MARCH/APRIL 1979
$1.50

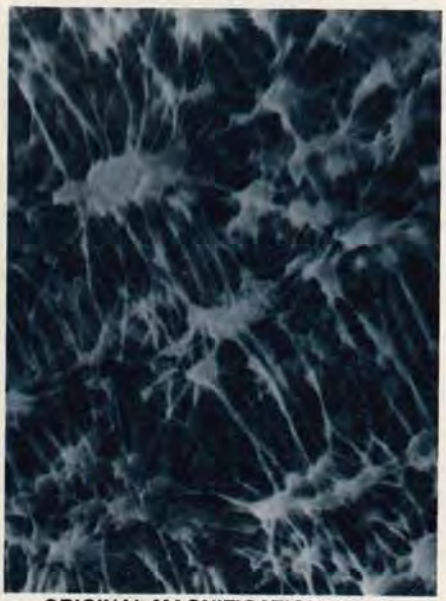
SIERRA

THE SIERRA CLUB BULLETIN

FACTS & FICTION ABOUT GORE-TEX™ fabrics

WHAT IS GORE-TEX™ FABRIC?

It is a combination of the unique GORE-TEX® membrane and woven and knit outerwear fabrics. While the shell and liner fabrics provide strength and durability, the key to performance is the GORE-TEX membrane which is microporous, yet hydrophobic (waterproof). The result of this combination is waterproof, windproof, and durable garments which are comfortable to wear because moisture inside is allowed to evaporate and escape.



ORIGINAL MAGNIFICATION 5000X

HOW DOES GORE-TEX FABRIC WORK?

The difference in surface energy between water and PTFE (the polymer from which the GORE-TEX membrane is formed) creates a strong surface tension, and much like water beads-up on a freshly waxed car, water droplets are formed which can only be forced through the GORE-TEX membrane at very high pressures. This is because its pores are many times smaller than the individual water droplets. The result is waterproofness equal to or better than most coated fabrics.

COMPLETELY WIND RESISTANT?

Yes, the same membrane which makes it waterproof also makes the fabric

windproof. GORE-TEX fabric garments are ideal windbreakers for *cycling, skiing, running,* while remaining breathable.

THE ULTIMATE SHELL FOR INSULATED GARMENTS

A GORE-TEX fabric shell is used in insulated garments for two reasons. First, all insulations to some degree lose some of their warmth-retaining properties when wet, and, second, the windproofness of GORE-TEX fabric actually increases the insulation value of the garment, so you stay warmer particularly in windy weather without the added weight or thickness.

COMFORT AND "BREATHABILITY"

The porous structure of the GORE-TEX membrane allows sufficient evaporation of moisture to keep you comfortable under most conditions. Depending on your level of physical activity, it is possible to get wet from perspiration no matter what you are wearing, even a cotton shirt. But when your activity level decreases, (while resting) this condensation is allowed to evaporate and you become dry and comfortable again.

PLEASE WASH GORE-TEX FABRICS

All of our fabrics are designed and tested to last many machine washings. In fact, continued waterproofness of shell garments can depend on frequent washing. So, consult the wash label on your garment for proper care instructions, and treat your GORE-TEX garments like other clothing... wash them.

GORE-TEX GIVES YOU SHELTER

Protection, simplicity, and super light weight have made *tents* and *sleeping bag covers* the no-hassle choice of backpackers and bicyclists. Whether your tent is made of GORE-TEX fabric or a conventional two-layer system, remember that some minimal condensation or frost in cold weather is bound to occur. In other words, GORE-TEX fabric tents and tents with a fly perform similarly, but the totally condensation free tent hasn't been invented.

SEAM CARE

The most prevalent problem in any waterproof garment is leakage through to the seams. Although some garments have seams sealed by the manufacturers, many are not and these seams must be sealed and maintained for waterproof performance. Check our SEAMSTUFF™ Seam Sealer instructions for proper sealing methods.

For more information, see your local outdoor equipment store or write:

W. L. Gore & Associates, Inc., Dept. S.C..
Route 213 North,
P. O. Box 1220,
Elkton, Maryland 21921.

Look for this tag

GORE-TEX fabrics

GORE-TEX™ Fabric....
trademark of W. L. Gore & Associates, Inc.

Founded in 1892, the Sierra Club works in the United States and other countries to restore the quality of the natural environment and to maintain the integrity of ecosystems. Educating the public to understand and support these objectives is a basic part of the Club's program. All are invited to participate in its activities, which include programs to ". . . study, explore, and enjoy wildlands."

United States offices: Alaska: 545 E. 4th Ave., #5, Anchorage, AK 99501/**New York & International:** 800 Second Ave., New York, NY 10017/**Legal Defense Fund:** 311 California St., San Francisco, CA 94104/**Midwest:** 140 W. Gorham St., Madison, WI 53703/**Northwest:** 4534½ University Way NE, Seattle, WA 98105/**Southern California:** 2410 Beverly Blvd., Los Angeles, CA 90057/**Southwest:** 338 East DeVargas, Santa Fe, NM 87501/**Washington, D.C.:** 330 Pennsylvania Ave., SE, Washington, D.C. 20003/**Wyoming and Northern Great Plains:** Box 1078, Lander WY 82520.

Canadian chapters, Western Canada Chapter, Box 35520, Station E, Vancouver, B.C. V6M 4G8 or Ontario Chapter, c/o National & Provincial Parks Assn., 47 Colborne St., Toronto, Ontario, M5E 1E3.

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SIERRA

THE SIERRA CLUB BULLETIN

MARCH/APRIL 1979 **VOLUME 64/NUMBER 2**

Cover: Robins begin feeding their offspring whole insects only a few days after the baby birds hatch. This family was photographed at Chain Lakes, Emigrant Basin Wilderness, California, by John Senser.

Ethical Investing

Hooray Elliott J. Weiss! I am pleased to read that someone else believes the environmentally concerned investor can effect positive changes in corporate America ("On Ethical Investing," May *Sierra*). As a stockbroker who has climbed from the bottom of the Grand Canyon to the top of Mt. McKinley, and an active Sierra Club member, I am continually striving to balance economic objectives with environmental responsibility.

We have all learned the importance of grass roots support for environmental protection. There is nothing more grass roots in corporate America than stockholders.

Stockbrokers do have access to the information necessary to evaluate a company's environmental responsiveness. You may even find a few brokers who will agree with your concern for environmental protection. I know one broker who is as concerned with the future of wilderness as he is with the future of the market.

Craig Renkert
Anchorage, Alaska

Advertising Policy

Thank you for clarifying the policy of *Sierra* concerning advertising ("Some News of *Sierra* and the *NNR*," October/November/December). Once again the integrity of the Sierra Club may provide some positive leadership in the field of environmental journalism. I hope that those who set policy for *Audubon* take the time to read your editorial and the Sierra Club position, which is "to accept no advertising copy that is in direct opposition to any Sierra Club position."

A recent copy of *Audubon* contains two ads that are examples of a total lack of editorial control. One ad, for an oil company, blatantly lies about the possible renovation of stripmined land; the other, for a timber company, can only be described as a slap in the face to the thousands of wilderness advocates and volunteers who give up valuable time and money in the struggle to save some of our remaining acres of roadless land.

I am ashamed of the Audubon Society for its failure to control the magazine's advertising policy. On the other hand, I am proud that the Sierra Club is not going to follow the Audubon Society down the path of printing any old ad that comes along. Leadership implies a responsibility to those who look toward that leadership. It is regrettable that the Audubon Society does not feel compelled to accept that responsibility.

Bob Warren
Reedsport, Oregon

Tragic Forestry

"The Tragedy of One-Shot Forestry" by Leon S. Minckler (July/August) grimly reminded me of what I saw last weekend in the southern part of the Ouachita Mountains, in southeastern Oklahoma, while on a backpacking trip. This area lies outside national forest boundaries, and its fate is determined by the individuals who own the land.

To the poor folk in these parts, I am sure, big business means big money, and many people appear to have sacrificed their souls and their land to earn the money that will make their lives better. In the southern Ouachitas, between Octavia and Hashoba, Oklahoma, one can see thousands of acres of clearcut land, and one knows that the folk living there have let companies such as Weyerhauser do as they wish and have worked for the logging companies themselves. The land is stripped until the hill slopes are too steep to negotiate with logging equipment, and defoliants have been sprayed over some areas on which regrowth had started, killing all deciduous seedlings (mostly oak) and leaving pine to cover the land.

If pine and oak normally live so closely together, perhaps they need each other, and their lives are so tied to one another that to kill one to nurture and multiply the other is unwise. Who am I to say? I merely wish to see them together as the natural cousins they seem to be.

The building and paper industries grow at the expense of our forests and prairies and the majority of us do not realize what has been sacrificed. We aspire to live as high as we can, estranged from the land and its resources, unaware of what true prices we pay.

Norman M. Meader
Oklahoma City, Oklahoma

"The Tragedy of One-Shot Forestry," by Leon S. Minkler, in the July-August *Sierra*, is timely and accurate. As a professional forester in federal, state and private forestry work for the past 47 years, I fully agree that the clearcutting practices of the U.S. Forest Service in the northeastern states is a tragic mistake that needs immediate policy correction.

The failure of the Forest Service to properly weigh all forest values, and the detrimental consequences of widespread clearcutting practices on those values, apparently requires legal action to prevent further damage to our national forests.

Clarence Petty
Canton, New York

Urban Gardens

The very interesting article, "The Urban Garden: A Growing Trend," by Bruce Stokes (July/August), failed to mention one serious hazard: theft, especially in community gardens. One works all summer to produce a bountiful crop of some delicious vegetable. Then one goes to the garden to harvest and finds that someone has already done it. Heartbreaking!

G.C. Wheeler
Reno, Nevada

Disney and the Lake

We were pleased to see Disney's proposed Independence Lake project mentioned in the "More California Controversies" section of the June issue. However, a correction should be made. The Disney project has not been stopped because of entanglement in "red tape," as the Disney Corporation charges and

your description of the controversy indicates. Disney has in fact received an unprecedented degree of cooperation from local, state and federal agencies.

Two facts will help make this clear. A task force of the State Resources Agency, set up when Disney first made its development proposal, dealt solely with the expedition of that proposal through the necessary governmental channels to complete the EIR/EIS process. And, in their May meeting with Governor Brown and other state officials, Disney officials could not specify one instance of bureaucratic delay in seeking approval.

Governmental agencies have shown a continued willingness to cooperate with the Disney Corporation. We view Disney's unfounded charges of governmental delay as an attempt to prevent further public and governmental scrutiny of the project and to hasten its development.

Something is said about the integrity of the project and of the developer when environmental analysis is forsaken, and when approval is sought through purely political and emotional means.

Jim Anderson
Truckee, California

Mono Lake's Future

I was heartened by Martin Litton's elegant photograph of Mono Lake in the June issue, and by your succinct assessment of the effects of water diversions on the Mono Lake ecosystem. Far more than the island-nesting gulls, however, are in jeopardy. Unless water diversions are curtailed, rising alkalinity will endanger millions of grebes and shorebirds, compromise air quality and destroy an awesome and irreplaceable natural treasure.

This year I joined with other concerned citizens to form the Mono Lake Committee. We have a position paper, "Mono Lake: Its Uncertain Future," a newsletter, and field trip announcements. *Sierra* readers interested in keeping informed about Mono Lake's future are invited to write to us at Box 2764, Oakland, CA 94602.

David Gaines

Mining the Public Wealth

As a Sierra Club member for 11 years, I share the deep desire to preserve and protect our nation's wild and scenic areas. As part of this country's mining community, I also see a need for the still undiscovered resources. David Sheridan's article, "Mining the Public Wealth" (*Sierra*, April 1978), is well written but takes the heavy-handed approach that the mining industry is ripping off the public because the government still provides incentives for exploration (i.e., no prospecting permits are required, no royalties are collected on mineral production, free access to public land is allowed, and mining is given priority over timber and grazing rights). My colleagues and I deeply resent such implications. Besides the fact that mining is a primary industry in many western states, providing jobs and paying taxes, we like to feel that it contributes to our country's economic strength and to a high standard of living.

Although mining operations tend to be highly visible, mines and their facilities occupy a truly insignificant amount of land. Arizona produces 63% of the nation's copper, yet mining there disrupts less than one quarter of 1% of the land. Through provisions in current laws, billions of dollars are being spent on reclamation and pollution control. In the copper industry alone, $1.1 billion has been spent on air and water pollution control equipment since 1970. As an example of the sacrifices made, Inspiration Consolidated Copper Company (which produces 3% of the U.S.'s copper output) spent $62.5 million cleaning its smelter emissons; the $55 million borrowed for this was slightly less than the company's net worth. Nonproductive mining costs (especially royalties) only force companies to increase their returns by mining the higher-grade parts of a deposit and leaving the less profitable parts as waste.

At the U.S. Geological Survey and in the Bureau of Land Management, geologists and engineers try to predict the quantity and value of leasable commodities that exist in the ground so that government economists can determine the minimum price companies should bid for the privilege of mining a deposit or drilling a field. Competitive bidding is standard procedure for leasing mineral lands. Yet, there is no guarantee that a deposit will be profitable. Several years ago, Exxon bid millions of dollars on a tract at Destin Dome that proved completely barren. Conoco has just completed drilling a $4-million dry hole in the Baltimore Canyon area. Such large expenditures on unproductive properties may be considered windfall profits for the government.

In contrast to hydrocarbon exploration, where high risks are often matched by rapid and sometimes spectacular returns, a mining company must invest huge sums of money in a high-risk venture over tens of years before receiving any return on its investment. This, along with the desire to be less dependent on foreign sources of raw materials, is the basis for the present system of incentives.

Removing these incentives would hurt the small-mine operator and individual prospector most. Although large companies generate their own prospects, a large proportion of those considered are submitted by individuals, and experience shows that these are often first-rate.

Finally, the Mining Law of 1872 should not be "retired" just because it is more than 100 years old. Mining laws have been updated to reflect contemporary needs and concerns. Some recent laws affecting the mining industry include the National Environmental Policy Act of 1969, the Clean Air Act of 1970, the Federal Water Control Act Amendments of 1972, the Federal Land Management Policy Act of 1976, the Clean Air Act Amendments of 1977, and the Surface Mining Control and Reclamation Act of 1977.

Just as there are only a few unspoiled lands left, there are only certain geologic environments where hardrock mineral deposits occur. When both occur in the same area, instead of taking extreme attitudes toward exploitation or preservation we should make sincere efforts to reconcile the best intentions and interests of each group. And let us not put down the mining industry for "mining the public wealth." The mining industry serves the public and the wealth is mined for the public.

Gary Prost
Houston, Texas

David Sheridan replies:

Mr. Prost's thoughtful letter raises some points that deserve careful attention.

First, he suggests that the article "takes the heavy-handed approach that the mining industry is ripping off the public." This interpretation is unfortunate. Nowhere in the article are the words "ripping

Make Plans for a Nostalgic Annual Dinner

THE SIERRA CLUB Annual Dinner will be held on Saturday, May 5, at the First Unitarian Church in San Francisco, California.

The Annual Dinner will be a recreation of a High-Trip Dinner, like the ones served on the old-time outings. Hasse Bunnelle, author of several Sierra Club cookbooks and an authority on high-trip cooking, will be in charge of the cook crew.

In keeping with the spirit of the occasion, there will be three contests for those attending: for the best high-trip costume, for the most colorful bandana, and for the most typical high-trip hat.

Of course, bring your Sierra Club cup! We're trying to produce a special commemorative cup for the dinner, and if we get them made they will be for sale at the door.

After dinner we will assemble in the main auditorium of the church for presentation of awards and an address by Honorable Cecil Andrus, Secretary of the Interior.

The social hour will begin at 5:30 p.m. The dinner line will form at 6:30, and introductions and presentations of awards will begin at 8:00. Members and guests who wish to may arrive at 8:00 for the formal part of the evening.

Tickets for the annual dinner are $8.00 each (subject to change if circumstances make this necessary). Please send your check and a *self-addressed, stamped envelope* to: Annual Dinner, Sierra Club, 530 Bush Street, San Francisco, CA 94108. Mail orders will be filled between April 2 and April 27. Tickets will be held at the door for paid requests received after that date. □

off'' used, and indeed, special care was taken to avoid such inflammatory terms because they contribute nothing to the important public dialogue on this issue.

The article simply points out that under the Mining Law of 1872, hardrock mining companies enjoy privileges not enjoyed by any other commercial users of the public lands—ranchers, lumber companies, recreational complexes, oil and gas producers or coal miners. To say that hardrock mining companies avail themselves of these unique privileges is quite different than to ''put down the mining industry,'' to use Mr. Prost's words. Certainly he is correct in saying that the mining industry is ''contributing to our country's economic strength and to a high standard of living.''

But that is not the question. The question is why should the hardrock mining industry continue to enjoy privileges not afforded to other users of public land? By not receiving a fair return for the exploitation of its hardrock mineral resources, the public is, in effect, subsidizing this industry. Is such a subsidy necessary? Mr. Prost fails to note that mining companies explore for and produce hardrock minerals on private lands in the United States as well as on private and public lands in other countries around the world without such ''incentives.'' They even mine hardrock minerals on some public lands within the United States without subsidies; lead, zinc, copper and certain other minerals are mined under a leasing system (in which the companies pay royalties) on the 56.3 million acres of land—about 8% of the total public domain—that the federal government has acquired from private owners rather than from other countries. And if we are concerned about becoming too dependent on foreign sources for our mineral supply, why not provide incentives for more efficient use through recycling instead of by subsidizing consumption?

Mr. Prost notes that nonproductive mining costs such as royalties ''force companies to increase their returns by mining the higher-grade parts of a deposit and leaving the less-profitable parts as waste.'' What is wrong with leaving behind the lower-grade ores? Let the market determine when they should be mined. As our finite resources are further depleted and prices increase, it will eventually become profitable to mine lower-grade ores.

Also, Mr. Prost notes that in a competitive bidding situation, the money a company spends to acquire exploration rights for a certain area ''may be considered a windfall profit for the government'' if no minerals are discovered. Perhaps this is true, but how else is the government to choose among competing companies? The same thing happens on private land. If no minerals are found, the mining companies write off their losses and look elsewhere. It is one of the risks of the mineral business. Market prices determine how many investors are willing to take the risk. When uranium prices more than doubled in the 1973–74 period, uranium exploration boomed.

Although the overall impact of hardrock mineral production on the land mass of the United States is small, as Mr. Prost observes, it can have a devastating effect on an area's wildlife, vegetation, hydrology and air quality. For this reason, access to the public's land should be controlled, not to keep miners out in most instances, but to assure that environmental damage is minimal. The environmental integrity of the public's land cannot be left entirely to the good intentions of mining companies. Under current law, it is unclear whether the public land-management agencies have adequate authority to require mining companies to minimize environmental damage during and after operations. This is a cost that should be included in the price of minerals.

Lastly, reform of the Mining Law of 1872 has nothing to do with its age *per se*, but rather with the changed world we live in. The resources of the public lands are in greater demand than ever, and we now understand that they are not unlimited. Balancing the public's need for timber, livestock, recreation and minerals requires that the stewards of the land—the Bureau of Land Management, the Forest Service and so on—actually manage the land. For this to happen, hardrock mining must be brought into the existing land-use planning and decision-making process, just as coal stripmining has been under the Surface Mining Control and Reclamation Law of 1977.

Correction

The photo of Joshua Tree National Monument, on page 47 of the January/February *Sierra*, was incorrectly credited. The photo was taken by Ed Cooper. *–The Editor*

Editorial

Looking At the Sierra Club's Budget

IN ACCORDANCE with the Sierra Club's usual practice, the financial statements for the fiscal year that ended on September 30 are published in this issue of *Sierra*. See pages 40 through 43. In 1978 the budget did not balance, and a small deficit was incurred; this led the board of directors to impose strong restrictions on the 1979 budget, which was adopted in September. A further explanation of the situation is in order.

Financially, the Sierra Club is run as a business—actually, as a conglomerate of several loosely related businesses. The Club anticipates $8 million in income during 1979; not all that money, however, can be spent on conservation programs.

Not all Club income comes from dues payments. The Outings Department, with $1,345,000 in anticipated income, will incur expenses of approximately $1,255,000. The award-winning Sierra Club Books anticipates revenues of $1,421,000 and expenses of $1,174,000. Clair Tappaan Lodge expects to earn $105,000 and to spend $100,000. Attempts to cut expenses in these departments also reduce income and so yield little net savings.

Other departments, whose purposes are more educational than commercial, also bring in some revenue. Producing *Sierra*, films and the *National News Report* will cost $609,000 in fiscal year 1979, yet will earn only about $190,000, chiefly from advertisements and some subscriptions.

The Sierra Club supports a talented staff of conservation professionals, including Washington, D.C., lobbyists and a number of field staff. Obviously they cannot be expected to raise money in addition to their other responsibilities. To make the whole organization function, the Club must maintain a staff of administrators, accountants, membership-record keepers and receptionists. Such support staff has no opportunity to raise funds.

A significant portion of Sierra Club income—about $547,000 in 1979—will be allocated to chapters, regional conservation committees (RCCs) and volunteer committees to aid them in their tasks.

In forming the budget for fiscal year 1979, the board was faced with several realities: (1) Reducing the size of revenue-producing programs will reduce revenue. (2) The Club's income has not increased as fast as inflation; even though we have more money, it is worth less. (3) The Club cannot spend all its income; some must be set aside for "working capital"—funds kept in reserve to bridge the gap between months of low and high income, to provide a financial base for bank loans, and to capitalize the books program.

In 1974 the board adopted a plan for building this working capital; in 1977 the plan was updated. But in 1978 the Club reached the limit of its borrowing ability and so had to impose stringent measures to conserve working capital during the first quarter of the current fiscal year.

This means that the Club's need for working capital is as great as its need for conservation efforts. In the year just ended, the Club did not add to its working capital, and the board is now more determined than ever to set aside working capital in this and future years.

Adjusting the 1979 budget to meet this need has been a painful process. There is more that needs to be done than can be done.

The board must limit the number of battles the Club fights. It cannot cover every issue—or even every aspect of a single issue. When members wish to take on issues that the Club has not adopted as major priorities, it must be with the understanding that there will be no financial or staff support from the Club.

The board must set priorities among the issues it decides the Club should pursue. Those priorities must reflect the wishes of the membership and the particular strengths and aptitudes of the Club. The board must then allocate the Club's resources in accordance with the priorities set. And, of course, board, staff and volunteers must all exercise the stiffest discipline to see that budgets are adhered to.

But the board also recognizes that cutting expenses is not the entire solution to the Club's problems. Raising more money is also essential to the Club's financial future. Recently, the Sierra Club and the Sierra Club Foundation successfully combined their fund-raising staffs and talent into a single Fund Raising Center. This will eliminate duplication of effort and will encourage better coordination. A fund-raising consultant has also been retained, and the Club is benefitting from his expert advice. A fund-raising committee has been formed to develop new ideas for raising money. A membership-development program is well under way to recruit new members and to keep old ones.

The Sierra Club will never have enough money. There's too much to do; we must be frank with ourselves about that. The limits of our resources point up the need to set priorities realistically and to adhere to them. *—Theodore Snyder*

Are the Only Animals We Care About the Ones We Kill?

Nongame Wildlife

MAXINE McCLOSKEY

Kent Stucky

There is a large lake straddling the California-Oregon border called Goose Lake. It is one of the few lakes in the western United States that is still dominated by native fish, but virtually nothing else is known about the Goose Lake ecosystem. Public access to the lake is rather limited, so there is little fishing.

In 1977 the California Department of Fish and Game released 7300 yearling striped bass into the lake, and in September 1978 it released 27,000 striped bass fingerlings. Plantings of the exotic predator game fish are part of an experimental program to see whether striped bass can survive and grow in Goose Lake; while the Department of Fish and Game assumes the bass will not be able to reproduce there, it wants to know whether to embark on a large-scale striped bass stocking program. The decision whether to establish a stocked bass sport fishery will be made two or three years hence.

This is a typical scenario for decision-making by wildlife management agencies in all 50 states.

