is the portraiture of fellow beings—the great whales, dolphins and seals. What makes his portraits so special? Simply put, Curtsinger goes where they go: under Arctic ice, under sky-blue tropical seas, under Antarctic ice floes, under green plankton-rich inshore waters. The photos in the book are all of wild animals, many photographed underwater in an environment Curtsinger has managed to penetrate (or, rather, tolerate for short periods of time) as no other photographer has.

This exhibit-format book is the tenth in Friends of the Earth's "The Earth's Wild Places" series. The final chapter lists organizations active in protecting whales and other marine mammals. □

Hummingbirds

SHARON LEICHLITER CATTO

YOU ARE WALKING through a forest one morning when you hear a soft whirring sound. Looking at a patch of red flowers, you think you see a tiny, wonderfully colored helicopter hovering before a blossom. Quietly walking closer, you see that the lovely creature has a long, slender bill, which it pokes deep into a blossom. Then it darts to another blossom to repeat the process. As you watch, you see that the blur behind its head is quickly beating wings, which carry the creature up, down, sideways, and even backwards, and that its feet never come to rest on the blossom.

You have been the lucky observer of a member of the large family called hummingbirds. Many of these beautiful birds are brightly colored; the males in particular gleam red, green, blue and purple in the sun. Most hummingbirds are so tiny that several could nest in your hand, and the family includes the smallest bird in the world, the bee hummingbird of Cuba, which is only two inches long.

Hummingbirds are truly "New World" birds. They dwell naturally only in the Western Hemisphere, most of the 319 species in warm, tropical regions. Although about fifteen species can be sighted in the United States, only the ruby-throat lives east of the Mississippi River.

The flight of the hummingbird is as wonderful as its colors. Even its name comes from the sound made by its fast-beating wings as it flies. No other bird can move backward, sideways and straight up and down, or hover in one spot, as it does. But though hum-

A hummingbird visits a feeder. Hummingbirds are attracted to red objects, but it's better to use a red ribbon than to add red food coloring to the food mixture; the food coloring may be dangerous to the hummingbird.

***Left:** A mother broad-tailed hummingbird feeding her young: these youngsters are almost ready to learn to fly.* ***Below:** a hummingbird's nest with two eggs.*

mingbirds' wings are unusually strong, most of the birds are unable to walk or hop, and they use their small weak feet only to grasp twigs as they rest.

For the strength hummingbirds need for their rapid flight and for the energy to keep their little bodies warm, they eat fifty to sixty meals a day. Flower nectar is their main food, and they also catch small insects. Flower nectar is the sweetened water made and stored by plants deep inside their flowers. The hummingbird's long slender bill and tongue are like a straw, and so are well-suited for sucking up this sweet food as the bird hovers before a flower.

Hummingbirds like to live alone, and even a male and female pair stays together only long enough to mate. The female builds the nest and cares for the young by herself. She uses her feet, bill and breast to build and mold the soft bits of plant and animal down into the shape of a cup and glues it together and to a branch with spiderweb and her own saliva. The outside of the nest is camouflaged with pieces of lichen and moss, so that it looks like only a bump on the branch or twig. The bird then lays one or two thin white eggs, the size of beans, and begins her job of incubating them. She leaves the nest only to feed herself, to chase away enemies, or to gather materials to repair the nest.

After two or three weeks, her tiny, blind, naked babies hatch, and the mother feeds and cares for them. She flies away from the nest to gather nectar and insects, and when she returns and lands on the edge of the nest, the babies know it is time to open their mouths. She feeds them by pushing her bill far down their throats and depositing the partially digested food that she had swallowed. As the babies grow, the nest becomes very crowded. By the time they are sixteen days old, they are covered with feathers and may perch on the edge of the nest and exercise their wings. About three weeks after the babies hatch, they are as big as adult birds—their flight feathers are stiff and strong, and they are ready to fly. The hummingbird mother will continue to feed them for a few weeks after they leave the nest. They will then begin to feed themselves but they won't have a full set of adult, bright-colored feathers until they are about nine months old.