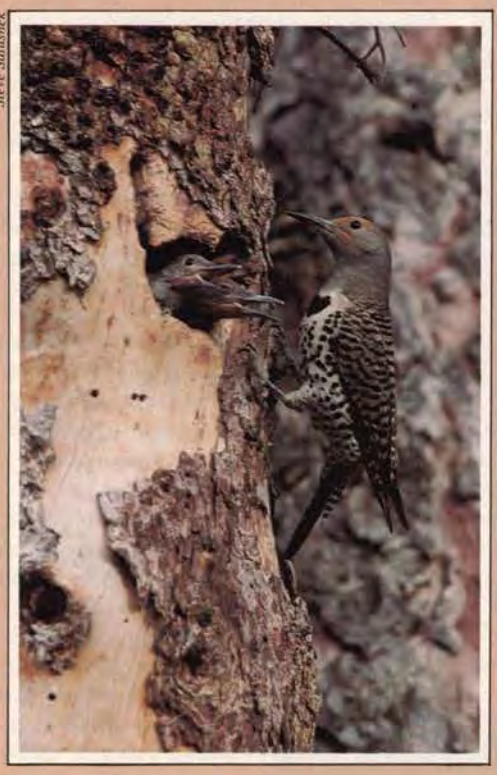
Is there anything inherently wrong or unsound about stocking Goose Lake? This business-as-usual decision to deliberately introduce game species was made in virtual ignorance of the effects the introduction of exotics might have on a relatively unmodified lake. According to Professor Peter Moyle, ichthyologist and member of the California Citizen Nongame Advisory Committee, "the only fisheries investigation made before the plant of bass consisted of eight gill net sets made in 1966. No investigations of invertebrates were made. No effort was made before the plants to determine the taxonomic status of the nongame fishes or to determine what impact a large population of predatory fish might have on their populations."

Professor Moyle alerted the committee to the stocking and the committee reaffirmed an earlier recommendation that exotic animals should not be released until it is reasonably certain that they will not be detrimental to native wildlife.

Now, after the experimental plants of striped bass have been made, samples of nongame fish and invertebrates will be taken by the department. The point is, however, that those studies should have been completed *before* the exper-

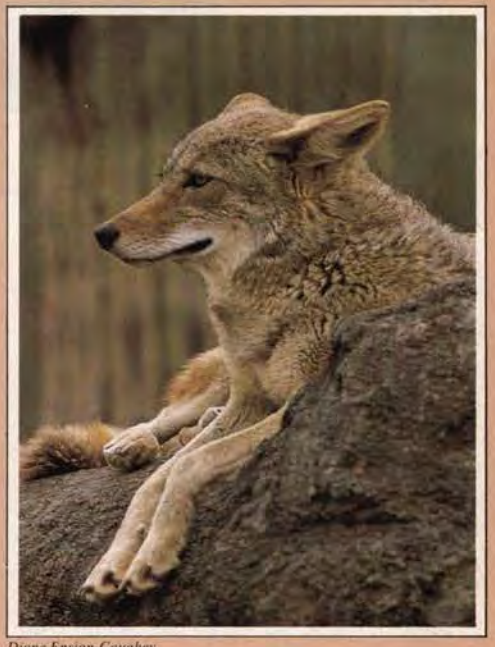
Right: *Brown pelicans, cormorants and gulls typify nongame species: they are not hunted or trapped, yet they may still need protection from pollution. The brown pelican is an endangered species.*

Tupper Ansel Blake



Steve Satushek

Habitat protection may be necessary for many nongame species. ***Left:*** *The red-shafted flicker is sometimes threatened by such common forestry practices as cutting dead trees, where flickers nest.* ***Below:*** *The leopard frog's territory includes nearly every state. It loses habitat as moist ground is drained for agriculture or for development.*

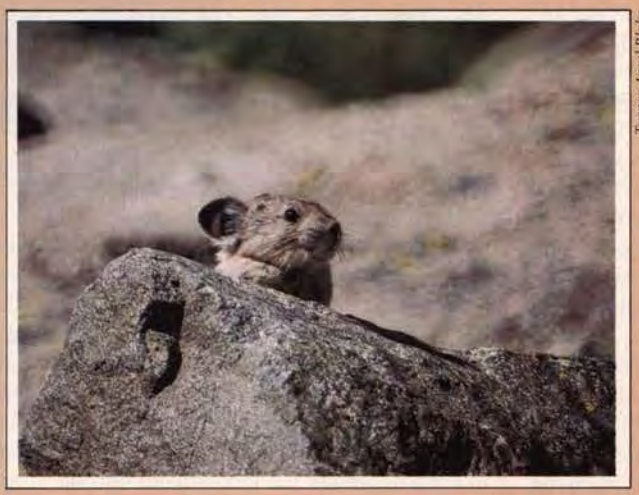


Diane Ensign-Caughey

Kent Stucky

Tony C. Caprio

Above: *The bighorn sheep is generally a protected mammal, but it is still frequently classified as a big game animal–a disturbing portent for its future.*



Tupper Ansel Blake

Above: *Is the coyote a nongame species? It is rarely hunted for sport, but it is frequently trapped and poisoned throughout the West because it supposedly preys on lambs.*

Left: *The pika is one nongame species unlikely to require much human protection. It lives in rockslides near timberline in the mountains of North America. It's too small to hunt and does no damage to human activities.*

imental stocking of an exotic species. Without knowledge of prior conditions, how can the effect of introduced species on native species and the ecosystem be determined?

This example illustrates what could be one motto of state wildlife agencies: "Find a lake and stock it." Another could be: "Provide moving targets."

The history of wildlife management in the United States demonstrates consistent policies of providing animals for the use of hunters, trappers, sport and commercial fishermen. Game species comprise about 1.5% of all vertebrates, but approximately 98% of the wildlife money spent by the states is directed toward management for consumption—that is, for species that can be hunted or fished. About ten years ago people began to point out that the needs of the other 98.5% of species were being neglected. The term "nongame" includes all the "other" animals.

Diane Ensign-Caughey

***Above:** Even the moose, which is hunted in Alaska and Canada, is a nongame species during the nonhunting season.* ***Below:** Although birds of prey are nongame species, they too require protection from being shot or poisoned.*

While wildlife law continues to evolve through a growing number of court decisions, it is generally accepted that wildlife is the common property of the people, title to which is held by the states. Through establishment of wildlife laws and programs, the states fulfill their trust responsibility. (Programs to produce game and fish for direct consumption by the public are primarily state programs, although hunting—especially for migratory waterfowl—is now allowed on half the federal wildlife refuges.) States have clearest authority over wildlife on state and private land; they also dominate most wildlife management on most federal land through mandated cooperative agreements. Under the Constitution, federal wildlife programs—other than for management of federal refuges and ranges—must be tied to interstate commerce, to treaties or to the taxing and spending powers.

State programs aimed at the production of ducks, deer, quail and similar game overlook the requirements of other native species. When this single-purpose management is combined with continuing habitat conversion or destruction, the pressures on native species become intense. This leads to declining numbers; the logical result is their designation as threatened and endangered species. Only when populations sink to such dangerously low levels do state and federal programs commence.

The goal of endangered species programs is to enable populations to recover so that they can be removed from the endangered or threatened lists. How dismal it is when animals are removed from the lists because they are indeed extinct. This was the recent fate of the tiny Tecopa pupfish; it is gone forever. This need not have happened. It makes sense to improve existing programs and begin new ones that *prevent* population declines before massive aid is required to stave off extinction.

Tupper Ansel Blake

The case of the California condor is a prime example. A report issued in 1978 by the Condor Advisory Panel, appointed by the American Ornithologists' Union and the National Audubon Society, concluded that "the California condor is rapidly declining to extinction." Pesticide and rodenticide pollution, human disturbance, subdivision developments in their historic feeding ranges, earlier egg collectors, shooting deaths—all have combined to spell doom for the largest land bird on the North American continent; there are only 30 to 40 condors left. Federal and state agencies are now considering a very expensive last-ditch effort to save the condor—captive breeding. The Condor Advisory Panel recommends that "The only reasonable hope for achieving a large population of condors in the wild is a program of captive propagation." The effort would include the capture of birds from the wild, propagation under close protection and monitoring, and eventual reintroduction of progeny into the wild. Other recommendations include further habitat protection and research efforts. The program could cost several million dollars over several decades—and fail. If the needs of this remarkable soaring bird had been recognized and provided for in the past, this controversial, manipulative effort would not be considered today.

Approximately 100 years ago, states began establishing fish and game commissions to prevent overhunting. Departments were established to implement and enforce the regulations set by the commissions, and, to pay for the programs, hunting and fishing licenses were instituted. Later on, federal excise taxes were imposed on arms and fishing equipment to provide special earmarked grant-in-aid funds that are returned to the individual states for game and fish programs.

As Professor A. Starker Leopold has pointed out, this process created a commission - department-sportsman axis that continues to dominate wildlife management today. This axis leaves no role for the nonconsuming public, for wildlife enthusiasts who do not hunt or fish. As issues arose—such as continued regulated hunting of the severely reduced tule elk in California, or the indiscriminate shooting of birds of prey in the eastern United States—concerned individuals and organizations were not able to influence state wildlife agencies. They had to seek help from state legislatures or from Congress. Environmentalists are still forced to bypass state

game commissions and departments and go directly to the legislatures in order to try to prevent such wildlife abuse as trapping bobcats and continued use of rodenticides and predator poisons, and to establish programs for endangered species and nongame wildlife.

The key to enlarging the scope of state wildlife agencies and commissions lies in finding ways to broaden their financial support. At present, hunters, trappers and fishermen pay the piper, and they call the tune. Since the public owns the wildlife and the states have legal responsibility for its management, it seems fair and proper for the public to share the cost of broadened wildlife programs. More and more people are accepting that proposition. Several states are trying an assortment of ways to get new revenues.

New Jersey, Pennsylvania, California and a few other states have tried to support nongame programs by soliciting contributions from the public through the sale of decals. Because contributions are voluntary, they are disappointingly small. Purchase of licenses, however, is mandatory, as is the payment of federal excise taxes on hunting and fishing equipment—no wonder the sporting interests have been able to pay for the programs they want and get.

Washington and California use a special automobile license program that generates some revenue, but it is still not enough.

Missouri voters passed a constitutional amendment in 1976 that increased the state sales tax by one eighth of one percent. The revenue goes to the Department of Conservation, which has authority over fish, wildlife and forestry programs. The tax produced $24.3 million in 1977-1978, and the state has budgeted an anticipated $26.5 million for 1978-1979. The Conservation Commission has determined that 80% of the money will go for capital improvements, and 80% of that will go for land acquisition. The commission spent $14 million for land in 1977-1978 and will spend $17 million in 1978-1979. Missouri now has a new natural history program, one that includes developing a system of nature centers and trails for wildlife viewing. The state has hired research biologists who are studying nongame animals, and it is developing a broad new education program.

The initiative petition that achieved the successful innovation was spearheaded by the Conservation Federation of Missouri, a coalition of sportsmen and environmental groups. The sales tax approach contains the necessary ingredients for nongame funding: it is mandatory; it produces a lot of revenue; the money comes from the general public, and it is easy to collect.

Colorado is pioneering a new effort to get money for its nongame-wildlife management programs. Colorado taxpayers can donate a portion of their state income-tax refunds to the Division of Wildlife for nongame management. The opportunity to donate is provided by a check-off box on state tax returns. The check-off boxes give the taxpayer an opportunity to contribute $1, $5 or $10 from the refund; donors can deduct the amount of the contribution from next year's income tax.

The voluntary program yielded $349,000 in 1978, exceeding the hopes of environmentalists who had worked for adoption of this new technique. They expected the new funds to augment existing appropriations from the state's general fund and, when combined, to enable the wildlife division to undertake its most substantial nongame wildlife program so far.

"It turned out to be a mixed blessing," according to Ron Lestina, wildlife chairman of the Rocky Mountain Chapter of the Sierra Club, and also a member of the Colorado Non Game Advisory Council. "Instead of allocating all the money contributors had given, the legislature allocated $150,000 and retained the excess to wait and see what happens next year. Furthermore, the legislature refused to increase the appropriations from the general fund. The net effect is that the nongame program has barely a standby budget and is in little better shape than the previous year." Lestina attributes the disappointing actions of the legislature to the fiscal conservatism of its members and to their lack of interest in and understanding of nongame wildlife.

A later development bears this out. The chairman of Colorado's powerful Joint Budget Committee is seeking legislation that would eliminate general funds for nongame programs. He reasons that in the face of such substantial public support for nongame, it is no longer necessary to appropriate general funds. This is a no-win situation for nongame: because the public responded to the check-off opportunity, general funds are to be withdrawn; if the public hadn't responded, they would have been withdrawn anyway because of lack of public support. Further, proposals are being made for more check-off boxes for additional state needs, so that nongame will be thrust back into competition for the taxpayer's dollars. There are likely to be fluctuations in the amounts received from year to year with no opportunity to make up the difference with general funds.

The experience in Colorado demonstrates the strength of the old bias toward game programs that still permeates many state legislatures. Generally they lack understanding of or interest in the role of wildlife in the natural world. Experienced hands in wildlife management do recognize, though, that the trend to broad nongame programs is coming. It is inevitable, they say. These matters are discussed every year at the North American Wildlife and Natural Resources conferences sponsored by the Wildlife Management Institute. The International Association of Fish and Wildlife Agencies has established committees on nongame programs. The director of the Montana Fish and Game Department, Bob Wambach, sees nongame programs as the "wave of the future."

While knowledge about (and programs for) endangered and threatened species are increasing, the more we learn, the larger the endangered numbers grow. As of November 1978 there are 177 endangered and 37 threatened species of wildlife in the U.S. An additional 158 species have been proposed for listing. Recovery programs for resident species depend on individual states for implementation.

Some states are unable to qualify for federal funds for endangered species because they don't have their own required one-third share of the matching money. They have no nongame funds and are unwilling to use sportsmen's funds. The most precious of the public's wildlife—its endangered and threatened species—are neglected in those states. Game programs are well-funded partly because sportsmen are well-organized in every state. They are members of hunting, shooting, fishing, trapping, varmint calling, commercial diving and fishing organizations that work closely with state game agencies.

There is no comparable state-by-state organizational framework of groups concerned about all wildlife to work with agencies and commissions. The closest are the humane societies. They are organized on city, county and state levels, although some have national and international operations. Many are so overwhelmed with the desperate needs of

domestic animals that they are unable to extend their meager resources to champion wildlife vigorously. A good deal of their effort is directed toward improving methods of euthanasia, and providing those and other services.

The Audubon societies are organized by state, so they are the most widely distributed wildlife constituency in existence. It is encouraging that they are becoming more active in influencing state agencies. Defenders of Wildlife and Fund for Animals are two of a number of national wildlife organizations. Most effective on the national scene in Washington, they are extending their organizations on a regional basis. If they can continue to build local and state frameworks, they can bring a refreshing new constituency to bear on state legislatures and wildlife agencies.

Major national conservation organizations, such as the Sierra Club, have traditionally been oriented toward protecting the land through parks, wilderness and other systems. They are concerned with forest practices, water and air quality, and energy. Their efforts for wildlife are a predominant part of their efforts to protect the land, and thus wildlife habitat. In this way they have done a great deal for wildlife, for nothing is more basic to its needs than a place to live. Some state chapters of the Sierra Club take up the problems of wildlife with vigor.

This brief glance at wildlife organizations shows that those concerned with the broad picture of wildlife needs aren't yet strong enough to put the necessary pressure on states to turn the tide. The greatest obstacle is the lack of money to pay for the programs that are needed. Nongame wildlife management is mostly nonfunded; the federal cooperative program for endangered species is the only significant one, but half the states don't participate in it.

There is a good reason for the lack of attention to nongame wildlife—ignorance. If the general public thinks about wildlife at all, it is probably about deer, ducks and other game animals, and most people know those species are being taken care of. Or they may be concerned about endangered species, and there are federal and some state programs for those animals. But most people may not know about the 98.5% of vertebrate species that receive practically no attention. If the public knew about the neglect and decline of many nongame species and their habitats, would they be willing to pay for broadened wildlife programs? The record of accomplishment of voluntary contribution programs (with the exception of Colorado's convenient income tax refund check-off) is pitifully small. If the public is ready to pay with state general funds—tax money—such demand is not yet apparent.

Tupper Ansel Blake

Besides being attractive, such common species as the black-tailed jack rabbit and the California ground squirrel shown here are integral parts of ecosystems.

One reason the public is uninformed is that journalists ignore much of wildlife. The regular newspaper, magazine and TV columns are by writers of game and fishing news; coverage appears in the sports sections. And there are, of course, a number of widely distributed commercial magazines devoted to hunting and fishing. The concept of wildlife as a resource to be consumed is reinforced by such journalism. Certainly these writers serve a sizable audience; in 1975, 16.6 million hunters spent $5.8 billion on their sport, including the fees and excise taxes that support state game programs. I believe it is time for a new journalism to appear, one that focuses on the nature of all kinds of wildlife, their needs and problems, on opportunities to view them in their natural habitat, and on the human response.

The history of wildlife advocacy presents an additional hindrance. Nonhunting wildlife supporters are generally so distrustful of state game agencies that they are reluctant to give the agencies public money. But without public money and an organized constituency, nongame wildlife has a bleak future.

Who would such a constituency include? In a study reported in February 1978, a group of nongame wildlife enthusiasts were questioned on their beliefs about wildlife management programs and policies, and some very important characteristics and attitudes were revealed. The study, by Witter, Shaw, King and Richards of the University of Arizona, Tucson, showed that 73% of the 591 people interviewed "belonged or contributed to at least two private conservation organizations of a nonconsumptive orientation, and 54% to three or more such groups. In other words, this group actively supports wildlife conservation, but not the programs of the public sector." The study also revealed that "they perceive the management theme of agencies as 'pro-hunting' rather than 'pro-wildlife,' and see difficulties becoming involved in the present system."

One way of getting the public involved in fish and game agencies is to create state advisory committees that can assist in starting and conducting nongame programs. Such a committee was appointed in California early in 1975 by the new director of the Department of Fish and Game, Charles Fullerton. Essentially the committee develops its own agenda, although it responds to requests from the department. The committee meets monthly during the academic year; it has published two reports.

The committee's first annual report begins with this statement of policy: "All native animal and plant species in the state should be protected by the department for their own intrinsic values and to insure their perpetuation as viable components of their ecosystems. Efforts should be directed toward achieving self-sustaining population levels of all

native species." The report contains a number of recommendations, almost all of which Director Fullerton has endorsed—although he points out that additional funding is needed before any recommendations could be implemented. The heart of these recommendations is this objective: "There should be an increase in attention paid to nongame wildlife until personnel and fiscal resources and programs devoted to nongame species are comparable to consumption programs. There should be an annual program of increasing attention given to nongame activities over a five-year period until this goal is reached." The committee recommends that the department devote equal attention to game and nongame species.

To begin a suitable management approach, the committee recommends: "In order to prevent any further decline of native species into endangered or threatened status, a systematic monitoring of the populations of selected species should be established." The committee further recommends that, as this information is gathered, "A series of protected areas or reserves should be established that will be large enough to insure the continued existence of natural ecosystems or biotic communities with all their constituent species."

Other recommendations include "an aggressive program of public and intra-departmental education aimed at developing an awareness of the importance and fragility of natural ecosystems and a concern for all wildlife." It would be helpful if such loaded terms as "varmint" and "trash" were dropped.

On endangered species, the committee says: "Programs to restore presently endangered or threatened species to healthy, self-perpetuating population levels should be strengthened. These efforts, of necessity, should have priority over other programs insofar as is practical."

The nongame committee recommends that increased appropriations from general funds is the appropriate answer to the state funding problem. It also supports the proposed federal nongame funding program, a grant-in-aid program comparable to those already functioning so well for fish and game species.

The department has to take visible, productive steps if it is to earn the confidence of the nongame wildlife public. Environmentalists have to be willing to support and work for new sources of revenue for new state wildlife programs. Because this involves taxation, it will be a very difficult goal to achieve—the public tax revolt has become fervent. One solution is to seek funding from a state's general tax revenues on the grounds that the public's wildlife is an obligation of the state and should be supported by the public. Wildlife then comes into direct competition with other legitimate programs of the state for the dwindling tax resources. A number of states now use general fund money for wildlife programs. California is the leader, with appropriations in fiscal 1979 of $2,255,889, about 5% of the total Fish and Game Department budget of $43,408,388. Most of this appropriation is for nongame wildlife, including endangered species. In addition, California gets the largest share of federal money from endangered species cooperative programs—$450,000 in fiscal 1977. Total nongame expenditures are $2,297,917.

Another likely source of money is the federal government. For the last two sessions of Congress, bills have been considered that would set up a grants-in-aid program. Senator Gary Hart of Colorado was prime sponsor of the proposed Federal Aid in Nongame Fish and Wildlife Conservation Act in the last Congress. As introduced, it would have authorized the Department of the Interior to distribute $20 million, $30 million and $40 million to the states in fiscal years 1978, 1979 and 1980, respectively, for nongame fish and wildlife conservation programs. Under this bill the federal government would use general appropriations to fund 75% of the cost of the programs, with the remaining 25% to be funded by the states. Further, no more than 10% of a state's share could be derived from hunting, fishing or trapping licenses. Other restrictions insured that primary emphasis would be placed upon fundamental research and management activities. Federal departments and agencies would be authorized to enter into cooperative agreements with the states to carry out these programs on federal lands.

Enactment of this legislation would have encouraged states to come up with new sources of funds for their 25% share of the matching money. State programs would also have had to be developed to qualify for federal support. Since only a small part of the state's matching share could have come from licenses, sportsmen would not have made a strong case in opposition. In fact, national leaders of sportsmen's groups, such as the National Wildlife Federation and the Wildlife Management Institute, actually led the way in planning the legislation and in trying to get it through Congress. The National Audubon Society worked with them from the beginning, and many other groups joined the effort, including the Humane Society of the United States.

The legislation passed the Senate in May 1978 and then passed the House Merchant Marine and Fisheries Committee, only to get stuck in the House Rules Committee. Opposition then came from three sources: President Carter, the U.S. Chamber of Commerce and the National

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What Does "Nongame" Mean?

THE TERM "nongame" is usually given to wildlife species that are not hunted for sport or food. But when the difference between game and nongame is refined, other uses of animals may be difficult to classify. Do we exclude from nongame those species taken for commercial purposes, such as for sale by dealers, commercial fishing, or trapping for fur or population control? How should we classify birds taken for falconry, or rodents subject to population control? Since these are not game uses, by definition they should be called nongame. A further complication comes from the variation in classification from state to state; some species may be game in one and nongame in another. Mourning doves, for example, are game birds in California and song birds in Iowa. While the bighorn sheep is generally protected, it is frequently still classed as big game—a disturbing portent of the future. There is also no general agreement on classification of animals subject to trapping. When defining nongame, the federal nongame funding bill includes animal species not taken for fur. But in general, nongame species are those that are not moving targets for hook, bullet, arrow or trap.

Results Are In From an Environmental Survey

How Sierra Club Members See Environmental Issues

KATHRYN ANN UTRUP

RESULTS FROM a recent national survey of the Sierra Club membership suggest that a new, broadened Sierra Club motto might be in order. It would read: ". . . To preserve, explore and enjoy the nation's wilderness, parks, forests and natural areas, to clean the nation's air and water, to protect wildlife, promote the development of alternative, renewable energy resources and conserve energy to further this goal."

This new motto would perhaps best illustrate an image of the Sierra Club revealed by the attitudes of its members. As the Sierra Club has grown and expanded over the years, so too have the interests and activities of its membership. Once a small group of Californians oriented toward recreation and the preservation of nature, the Sierra Club has become a dynamic, national grassroots organization with a high-powered lobbying and litigative force, active on a variety of environmental issues.

In May 1978 a random sample of 1000 Sierra Club members were sent a mail survey. The 24-page questionnaire was designed to review a wide range of opinions on conservation and energy topics. It also included questions about the Sierra Club, political attitudes, members' activities and interests, as well as social background characteristics of the respondents. The survey was part of a larger study of the national environmental movement that is being conducted by Robert C. Mitchell of Resources for the Future (RFF), a nonprofit, Washington, D.C.-based research organization.

Members of four other environmental organizations also participated in the survey: The Environmental Defense Fund, Environmental Action, The National Wildlife Federation (associate members only) and The Wilderness Society.

In true volunteer spirit, 70% of the Sierra Club members polled responded enthusiastically and took the time to fill out and return the questionnaires. This is an extremely high response rate for a mail survey and reflects the dedication and commitment of the Club's membership. According to sampling theory, the attitudes expressed by these members can be considered representative of the entire Sierra Club.

A national environmental telephone poll of the general public was also conducted for Resources for the Future, in order to compare the attitudes of environmentalists with those of the public. In this survey, more than 1000 randomly selected individuals answered 47 questions covering a wide range of environmental and energy issues. Some of the results from this survey will also be noted here.

"I belong to the Club because. . ."

Given twelve choices, the top three reasons members cited for belonging to the Sierra Club were:

- If we don't act now to preserve the environment, things will get much worse. 64%

- If the Club achieves its goals, my life and my children's lives will benefit. 56%
- My contribution to the Sierra Club is helping to influence government action on environmental/conservation problems. 42%

These themes of preserving the environment for the future while affecting political action in the present closely parallel the views of the Club's founders. John Muir saw his role as one of educator and advocate seeking to influence public thinking and political decision-making. In 1909 his colleague, William Colby, articulated the same concerns Club members express today about shortsighted action that affects the future:

"What I am opposed to is the determination right now that Hetch-Hetchy shall be flooded 50 years from now. I feel the decision ought properly to be reserved for those who will live 50 years hence. We surely can trust that their decision will be wiser than any we can make for them."

How well does the Club represent the views of its membership?

More than eight out of ten members exhibited a strong conviction that the Sierra Club is not only representing their views to the government on environmental/conservation issues, but is also very effective in influencing national policy on these matters.

The overwhelming majority of the membership demonstrated strong support for Club policy stands. Only 7% thought the Club tends to be "too weak and willing to compromise." Nineteen percent held the reverse opinion and said "the Club often takes too strong a stand on environmental issues." Asked how often they agree with the Club's policies, 60% said they "agree with all or most of the conservation policies of the Club," while 31% agree with "some" of them.

How serious are the nation's environmental and energy problems?

Although members unanimously (99%) agreed that the nation's environmental problems are serious, 16% regard the situation as "rapidly approaching disaster." Most were less pessimistic and responded "very serious" (55%) and "serious" (22%) to this question. Answers to one question from the national environmental survey illustrate that the general public is not far behind the Club in sharing this concern: 62% of the public *disagreed* with the statement that "environmental problems are not as serious as some people would have us believe." (See Table 1).

When members were asked about air and water pollution in their own states, 82% said air pollution was serious, and 77% found water pollution serious. Similarly, the public shared much the same level of concern about air and water pollution *in this country.* Seventy-eight percent of the public felt air pollution in this country was serious and 75% claimed water pollution serious—both high levels of concern.

Looking at energy, 98% of the Club categorized the "energy situation" in this country as serious, as did 77% of the general public in answer to a comparable question about the "energy shortage." While the public shows almost as much concern as Club members about the seriousness of air and water pollution, it does not express the same magnitude of concern about environmental and energy problems in general. This difference occurs partly because air and water pollution receive the most media attention and are therefore the environmental issues the public knows most about. Club members, however, rate the seriousness of environmental and energy problems equally high, perhaps because they have a broader environmental awareness.

Table 1. Are Environmental Problems Serious?

Sierra Club Members	Serious
Environmental problems	99%
Energy situation	98%
Air pollution (in this state)	82%
Water pollution (in this state)	77%

Source: 1978 Sierra Club Survey

The General Public	Serious
*Environmental problems	62%
Energy shortage	77%
Air pollution (in this country)	78%
Water pollution (in this country)	75%

Source: Resources for the Future, 1978 National Environmental Survey.

*The question asked the public was: "Do you agree or disagree that environmental problems are not as serious as some people would have us believe?" 62% Disagreed.

Are environmental/conservation problems more complex today?

While Club members view environmental and energy problems as serious, 82% also contend that "environmental/conservation issues seem much more complex today than they were a few years ago." This feeling certainly reflects the history of the Club's issue involvement. Long before the Arab oil embargo of 1973 alarmed the general public, the Club had discovered that investigating environmental issues opened a Pandora's box of energy-related problems. Issues in the 1970s range from the traditional concerns of wilderness preservation to such baffling technical and ethical issues as recombinant DNA experimentation.

Are more people doing something about environmental problems today?

Although environmental issues have become more varied and complex in recent years, there is some comfort in feeling that more activists have joined the crusade to help take them on. Sixty-six percent of the Club members feel that more people are actively doing something about environmental problems today than were two years ago.

What are the most important causes of environmental problems?

Members were no quicker to blame industry (97%) than the general carelessness of people (96%) when asked to rate the

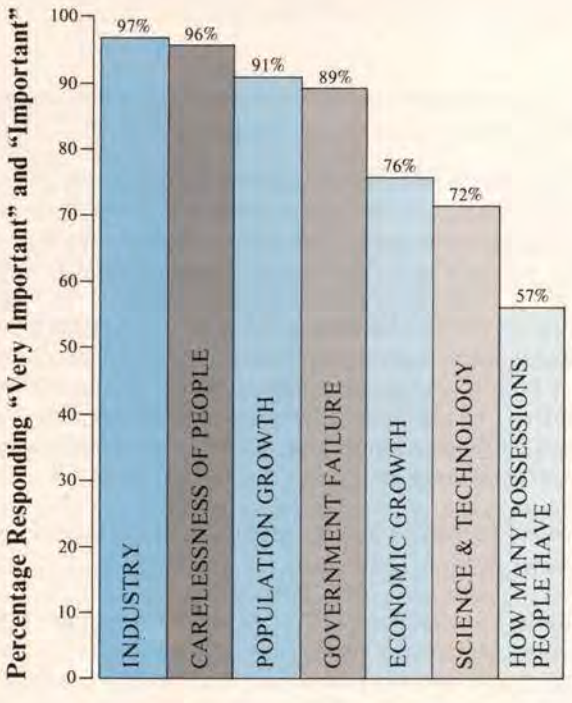
importance of a list of possible causes of environmental problems (See Table 2). Nor do members feel environmentalists should adopt a totally adversary approach in their relations with industry. Ninety-five percent agreed that "it is a good idea for environmental leaders to engage in dialogue with industry to break down the stereotypes and see if there is any common ground for the solution to specific conflicts."

"Population growth" and "government failure" were causes of environmental problems cited by about nine out of ten people. Another question revealed skepticism about government action; only 5% agreed that "you can just about *always* trust the federal government to do what is right."

Seven out of ten found "economic growth" and "science and technology" responsible for environmental problems. Other questions further tapped members' attitudes about economic growth and science and technology.

- Two thirds of the members were willing to agree that "if the price of a beautiful and healthful environment is the cessation of further economic growth, it is a price worth paying."
- Two thirds also agreed that "people would be better off living a simpler life without so much technology." However, opinion was more divided (48% "yes," 43% "no") as to whether we had "already let technology run away with us." Equally divided (44% to 44%) was faith in the proposition that "the future welfare of our society depends on the discoveries of science."

Table 2. The Most Important Causes of Environmental Problems



What issues do Sierra Club members view as very important to them personally and what issues do they feel should be high priorities for the Club?

Wilderness is still the most important issue to Club members. Since its inception in 1892, the Sierra Club has been one of the nation's most enthusiastic advocates of the preservation of wilderness and of natural areas. Muir and his companions founded the Sierra Club partly to aid in the fight to preserve Yosemite. As he wrote,

> "These sacred mountain temples are the holiest ground that the heart of man has consecrated and it behooves us all faithfully to do our part in seeing that our wild mountain parks are passed on unspoiled to those who come after us, for they are national properties to which every man has a right and an interest."

The Club has been battling relentlessly ever since those early days to add irreplaceable scenic natural resources to the nation's preservation systems. Besides wilderness, the National Preservation System includes national forests, parks, seashores, wild and scenic rivers, wildlife refuges and monuments. The survey asked members to rate a list of 23 environmental issues according to their importance. Two thirds of the members rated "wilderness preservation" and "preserving other natural areas" as both their top personal interests and the top priorities for the Club. (See Table 3.) Preservation of wilderness and of natural areas were also the two issues that members said they are most willing to work on.

Two relatively newer environmental issues, air and water pollution, tied for second place with "preserving natural areas" as top personal priorities for Club members and ranked almost as high as priorities for the Club. Increasingly, pollution is being understood as more than a problem of aesthetics. Air pollution alone cost Americans at least $10 billion during 1978 in health expenses, not to mention the number of deaths it causes. Contaminants in our water supply are no less expensive and dangerous. The Sierra Club has been a consistent driving force behind campaigns for passage and implementation of clean air and water legislation. This activism could not have been possible without the concern about pollution expressed by a dedicated membership. The message these members are still sending to the Club is "don't let up."

Those unfamiliar with the Sierra Club might be surprised to learn that "alternative energy sources/energy conservation" scored so high with a group of wilderness buffs. The issue ranks fifth as a personal concern and seventh as a priority members feel the Club should have, which reflects the realization that current energy-consumption patterns will promote the development and exploitation of nonrenewable resources and thereby threaten future environmental quality. In response to another question, one third of the members felt that "energy issues" need more effort on the part of the Club. Energy was also the third most popular issue Club members showed willingness to spend more time working on. Rather than wait for another energy crisis to make conservation necessary, 58% of the members indicated they "regularly or frequently made personal sacrifices to conserve energy." Attitudes about specific energy options will be explored later in more detail.

"Protection of wildlife in its natural habitat" is an issue synonymous with preservation of wilderness and natural areas. It ranks sixth and fifth respectively, as priorities chosen by members both for themselves and for the Club. When members were asked if "endangered species should be protected even at the expense of commercial activities," 81% said yes. It is especially important that the Club is also supported in this opinion by a strong majority (67%) of the public who were asked the same question. Public support of endangered species was unshaken by publicity over the snail darter's role in halting construction of the Tellico Dam.

Given the concern about protection of wildlife habitat, it fol-

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Illustration by Roger Bayless from THE DARK RANGE by David Rains Wallace. Published by Sierra Club Books

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Table 3. The Top Ten Environmental/Conservation Issues

Personally Very Important

1.	Wilderness preservation	67%
2.	Preserving natural areas	65%
	Air pollution	65%
	Water pollution	65%
5.	Alternative energy sources/energy conservation	60%
6.	Wildlife: animals and birds in their natural habitat	53%
	Toxic substances in food and drinking water	53%
8.	Animal protection	48%
9.	Population problems	47%
10.	Rational planning for the use of the nation's lands	46%

Should Be a High Priority for the Sierra Club

1.	Wilderness preservation	66%
2.	Preserving natural areas	65%
3.	Water pollution	63%
4.	Air pollution	62%
5.	Wildlife animals and birds in their natural habitat	59%
	Rational planning for the use of the nation's lands	59%
7.	Alternative energy sources/energy conservation	56%
8.	Toxic substances in food and drinking water	49%
9.	Animal protection	48%
10.	Population problems	43%

*Percentages are of those who checked these issues from a list of 23. Other issues on the list in order of personal importance were:

Noise pollution
Opposition to nuclear power
Alternative technology
Food supply
Urban environment
Runaway technology
No-growth society
International environment
Self-sufficient ecological communities
Shortage of mineral resources
Wildlife management for improved hunting and fishing
Control of recombinant DNA research

lows that members rank general protection of animals almost as high (48%). This regard suggests an attitude of sharing toward the earth and other life forms. Only 13% of Club members believe that "animals and plants exist primarily for the use of man." In concert with this feeling, when members were asked to rank a list of a dozen goals for this country in the next decade—protecting nature, crime prevention, a stable economy, economic growth, national defense, more jobs, halting inflation, progress toward a more humane society, and others—"protecting nature" and "progress toward a more humane society" topped the list.

Concern about controlling toxic substances is largely a health consideration; 53% of Club members listed it as a very important personal concern, tying it in sixth place with their wildlife interests. They ranked it slightly lower as a priority for the Club. A related concern involves carcinogens.

Eight out of ten members approved of a recent government ban on food dyes in hot dogs and cherries, dyes that are thought to be carcinogenic. By comparison, six people out of ten in the public survey approved of this government action.

At the root of modern environmental problems and resource shortages are the global dynamics of the population crisis. Nine out of ten members agreed that population growth is an important cause of environmental problems. Forty-seven percent of the members rated population problems as very important to them personally, while a slightly lower 43% indicated that population problems should be a Club priority.

It is interesting that concern about "food supply" ranks much lower than population problems and land-use planning—two issues closely related to the issue of food supply. It didn't make the top ten list; it was checked by only a third of the members as a very important personal interest. This low response coincides with a similar low level of interest in international problems. That the food supply problem may seem remote to many is understandable in this land of plenty, where the only hunger most of us ever experience is the self-induced kind inflicted as a method of weight loss.

Urban sprawl, loss of fertile farmland to suburban shopping centers, clearcutting of the nation's forests and extensive stripmining of western ranchland all testify to the need for rational land-use planning. Consistent with the members' high regard for preserving the nation's land is the goal of rational planning for its use. This proves to be the one issue that members rank significantly higher as a priority (59%—fifth position) for the Club than as a personal priority, where it ranks tenth. This difference in ranking may reflect a recognition of past Club efforts and achievements in resolving land-use problems (for example, Mineral King and Alaska) and a desire for the Club to play a role in circumventing future problems of this nature by helping to plan ahead for appropriate land-use designations.

These then are the top ten environmental/conservation issues as Club members view them. In general there is fairly close agreement between personal concerns and top priorities for the Club. The list is diverse and encompasses a wide range of issues, from classics such as wilderness preservation to relative newcomers such as energy.

Many members found the choice of issues difficult to make and wrote in the margins of the questionnaire that they were all important. If choosing between issues is difficult for individual members, it is no less difficult for the organization that represents them. The problem is often most acute when it comes to setting an agenda. There is always a concern about effectiveness if efforts become either too widely dispersed or too narrowly focused. Where does one draw the line between being too specialized or too broad-based in a democratic organization? The Sierra Club has been debating this matter for a number of years, as environmental issues have become increasingly complex and demanding. Some members would limit the agenda in order to concentrate effectiveness. Others prefer to deal with a wide range of issues, in an effort to approach environmental problems in a more holistic manner. Every member, of course, would like to see his or her pet issues receive the most attention. The question of whether or not the Club should become more involved in urban and international environmental problems presents a classic illustration of this dilemma.

Since 1972-73 the Sierra Club Board of Directors has made a conscious effort to include urban environmental issues on the agenda despite a lack of enthusiasm shown by some members of the Club. One might keep in mind that 44% of the Club's membership lives either in cities of 250,000 or more people or in suburbs of cities this size. The second-largest statewide Club membership is New York's. About a third of the Club's members view "modern cities as having problems but still the most exciting places to live." Roughly a third indicate an interest in urban environmental problems, and a slightly larger 39% say they should be a high priority for the Club. Large urban centers with their high population densities naturally account for the majority of voters in this country. How people who live in large

cities (many of whom may have had few outdoor experiences outside the city) view the environment and how they vote on preservation issues may well decide the future of the American environment. Can we afford not to consider their interests?

The same dilemma faces other important environmental issues that do not yet enjoy widespread popularity. The Sierra Club has maintained an international environmental program since 1971, and 25% of Club members felt that international problems were very important to them personally. A slightly larger percentage (37%), aware that the interconnected nature of most environmental, energy and population problems make them a global concern, would set international issues as a high priority for the Sierra Club. The words of a Sierra Club international activist are worth keeping in mind: "We could win the battles at home and lose the war."

The debate over the Sierra Club agenda will go on as long as the Club continues to change and diversify its orientation in an effort to confront an ever-expanding number of environmental problems. It's a healthy debate, though, and reflects a dynamic and thriving membership organization.

A Closer Look at Energy Issues

Petroleum, a nonrenewable resource, currently supplies about one-half of the U.S. energy demand. Even the most optimistic projections of domestic oil production do not assume that the supply will be able to keep up with our voracious energy appetites. This forces the U.S. into a position of dependency on insecure and sometimes temperamental foreign exporters for almost one-half of our oil supply and leaves us all driving down the road with the feeling that we are "running on empty." There are several paths we could take that would lead away from dependency on foreign oil imports. Probably the easiest, cheapest and fastest way to increase energy supply is through conservation. Other major options are coal, nuclear and solar energy.

Sierra Club members do *not* favor the nuclear alternative as the answer to the energy problem. Sixty-nine percent were "unfavorable" and 27% were "favorable" toward nuclear power plants in general. This is almost the total reverse of the general public's response in the RFF national survey, suggesting an understanding of the risks and diseconomies of nuclear power on the part of Club members that the rest of the public does not yet possess.

The Club members' opposition to nuclear power plants reflects the policy stance taken by the board of directors in January 1974 opposing construction of new nuclear power plants before solutions have been found to problems of storage of radioactive wastes, reactor safety, nuclear sabotage and terrorism, and the effects of radiation on public health. When members were asked to choose what policy should be adopted toward building new nuclear power plants and operating existing ones, 47% chose the option that reflects Club policy: "No more plants should be built until the problem of the storage of nuclear wastes is solved and improved safety features are developed, but present plants should be allowed to operate." Otherwise, there was a 21%-23% split between those who want no more new plants and also want existing ones taken out of use whether or not these problems are solved; and those who want new plants to be built, but only as a last resort to meet power requirements and only if extensive efforts are made to solve these problems. Only 7% said "more nuclear power plants should be built as needed," regardless of problems. Another question revealed that 75% are sympathetic with the anti-nuclear movement, a significantly higher proportion than the general public's 29%. The Club members' responses do not suggest a radical opposition to nuclear power, but a serious, thoughtful concern about the problems associated with nuclear power and the failure so far to find acceptable solutions.

If forced to choose between a coal and a nuclear power plant "in my area," twice as many Club members preferred coal (54%) to nuclear (26%). At least 19% refused to make this choice and said "don't know."

If the nuclear and coal power picture seems bleak, all is not despair. Three out of four members expressed a strong interest in solar power, with the remainder expressing "some or a little" interest. Of those with a serious interest in solar energy, 98% attribute their interest to the need for a renewable, inexhaustible, nonpolluting substitute for conventional fuels and a source of power for future generations. Solar power plays the lead role in Amory Lovins' "soft energy path" model for an alternative energy future; 81% of Club members would agree with the view that "the key to our problems is to develop 'alternative' or 'soft' technologies which are nonpolluting and low energy and resource consuming."

All in all, how do you feel about the quality of life in this country now as compared to ten years ago?

There is no clear consensus that the quality of life has either improved or worsened as far as both Club members and the general public are concerned. Opinion among Club members is evenly divided between those who feel it has "improved" (34%), "gotten worse" (33%) and "stayed the same" (33%). The public, by contrast, showed a slight tendency to feel that the quality of life has gotten worse (41%) rather than better (39%), while only 20% felt it had stayed the same. Perhaps Club members are more likely to note and appreciate the environmental gains that have been made in the last decade than are some Americans who are understanding the depth of the problem for the first time and therefore are inclined to be a bit more pessimistic.

What about the future of environmental quality?

In the long run, optimism wins over pessimism as a general attitude about the future of environmental quality.

- By a margin of 45% to 30%, members agreed that "many people are taking notice and becoming worried about our social and environmental problems. As a result, over the next 50 years we shall see a cleaner, better world."
- As a rule members tended to be more optimistic than pessimistic about life: 52% *disagreed* that "the lot of the average man is getting worse not better;" 36% agreed.

Analysis of these survey results reveals a membership that is seriously concerned about a variety of environmental/conservation and energy issues, interests shared to some degree by the American public. Sierra Club members exhibit a sincere belief in the Club's ability to take action on issues, to represent their views to government policymakers and to effect change and improvement.

It's a tall order, but it carries the conviction that victories will be achieved by the Club and will produce benefits not only for Club members and the general public, but also for future generations who have a right to a legacy of environmental quality. □

Kathryn Ann Utrup is a Research Associate with Resources for the Future.

Nongame Wildlife
Continued from page 13

Rural Electric Cooperative Association. Eventually the opposition of the last two was withdrawn when provisions of the bill were explained to them. But the anti-inflation opposition of the Carter Administration to new spending programs remained. A last-ditch effort for compromise was suggested by the Department of the Interior in the waning days of the 95th Congress; a scaled-down bill to provide only an incentive for states to start planning nongame programs. It failed to move at the end of Congress.

New bills will be introduced in 1979. They undoubtedly will be similar to the one that passed the Senate to authorize appropriations of general revenues. This method accurately reflects the fact that the public is responsible for all wildlife. It contrasts with an oft-proposed excise-tax approach that would, in effect, put the responsibility for wildlife on those whose purchases of outdoor equipment and wild birdseed would be taxed. The excise-tax approach is quite controversial. Though it has the backing of at least two powerful environmental groups—the Sierra Club and the National Wildlife Federation—other conservationists feel it is unfair. One irate birdwatcher wrote in a letter to the *High Country News*, "Why should those who protect and feed the birds now be penalized for their services?"

In the meantime, a number of states are moving to broaden their wildlife programs. New Jersey has several successful nongame programs, including restoration of blacknecked stilts and avocets to the state's breeding avifauna; provision of nesting poles for osprey; and reintroduction of peregrine falcons to the wild.

Alaska, Washington, Pennsylvania, Montana and Tennessee are appointing citizen nongame advisory councils to help develop programs. These are important steps that will facilitate the big leap over the funding hurdle as well as change the direction of the departments. The awakened wildlife constituency in various states can help persuade the legislatures to provide general funding for nongame programs. And it can insist that President Carter and the new Congress work together to enact a new federal funding program that will help the states. The wildlife constituency must also work closely with state wildlife agencies to transform the old game-oriented policies into a general wildlife policy.

Interest in nongame wildlife should not cause game programs to be diminished or their funds to be diverted. When advocating new funds for nongame, the California nongame committee stated, "Equity demands that the public's nongame wildlife be managed with public money." It should be emphasized that advocating support for nongame programs and public money to pay for them is not an anti-hunting position. Actually, these programs are neutral on hunting. Just as nongame animals benefit from present game programs that protect habitat, game animals will also benefit from many nongame programs. In fact, game animals are also nongame wildlife for part of the year, when hunting is closed. All who are interested in nature and the out-of-doors feel a gentle raise of the pulse when coming upon a deer or seeing migrating waterfowl. Shooting with a camera or aiming binoculars is satisfying to many people who don't distinguish between game and nongame species.

"Game" is a four-letter word that will be dropped when the sharp distinction between game and nongame animals ultimately fades away. Then regulated harvesting would be only one function of wildlife departments. Other functions would include: recovery programs for endangered and threatened species; systematic, periodic inventories of populations and mapping of biotic communities; establishing systems of reserves for unique natural areas and special habitats such as estuaries and riparian and vernal pools; making available wildlife viewing opportunities and environmental education programs that would be especially meaningful for urban residents; research; and monitoring of environmental alterations, forestry and agricultural practices with an eye to wildlife needs.

Wildlife is an essential component of nature and plays a key role in the energy-food cycle of each ecosystem. Its variety, habits and beauty add fascination to the human experience on earth. To many people there is satisfaction enough in just knowing that the diverse creatures are out there, even though we may not be able to see many of the elusive, secretive species.

The public and the environment will both benefit when the needs of all wildlife are incorporated into state wildlife programs. □

Maxine McCloskey has chaired the California Citizen Nongame Advisory Committee since its inception in 1975.

The Navy Ignores Environmental Factors in Its Plan for a New Ammunition Pier

DAVID T. LOTZ

GUAM

Robert Wenkam

Inarajan village, on Guam's south shore, typifies the attractions of the island.

GUAM, the westernmost possession of the United States, lies 6000 miles west of San Francisco but only 2100 miles from mainland China. This strategic location has made the island a prime choice for military bases. Currently there are six major U.S. Navy commands—two bases—on the island and one large U.S. Air Force base. During World War II, the island was the site of two battles and was also used as a springboard for B-29 raids on Japan in 1944 and 1945. In 1951, civilian rule came to the island after 53 years of military rule, but the military still dominates Guam's economy.

Guam, 212 square miles squeezed into a 30-mile-long by 4-to-9-mile-wide shape, includes a considerable variety of landforms. The northern half consists of a large rolling limestone plateau raised several hundred feet above sea level. The southern half is formed of volcanic mountains running down to the sea and surrounded by coral reefs.

Of present concern is the westernmost point of Guam and thus the westernmost point of the United States, Orote Peninsula. This peninsula forms the south shore of the only major harbor on Guam, Apra Harbor. The Navy has proposed building an ammunition pier at the tip of the peninsula on a large limestone block.