If you would like to see more of your new bird friends, you might try to attract them to your own garden with a hummingbird feeder. That is a special kind of bottle that you fill with a mixture of one part sugar and four to five parts water. Because red is such an attractive color to North American hummingbirds, you might want to tie some red cloth or ribbon to your feeder, or to paint part of it red. (Some people believe red food coloring is harmful to hummingbirds, so the food mixture itself should not be colored.) The feeder must have a special long tube or hole at the bottom. Then the hummingbirds can use their long, thin bills to suck out the sweetened water just as they would from a flower.□

Sharon Leichliter Catto is a free-lance writer in Boulder, Colorado.

Photographs by Robert Pollock

A Wrapup of the Sierra Club's Annual Meeting

ROBERT A. IRWIN

After an absence of three years as an observer and ten or so as a participant, I was struck by some startling changes at the Sierra Club's annual meeting last May. At the last minute I had been pressed into service by my chapter to attend as its alternate delegate to the Sierra Club Council. The first shock was that this was to be a four-day meeting. I had been used to two-day stints—perhaps a committee meeting Friday evening and Council and Board of Directors' meetings on Saturday and part of Sunday. But four days! I could manage only the last two, yet the great majority of the delegates from the Club's 53 chapters attended the entire May 1 to 4 so-called circus. Another shock was the amount of work those four days encompassed; the delegates took part in workshops, were briefed by staff, held committee meetings and attended both Council and Board meetings.

The annual meeting, as well as the one held November 14 and 15 this year, has been dubbed a "circus" meeting because there's so much going on, and much of it at the same time. The 15 directors, the 53 Council delegates, the 12 regional vice presidents—who also chair the ten Regional Conservation Committees (RCCs) and the Alaska and Hawaii conservation committees and who constitute the RCC Caucus—all take part in the "circus," as do members of the Club's many national committees and task forces. All are unpaid volunteers. The whole endeavor is backed by the paid, but equally dedicated, staff—mostly from Club headquarters, but many from the Washington, D.C., office and from the other field offices. Yet, surprisingly, a certain orderliness emerged from this seemingly chaotic circus.

Never before in my many years as an annual-meeting watcher have I seen such well-run and productive council and Board meetings. Perhaps the efficiency was a result of the Skills Workshop on Conducting Meetings put on last November by the Council. Both of the chairmen, the Council's Bob Howard and the Board's Joe Fontaine, opened their meetings on time, moved through the agendas and adhered to timetables, encouraged adequate discussion, avoided parliamentary quagmires, and generally facilitated action and decision-making. All in all, it was a welcome switch from the disorganization, loquacious oratory and grandstanding that has sometimes impeded meetings. And in the Council, especially, gone are the old laments of "Why are we here?" or "We're just wasting the Club's money," or "Let's abolish the Council." Today's Council knows what its role is: to do all it can to strengthen the volunteer arm of the Sierra Club in all sections of the United States and Canada. Through its several active committees—Membership, Chapter Outings, Finance, Leadership Training and Newsletter—the Council is doing just that: Both the Council and the RCC Caucus have developed into vital, essential units of the Club's volunteer structure. The Council advises and assists the Board on internal and organization matters; the Caucus provides the same service to the Board on national conservation and environmental issues. The Board of Directors, elected directly by the Club's members, is the governing body of the Club, and as such it delegates some of its authority to the Council and the Caucus. To the Council goes the prime responsibility for handling chapter and membership concerns; to the Caucus goes the freedom to act on regional-level conservation and environmental issues.

The Club's Elections, Dinner And Awards

The yearly changing of the guard also takes place at the Sierra Club's annual

meeting. For that reason, the May circus meeting is also called the organizational meeting. The official results of the annual election are reported to the Board of Directors then, and the five successful candidates are seated with the ten holdover directors to begin their three-year terms. This year the five are: Betsy Barnett, Joe Fontaine (a reelected incumbent and the Club's new president), Philip Hocker, Peg Tileston and Edgar Wayburn. In the April voting, 38,275 of the Club's members, or 20.6%, cast valid ballots, a bit more than the 18.2% of 1978. In the early to mid 1970s, participation had been in the 28% to 29% range, and in 1966, when our membership stood at 34,000 (current membership is 184,000), some 41% cast ballots. Growth seems to have its penalties.