The U.S. Navy, along with the civilian government of Guam, has determined that the present ammunition pier at Hotel Wharf must be moved to a new location since it presents a potential hazard and blocks expansion of the commercial port of Guam. For several years the Navy has studied possible locations for the ammunition pier that can meet two conditions. First, the facility must accommodate deep-draft Navy vessels such as ammunition ships and modern attack-aircraft carriers. Second, the facility must be far enough from residences and businesses to minimize possible damage and deaths from explosions. More specifically, a facility such as Orote Point, designed to handle 9 million pounds of explosives at one time, must be located at least 10,400 feet from structures and as far as possible from people. Finding an area on the island with a radius of 10,400 feet that is free of people and structures is close to impossible. In 1968, the Navy chose Sella Bay for the ammunition pier. This choice and the subsequent land deal with the government of Guam proved very unpopular and were later ruled invalid by the courts. Sella Bay is surrounded by a wild area that has been proposed for a national park. In addition, Sella Bay is important to the tourist industry on Guam. Further, on an island that is already one-third military owned, the proposed acquisition of an additional 3720 acres by the military was not favorably received. The proposal, typical of military planning for Guam, reflected only military needs and goals and did not consider local civilian, political, economic or environmental interests.

This military attitude toward planning persists—no one has reevaluated the military situation in the western Pacific or the need for an ammunition pier on Guam. In fact, the facility is no longer needed. The present Hotel Wharf was used for unloading conventional bombs during the Vietnam War. The bombs were trucked from the wharf to Andersen Air Force Base and loaded onto B-52s to be dropped on Vietnam. At that time, ships were unloading ammunition around the clock, with as many as two ships waiting to unload. Today, the wharf is deserted and goes unused for months at a time.

Orote Point is the western tip of Orote Peninsula and part of Guam's naval station. The limestone peninsula rises 200 feet above the surrounding ocean and

reefs. Below the steep cliffs lies a natural area pristine compared with the surrounding areas of Apra Harbor. It lies at the base of the cliffs and consists of several sandy beaches, rocky headlands, several rocky islets, coral reefs and one large island, Orote Island, that rises 100 feet from the ocean. Steep sea cliffs and rugged limestone topography keep the island inaccessible, an excellent nesting area for birds such as the brown booby.

The Navy intends to construct the ammunition port's two 800-foot wharves here. One wharf will be built on the eastern half of Orote Island, which will then be linked by a causeway to Orote Peninsula. A breakwater will be built because the area is not protected by the existing Glass Breakwater of Apra Harbor.

This barrier will shelter 21 acres of reef flat that will be dredged for mooring purposes to some 45 feet below its present level. Twelve acres will then be filled in for breakwaters, seawalls, wharves and buildings. In addition, a service area on Orote Peninsula will be replaced by a building, a parking lot and an access road. In order to connect the service area with existing roads on top of the peninsula, a 1900-foot road will be constructed of fill on the coral reef and, by using extensive road cuts, will climb the steep cliffs of Orote Peninsula to the existing road.

The Draft Environmental Impact Statement (dEIS) addresses only this project. However, the statement makes perfectly clear that the entire project involves two stages in addition to the Orote Point pier. The second phase calls for creation of a 100-acre harbor basin at the northern end of Guam for barging ammunition to Andersen Air Force Base. The project would require removing more than 6 million cubic yards of hard material and, in some places, excavating some 90 feet of earth. This phase would also destroy one of the most scenic beaches in the Pacific, Tarague Beach.

The third phase would create a second entrance into Apra Harbor across Luminao Barrier Reef and the Glass Breakwater. This was proposed so that ships could enter the harbor while ammunition was being unloaded at the Orote Point site. Federal regulations prohibit ship movements within the blast zone during ammunition unloading. Since the ammunition pier is located adjacent to the harbor entrance, entry and exit to the harbor would be forbidden during operations. Thus a second entrance was planned. However, the civilian commercial port of Guam and the shipping lines that serve Guam have cautioned that a second entrance could not be navigated by commercial ships, as it would require making two 90° turns within a short distance while also passing through a 2000-foot-long and 60-foot-deep narrow channel into the harbor.

The total anticipated cost of the three-phase project is at least $73 million. This breaks down to $23 million for phase one, Orote Point ammunition pier; $40 million for phase two, Tarague Harbor; and $10 million for phase three, the second Apra Harbor entrance. All for a defense project that might never be used.

Unfortunately, the dEIS addresses only the first phase. This is contrary to recent court rulings that environmental impact statements must discuss entire projects. Moreover, the dEIS does not discuss the actual proposal for Orote Point. The transmittal letter with the dEIS says significant changes were made in the proposal after the dEIS was written, mostly with regard to moving the military wharf. The statement itself does not discuss or evaluate that segment of the project.

As is true in many cases, the dEIS was written after the project site was selected.

This is in violation of the Council on Environmental Quality regulation 40 CFR 1500.2(a) which states "As early as possible and in all cases prior to agency decision concerning recommendations or favorable reports . . . Federal agencies will . . . assess in detail the potential environmental impact." In reality, this dEIS is intended to support a decision already made, and alternatives are poorly discussed.

This project is not only in conflict with environmental concerns on Guam, but it will also impair the economic growth of the island, even though one of the anticipated benefits is the expansion of the commercial port. Guam is now trying to diversify its economy in order to reduce its dependence on the federal government and on the military. The program of economic diversification includes communications, agriculture, transshipment, an oil refinery, small assembly factories and tourism. Tourism has been the most spectacular leader, with a rapid increase from 1500 tourists in 1963 to 223,096 in 1976. Most of the visitors come from Japan; they come for the natural environment—the tropical vegetation and the scenic vistas. The commercial port of Guam recently completed a passenger terminal to handle the anticipated increase in cruise ships from Japan. Currently, cruise ships entering the harbor give their passengers a spectacular vista of Orote Peninsula and Orote Island with the surrounding reef, a scenic first glimpse of Guam. Replacing the view with an ammunition pier would surely give tourists a negative first impression.

The Bechtel Corporation, employed by the Guam Economic Development Authority, has stated that the Orote Point site is poor from the standpoint of shipping; the ammunition pier, once in operation, would force ships to wait outside the harbor until the ammunition is unloaded. This delay could cause increased shipping costs which would, of course, be passed on to the consumers of Guam.

Relocating the ammunition pier is intended to free other Navy-owned land for use by the commercial port. However, no commitment has been made for the fee-simple transfer of the land to the government of Guam. Large areas are vacant, but only vague mention of leases has been made.

Finally, there is a possibility that commercial fishing from Guam could become a large operation. Sport fishing is excellent offshore. One of the prime indicators of the location of tuna is the flocking behavior of the noddy terns. But the ammunition pier would destroy their only nesting area on Guam.

The dEIS was very badly written—possibly because it was drafted in Hawaii, 3700 miles away. Entire sections are inaccurate, and vital topics are ignored—such as the impact on recreation. The discussion of the effects on flora and fauna is hopelessly inadequate. The geologic impact of dredging 21 acres and filling 12 acres is summarily dismissed: "The proposed action will cause no significant geological disturbance." The geologic impact would, in fact, be extensive. Orote Island will be considerably altered, if not totally ruined. The beaches will be replaced by wharves. A small limestone cave will be destroyed. The road will create an extensive scar on the cliffs. A total of 33 acres of reef will be altered by dredging and filling, and 1900 feet of fill will be excavated for the roadway to be built on the reef. The reef flat at the project site varies from 100 to 300 feet in length and lies from one to three feet below the surface of the ocean. It supports a moderate growth of coral, which in turn supports a diverse population of tropical reef fish—especially between the mainland Orote Point and Orote Island. However, the destruction of the reef habitat is not limited to the 33 acres to be dredged and filled. An extensive but undetermined area will be adversely affected by sediments raised and transported by currents and by turbidity from the dredging operations. These sediments will be mostly calcium carbonate materials that would impair photosynthesis and, by deposition, kill coral and other marine organisms. Unfortunately, no current studies have been accomplished to accurately assess the damage.

Perhaps the worst aspect of the project would be the destruction of wildlife habitat. Consider the impact. In order to maintain a viable population of fruit bats, brown boobys and noddy terns on Guam, the nesting and roosting areas need to remain undisturbed by noise, air pollution, shock waves and other disruptions associated with construction. Orote Island is one of the few places where these species are found on Guam, and both the brown booby and fruit bat are in the process of being declared endangered species on the island.

The area has been a harbor for centuries, so it is not surprising that the project will affect historic features dating from the Spanish days of the 1700s to World War II. Remains of a Spanish well

are located on the site. Old "Spanish Steps" lead down the cliff to the proposed construction area.

Within the blast zone are several historic features that are included in (or merit inclusion within) the National Register of Historic Places, including the site of Fort Santiago, a fortification from Spanish days; pre-World War II American gun emplacements at Orote Point; and Orote Field, a pioneer Pacific airfield dating from 1922 that was used by both sides in World War II and was a battlefield during the liberation of Guam in July 1944.

Interestingly enough, a much more feasible site for the ammunition pier exists north of the harbor entrance at the end of the Glass Breakwater. Although it would also prevent entry of vessels into the harbor during unloading of ammunition and would require essentially the same blast zone, the Glass Breakwater site has numerous advantages. It is better protected from swell conditions of the Pacific Ocean. The area has already been extensively modified by human activity and the water is deep enough to eliminate the need for much blasting, dredging, and filling. The impact on marine and wildlife would be minimal; the project would be less of an eyesore there and the cost would be $20 million as compared to $23 million at the Orote Point site.

One year and seven months after release of the dEIS, the U.S. Navy and the Army Corps of Engineers held a public hearing about the proposed Orote Point ammunition pier. Business representatives at the November hearing cited the economic benefits that would result from constructing the pier, but government officials and private individuals opposed the project because of its anticipated effects on historic features and the environment. The project, opponents asserted, could be built faster and with less environmental damage at the end of the Glass Breakwater.

New and interesting information emerged at the hearing. Besides the rare birds found at Orote, the site contains rare plant and marine life. Also, the project's need for a considerable volume of water could cause a water shortage at the villages of Agat and Santa Rita.

Opposition to the project has centered around the group Save Orote's Beauty, which can be reached at P.O. Box 20721, Guam Main Facility, Guam, M.I. 96921. □

David T. Lotz is a resident of Guam and one of ten Sierra Club members there.

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Following the President's Lead

Alaska 1979

EDGAR WAYBURN

LAST December, President Jimmy Carter was hailed as "the greatest conservationist president since Theodore Roosevelt" when he established national monuments that totalled 56 million acres and directed Interior Secretary Cecil Andrus to use appropriate sections of the 1976 Federal Land Policy and Management Act (the BLM Organic Act) to designate an additional 40 million acres in national wildlife refuges on the federal national-interest lands in Alaska. This historic action saved the areas from reverting to classification as open public lands and extended the Congressional effort to preserve and protect them in perpetuity.

Canoeing at Wonder Lake, in McKinley National Park

As was expected, however, mining, oil and timber companies along with the State of Alaska are mounting an all-out campaign to revoke the President's national monument proclamations, to open the national interest lands to state and private appropriation and to legislate an across-the-board weakening of the public-land laws and policies that would govern Alaska conservation-system units. Private interest groups are again heavily financing high-powered lobbying and media programs. The State of Alaska has filed suit against the federal government, and Governor Jay Hammond has requested $2.5 million from the state legislature to lobby Congress.

Conservationists now face three major challenges for Alaska in the 96th Congress:

- to prevent basic inroads into the protection afforded Alaska's national-interest lands under national monument status;
- to insure the integrity of the wildlife refuges established by Secretary Andrus;
- to gain protection for an additional 18 million acres (not included in the new monuments and refuges) as national parks, wildlife refuges, wild and scenic rivers, and wilderness. The Arctic National Wildlife Range and portions of the Tongass National Forest are critically important and require wilderness protection.

As of this writing, action is gearing up rapidly in Congress. It centers on two strong bills and one bill considered totally inadequate by conservationists.

In the House, Representative Morris K. Udall (D-Arizona) and 132 cosponsors have introduced H.R. 39 (the same bill number as in the 95th Congress). This bill confirms the monuments proclaimed by the President and designates an additional 58 million acres as national wildlife refuges, national preserves, and wild and scenic rivers. It classifies as wilderness a total of 85.5 million acres. A similar bill, S. 222, has been introduced in the Senate; the eighteen cosponsors are Senators Durkin (D-New Hampshire), Roth (R-Delaware), Nelson (D-Wisconsin), Hollings (D-South Carolina), Kennedy (D-Massachusetts), Leahy (D-Vermont), Levin (D-Michigan), Hart (D-Colorado), Biden (D-Delaware), McGovern (D-South Dakota), Metzenbaum (D-Ohio), Pell (D-Rhode Island), Proxmire (D-Wisconsin), Ribicoff (D-Connecticut), Tsongas (D-Massachusetts), Baucus (D-Montana), Riegle (D-Michigan), and Cranston (D-California).

The third Alaska lands bill, S. 9, introduced by Senator Henry Jackson (D-Washington), is essentially last year's Energy and Natural Resources Committee bill. It draws conservation system boundaries throughout Alaska along arbitrary, fragmented lines rather than along the natural boundaries of resource regions and ecosystems followed in H.R. 39 and S. 222. Its inadequacies also include mandating oil exploration in the Arctic National Wildlife Range and reclassifying other wildlife refuges under the commodity-development oriented U.S. Forest Service and BLM.

Hearings on H.R. 39 were conducted in early February by the House Interior Committee and during the week of February 19 by the House Merchant Marine Committee. The Speaker has directed both committees to report the legislation by March 19 for action by the full House. Opponents of H.R. 39 plan to substitute a far weaker bill. Senate action is anticipated in April. The battle in both houses will be at least as great this year as last. Each passing year emphasizes the magnitude of the stakes. Please write and ask your representative and your senators to support the provisions of H.R. 39 and S. 222. □

Climbing Sweden's Highest Mountain

The Kebnekaise Jaunt

Illustration by Colleen Quinn

MARY DUTTON SMITH

IT'S NOT THAT Kebnekaise is so high or so difficult to climb, even though it is Sweden's highest mountain; it's just that the logistics of getting 55 people of various ages, abilities and nationalities up and down the mountain in one day made for a rather unusual experience! Especially for us, since we usually hike alone and at our own leisurely pace.

But not this time—far from it. Ben and I were in a group of 22 Americans on a Sierra Club trip to Sweden and Lapland; ten days of canoeing followed by ten days of hiking. Feeling thoroughly organized, we had arrived at Kebnekaise lodge in northern Lapland after a short day's hike from Nikkoluokta, at the end of the road, where the 80-mile trail began. Here also was the start of the mountain climb; we found the lodge full of restless hikers waiting for the weather to clear. No one had gone up for four days because of rain, snow or heavy clouds. We heard no English—we were the only Americans. There were Swedes, Danes, Germans, French, long-legged, tan, muscular, slim, patiently waiting, watching the weather.

At dinner that night a climb was announced for early the next morning, and six of our group signed up. The rest planned to explore a nearby glacier. Ross, our leader, came over to our table to ask if we were really serious about climbing, looking rather doubtfully at me. He explained that the Sierra Club had to pay a guide fee for each climber, and there would be no refunds. I hesitated, but Ben said yes, we would climb—no problem at all. Now, I thought, I'd *better* get to the top.

The next morning the sky was a brilliant blue. The peak of Kebnekaise glistened white in the distance. After breakfast, we hurriedly packed lunches and parkas and gathered in front of the lodge. More and more people arrived—experienced hikers, eager, *young*—wearing the familiar rubber boots seen everywhere in Sweden—some with knapsacks, a few with ropes. No one spoke English, except the six Americans; everyone was serious and talked softly, except the six Americans. When our guide appeared, he looked somewhat aghast at our numbers and promptly disappeared, returning with another guide to help with the crowd of more than 50 hikers. The usual size of a climbing group is eight to ten.

We started promptly at eight, over open, treeless slopes, winding up the long valley, and very soon the lodge was a small brown spot below us. Late wild flowers stood out here and there against the green tundra and low shrubs. Small streams crossed and recrossed our trail. Gradually we spread out along the hillside, each one at his own pace; it seemed to me that no one ever stopped or slowed down, even a little. Finally, after two miles without a pause, the guide stopped. It took several minutes for all of us to catch up. I was the last, trying not to appear completely out of breath.

"We make two groups," said the guide, "the slow and the fast." *Good*, I thought. "Fast is here." About 40 hikers joined him. I stayed right where I was, and slowly about ten others moved over, including three Sierra Clubbers. "O.K., we go. In five minutes, you come." Hurray, five whole minutes to rest.

The fast group moved off and were nearly out of sight above us when we started. Soon we were crossing and recrossing snow fields, digging in with our heels and not looking back—and not

going very slowly, either, I might add. Around noon we reached a steep cliff partly covered with fresh snow. Here four of the fast group had stopped and were coming back down the ridge. As they passed us they shook their heads, and one said, "Too steep, too much snow, too cold." Evidently strong hikers, they were not used to rock climbing or anything very steep. Our Sierra climbing had prepared us well.

We could hear voices high above us, but now the fast group was moving very slowly, and we heard the guide exhorting, persuading and scolding. The snow was slippery, the rocks icy, and there were too many hikers to help individually. We soon reached the same rocks; we found two or three fixed ropes but preferred to use our own hand and foot holds, though we wished there weren't quite so many climbers above and below us. It was disconcerting to see the man above me clinging desperately to the rock face as he searched for the next crack, and to feel a hand below me grab my boot as I was about to move up. We could only smile or grimace and wish we spoke more Swedish or Danish or German. Everyone was anxious to get beyond this stretch, and the guides seemed to be high above us; we felt very much on our own.

Finally we scrambled over a cornice of soft snow, and there was the peak about a thousand feet ahead, up a moderately steep snowfield. Clouds were beginning to close in on us. We put on gloves and parkas and went on as fast as we could. At one o'clock we were on top—I was the last one up—and our brief view was spectacular in all directions: Norway's rugged peaks on one side, and the lower ridges and mountains of Sweden sweeping away on the other. Then the clouds dropped over us, and the world was white again.

We jogged back down the snowfield to a small hut below the clouds, and there we sat, all 55 of us, smiling and shaking hands and savoring our Swedish lunch of rye crackers, liver paste, cheese, fish paste and chocolate—absolutely delicious! Then voices were raised, and we felt as well as heard a vehement discussion about how we would *not* go back the same route we had come up; several had been very frightened. The guide explained that the other way back was at least three miles longer, but a dozen climbers were adamant; it would be even more icy on the return trip. So we started down a rock-strewn slope, over several ridges, slipping and sliding as we went. Not once did those wearing the loose rubber boots lose their footing and they waded through the many small streams while we hopped from rock to rock.

It was a very long walk back; eight miles instead of five. But the air was clear and warm, the hills a soft green, and our legs were strong. It was nearly dusk before the lodge came into sight, and we hurried on, hoping some dinner was being saved for us. At eight o'clock I walked into the dining room, *not* the last one down (next to the last). I looked around for Ross, our leader, to assure him the Sierra Club had not spent its funds in vain on my climb. The four Swedes at the next table saw me coming, smiled, stood up and shook my hand. They were the ones who had turned back. But after all, they were in their seventies; I was only 61. It had been a beautiful day. □

Mary Dutton Smith has hiked and climbed in the Sierra Nevada since 1941. She is a Club member living in Murphys, California.

The Corps of Engineers Proposes Construction; The Club's Atlantic Chapter Proposes Reconsideration

New York City's Hudson River Project

SARAH OAKES and SAMUEL H. SAGE

BARELY A decade has passed since the Northeast had a drought so severe that it was estimated to occur only once every 400 years. Exceptionally low rainfall from 1961 to 1967 dropped the water levels in New York Metropolitan Area reservoirs to alarming levels, and 14 million of the Northeast's 50 million people had to restrict their use of water. New York City's massive supply system was put under unusual stress. Lacking adequate contingency plans, state and urban officials feared a crisis of unmanageable proportions and turned to Washington with pleas for relief. Out of this desperation for water resource planning, the Hudson River Project was conceived.

The U.S. Army Corps of Engineers was called upon to design a water-supply control project in 1965, when the federal legislature enacted the Northeastern United States Water Supply (NEWS) Study by Public Law 89-298. This new law directed the Corps to ". . . cooperate with Federal, State and local agencies in preparing plans . . . to meet the long-range water needs of the Northeastern United States . . ." These plans were authorized to provide for construction, operation and maintenance by the federal government of a system of major reservoirs, interbasin conveyances and purification equipment.

In this attempt to protect the northeastern metropolitan centers against future droughts, Congress broke with an important historical precedent. No longer would development or augmentation of water supplies for the Northeast be the sole province of local authorities antagonistic to all but their own needs. Through the NEWS Study, the federal government would provide a coordinated, general plan for water supply development in the Northeast. With the NEWS Study the Corps was to take the first steps toward regionalizing the highly fragmented and competitive supply systems that had evolved piecemeal as the Northeast developed. In other respects, however, the new law followed an only too familiar path: its wording and its funding provisions encouraged structural additions (construction of reservoir and conveyance systems) to expand the existing supply capacity and did not encourage nonstructural steps—conservation measures and leakage control—that could decrease demand.

Over the next twelve years, the Corps presented alternative plans for three "critical" areas where it believed there was an immediate need to develop water supply sources. For two of these areas, the Washington Metropolitan Area and the Eastern Massachusetts-Rhode Island Metropolitan Area, the Corps recommended actual construction of projects, as it was authorized to do under the 1965 law. For the New York Metropolitan Area, however, the Corps took the unusual step of recommending that Congress allocate at least $7 million for three to five years of further study of the Corps' plan, as well as authorizing the Hudson River Project itself. Environmentalists agree that the plan needs further study but balk at authorizing the project before study results are in (Congress is expected to consider the Corps' recommendation this year). The Corps' caution in requesting further study may result not only from the size and complexity of the proposed project but also from its controversial reception; many citizen groups are asking critical questions about the proposal. Even New York's Board of Water Supply, staffed by engineers predisposed to structural solutions, has been compelled to point out "fundamental flaws inherent in such a short-range Project."

In brief, the Hudson River Project is intended to meet a projected New York City water deficit of 400 million gallons per day by the year 2000. Reliance on the Hudson as a permanent supply source is not a new idea. But the idea has always been rejected, principally because of the river's long-polluted condition. Nevertheless, the Corps' proposed plan presumes the Hudson's suitability and entails the following major elements:

- A high-flow skimming project comprising an intake and raw-water pumping station on the west bank of the river some 85 miles upstream from the tip of Man-

Opposite: *The U.S. Army Corps of Engineers wants to divert Hudson River water to New York City from about 20 miles north of this site near West Point. New Yorkers are concerned that adequate pollution-treatment technology has not been planned.*

Photograph by Ed Cooper

hattan. This would divert Hudson River water into the city's reservoirs when they reach predetermined low water levels and when the river flow is high enough to be used for supplemental supplies;

- A 14-mile pressure tunnel, 17 feet in diameter, to divert the water to a proposed water treatment plant at Modena, in Ulster County;
- A 53-mile-long deep-rock gravity tunnel, 16 feet in diameter, to the city's main storage reservoir;
- Conveyance facilities constructed below the storage reservoir. These facilities entail completion of Stages 1, 2 and 3 of the city's third distribution tunnel (City Tunnel No. 3);
- A pipeline linking the water systems of New York City and Nassau County, Long Island.

Total construction costs of the project, in 1976 dollars, are estimated to be $3.70 billion. The average annual cost of debt service (assuming a federal 50-year, low-interest loan for construction), together with operation, maintenance and replacement costs, would amount to $365 million per year, also in 1976 dollars. (The Corps is recommending that New York City reimburse the federal government for all costs of advance planning, design and construction of the project in accordance with the amended provisions of the Water Supply Act of 1958.)

The high-flow skimming project, first proposed by a mayoral committee years ago, became the Corps' preferred plan by mid-1975 after intense political opposition on Long Island blocked the major alternative, a "Long Island Exchange" project. Under the "exchange," New York City would have supplied upstate water to Long Island in years of normal rainfall, allowing Long Island's aquifers to recharge, and Long Island would supply groundwater to the city in years of drought.

The Ad Hoc Committee on Water Supply, including the Sierra Club Atlantic Chapter and 26 other groups, was formed in early 1978 out of concern for the misplaced priorities and misallocation of funds entailed in the Hudson River Project. The committee maintains that:

- There is an urgent need for further analysis of the New York Metropolitan Area's water supply needs and of alternatives for meeting them, beyond the work done by the Corps in the NEWS Study;
- The needs of supply systems already in place should have the highest priority for funding. These include completion of Stage 1 of City Tunnel No. 3 and immediate attention to problems in later stages of that project;
- The high-flow skimming project should be dropped from consideration until the need for new regional supplies has been more clearly established, until other alternatives have been more fully explored and until effective treatment for the many toxic agents known to permeate the Hudson is proven and available.

The committee has presented its views at hearings of state and federal legislative committees, in correspondence with the Secretary of the Army and at meetings with federal, state and city environmental officials, the Corps and the regional administrator of the Environmental Protection Agency. Construction union leaders have backed the committee's views. Individual groups are also taking action on their own, including preparing for legal action.

The many deficiencies of the NEWS Study and the proposed Hudson River Project point toward larger questions of national water-resource planning. We need a national policy that allows federal funding of water projects only when they include water conservation measures and only when the projects are preceded by full assessment of each possible way of providing the needed water. Assessment of the Hudson River Project should examine at least the following: the degree of risk to be considered acceptable in drinking Hudson River water; the use of reservoir reserves in drought planning; the cost of projected shortages compared to the cost of structural means to avoid them; management of demand by varying user charges; the reasonableness of population projections; and the availability of ground water.

National water-resource planning, as it is practiced today, ignores consideration of conservation measures; President Carter's water policy is a step forward for the nation because it addresses some of these issues. The Atlantic Chapter's involvement with the Hudson River Project has led it to recognize the need for a water policy that addresses the particular requirements of older urban systems as well as the frequently debated claims in the West. We hope other chapters will join the dialogue on national water policy. □

Sarah Oakes lives in New York City and works on toxic substances and water issues in the Hudson Valley. Sam Sage chairs the Atlantic Chapter and cochairs the Club's Water Quality Task Force.

A Quiz

How Much Do You Know About Energy?

KEITH KLINE

EARTH DAY was first celebrated in 1970, nearly a decade ago. At that time, energy issues were unfamiliar and were the province of a few specialized experts. The oil embargo by Arab nations in 1973 changed the situation dramatically and permanently. Since then, energy policy has become increasingly important to consumers, politicians, industrialists, environmentalists—to everyone, in fact. Today there is widespread discussion of such complex topics as nuclear economics, reactor safety, gas pricing, power-plant siting, LNG imports and so on, but some of the more basic information about energy remains widely unappreciated.

How much do you know about energy? Take this quiz, and check your answers with those on pages 33 to 35.

1. Which of the following fuel resources is in the greatest danger of exhaustion?

(a) coal (c) natural gas
(b) petroleum (d) hydropower

2. What fraction of the world's energy does the U.S. consume?

(a) one tenth (c) one third
(b) one fifth (d) one half

3. How much of the energy consumed in the U.S. comes from oil and gas?

(a) 30% (c) 75%
(b) 50% (d) 90%

4. Energy is often measured in "quads." One quad (Q) is equivalent to:

(a) 10^{15} British Thermal Units (BTU)
(b) 4000 megawatts
(c) the heat generated by four days of Congressional debate.
(d) 4 billion gallons of oil

5. How much energy did the U.S. consume in 1977?

(a) 40 quads (6880 million barrels of oil (Mbbl) equivalent)
(b) 62 quads (10,664 Mbbl)
(c) 76 quads (13,072 Mbbl)
(d) 100 quads (17,200 Mbbl)

6. Throughout much of U.S. history, energy was cheap, plentiful and taken for granted. During the Industrial Revolution, energy was rarely a "factor of production" and was used whenever possible to replace costly human labor or scarce mineral resources. In what year did U.S. production of oil begin to decline, making the limits of primary energy resources a leading national issue?

(a) 1960 (c) 1973
(b) 1970 (d) 1976

7. How much did the U.S. spend on foreign oil imports in 1977, when the U.S. balance-of-trade deficit was $29 billion?

(a) $800 million (c) $20 billion
(b) $2 billion (d) $45 billion

8. How much did domestic demand for petroleum products increase between 1976 and 1977? (Mbbl/d = millions of barrels of oil per day; one bbl = 44 gallons of crude oil.)

(a) 1 Mbbl/d (c) 10 Mbbl/d
(b) 2 Mbbl/d (d) 20 Mbbl/d

9. Estimates of oil reserves and other energy resources often change dramatically. What country recently revised its oil reserve estimates upwards by nearly 30-fold, sparking a great U.S. interest in trade and production agreements?

(a) Mexico (c) Canada
(b) United Kingdom (d) China

10. According to a study by the President's Council on Environmental Quality (CEQ), how much of our present energy use is needlessly wasted?

(a) 10% (c) 40%
(b) 25% (d) 70%

11. Electricity has been praised for its adaptability to nearly any use and for its ease of transmission. What percent of energy used in the production of electricity actually reaches the consumer after electrical generation and transmission?

(a) 29% (c) 69%
(b) 49% (d) 89%

12. Rank the following economic sectors in order of decreasing energy use:

(a) residential (c) commercial
(b) industrial (d) transportation

13. How much of the energy used in gas stoves supplies the pilot lights?

(a) 1% (c) 25%
(b) 10% (d) 50%

14. On the average, how much of the electricity used in homes goes to lighting?

(a) 6% (c) 16%
(b) 10% (d) 25%

15. One 40-watt fluorescent light gives the same amount of light as:
(a) one 40-watt incandescent bulb
(b) one 60-watt incandescent bulb
(c) two 60-watt incandescent bulbs
(d) three 60-watt incandescent bulbs

16. How much of the energy stored in crude petroleum is lost between the oil well and a moving car?
(a) 20% (c) 61%
(b) 42% (d) 94%

17. Which of the following do most experts consider forms of solar energy?
(a) oil shale
(b) ocean temperature gradients
(c) direct sunlight
(d) tar sands
(e) falling water (hydroelectric power)
(f) plant materials (biomass)
(g) geothermal energy
(h) wind
(i) nuclear fission
(j) coal

18. How much of the total U.S. energy is currently supplied by solar power?
(a) 1% (c) 12%
(b) 5% (d) 20%

19. According to an April 1978 CEQ study, what percentage of our total energy needs could be met by solar technology by the year 2000?
(a) 5% (c) 15%
(b) 10% (d) 25%
By the year 2020?
(a) 10% (c) 40%
(b) 20% (d) 60%

20. Match the following programs with the percentages allocated to them from the 1978 Department of Energy budget authorization.

conservation	2%
geothermal	6%
fossil fuels	5%
nuclear	7%
solar	14%
other (administration, environmental safety, etc.)	66%

21. As of January 1979 how many nuclear power plants in the U.S. had operating licenses?
(a) 41 (c) 72
(b) 60 (d) 92

22. How much of the total U.S. electric generating capacity was supplied by nuclear power plants in 1978?
(a) 1% (c) 12%
(b) 7% (d) 16%

23. Since 1918, the federal government has subsidized the following energy sources with approximately $130 billion. Match the energy source with the amount

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of government subsidy (in billions of dollars).

coal	6.5
hydroelectric	13.3
oil	77.2
natural gas	15.1
nuclear	16.2

Energy Quiz Answers

1. (c) Natural gas reserves in the U.S. are expected to be exhausted in approximately 40 years. Petroleum should last a century; coal, 500 years or so. Hydroelectric power is a renewable resource, although the number of sites is limited.

2. (c) With only 6% of the world's population, the U.S. consumes more than 33% of the energy consumed world-wide and about the same percentage of the world's oil.

3. (c) About three fourths of the energy consumed in the U.S. is in the form of oil and gas—the resources that must be conserved the most because they are in shortest supply.

4. (a) One Q = a quadrillion (10^{15}) BTU—the energy equivalent of 172 million barrels of oil (Mbbl).

5. (c) Total U.S. consumption in 1977 was 76Q, the energy equivalent of 572 billion gallons of oil. Total U.S. energy demand for the year 2000 has been variously estimated to be as low as 80Q and as high as 120Q—depending on the assumptions made about prices and conservation. For the year 2020, energy demand has been estimated to be as low as 70Q or as high as 140Q, again depending on which assumptions are made.

6. (b) U.S. oil production began to decline in 1970, and domestic natural-gas production peaked in 1972. U.S. oil and gas production increased modestly in 1977, for the first time in more than five years, due to new oil from Alaska's North Slope, offshore drilling for natural gas and a rise in oil prices that made many smaller oil and gas deposits economically exploitable. In 1920 the director of the U.S. Geological Survey, certain we were on the verge of an energy crisis, declared "The position of the United States in regard to oil can best be characterized as precarious. Americans will have to depend on foreign sources or use less oil, or perhaps both." An oil glut

similar to the one that hit the U.S. in the summer of 1978 followed the gloomy forecasts of 1920.

7. (d) The U.S. imported 8.7 million barrels of oil per day (Mbbl/d) in 1977 at a cost of $45 billion. Imports have steadily increased from 1.8 Mbbl/d (costing $1.5 billion in 1960) to 3.4 Mbbl/d (costing $3 billion in 1970) to the present.

8. (a) Domestic demand was 18.4 Mbbl/d in 1977, compared to 17.4 in 1976. Demand was 17.3 Mbbl/d in 1973, and fell to 16.7 and 16.3 Mbbl/d in 1974 and 1975, respectively, when conservation was induced by sharp OPEC price increases. OPEC oil prices have declined in real terms since 1973; price increases have not kept pace with inflation, and demand has once again increased.

9. (a) Seven years ago, oil reserves of Mexico were estimated to be 3.6 billion barrels. Now Mexico is ranked with Iraq in the range of 100 billion barrels—possibly second only to Saudi Arabia. The U.S. is very interested in Mexico's oil, which could reduce our dependence on oil from the Middle East. The 100-billion-barrel estimate is privately accepted by DOE, but it is an estimate rather than a statement of proven reserves.

10. (c) The CEQ and other government agencies have estimated we needlessly waste about 40% of the energy we use at present.

11. (a) Only 29% of the energy used by utilities and electric-generating plants actually gets distributed to consumers. In 1976 electrical generation and transmission used 20.7Q, yet only 5.9Q was distributed as electricity. 71% of the energy was lost in the generation and transmission process.

12. (b, d, a, c) The industrial sector uses 37%; transportation, 26%; residential, 21% and commercial, 16%.

13. (d) Nearly half the gas used in a gas stove fuels the pilot lights (41% in ovens, and 53% in top burners) because pilot lights burn continuously.

14. (c) More than 16% of residential electricity is used for lighting, and most American homes are overlit most of the time. In five hours, six 100-watt bulbs consume 10,230 BTU, equivalent to the energy content of about a pound of coal or one-half pint of oil (1kW = 1000 watts = 3413 BTU/hr.).

15. (d) Fluorescent lights give off three to four times as much light per watt as do incandescent lamps. One 40-watt fluorescent light gives more light than *three* average 60-watt incandescent bulbs.

16. (d) Approximately 94% of the energy in crude petroleum is lost by the time it makes an automobile move. Each step, from the production of crude oil to the rolling car, loses a certain percentage of energy (thus, a process that is 75% efficient loses 25% of its original energy). The efficiencies at the most important steps where energy is lost are:

producing crude oil	96%
refining	87%
gasoline transport	97%
engine thermal efficiency	29%
engine mechanical efficiency	71%
rolling efficiency	30%

The total efficiency of the system, determined by combining these six factors, is only about 6%.

17. (b, c, e, f, h) Energy is derived from the sun in many ways. Solar radiation interacts with the atmosphere first, and then with everything on the earth's surface: water, land and vegetation. Photosynthesis converts this radiant energy into the potential energy of organic substances—thus, the potential energy in biomass (wood, food, etc.) is a form of solar energy.

The earth does not uniformly absorb the heat of the sun, and the atmosphere is warmer in some places than in others. The differences in air temperature create air movement. Wind is, therefore, also a form of solar energy.

As surface waters absorb solar energy they are heated, and some water evaporates. The vapor is carried upward by solar-heated air, which eventually loses heat, causing the vapor to condense, forming clouds. Finally, rain forms and falls back to earth. The kinetic energy in falling water is also a form of solar energy, often concentrated in a stream or river, where it can be used by a hydroelectric plant.

The sun also heats the top layers of the ocean more than the bottom layers, creating thermal gradients in the water, yet another form of potential solar energy.

Solar energy is renewable—as long as the sun shines and water and plants exist. Fossil fuels such as coal, oil and gas are not renewable and are not considered forms of solar energy. Although the sun supplied the energy to produce the original biomass from which these fuels are derived, they were transformed through ages of geologic processes before becoming "fossil fuels." Geothermal and nuclear power, like fossil fuels, are finite, nonsolar energy resources.

18. (b) The U.S. presently derives 4Q, nearly 5% of its energy, from solar sources, most of it from hydroelectric facilities.

19. (d, d)The CEQ estimates that with a strong commitment to solar power and to conservation, the U.S. could supply 25% of its energy needs with solar power in 2000, and solar power could provide significantly more than half our energy by the year 2020.

20. The Department of Energy's 1978 budget authorization was more than $6 billion. Of that amount, nuclear activities received more than $4 billion, or 66%; fossil fuels received $856 million, or 14%; solar energy received only $394 million, or 7%; conservation, $366 million, or 6%; other (environmental safety, program planning and management, etc.), $343 million, or 5% and geothermal power $112 million, or 2%.

21. (c) To these plants, add 93 under construction and 52 nuclear plants on order, for a total of 206. In the first half of 1978, 27 nuclear plants were deferred or cancelled, and none were ordered. In the period from 1974 to mid-1977, 29 units were cancelled and more than 200 deferred. Enthusiasm among utilities for nuclear power has waned constantly since 1973, when 41 plants were ordered; 26 were ordered in 1974; 4 in 1975; 3 in 1976 and 4 in 1977.

22. (c) Nuclear power supplied 12.2% of U.S. electric generating capacity in 1978. Bear in mind that electricity makes up only around 10% of the nation's end-use energy supply.

23. A March 1978 study done for DOE by Battelle Laboratory examined federal government incentives to energy industries. The oil industry received the most, approximately $77.2 billion, much of which was in depletion allowances. The nuclear industry got about $16.2 billion, but this figure did not take into account such government subsidies as uranium enrichment activities and the Price-Anderson Act. Natural gas was subsidized for about $15.1 billion; hydroelectric, $13.3 billion and coal, $6.5 billion. Solar energy and "alternative energy" sources have received so little government support that they were considered insignificant in terms of federal subsidy. □

Keith Kline has worked on nuclear and solar power issues in the Club's Washington, D.C., office and now studies natural resources and public policy at the University of Michigan.

An Evening on Stephens Passage

This Tangled Brilliance

DAVID RAINS WALLACE

Summer sunsets last much of the night on the fjords of southeastern Alaska. The sun does not stay up all night, as it does above the Arctic Circle, but darkness is very late in descending.

A little shoreline meadow on Stephens Passage glowed in the slanting sunlight of a late afternoon in July. The wet climate and long days had packed the slope between the salt water of the passage and the trees of Tongass National Forest with oversized cow parsnips, dandelions and ferns. Pale paintbrush, a wildflower whose greenish-yellow bracts are barely tinged with the scarlet of its mountain relatives, grew several feet tall. The dark purple blossoms of Indian rice (so called for the masses of small, edible tubers at its roots) stood out like dark stars against this tangled brilliance.

The shade of the forest's Sitka spruce, western hemlock and alder seemed very dark in contrast to the meadow, but there were flowers there too—orderly beds of white clintonia and spiky devil's club. A small porcupine was climbing one of the alders. When it reached a height to its liking, it pulled a leafy branch to its mouth with its forepaws. The hairs on its forehead drooped and nodded as it munched the leaves. Its footprints in the soft earth at the base of the tree resembled a human baby's.

The meadow was rich in odors as the afternoon breezes stirred the air. The forest exhaled dim odors of mold and spruce gum that mingled with spicy meadow herb fragrances and fishy, rocky smells from the shore. The tide was out, and the sea smells were accentuated by piles of damp seaweed and the decomposing remains of a harbor seal.

The meadow overlooked a small cove, a crescent of sand and granite boulders overgrown with rockweed and red algae. Both ends of the crescent were walled with steeply upended rock strata from which the tides had eroded the boulders. Little tidepools lay in the crevices—reminders that the sea had released the rocks only temporarily. Shore crabs with neat, white leg-joints sidled about in the pools, and tiny yellow blennies—fish especially adapted to life in tidepools—hid in the rockweed. They were slender as eels and so well camouflaged that only their movements revealed them.

Another species of blenny that lived in the tidepools had evolved a very different camouflage strategy. They resembled the members of a large mussel colony, being exactly the right dark blue color when they lay in the shadows of the colony (although they were light green in sunlight), and having on their bodies blotches of bone white that perfectly mimicked the barnacles growing on the mussels. They are aggressive fish, chasing their companions about their small niche and rising to the surface at every falling speck. Soon they would have to retire deeper into the mussel beds, however; the tide was beginning to come in, bringing larger predators.

The tide came in gently because the cove was screened from the open Pacific by the massive bulk of Admiralty Island, visible a few miles across Stephens Passage. As the tide slowly rose in the cove, the snow cornices on Admiralty's distant peaks became tinged with orange. The island became a backdrop for a crowded stage as dozens of shoreline creatures came out for the evening feeding period.

A flock of gulls circled above a school of fish, and a bald eagle flew past them toward its nest in a spruce just north of the cove. The eagle whistled and chattered like an overgrown songbird as it wheeled about the untidy platform of sticks built halfway up the tree. Just off the cove a guillemot in black and white summer plumage stretched its wings, then dove underwater. Two gray-headed arctic loons sat placidly on the surface.

A humpback whale spouted in the deep water. The sound of its exhalation reached the cove several seconds after the white spume and dark back had subsided into the quiet water. The little guillemot surfaced. Gull cries drifted across the water. On the shore, a strangely bedraggled red squirrel ran along one of the big drift logs that separated the meadow from the beach. It passed this way most evenings. When it reached the end of the

log, it followed a well-beaten trail back into the trees.

The light on the meadow and its surrounding trees grew intense as the sun sank toward the Admiralty peaks. A blue-needled spruce sapling seemed to crackle with electricity at the top of the meadow. The granite boulders on the shore took on an orange glow, and the snowfields on Admiralty began to turn pink. A raven croaked in the trees.

Three whales surfaced in quick succession. One of them held its flukes in the air for a long moment before sliding ponderously out of sight. The gull flock had drifted westward, and two eagles appeared to prowl along its edges. One of the eagles swooped and stole a fish from a gull, then fled in the direction of the nest north of the cove. Three gulls pursued a little way, screeching in annoyance, then gave up and flew eastward over the meadow. There was a rocky inlet in that direction where tired gulls could rest.

The gentle rise of the tide had been accelerating, and all at once the rockweed that had been drying in the sun was waving underwater. At the same time, the sun began to leave the cove. The light weakened and faded first on the sand and granite, then on the meadow. It lingered on the trees, though, and clouds of excited midges danced in its brilliance. The air grew cooler, and a breeze arose to ruffle the newly risen water. It carried a salty smell deep into the trees.

There was an abrupt fading of the light. Shadows crept to the treetops in a few minutes. The sun had set on the cove, although it still shone full on the mountains of the Glass Peninsula of Admiralty Island. The circling gulls appeared black against the illuminated peaks. The bald eagle that remained was distinguishable from the gulls by its longer, slower-moving wings.

The breeze died down, and the water of Stephens Passage became very smooth, mirroring the orange of the sky and the silver of the peaks. Sounds were emphatic in the stillness. A squirrel scolded in the trees. A fish jumped, then jumped again. A boat passed along the shore, heading north to Juneau. After it was out of sight, its wake splashed into the cove, tossing tufts of salt rush that grew at the water's edge. Even the rustle of a vole running through the meadow seemed loud. It was getting chilly, and no insect calls masked the other sounds.

The bald eagle left the gull flock and headed for the nest. Larger size and harsher cries identified it as the female of the pair. The chatter of the circling gulls sounded clearly over a mile of water. Two ravens flew over the cove, calling softly to one another. Their calls were so precisely enunciated and inflected that they might have been conversing.

"Kah. Koo-ah pah."

"Kapa. Koo-ra ka."

The shadows reached timberline on the Admiralty peaks, intensifying the contrast of forest and snowfield. The sky was red at the horizon, and the water paled from silver to platinum. The darkening had slowed considerably, however, and the rosy light stayed on the mountaintops a long time. Small clouds appeared, also rose-colored, and drifted eastward above the peaks.

Ed Cooper

Daylight fades in the Tongass National Forest, near Stephens Passage.

A whale reared its bulk halfway out of the passage, making an explosive sound as it toppled back into the quiet water.

"Whump!"

The harsh cry of the female eagle came from the nest. The male eagle was flying over the cove at that moment, and he turned his head to glance back at his mate before veering across the water toward the gulls. A pair of guillemots fluttered along the shore and landed in the cove. The dove-sized, penguinlike birds rested on the water for a moment, ducking their heads with quick, rhythmic movements as though to make sure their feathers were fully waterproofed. Then they dived underwater in search of fish.

Colors shifted again as the light faded from the highest peaks. The little clouds on the horizon darkened to purple, the mountains to blue, and the water reflected them to green. For a moment, a jet climbing from Juneau caught the sunlight, and it left an indigo vapor trail across the sky. Away from the green land shadows, the passage waters glowed a very faint orange.

The final descent of the sun affected the gulls. They stopped fishing and began to circle upward in a column that soon rose high above the peaks. The male eagle remained among them, which seemed a not-altogether intelligent thing to do since there were no more fish to steal. Gulls swooped at him from time to time, but he merely ducked away. Perhaps he simply enjoyed being part of the ascending throng.

Suddenly the entire southwestern sky turned bright coral except for the dark seam of the jet vapor trail. Two swallows

flitted past the cove, and one of the guillemots rose from the water and flew after them. The white of the guillemots' wings was still discernible, but the trees around the cove and the outline of the distant mountains were becoming vague. The pink sky faded to dull violet as suddenly as it had flared up.

The breeze came up again, raising leaden swells along the shoreline of the cove. A mink emerged from the forest and loped down to the water's edge, making tiny scampering sounds on the sand, driftwood and stones as it hurried along. It didn't pause to look about or even sniff the ground. Like the red squirrel, the mink had a habit of passing this way at a certain time of evening. It followed the same well-beaten trail back into the forest. It was a diminutive predator, hardly larger than the squirrel.

The alder trees tossed in the breeze, but the spruces and hemlocks only stirred stiffly and sighed. Grunts and crunching sounds from one alder indicated that the small porcupine was still feeding, oblivious of the gathering darkness. Darkness was welcome to the deer mice that lived in the forest; the meadow's edge resounded with patterings and bumps as they emerged to look for seeds and berries.

A buoy lit up across the passage. The water was dim and gray now, a gulf broken only occasionally by the fluke of a spouting whale. The whales' ponderous breathing sounded close in the dimness, as though the great animals were rising just outside the cove.

The tide was in. It covered the sand beach completely, and its wavelets lapped at the driftwood logs. The sloping garden of wildflowers was a vague, greenish mass beneath the black of the trees. Some buzzing creature, sphinx moth or hummingbird, paused above a lacy cow-parsnip umbel for a moment.