The Sierra Club Council also has an annual May election—not for membership on the Council (the members are appointed by the chapters' respective executive committees) but for a chairman and four members to form the executive committee for the coming year. At this year's organizational meeting, the delegates unanimously reelected Bob Howard of the Rio Grande Chapter as their chairman. The other four and their respective chapters are: Jerry Lieberman (Joseph LeConte), Paul Lowe (Alaska), Carroll Tichenor (Cumberland), and Lawrence Downing (North Star).

Despite its size, the Sierra Club is still a club. Enjoyment, after all, is part of its purpose, and the capacity throng that gathered for the annual dinner in Berkeley did just that—enjoyed themselves. The speaker was one of us, James W. Moorman, former head of the Sierra Club Legal Defense Fund and now an assistant U.S. attorney general in charge of environmental and land-use litigation. His talk was a low-key analysis of the energy crunch and why he thinks the environmental movement has been unable to bring about the necessary solution. The trouble, Moorman said, is that the people just don't believe there is a crisis. Instead, they're convinced there is plenty of oil, that it's all a plot by big oil, the Arabs and the politicians. As evidence, Moorman cited the recent voter rejection of Canada's Conservative government over its realistic proposal of a 25-cent rise in the price of gasoline. The first task facing the environmentalists, he said, must be to convince the general public that the crisis is real, and that conservation of petroleum is worth the price of

their personal inconvenience. Without the public solidly behind Congress or the President, Moorman concluded, neither will dare to take the steps necessary to deal with the energy crunch and end its potentially calamitous effects on the environment, the economy, world peace and life itself.

The annual dinner is also the occasion for presenting special awards in recognition of the work of Sierra Club members and others in furthering the cause of conservation. This year the Club's highest honor, the John Muir Award, went to Paul R. Ehrlich, Stanford University biologist and ecologist, the author of the classic *The Population Bomb*. The newest honor, the first William O. Douglas Award, was presented to the evening's speaker, James W. Moorman. The other awards and their winners were: the William E. Colby Award to Abigail Avery, the Walter A. Starr Award to John H. Ricker, the Edgar Wayburn Award to U.S. Representative Morris K. Udall, the Oliver Kehrlein Award to H. Stewart Kimball, and a Distinguished Service Award to Teno Roncalio. Special Service Awards went to Australia's Project Jonah, which was successful in winning that government's ban on all whaling within Australia's 200-mile coastal zone; and to Dave Van de Mark and Lucille Vinyard for their valiant roles in the long struggle to establish Redwood National Park.

Other honors were announced earlier at the Sierra Club Council's meeting: Susan Miller Council Service Awards went to Charles R. Wesner of the Oklahoma Chapter, Virginia-Jean Gleadall of the Mother Lode Chapter, and John Reindl of the John Muir Chapter. The Redwood Chapter received the Council Chapter Membership Award for achieving the highest percentage gain in membership in the past 12 months—more than 7%, while the Club as a whole grew about 1%. Achievements in either membership development or conservation fundraising will be recognized at the Club's November circus meeting with the new Denny and Ida Wilcher Award. The award has been endowed by an anonymous donor, and the winner will receive $3000. All volunteer entities of the Club, such as groups, chapters and committees, are eligible; nominations and applications are due August 1, 1980. For details, write to The Denny and Ida Wilcher Award Committee, Sierra Club Volunteer Services Office, 530 Bush Street, San Francisco, CA 94108. □

GUEST OPINION

Of Whales and Wisdom

ROBERT McNALLY

Robert McNally is a freelance writer in Chico, California. He is working on a book about the human fascination with whales.