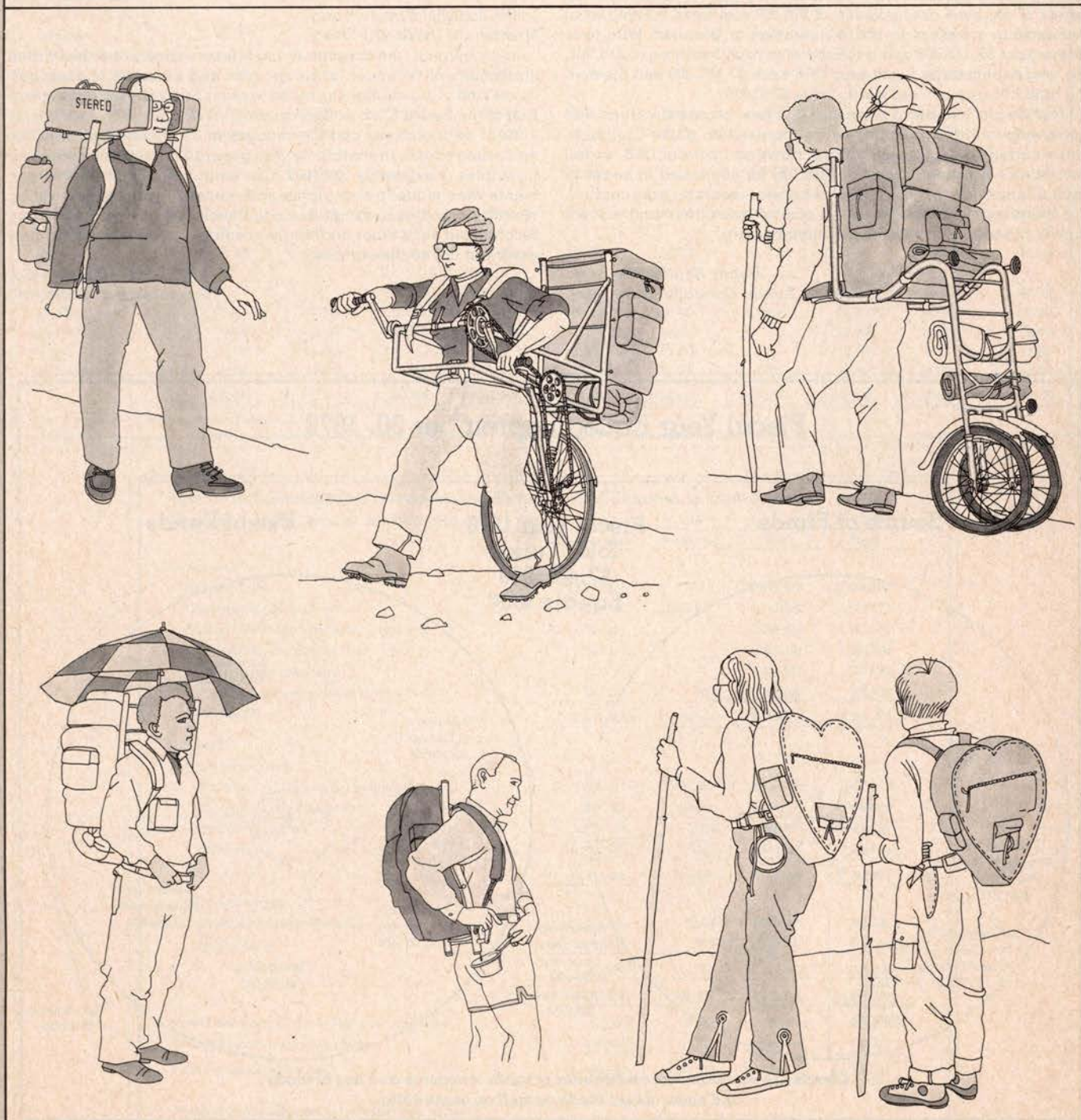
The seam of the vapor trail was reversed—a pale streak against the dark sky. Directly above the cove, the first small star began to shine. It was past midnight. □

David Rains Wallace has written many articles on wildlife and is author of the Sierra Club book, The Dark Range.

Even More Backpacks
A Cartoon Fantasy

STEVEN M. JOHNSON

Just in time for spring backpacking, here's a third set of whimsical inventions in our series by cartoonist Steve Johnson.



Sierra Club Financial Report

To Members of the Sierra Club

The fiscal year ended September 30, 1978 saw the Club have an excess of expense over revenue of $16,901 and have a leveling in membership growth with 178,144 members at year-end. With total revenues of $7,415,308 and a reduction in fund balances of $16,901, the total expenses for fiscal year 1978 were $7,432,209 and the ending fund balance, or "net worth," was $740,010.

Over the last four fiscal years the Club has increased its fund balances substantially, thus improving the position of the Club to finance current and future operations. However, in fiscal 1978, we fell short of our budgeted target of $245,000 for continued increase in capital funds due to a near breakeven year resulting from continuing inflationary pressures on our cost of operations and no real growth in sources of revenue and membership.

Denny Shaffer, Treasurer
Allen E. Smith, Controller/Asst. Treas.

Report of Independent Accountants

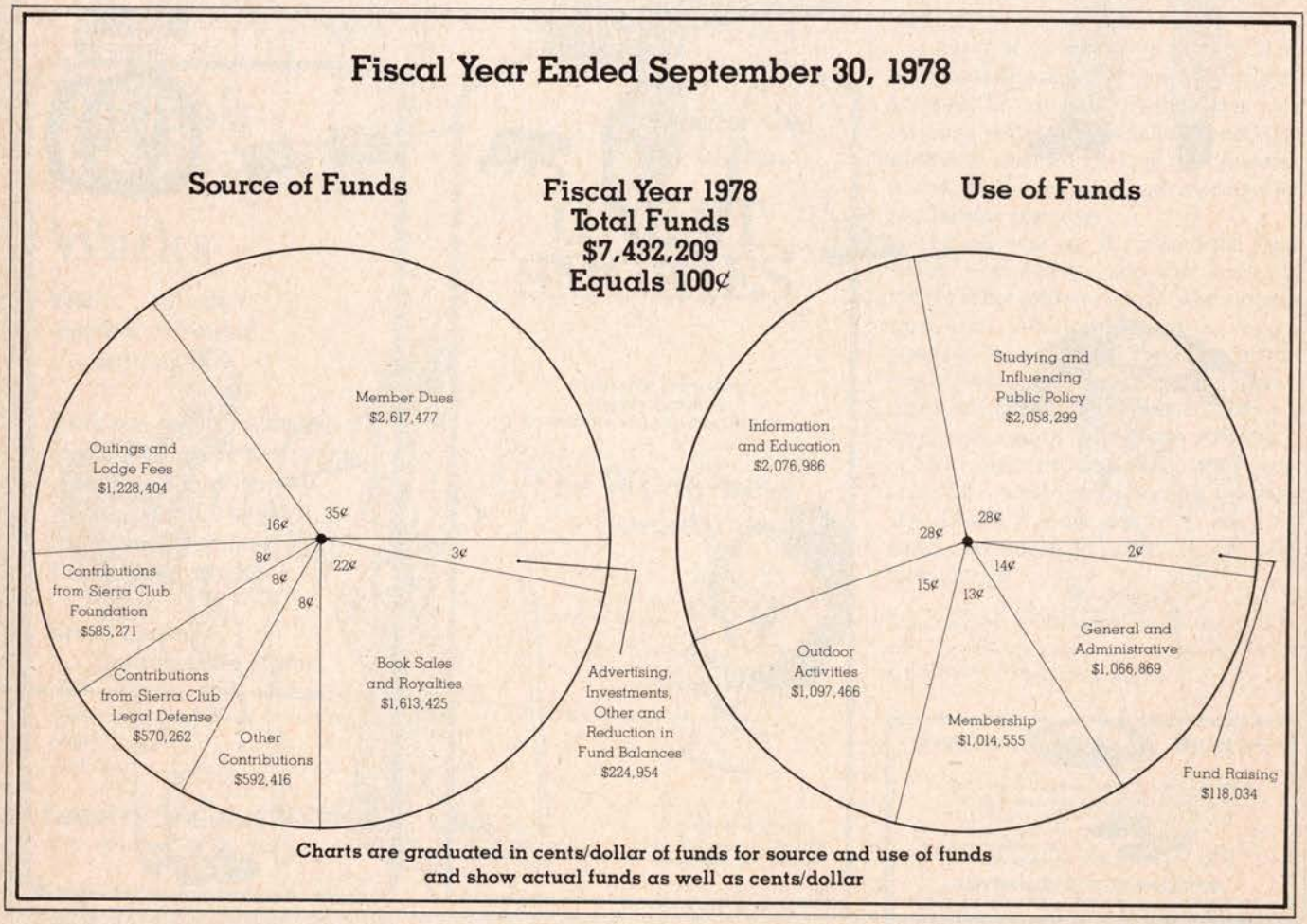
December 5, 1978

To the Board of Directors and
Members of the Sierra Club

In our opinion, the accompanying balance sheets and the related statements of revenues and expenses and changes in fund balances and of functional expenses present fairly the financial position of the Sierra Club at September 30, 1978 and 1977, and the results of its operations and the changes in its fund balances for the years then ended, in conformity with generally accepted accounting principles consistently applied. Our examinations of these statements were made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Price Waterhouse & Co.
San Francisco, California

Fiscal Year Ended September 30, 1978



Charts are graduated in cents/dollar of funds for source and use of funds and show actual funds as well as cents/dollar

Sierra Club Statement of Functional Expenses *Years ended September 30, 1978 and 1977*

	Program services					Support services				
	Studying and influencing public policy	Information and education	Outdoor activities	Membership	Total	General and administrative	Fund raising	Total	Total expenses 1978	Total expenses 1977
Salaries and employee benefits	$ 846,341	$ 302,222	$ 128,338	$ 157,683	$1,434,584	$ 501,075	$ 51,004	$ 552,079	$1,986,663	$1,815,046
Outside contract services	69,385	335,020	2,194	116,345	522,944	135,024	6,928	141,952	664,896	683,703
SCLDF legal services (Note 8)	562,400				562,400				562,400	483,189
Lodge and outings field expense			748,658		748,658				748,658	674,471
Cost of sales, principally of publications		488,673	81		488,754				488,754	427,820
Copying and printing expenses	62,173	18,112	8,923	57,369	146,577	(14,823)	7,874	(6,949)	139,628	128,504
Bulletin production expense	10	253,790	15,950	14,677	284,427	150	253	403	284,830	251,620
Mailing and office supplies	115,475	179,207	39,572	187,257	521,511	70,939	36,681	107,620	629,131	556,204
Travel and meetings	163,945	49,451	44,033	363	257,792	88,609	6,546	95,155	352,947	368,165
Royalties on publications		190,737			190,737				190,737	203,622
Rent and office expenses	69,275	49,636	9,557	18,004	146,472	82,783	4,411	87,194	233,666	225,356
Advertising and promotion	3,278	133,919	4,045	1,755	142,997	4,088	2	4,090	147,087	145,095
Chapter dues allocations				458,276	458,276				458,276	483,897
Telephone	132,765	16,835	10,121	2,592	162,313	18,431	2,940	21,371	183,684	173,234
Insurance	(111)	6,133	74,129		80,151	39,095		39,095	119,246	99,480
Interest	1,394	20,171			21,565	53,412		53,412	74,977	32,608
Other expenses	31,969	33,080	11,865	234	77,148	88,086	1,395	89,481	166,629	134,781
	$2,058,299	$2,076,986	$1,097,466	$1,014,555	$6,247,306	$1,066,869	$118,034	$1,184,903	$7,432,209	$6,886,795

See accompanying notes to financial statements.

Sierra Club Statement of Revenues and Expenses and Changes in Fund Balances

Years Ended September 30, 1978 and 1977

	1978			1977
	Unrestricted	Restricted	Total	Total
Revenues:				
Member dues	$2,617,477		$2,617,477	$2,544,390
Contributions (Note 8)	945,905	$802,044	1,747,949	1,947,073
Outings and lodge reservations and fees	1,228,404		1,228,404	1,151,583
Sales, principally publications	1,208,124		1,208,124	1,085,606
Royalties on publications	405,301		405,301	327,493
Advertising, investment and other income	207,253	800	208,053	170,730
	6,612,464	802,844	7,415,308	7,226,875
Expenses:				
Program services:				
Studying and influencing public policy	1,520,371	537,928	2,058,299	1,917,701
Information and education	1,821,005	255,981	2,076,986	1,916,948
Outdoor activities	1,095,377	2,089	1,097,466	1,056,281
Membership	1,014,269	286	1,014,555	982,345
	5,451,022	796,284	6,247,306	5,873,275
Support services:				
General and administrative	1,063,835	3,034	1,066,869	894,386
Fund raising	117,059	975	118,034	119,134
	1,180,894	4,009	1,184,903	1,013,520
	6,631,916	800,293	7,432,209	6,886,795
Excess (deficiency) of revenues over expenses	(19,452)	2,551	(16,901)	340,080
Fund balances, beginning of year	689,538	67,373	756,911	416,831
Fund balances, end of year	$ 670,086	$ 69,924	$ 740,010	$ 756,911

See accompanying notes to financial statements.

Sierra Club
Balance Sheet

ASSETS

	September 30 1978	1977
Current assets:		
Cash	$ 100,294	$ 50,586
Accounts receivable—publications	464,081	359,531
Other receivables, less allowance for doubtful accounts of $6,000 in 1978 and $10,000 in 1977	149,767	147,864
Note receivable—sale of bequested land	141,700	148,429
Federal grant receivable	88,000	
Investments, pledged as security for notes payable to bank (Notes 2 and 4)	729,798	684,487
Inventories—principally publications at the lower of cost (first-in, first-out) or market	294,752	241,058
Royalty and other advances (less allowance of $45,894 in 1978 and $39,344 in 1977)	245,250	162,697
Prepaid expenses	187,912	154,428
Contributed property held for sale	67,800	67,800
Total current assets	2,469,354	2,016,880
Property and equipment, less accumulated depreciation (Note 3)	530,822	568,452
	$3,000,176	$2,585,332

LIABILITIES AND FUND BALANCES

Current liabilities:		
Accounts payable	$ 705,785	$ 588,871
Note payable to bank (Note 4)	600,000	350,000
Other note payable (Note 4)	100,000	100,000
Obligations under capital leases (Note 7)	25,138	21,773
Accrued salaries, royalties and other expenses	212,015	236,186
Advance travel reservations, publication orders and other deferred revenues	311,893	201,118
Total current liabilities	1,954,831	1,497,948
Long-term obligations under capital leases (Note 7)	305,335	330,473
	2,260,166	1,828,421
Fund balances (Note 9):		
Restricted	69,924	67,373
Unrestricted	670,086	689,538
	740,010	756,911
See accompanying notes to financial statements.	$3,000,176	$2,585,332

Sierra Club

Notes to Financial Statements
September 30, 1978 and 1977

NOTE 1—*Organization and accounting and reporting policies:*

The Sierra Club is a not-for-profit voluntary membership organization established to restore the quality of the natural environment and to maintain the integrity of its ecosystems. The Club operates many diverse public-interest programs covering a broad range of environmental issues. The studying and influencing public policy program consists of staff and volunteers engaged in both legislative and non-legislative activities including lobbying, research, legal and policy development. Information and education includes the literary programs of Sierra Club Books and *Sierra*, the Club's bulletin. Outdoor activities include a national and international outings program of over 250 trips annually. The membership program includes support and funding to 53 volunteer chapters and over 280 groups, and the development of a broad-based volunteer membership.

Basis of accounting

The financial statements of the Club do not include the financial activities of the Club's various self-directed chapter and group organizations.

A number of members of the Club have donated significant amounts of time to both the Club and its chapters, groups and committees in furthering the Club's programs and objectives. No amounts have been reflected in the financial statements for donated member or volunteer services to the Club inasmuch as no objective basis is available to measure the value of such services.

Summary of significant accounting policies

The financial statements of the Club are prepared on the accrual basis of accounting.

Property and equipment is recorded at historical cost or market value at date of gift or bequest, as appropriate. Depreciation expense is determined using the straight-line method over the estimated useful lives (5 to 30 years) of the related assets.

Investments in marketable securities expected to be held to maturity are recorded at cost.

Payments made on behalf of the Club by The Sierra Club Foundation and legal services performed on behalf of the Club by Sierra Club Legal Defense Fund are recorded as contributions revenue with equivalent amounts charged to appropriate expense accounts. All contributions are considered to be available for unrestricted use unless specifically restricted by the donor.

NOTE 2—*Investments, pledged as security for notes payable to bank (see Note 4):*

	Recorded Value	Market Value
September 30, 1978:		
U.S. Government and Federal Agency Bonds	$655,617	$643,915
Cash in savings account held for investment in marketable securities	74,181	74,181
	$729,798	$718,096
September 30, 1977:		
U.S. Government and Federal Agency Bonds	$572,497	$574,435
Cash in savings account held for investment in marketable securities	111,990	111,990
	$684,487	$686,425

Investment income amounted to $69,046 in 1978 and $53,334 in 1977 and includes realized net losses on the sale of marketable securities of $879 in 1978 and $1,785 in 1977.

NOTE 3—*Property and equipment:*

	September 30	
	1978	1977
Land	$ 3,300	$ 3,300
Buildings and leasehold improvements	158,627	136,803
Furniture and equipment	106,368	90,051
Leased equipment	381,558	381,558
	649,853	611,712
Less—Accumulated depreciation and amortization	119,031	43,260
	$530,822	$568,452

Depreciation and amortization included in expenses amounted to $76,131 in 1978 and $23,332 in 1977.

NOTE 4—*Notes payable:*

At September 30, 1978 and 1977, the Club had a revolving line of credit of $600,000 and $550,000, respectively, with a bank at the bank's prime interest rate. Borrowings are secured by the Club's marketable securities and cash in savings account held for investment in marketable securities (see Note 2).

The other note payable is unsecured and bears an interest rate of 5¼% at September 30, 1978 and 1977.

NOTE 5—*Tax status:*

The Club has been granted tax-exempt status under Section 501(c)(4) of the Internal Revenue Code as a civic organization operated exclusively for the promotion of social welfare and Section 23701d of the California Revenue and Taxation Code, whereby only unrelated business income, as defined by the Codes, is subject to income tax. For the years ending September 30, 1978 and 1977, the Club's unrelated business activities did not result in taxable income and, accordingly, the financial statements include no provisions for federal or state income taxes. Contributions to the Club are not deductible for tax purposes by the donor.

NOTE 6—*Pension plan:*

Under the Club's insured pension plan, all employees who have been engaged for more than six months, providing they work at least 1,000 hours per year for the Club and are between 24½ and 62 years of age at the time of joining, are covered by the plan. While not required, employees may contribute a portion of their salaries to provide for increased retirement benefits.

Pension expense, representing the Club's annual contribution to the plan, was $48,788 in 1978 and $49,544 in 1977. Such expense includes the amortization of prior service cost over a 10 year period from October 1, 1976. The Club funds pension costs as accrued. At September 30, 1978, the market value of the plan assets exceeded the present value of vested benefits.

NOTE 7—*Lease commitments:*

The Club's San Francisco, Washington, D.C. and New York City office facilities and certain equipment are leased under various agreements expiring between 1981 and 1986. The initial term of the lease for the San Francisco office expires in November 1985. The lease provides for renewal options for two five-year terms after renegotiation of rental terms, and for an option to purchase, at fair market value, the office building and the underlying land after the fifteenth year of the lease. Other field offices are leased for periods of one year or less and such leases are renewed or replaced in the normal course of business.

Excluding the capital leases discussed below, at September 30, 1978, minimum annual rental commitments for office facilities and equipment for the next eight years are as follows: 1979—$195,382; 1980—$198,099; 1981—$198,099; 1982—$191,365; 1983—$186,286; 1984-1986—$373,620.

During 1976, the Club entered into two equipment leases which have been accounted for as capital leases. The following is a schedule by fiscal years of future lease payments under such capital leases together with the present value of the lease payments at September 30, 1978:

1979	$33,429
1980	33,429
1981	14,989
Total lease payments	81,847
Less—amount representing interest	13,300
Present value of lease payments	$68,547

The above amount is reflected in the balance sheet as current and long-term obligations under capital leases of $25,138 and $43,409, respectively.

In 1977, the Club entered into an agreement to purchase a computer system including customized application programs for a price not to exceed $328,495 whereby the Club's bank agreed to take title to the system and lease it back to the Club. The Club has an option to purchase the equipment for $1.00 at the end of the seven-year lease term. Through September 30, 1978, such equipment valued at $261,926 has been purchased by the bank and delivered to the Club. This amount is reflected in the balance sheet as leased equipment and a long-term obligation under capital leases. While the lease term will not commence until the total system is operational, the Club is currently paying interest to the bank for such equipment purchased to date.

NOTE 8—*Contributions from The Sierra Club Foundation and Sierra Club Legal Defense Fund:*

Contributions from The Sierra Club Foundation representing direct grants to the Club and payments on behalf of the Club in support of programs that are non-legislative in nature totalled $585,271 in 1978 and $689,595 in 1977.

Contributions from the Sierra Club Legal Defense Fund representing legal services performed on behalf of the Club totalled $562,400 in 1978 and $483,189 in 1977. In addition, the Sierra Club Legal Defense Fund donated funds to support the Club's legal research amounting to $7,862 in 1978 and $12,070 in 1977.

NOTE 9—*Funds:*

The following is a summary of fund balances:

	September 30	
	1978	1977
Restricted funds:		
Principal not available for expenditure	$ 55,500	$ 55,500
Principle and income available for expenditure	14,424	11,873
	69,924	67,373
Unrestricted funds:		
Fund designated by Club bylaws for permanent investment	618,037	594,742
Designated by Board of Directors for Clair Tappaan Lodge reserve	82,500	82,500
Investment in property and equipment	201,349	216,206
	901,886	893,448
Accumulated deficit from general operations	(231,800)	(203,910)
Total unrestricted funds	670,086	689,538
	$740,010	$756,911

Revenues from life memberships are designated by the bylaws of the Club for separate investment as a permanent fund, only the income of which may be expended for general operations. In addition, the Board of Directors has designated a portion of the unrestricted fund to provide for funds in addition to insurance coverage to rebuild Clair Tappaan Lodge in the event of fire.

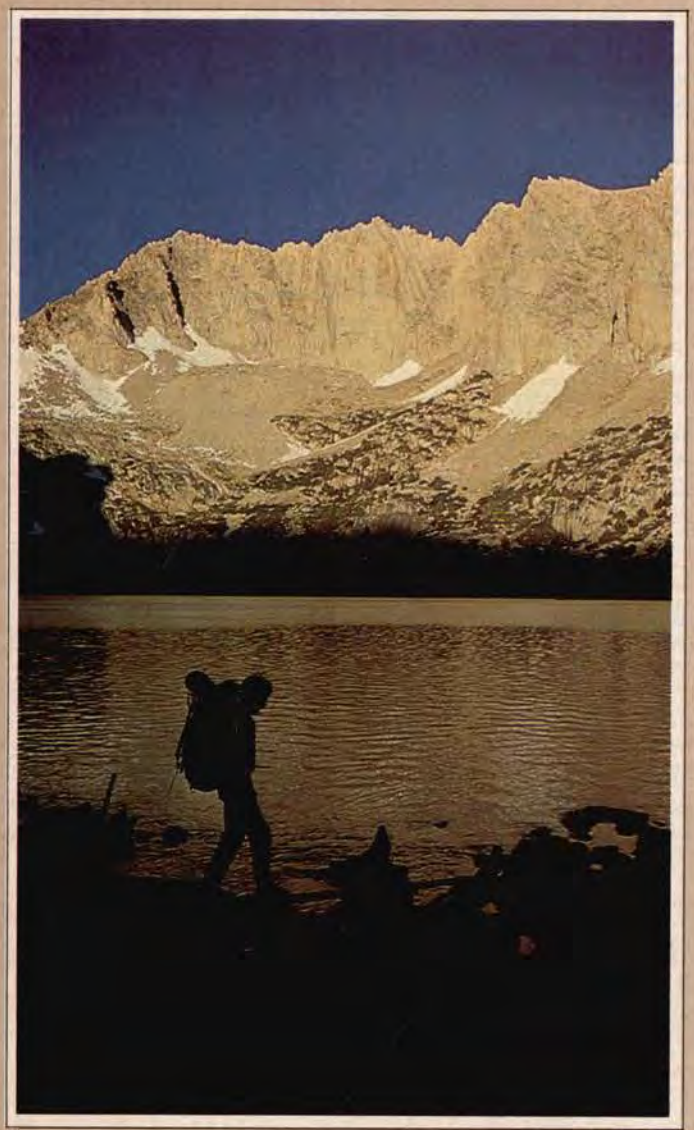
NOTE 10—*Pending litigation:*

The Sierra Club and certain editors of one of its chapter newsletters are defendants in a suit filed in U.S. District Court, in 1977, in which they have been charged by two individuals with publishing an article containing certain statements regarding the plaintiffs which were false and defamatory. The plaintiffs are seeking damages of $4,000,000. Management believes there is virtually no likelihood that any material liability will accrue to the Club upon resolution of this suit.

The Club has been named as a defendant in various other legal proceedings. Management is of the opinion that it is unlikely that any material liability will result from such proceedings.

If John Muir Were Alive Today, He'd Be a Wilderness Photographer

Learning to Photograph the Outdoors



Michael Teener

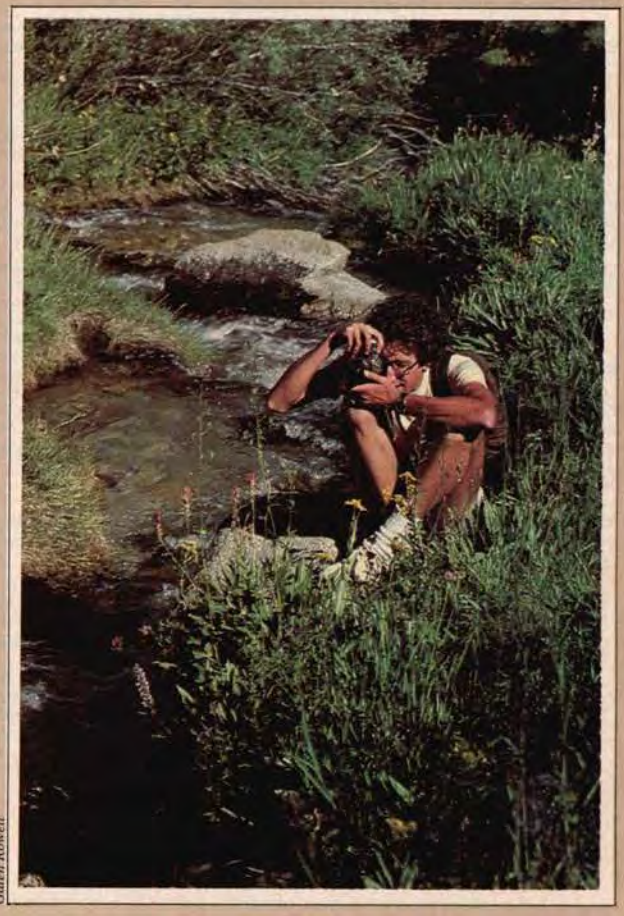
Above: *Dawn at Ruby Lake, in California's John Muir Wilderness. Shutters clicked as the group took turns as photographers and models at the lake's outlet. This shot had been carefully planned the evening before.* ***Right:*** *Using his knee as a tripod, a photographer stops for a closeup of Sierra wildflowers.* ***Opposite, top left:*** *Boulders east of the crest of the Sierra Nevada are ideal for practicing techniques that will be used in the mountains above. In this picture, the instructor is the model; students learned how profiles and the use of strong vertical lines emphasize the steepness of the terrain.* ***Opposite, upper right:*** *in California's White Mountains, a bristlecone pine, sculpted by the wind for thousands of years, takes on the appearance of the earth itself.*

IF JOHN MUIR were alive today, I think he'd be a wilderness photographer. In his time, photographic equipment was cumbersome, exposures slow, and the results were considered little more than objective records. But now, advances in film and equipment allow amateurs to achieve technically excellent results.

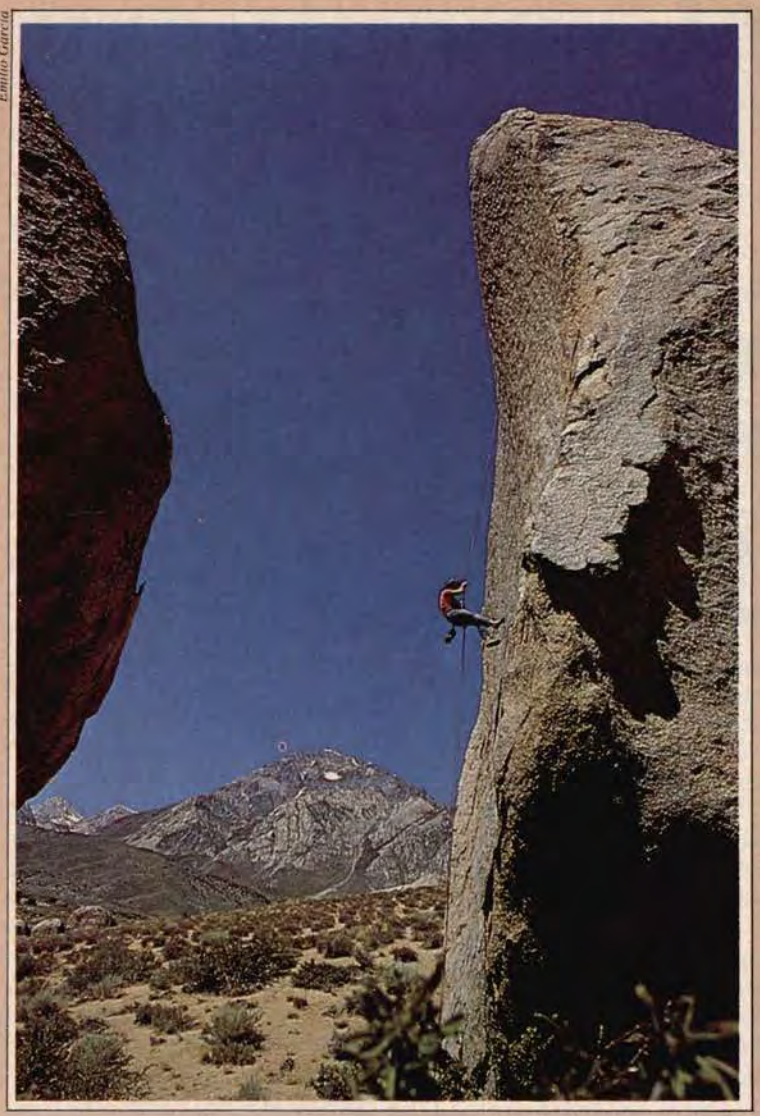
The common theme of all good wilderness photography is what mountain-lover John Ruskin once called "the expression of one soul talking to another." This is a language that takes talent, sensitivity and practice to master—even with the latest automatic equipment.

The Sierra Club aids gaining mastery by offering a variety of specialized photographic outings, such as last summer's Trans-Inyo Knapsack Wilderness Photography Seminar. The 21 participants in the week-long mountain trek planned their meal times to come either after or before the best light for photos. During hikes, everyone stopped where scenic situations presented themselves. And during the long midday hours of flat light we exchanged photographic lore in informal discussion groups. Members of the seminar made many fine photographs; only a few of them are shown here.

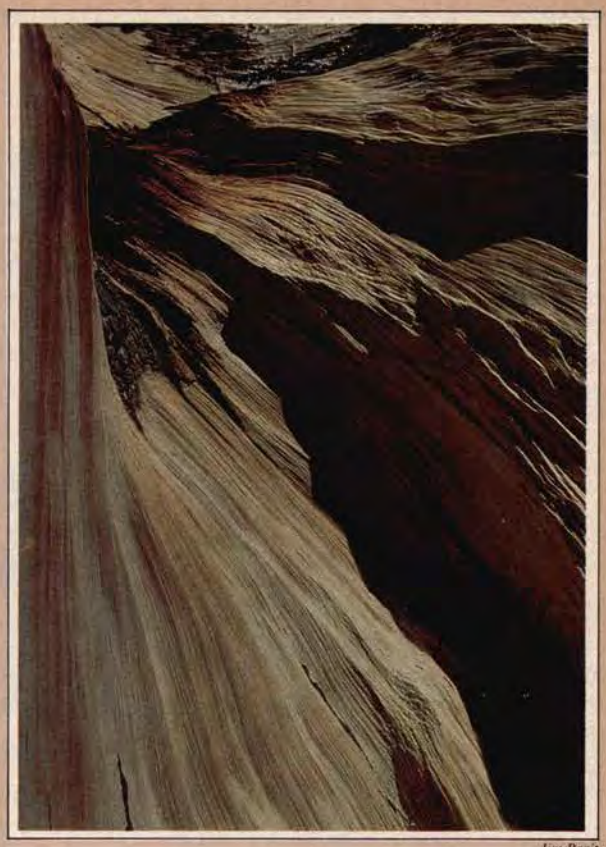
—Galen Rowell



Galen Rowell



Emilio Garcia

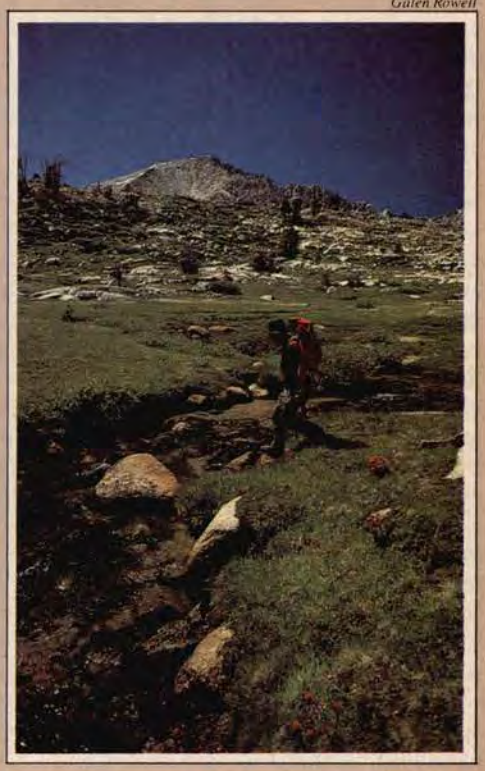


Jim Breit

Below left: *This bristlecone pine grew at a site that made rapid growth possible; it shows an unusual group of complementary and concentric swirls.* ***Below:*** *This shot of crossing a stream in California's Pioneer Basin was carefully composed before the backpacker walked through the scene. It looked so good that several photographers shot while different models crossed and recrossed the stream.*

Galen Rowell

Stanley Cedar



The Nuclear Commitment

RALPH NADER and JOHN ABBOTTS

As public enthusiasm builds for society's inevitable conversion to solar energy, citizens would do well to recognize the existing barriers to solar power so the mistakes of the past may be avoided in the future. As Amory Lovins has noted, there is probably no greater demonstration of the mutual exclusivity of "hard" and "soft" energy paths than the history of energy development in this country. The following article provides an historical perspective of the way nuclear power has developed at the expense of solar energy.

ATOMIC POWER is a technology so fraught with danger and controversy that it has split the scientific and engineering community. The well-informed opposition to nuclear power stems not only from technical controversies, but from unresolved institutional, social and moral problems as well. Members of the atomic establishment have left their positions in disgust or have found it necessary to go public when their dissent within the system went unheeded. Several recent events have illuminated the technical community's escalating disenchantment with atomic power:

• In September 1974, Carl J. Hocevar resigned his position with Aerojet Nuclear Corporation, which performed reactor safety research for the Atomic Energy Commission. Hocevar, an engineer who was the author of one of the commission's computer codes used to analyze nuclear plant safety, said in his letter of resignation to Dixy Lee Ray, head of the AEC, "In spite of the soothing reassurances that the AEC gives to the uninformed, misled public, unresolved questions about nuclear power safety are so grave that the United States should consider a complete halt to nuclear power-plant construction, until we see if these serious questions can, somehow, be resolved."

• In August 1975 more than 2300 scientists and engineers sent a petition to the President and Congress, noting that the dangers of nuclear power were "altogether too great," and urging a "drastic reduction" in the construction of nuclear plants.

• In September 1975 a distinguished panel of 60 citizens, including 15 Nobel laureates and 26 members of the National Academy of Sciences, noted that the use of plutonium fuel—which is intertwined with the atomic industry's future—was "morally indefensible and technically objectionable."

• In January 1976 Robert D. Pollard, a 35-year-old electrical engineer, resigned from the Nuclear Regulatory Commission, the federal agency that took over from the AEC the regulation of nuclear plants. At the time of his resignation, Pollard was project manager in charge of the safety review of Consolidated Edison's Indian Point reactors, located 26 miles north of New York City. He left the NRC because he felt it was "blind" to unresolved reactor safety issues.

• Pollard's resignation was followed in short order by the resignations of three nuclear engineers from the General Electric Company, the world's largest supplier of nuclear equipment. The three engineers said they resigned because they had concluded that nuclear energy represented a "profound threat to man." The resignation of these engineers could not be taken lightly, even by the atomic industry. The three men—Gregory C. Minor, Richard B. Hubbard and Dale G. Bridenbaugh—had together amassed 54 years of experience at General Electric. The GE engineers chose to work with citizen groups on behalf of the California Nuclear Initiative. Citizen-sponsored initiatives in California and other states in 1976 illustrated the general public's disillusionment with atomic energy.

• The pace of unprecedented technical rebellion within the Nuclear Regulatory Commission itself quickened in the latter months of 1976. In December Ronald Fluegge, an NRC engineer who had resigned in October, and four electrical engineers still employed by the NRC came before the Senate Government Operations Committee to testify on problems with nuclear plant safety and with the NRC's safety review process. They were the more visible vanguard of larger numbers of NRC technical employees who feel their findings and evaluations are being ignored or repressed by an agency still bent on promoting an industry it is mandated to regulate. Upon his resignation, Fluegge wrote that the NRC "covered up or brushed aside nuclear safety problems of far-reaching significance. We are allowing dozens of large nuclear plants to operate in populated areas, despite known safety deficiencies that could result in very damaging accidents."

• In December 1978 physicist Steven Stalows left his position as manager of a Rockwell International Corporation team monitoring 10.6 million gallons of radioactive waste, held in large tanks at the federal government's Hanford, Washington, facility. Stalows charged that Rockwell had ordered him to cut his program to monitor leaks from the tanks and

that Rockwell, "at the request of the Department of Energy, is still covering up leaks." Stalows further charged company officials with "irresponsible actions and unethical actions."

It was not always this way. For most of its existence, the commercial development of atomic energy enjoyed unquestioned acceptance by the government, the general public and the technical community. In the early 1950s, the nation reached a crossroad: it could have chosen nuclear power or solar energy. The federal government began a program to develop atomic energy and sealed the nation's energy future for the next quarter-century.

In 1952 President Truman established the Materials Policy Commission, headed by William S. Paley, chairman of the board of the Columbia Broadcasting System, to investigate a wide range of issues relevant to the depletion of natural resources. As part of its conclusions on energy policy, the Paley Commission examined nuclear and solar energy as future energy sources and concluded: "Efforts to harness solar energy economically are infinitesimal. It is time for aggressive research in the field of solar energy—an effort in which the United States could make an immense contribution to the welfare of the free world." Although the Paley Commission believed that either nuclear or solar power could become a significant energy source, early successes with experimental solar homes made the group much more enthusiastic about solar power. The commission believed that by 1975 thirteen million solar heating systems could be installed in commercial and residential buildings, supplying about 10% of the nation's energy needs. Nuclear energy received a more lukewarm recommendation, "that the present cooperative arrangements between the Atomic Energy Commission and privately owned electric utility companies and other interested companies and groups for developing economical ways to obtain electric power from atomic sources be continued."

Conventional wisdom has it that sunlight is a diffuse source of energy that must be concentrated. But uranium must also be concentrated before it can provide useful energy; the difference in the 1950s was that corporations and institutions were already in place to concentrate uranium energy. Existing energy companies could mine and mill uranium ore, and prepare it for further processing. The federal government's uranium enrichment plants, left idle after the war, were available to concentrate fissionable uranium for use as reactor fuel.

Once the reactor fuel was produced, uranium fit easily into the electric utility system; heat from uranium fuel rods boiled water to produce steam, which could drive a turbine to produce electricity. Uranium needed only to replace coal or oil as a heat source; the steam system and turbine could remain relatively unchanged.

In addition, the scientific and technical cadre established to produce the atomic bomb was ready and eager to demonstrate that the atom's destructive forces could be used for "peaceful" purposes. Federal government agencies were already in place to exploit the atom. In 1946, following the explosions of the Hiroshima and Nagasaki bombs, Congress had established the Atomic Energy Commission (AEC) to control nuclear material and to conduct weapons testing. The congressional Joint Committee on Atomic Energy (JCAE) was also established to oversee the AEC. Because much nuclear information was secret and technical, both the JCAE and the AEC operated without much interest from other Members of Congress, who were content to leave the complex nuclear issues to the "experts."

Solar energy had none of these institutions to foster its development. In fact, with its ability to bypass energy corporations and electric utilities by providing energy at individual buildings and sites, solar power could reduce the influence of existing companies. The energy establishment was uninterested in solar technologies.

President Truman asked the National Security Resources Board (NSRB), a federal agency of the executive branch that has since been absorbed by the Defense Department, to convert the Paley Commission report into policy. By a quirk of fate—and expediency—the NSRB examined only the commission's recommendations, which effectively cut solar power out of the picture. Although the Paley Commission's enthusiasm for solar energy was evident in its summary report, it made no formal recommendations for its development.

As part of *its* analysis, the NSRB took the Materials Policy Commission

The Sierra Club's Position on Nuclear Power

"Nuclear power is beset with problems that give cause for great concern. Most crucial are disposal of radioactive spent fuel and wastes, reactor safety, and possible illegal diversion of nuclear material for blackmail or weapons construction.

We oppose the licensing, construction and operation of new nuclear-fission plants until these problems are solved and regulatory machinery is established to guarantee the solutions.

Environmental and safety problems of existing reactors should be evaluated case by case. When necessary, power, temperature and heat-transfer rates should be reduced to increase safety margins in large plants.

The Sierra Club favors repeal of the provisions of the Price-Anderson Act that create an artificial public subsidy of the nuclear industry by limiting maximum liability and providing federal insurance for nuclear power-plant owners.

We oppose the introduction or expanded use of plutonium separation or any other technology or system that would increase the net risks of diversion or release of fissionable materials or that would contribute to the proliferation of nuclear weapons. For these reasons, we oppose the separation and storage of plutonium for any purpose."

—From "Nuclear Power and the Sierra Club." The full text is available for 25¢ from Sierra Club Information Services, 530 Bush Street, San Francisco, CA 94108.

VOICES FOR THE EARTH
A Treasury of the Sierra Club Bulletin
Edited by Ann Gilliam,
with an Introduction by Harold Gilliam

A distillation of the high moments from over 70 years of the finest in environmental writing, reflecting the many dramatic battles, wilderness adventure and challenges of the conservation movement.

THE BIG DROPS
Ten Legendary Rapids
by Robert O. Collins & Roderick Nash
Color photographs by John Blaustein

Short of the real thing, this book comes closest to capturing the exhilarating experience of running rapids. Text and photos together bring the river-running experience vividly to life.

THE POLITICS OF CANCER
by Samuel S. Epstein, M.D.

An incisive look at the rising incidence of cancer in the U.S., including the role of synthetic carcinogens, inadequate standards for regulating man-made carcinogens, industry resistance to pre-market testing, and observations on how we can reduce that large percentage of cancer which is preventable.

THE DARK RANGE
A Naturalist's Night Notebook
by David Rains Wallace
Illustrations by Roger Bayless

Wallace's special fascination is the wilderness at night, and his skillful blending of fact and fiction — visually complemented by Bayless' superb color and black-and-white paintings — take the reader on a sunset-to-sunrise odyssey through a strange and marvelous world.

HELP US BUILD OUR MEMBERSHIP, WE'LL HELP YOU BUILD YOUR LIBRARY!

The Sierra Club Membership Week Book Offer

Membership Week, during the week of May 21-28, 1979, celebrates the 87th anniversary of the Club's founding. John Muir and 182 other early conservationists foresaw the need for protecting the quality of the world we live in, and their heritage today is this nation's most effective conservation lobby.

The key to the Sierra Club's success spanning so many years is the continuing commitment and involvement of our members. Even though there are now 180,000 members, each one is just as important to the Club's continuing effectiveness as the original group working with John Muir.

Today, Club programs encompass an exciting publishing program, including books, calendars and the magazine, *Sierra*; a highly effective legislative and lobbying program on both national and local levels; an international outings program that remains one-of-a-kind; and, local outings and activities that become more extensive and popular with each year.

To sustain these important efforts, we need your help. We must continue to build and strengthen our membership — and we are prepared to reward your recruitment efforts with your choice of four new Sierra Club books. What better way to improve your own library, or, to introduce a new member to the Sierra Club?

Participation in Membership Week is simple. You recruit a new member and tell us which book you want — and whether you or the new member should receive it (please see the applications inserted in this issue). Although Membership Week itself is in May, you can start recruiting right now. Just be sure you send in your applications *no later* than June 15, 1979.

Thank you for helping your Sierra Club!

DON'T GET CAUGHT

...without a Sierra Club membership in 1979!

Members, we need your help to spread the message that there is no need for *anyone* to get caught without a Sierra Club membership this year. Membership Week is about to begin—our annual new membership drive where *you* do the recruiting and we do the rewarding!

This year, to thank you for your efforts in recruiting new members, we are offering you a choice of four recently published, exciting Sierra Club books—free. Of course, the books would make a nice gift for new members, too, but the choice is yours.

Help keep the Sierra Club growing. See page 48 of this issue of *Sierra* for more details, and then start using the applications on the other side of this insert.

Illustration by Roger Bayless from THE DARK RANGE by David Rains Wallace. Published by Sierra Club Books

SIERRA CLUB MEMBERSHIP WEEK. May 21-28, 1979

Enclosed is $_____ for a new membership in the category marked below.

New Member Name(s): _____

Address: _____

City _____ Zip _____

Please choose from these membership categories:

	Individual	Joint
☐ Regular	25.00	29.00
☐ Supporting	40.00	44.00
☐ Contributing	100.00	104.00
☐ Life (per person)	750.00	

(Dues *include* subscriptions to *Sierra*, $3.00, and regional newsletter, $1.00)

MEMBERSHIP WEEK offers one book for each new member only in the above membership categories. *You may choose whether you or the new member receives the book.* Please indicate the book choice below:

- ☐ Voices for the Earth
  (Publication date in July; please allow extra time for delivery).
- ☐ The Big Drops
- ☐ The Politics of Cancer
- ☐ The Dark Range

Please Send the indicated book to:

Name: _____

Address _____

City _____ Zip _____

START TODAY! Applications must be received by June 15, 1979, to qualify for the Membership Week Book Offer. Please allow *at least 6 weeks* for delivery of your book (longer for *Voices of the Earth*).

MAIL TO: Sierra Club, Dept. MW-3, P.O. Box 7959
Rincon Annex, San Francisco, CA 94120

SIERRA CLUB MEMBERSHIP WEEK. May 21-28, 1979

Enclosed is $_____ for a new membership in the category marked below.

New Member Name(s): _____

Address: _____

City _____ Zip _____

Please choose from these membership categories:

	Individual	Joint
☐ Regular	25.00	29.00
☐ Supporting	40.00	44.00
☐ Contributing	100.00	104.00
☐ Life (per person)	750.00	

(Dues *include* subscriptions to *Sierra*, $3.00, and regional newsletter, $1.00)

MEMBERSHIP WEEK offers one book for each new member only in the above membership categories. *You may choose whether you or the new member receives the book.* Please indicate the book choice below:

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Rincon Annex, San Francisco, CA 94120

atomic-power recommendation and extended it. The NSRB advised that the Atomic Energy Act of 1946 should be amended to facilitate commercial exploitation of nuclear power. What is more important, the NSRB made this one of its seventeen "key" recommendations. As a result, when the press covered the NSRB report in December 1952, the lion's share of attention went to the idea that the Atomic Energy Act should be amended. Congress and the AEC were only too willing to draft the necessary legislation.

The 1952 elections changed presidents, but the institutional commitment to atomic development remained. Dwight D. Eisenhower's advisers were also partial to the atom, and in December 1953 President Eisenhower went before the United Nations to endorse an international program to develop "Atoms for Peace," noting that "this greatest of destructive forces can be developed into a great boon, for the benefit of all mankind." Lewis L. Strauss, Eisenhower's chairman of the AEC, promised in 1954 that electricity from nuclear power would be "too cheap to meter," further reflecting the established optimism about atomic technology. In the same year, Congress passed the Atomic Energy Act of 1954 to "encourage widespread participation in the development and utilization of atomic energy," making a commercial nuclear industry possible. The Paley Commission's optimistic words on solar energy were left to gather dust.

In 1955 the AEC launched a "Cooperative Power Reactor Demonstration Program," through which the commission underwrote some construction costs and provided liberal research assistance. Still, electric utility companies were cool to the idea of investing in nuclear plants. AEC Commissioner Willard Libby told the JCAE in 1956 that he was worried about the reluctance of companies "to come into this peaceful uses program as quickly and as well as they have come into the weapons thing." In 1957 a study commissioned by the AEC made private companies even more reluctant to build nuclear plants.

The study, *Theoretical Possibilities and Consequences of Major Accidents in Large Nuclear Plants,* examined the possible effects of a reactor accident. It was completed by the Brookhaven National Laboratory on Long Island. The

study team concluded that the chances of a major accident were remote, but the "worst case" accident would kill 3400 people and injure another 43,000. In addition, the accident would cause $7 billion in property damage over an area as large as 150,000 square miles.

The Atomic Energy Commission stressed that these damage estimates were extremely pessimistic and that such an accident was highly unlikely. But utilities balked at the prospect of assuming financial responsibility for an atomic reactor accident. Hubert W. Yount, then vice-president of Liberty Mutual Insurance Company, explained the insurance industry's reluctance in testimony before the Joint Committee on Atomic Energy in 1956:

> "The catastrophe hazard is apparently many times as great as anything previously known in industry and therefore poses a major challenge to insurance companies. . . . We have heard estimates of catastrophe potential under the worst possible circumstances running not merely into millions or tens of millions but into hundreds of millions and billions of dollars. *It is a reasonable question of public policy as to whether a hazard of this magnitude should be permitted*, if it actually exists. Obviously there is no principle of insurance which can be applied to a single location where the potential loss approached such astronomical proportions. Even if insurance could be found, there is a serious question whether the amount of damage to persons and property would be worth the possible benefit accruing from atomic development." [Emphasis added.]