ALWAYS WE HAVE sought after wisdom. The urge itself never changes, but the site of the search often does. Sometimes we turn to the stars, sometimes to cast monkey bones, sometimes to messiahs or gurus or ayatollahs. Lately we're looking to the sea. The wisdom of the ages, it is being said, resides in the whales and dolphins.

Once I listened to a woman who had swum with a beluga, an experience she found "a little like falling in love." The swim aroused in her a sense of "a crack in the cosmic egg, a tunnel of experience that scratched a genetic memory." She came away "a fuller human being, not so arrogant."

She is hardly alone. People go "gaga" at the sight of dolphins, and cries of seraphic transport rise at the close approach of a great whale. This is not pretense; there is something very real here. On the open sea no sight equals the coming of the dolphins. "If you yourself can withhold three cheers at beholding these vivacious fish," Melville wrote of the dolphins, "then heaven help ye; the spirit of godly gamesomeness is not in ye."

But there's something more going on these days. It began largely with John Lilly and his books and articles on cetaceans. Lilly holds that cetaceans are every bit as high on the evolutionary scale as humans, and perhaps even higher. Lilly maintains that dolphins, because of their large and well-developed brains, are more intelligent than humans. They are also wiser and happier. They live freely and joyfully, without inhibitions about sex or elimination, without anxiety or tension. And cetaceans are transcendentally accomplished; they daily achieve religious heights a human mystic rarely can reach in a whole lifetime.

There is an empirical issue here: Do the facts bear out Lilly's view or not? No categorical answer is available, simply because few facts are known. We know little about cetaceans' mental processes and communication; we know less about the social life of these animals in the wild.

Yet the empirical question is only part of the issue, and perhaps the less important part; the heart of the matter is philosophical. The image of the wise and happy dolphin has developed along with that curious assemblage of ideas and groups called the human-potential movement, whose purpose it is to raise our consciousness unto the New Age. The movement springs from a dissatisfaction with the bourgeois mentality. The typical middle-class American is seen as uptight, status-conscious, money-grubbing and sexually boring: These characteristics lead to prostate trouble, heart disease, child and alcohol abuse and protofascism. The New Age will arise with people who are loose, laid-back, flowing, sexually experimental, and able to be-in-the-moment. The cetaceans, so the New Age spokesmen intimate, have already hit upon this natural wisdom. They are what we should become.

This view of the Old Bourgeois versus the New Age as the whole spectrum of conscious and intelligent experience is incredibly presumptuous. Instead of seeing dolphins as different and unique, we narcissistically require them to be what we wish ourselves to be. We're not looking at the cetaceans; we're holding up a mirror to ourselves.

The New Age view of cetaceans is not new. It is merely the anthropocentrism of the ages in contemporary jargon. From the time of our earliest myths of special creation, we have seen ourselves as set apart from other animals. We are lord and master; the others are our servants and underlings. Darwin overturned this comfortably lordly world by showing that the human species is just like all the rest, the product of time and natural selection—but the point never quite sank in. Evolution, which is in fact chaotic and purposeless, was understood as a biological drive for perfection culminating in humankind. Thus, we have taken our need for primacy and underpinned it with Darwinian theory instead of religion. Humans are in the driver's seat, whether it was God or natural selection that put us there.

The New Age view of cetaceans is a contemporary variation on this theme. We are at the top: cetaceans are our equals: therefore, cetaceans must be like us. Our high status remains assured; we must only share it.

This self-deceiving solution erodes the real challenge: to understand other species as others, not as lesser creatures but as different beings. We have only a fragmentary understanding of the other animals; the discovery of some language ability in chimpanzees and gorillas shows how little we really know, how much more we have to learn. And much of that learning should focus on the cetaceans, because of their apparent intelligence, their beauty and grace, and especially because of the godly gamesomeness they inspire. They deserve to be understood on their own terms, not in an anthropocentric miscasting as the carriers of our current fantasy of salvation. □

Another Crack at the EMB
A legislative revolt against the Energy Mobilization Board (EMB) legislation has had great effect. strongly supported by environmentalists. In an attempt to respond to the energy crisis, the Carter Adminstration proposed a powerful EMB, and the White House subsequently supported a House bill giving the board extensive powers to waive environmental, health and safety laws, and to bypass procedural safeguards in order to speed "priority energy projects."

The Sierra Club fought against EMB provisions that would threaten the system of environmental protection built up over the last decade. A legislative compromise acceptable to conservationists was narrowly defeated in the House and lost by a wider margin in the Senate. Environmentalists then tried to work with the White House and with the House-Senate conferees to remove the offensive provisions from the final version of the legislation. Unfortunately, the White House caved in unnecessarily, and the conferees agreed to a bad "compromise" bill, one worse than either the House or the Senate versions. Meanwhile, however, discontent with the whole idea of the EMB had grown considerably. Two aspects of the EMB began to lose political popularity. First was the establishment of yet another level of unaccountable energy bureaucracy; second was the prospect that the EMB could override any state law or standard. The revolt climaxed when the House voted overwhelmingly in late June to recommit the unacceptable bill to conference, with instructions to delete the worst provisions. This parliamentary move insures that the aspects of the EMB that most disturbed environmentalists will not become law. Environmentalists hailed the vote as one of the most significant victories of recent years, one that protects the progress made over the last decade in preserving the environment.

River of No Return Wilderness
The "Central Idaho Wilderness Act" has, at long last, become law; these are the main features of the act:
- It establishes a 2,239,000-acre River of No Return Wilderness, the largest outside Alaska;
- It adds 105,000 acres to the existing Selway-Bitterroot Wilderness on the Montana-Idaho border, increasing that area to a total of 1.34 million acres
- It designates 125 miles of the Salmon as a Wild and Scenic River.

Senator Frank Church (D-Idaho), the bill's prime sponsor, said, "I'm delighted with the outcome. The final bill meets every one of my major objectives and creates not only the finest wilderness area in the American West, but puts to rest a simmering controversy that has raged for years."

Mississippi Nuclear Wastes Law
The Mississippi legislature has enacted a law establishing policies and procedures for proposed nuclear-waste storage in that state. The Club's Mississippi Chapter formed a coalition with other organizations to gain public support for the measure.

The new law relies on the U.S. policy of not forcing unwilling states to accept nuclear wastes. The law calls for review of technical, environmental and socio-economic studies by a number of state agencies; this provision, in effect, provides each agency with the power to veto specific proposals. State legislative approval will also be required before the U.S. Department of Energy can be granted authority to construct and operate a nuclear-waste repository in Mississippi.

The Lolo Sets a Precedent
The Lolo National Forest in western Montana will be the first to complete a management plan under the new National Forest Management Act regulations. All such plans are scheduled to be completed by the end of 1983.

Conservationists think that the "preferred alternative" in the Lolo plan (no. 7) is worthy of support; it will preserve a substantial amount of roadless land and will emphasize wildlife preservation by maintaining an adequate distribution of old-growth forest—prime habitat for many species. The most glaring flaw in this plan is a proposed motorcycle corridor that will split the existing Rattlesnake Roadless Area, thus allowing motor vehicle access to the heart of grizzly-bear habitat.

Conservationists can help by writing the Lolo National Forest supervisor, asking him to select "Alternative 7" and to use the guidelines of "Alternative 2" (not allowing motorcycle access) for the Rattlesnake Area. Write to: Orville Daniels, Supervisor, Lolo National Forest, Building 24, Fort Missoula, Missoula, MT 59801.

Club Sues to Protect Mono Lake
The Sierra Club and the Natural Resources Defense Council have filed suit requesting a federal court to order Interior Secretary Cecil Andrus to take immediate action to protect Mono Lake. The lake, on the east side of California's Sierra Nevada, is threatened by Los Angeles Department of Water and Power's large-scale export of water from the Mono Basin.

The complaint, filed in Federal District Court in Sacramento, asks Andrus to assert federal rights to sufficient amounts of the basin's waters to stabilize and maintain the lake at an environmentally acceptable level.

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