To remove one more impediment to civilian nuclear power, Congress in 1957 passed the Price-Anderson Act, to protect utility companies from full financial liability for nuclear accidents. The act set an absolute ceiling of $560 million on the damages that could be recovered by victims of an accident as a result of losses suffered. Moreover, the federal government itself assumed responsibility for $500 million of the liability, thus limiting the responsibility of private utilities to $60 million despite the fact that the AEC's own study stated that damage could be as high as $7 billion.

Even today, the Price-Anderson Act does not provide insurance coverage be-

yond a small fraction of the foreseeable personal and property damage of a major nuclear accident. What it does provide is a limitation on the liability of private utilities no matter how extensive the damage. At the time of its passage, the act freed the companies from financial liability in the event of a nuclear disaster.

In addition to the Cooperative Power Reactor and federal insurance programs, other incentives were offered. Reactor manufacturers were given access to government research facilities, and billions of dollars were spent by the federal government on research and development. The government offered uranium enrichment services for nuclear fuel at federally owned plants, which charged the utility companies only the cost of the services (i.e., the government made no profit).

Finally, to overcome the utility industry's reluctance, reactor manufacturers offered "loss leaders." The reactor vendors sold reactors at fixed prices that were less than the costs of production. By selling reactors at reduced prices, the vendors hoped that utilities would become hooked on nuclear power and continue to buy plants even when prices were raised in the future. A study conducted by the Rand Corporation on the early history of the industry concluded that the major vendors, General Electric and Westinghouse, lost at least $875 million on these early plants.

Having made the nuclear commitment, utilities received further benefits. A nuclear facility's construction costs are higher—typically by 20% or more—than those of a fossil-fueled electric plant. (A typical large, modern nuclear plant could cost over $1 billion to build, if construction started today.) Normally this extra cost would deter the development of a technology. However, under the system of utility regulation, the profit a company earns is in direct proportion to its "rate base," which is the amount of capital invested.

The rate base is a measure of the value of a utility company's power lines, generating plants, buildings and other equipment required to produce and sell electricity. The "rate of return," usually set by a regulatory commission, is the allowable profit expressed as a percentage of the rate base. If, for example, a com-

mission has set a rate of return at 8%, a utility investing in a $1-billion nuclear plant will in the first year of its operation collect $80 million from its customers *in profit*, above the operating costs of producing the electricity. If the utility had built an $800-million coal-fired plant instead, the return allowed would be only $64 million in the first year. In successive years the plants will depreciate in value, proportionately lowering the rate of return. Each utility desires a larger rate base to generate a greater cash flow, which in turn can attract new investment for future construction.

With the liability barriers removed, with research and development and other services assumed by the government, with the tempation of loss leaders, and with the incentive of a larger rate base, electric utilities finally began investing in atomic energy. As of November 1978 the industry had 71 nuclear plants operating, with plans for 300 or more by the end of the century. Although the industry is beginning to have serious doubts about the financial soundness of its commitment, vendors and utilities are nevertheless trapped by their cumulative multi-billion-dollar investments.

It is ironic that the Paley Commission produced both the optimistic projections for solar energy and (indirectly) the policy of atomic development. The nation can now see that it made the wrong choice 25 years ago and that atomic power has developed at the expense of solar energy. Solar power no doubt would have faced technical troubles, but its problems would be minuscule compared to the technical and institutional dangers of atomic energy. The secrecy and aura of mystery surrounding atomic energy helped prevent information on the technology's dangers from reaching the public. But that same secrecy contributed to the revolt of technical experts who decided the public should know. With the advantage of hindsight, the nation need not deepen its dependence on atomic power. The rebellion of the technical community and ordinary citizens can repeal the mistakes made decades ago. □

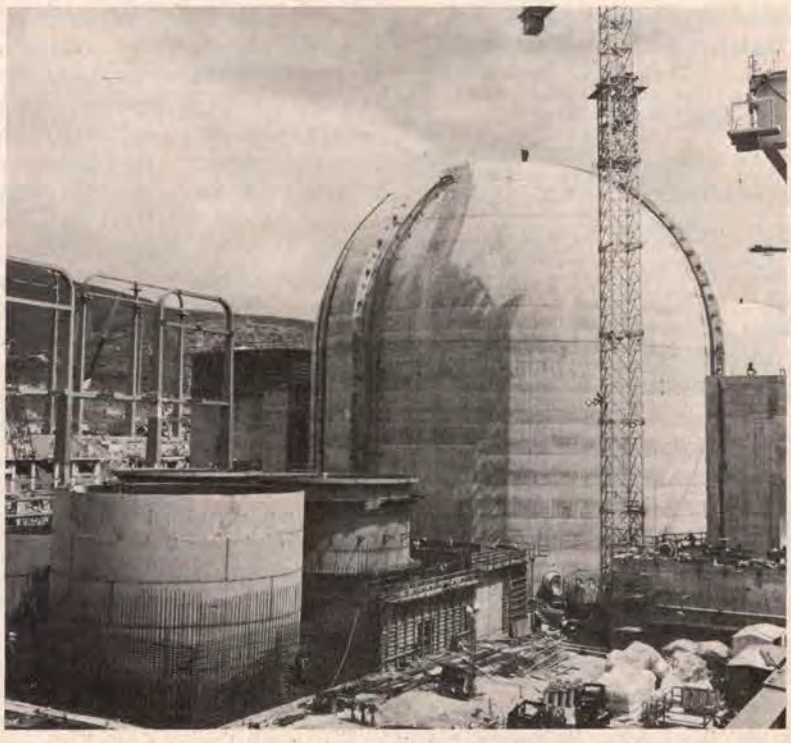
This article is the newly revised first chapter of The Menace of Atomic Energy, *by Ralph Nader and John Abbotts. An earlier version was published in 1977 by W.W. Norton Company, New York. Copyright Ralph Nader.*

Analyzing the Nuclear Dream

JOHN W. WINCHESTER

Light Water: How the Nuclear Dream Dissolved, by Irvin C. Bupp and Jean-Claude Derian; Basic Books, New York, 1978. Cloth, $10.00.

AN AMERICAN ECONOMIST and a French physicist, Messrs. Bupp and Derian, have written an illuminating historical analysis of how 30 years of well-financed international nuclear-power research, development and demonstration have led not to the dream of virtually unlimited energy for future prosperity, but to a virtual stand-still of nuclear development in Europe and America. A crisis of public confidence in nuclear power is now a reality throughout the western world; the much-publicized prediction that nuclear energy can be a cheap and practical alternative to our dwindling supplies of oil is no longer widely accepted. Yet the authors leave the reader wondering whether they believe that the nuclear dream can still be realized or that it is already completely dissolved in the economic swamp they eloquently describe.



The economic promise of nuclear power may have faded, but construction continues. San Onofre 2, pictured here, was planned in the 1960s but will not be completed until the 1980s. Meanwhile, assumptions about energy demand, costs and risks have changed dramatically.

Southern California Edison

The proponents of nuclear power have presented its potential advantages in economic terms: that electricity could be generated more cheaply by uranium-fueled reactors than by the use of other fuels, such as coal. Bupp and Derian show that, on the contrary, the principal failure of nuclear power has been economic. The public recognizes the failure, reacts against earlier misinformation and is demanding a halt to nuclear power.

Bupp and Derian identify interrelated factors that caused the present situation. Early postwar government interest, at least in the U.S. and France, focused on the military applications of atomic energy and left commercial power reactor development to private enterprise. Many people, whose memories of wartime nuclear blasts over Japan remain vivid, associate nuclear power with war, an association that may have been reinforced by government preoccupation with nuclear weapon development. More important for the Bupp-Derian analysis, however, has been the failure of governments to maintain their own independent expertise and judgment in guiding and evaluating commercial nuclear power development. Consequently, the public has generally been deprived of reliable information concerning radiation hazards, reactor accidents, weapons proliferation and waste disposal, the principal technical areas of concern about commercial nuclear power. Moreover, the promised economic benefits have not been demonstrated, and the public has grown uneasy about the rationale for choosing nuclear power over coal.

According to Bupp and Derian, the economics of nuclear power became severely distorted during the 1960s when the U.S. manufacturers of light-water reactors, General Electric and Westinghouse, offered to build nuclear generating stations for low, fixed prices. Starting in December 1963 with the Jersey Central Oyster Creek plant, there ensued a "great bandwagon market" for light-water reactors in the U.S. This boom spread to Europe because of the spurious belief that a technological breakthrough had occurred in light-water reactor design. As a result, alternative French and British designs were scrapped, and the U.S. light-water concept came to dominate the international marketplace, even though technical experts acknowledged that light-water reactors were wasteful of uranium and weak in safety of operation.

Since the industry dominated nuclear economics as well as engineering, governments did not realize that the manufacturers' pricing was based on expectation, not actual experience, and was

further affected by various companies' drive for market preeminence. By the late 1960s it was becoming clear that the real costs of plant construction (in constant dollars) were at least double the bid prices, and the hoped-for economy through learning experience had not occurred. The industry then attempted to achieve economies of scale by planning much larger generating stations to counter mushrooming construction costs. By 1978 it appeared that these economies had also not materialized. Bid prices of less than $150 per kilowatt in the mid-1960s have inflated to $1000 per kilowatt today.

The Arab oil embargo of late 1973 turned out to be a boon for the nuclear power industry, not because nuclear power was seen as an alternative to oil, but because skyrocketing prices of oil (and coal) elevated the costs of fossil fuel-generated electricity enough to make nuclear power again appear competitive. Bupp and Derian argue that a detailed comparison of the economics of coal and nuclear power is extremely difficult but shows that even now nuclear power is not cost-competitive with fossil fuel for electric power generation.

There is one glaring omission in the book. The public misconception that nuclear power could replace fossil fuel is not discussed. In fact, nuclear power is not useful for nonelectric applications; moreover, electricity now provides only about 10% of end-use energy in developed countries. Even a full-scale nuclear program could do little in the near future to reduce reliance on fossil fuel. As public understanding of the broader energy supply-and-demand picture improves, we may expect further disillusionment with the nuclear dream.

Bupp and Derian begin by asserting that nuclear power could supply part of our energy requirements in the immediate future. Their analysis shows, however, that through "abuse of a technology" it has failed. Of the three practical energy supply options—conservation, coal, and nuclear power—that could form the basis of an energy policy, the nuclear option is now seriously discredited despite 30 years of promotion. Unless its commercial, governmental and technological supporters recognize and deal effectively with public distrust, nuclear power may soon face final rejection.

The authors hold out the hope that if the promoters of nuclear energy act wisely there may still be time for agreement concerning its proper role in our energy supply strategy. In the authors' opinion, the one remaining technical area where positions in the debate are not polarized is the question of the safe handling and ultimate disposal of the highly radioactive waste products in spent nuclear-reactor fuel. To be sure, the past neglect of waste disposal is an embarrassment to the nuclear industry, but the proponents of nuclear power could still join the public in an open and objective evaluation of this hazard and look for a satisfactory answer (if one should exist) to the problem.

Proponents of nuclear power have long argued that disposal of high-level waste could be easy and cheap, but recently the public has begun to question that assumption and to press for proof. Increasingly, nuclear waste disposal is the focus of scientific and public controversy. The past record has been poor, and the U.S. government has moved responsibility for radioactive waste management to a high administrative level. It is imperative, the authors argue, that these moves result in proof, based on sound evidence, that a method exists for the safe disposal of nuclear wastes—and that the proof be promptly presented. □

John W. Winchester recently was advisor to the Swedish government on nuclear-waste disposal problems. He serves on two U.S. National Academy of Sciences panels on nuclear waste and is a professor of oceanography at Florida State University, Tallahassee.

For Younger Readers

Needed: Clean Air

GERALD SCHNEIDER

Try these questions (correct answers at end):

1. How much does sickness and damage from air pollution cost Americans each year?

2. What is the biggest cause of air pollution in cities?

What Is Air Pollution

Can you see the sky clearly where you live? If not, the air may be polluted. Polluted air can smell bad or look smoky. But pollution could also be there without your smelling or seeing it.

Air pollution comes from soot, fly ash, and chemicals produced by automobile exhaust fumes, chimney smoke, burning garbage dumps, and materials sprayed in the air. Soot from burning fuel oil is the main pollutant that gives smoke its dark color. Fly ash is tiny ashes that go up and out of chimneys and make smoke even darker. Chemicals of many kinds that you cannot see mix with the smoke. *Smog,* the eye-stinging haze that hangs over most cities, is produced when chemicals in the air mix with sunlight.

Damage To Things From Air Pollution

Air pollutants such as soot and fly ash settle out on things and make them dirty. Blown by the wind, air pollutants act like sandpaper and scratch away buildings and statues. Chemical air pollutants discolor and "eat away" (corrode) materials. Can you find any change in the color of bricks on old buildings near where you live? Is there a statue in the park that is crumbling away? If you find these things, chances are that air pollution was one of the causes.

Plants are also harmed by air pollution. Their leaves may get dry. Brown spots may appear on them. Or the leaves may turn yellow and fall off. Orange and other citrus trees and "salad" crops (such as lettuce and celery used in salads) are especially hurt.

Even house plants suffer from air pollution from cooking fumes. Are any of the plants in your house being affected by air pollution? (Look for symptoms mentioned above.)

Animals are also affected by air pollution. Cattle can get sick . . . and so can pets. A small amount of some chemicals sprayed near an aquarium may kill pet fish, for example. Care must be taken so that you and your pets are safe from fumes of many paints, lotions, glue, cleaning agents, and other chemicals.

Sickness From Air Pollution

Even a little air pollution can make your eyes burn and your head ache. It can tire you out, blur your vision, make you dizzy, and make it hard for you to breathe. Air pollutants can also affect asthma and make catching colds and flu more likely. And air pollutants have been linked to some cases of serious diseases such as lung cancer and heart ailments.

What To Do In A Pollution Alert

When air pollution gets very bad, many cities have a "pollution alert". A pollution alert is a warning that the air outside is not healthy. Factories may have to close to reduce chimney smoke. People may be asked not to drive their cars so as to reduce auto exhaust fumes.

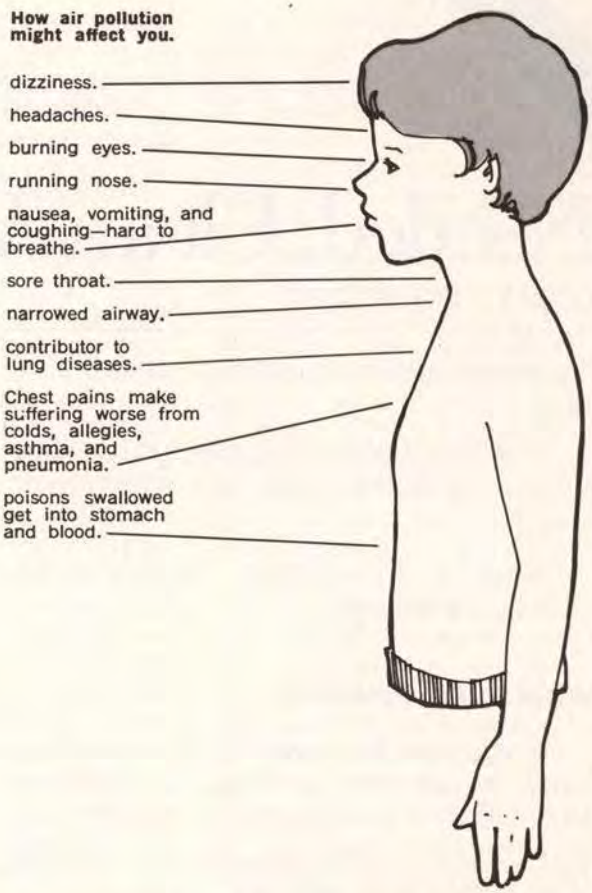
Pollution alerts usually end when fresh winds blow or rain washes the pollutants away.

Pollution alerts are especially dangerous to people who have breathing problems, hayfever, and other allergies. But you and everybody else should avoid bad air if you can.

If there is a pollution alert in your community, try to stay indoors more, move around less, and keep away from smoke. A parent or teacher may be able to tell you more about what you should do during a pollution alert.

Air Quality Today

Air quality in the United States is getting better but much more needs to be done. It will take the combined interest of everyone—you, other people, industry, and government—to help restore the quality of the air we breathe.



Is The Air In Your Neighborhood Polluted?

Why not find out if the air is polluted in your neighborhood? Try a "touch survey" and see how much dirt comes off on your fingers. Touch the sidewalk, buildings, stones, fences, trees, parked cars, and store windows. Wipe dirt off your fingers after each touch. Which things were dirty? Which were the dirtiest? Can you tell where the dirt came from?

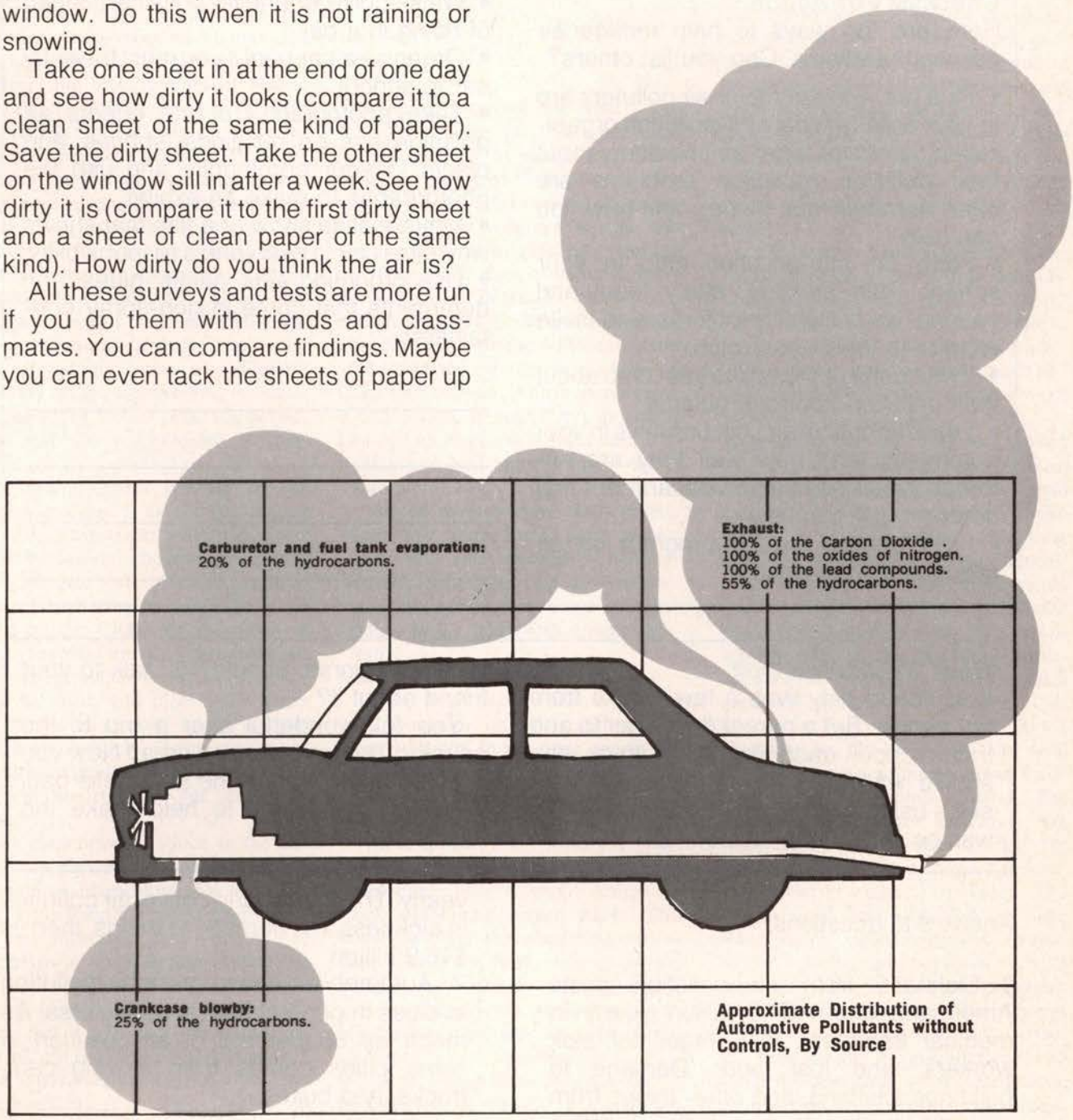
Do a "seeing survey." Can you see dirt on the window of your bedroom? Can you see dirt on clothes hung on a clothesline? How long does it take your bedroom windows to get dirty again after they are cleaned? How long can clean clothes hang on a clothesline before they get

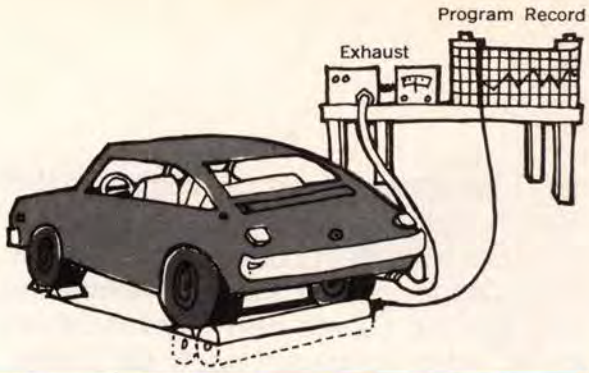
dirty? Where is the dirt coming from (is it from air pollution alone)?

Smear two sheets of the same kind of writing paper on one side with petroleum jelly. Put the sheets next to each other, smear sides up, on a window sill. Clamp the sheets in place with the closed window. Do this when it is not raining or snowing.

Take one sheet in at the end of one day and see how dirty it looks (compare it to a clean sheet of the same kind of paper). Save the dirty sheet. Take the other sheet on the window sill in after a week. See how dirty it is (compare it to the first dirty sheet and a sheet of clean paper of the same kind). How dirty do you think the air is?

All these surveys and tests are more fun if you do them with friends and classmates. You can compare findings. Maybe you can even tack the sheets of paper up on a bulletin board at school with a note about what you did. Why not have a contest to see who can find the dirtiest air? Have an adult help.





Checklist For Action

Here are ten ways to help reduce air pollution problems. Can you list others?

- Find out who the major air polluters are in your area (a local anti-pollution organization can help), what can be done about their pollution (pollution problems are often not their fault alone), and how you can help.
- Form an anti-pollution club in your school. Plan projects, study local and national air pollution problems, and invite experts to talk to your club.
- Invite polluters to talk to your club about their pollution control problems.
- Learn about the air pollution laws in your community and how well they are enforced (your local health department and other groups can help).
- Help plan a special program on air pollution at your school.
- Walk or bike whenever possible instead of riding in a car.
- Organize a car pool if you must travel by car to school.
- Take photographs of the effects air pollution has on buildings, statues, and plants in your community and use the photographs to make an exhibit.
- Make a slide show or a film that shows why clean air is everyone's responsibility.
- Use grooming aids, paints, glues, and detergents that come in non-spray containers.

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What Would You Do?

Your friend only lives a few blocks from her school. But a parent drives her to and from school each day. You think she should walk between home and school since using a car when you do not have to wastes fuel and makes air pollution problems worse. Should you talk to your friend about it?

You felt wonderful after a trip to the country. The fresh air was great! Now you are back in town and the air smells bad. What would you do to help make the town's air fresher?

Answers to questions:

1. Sickness from air pollution costs Americans about $4.6 billion yearly in medical treatment, lost wages for sick workers, and lost work. Damage to buildings, clothing, and other things from air pollution costs about $12.3 billion yearly. The total yearly cost of air pollution in sickness and damage to things, then, is $16.9 billion.

2. *Automobiles* cause more air pollution in cities in general than anything else! As much as 85 percent of air pollution in some cities comes from moving cars, trucks, and buses.

Gerald Schneider is president of A Better World, Inc.

From *Earth Trek . . . Explore Your Environment,* U.S. Environmental Protection Agency, October 1977.

The Sierra Club Cosponsors "City Care"

ROBERT A. IRWIN

From April 8 to 11, the Sierra Club is cosponsoring "City Care," a national conference on the urban environment, to be held in Detroit. Despite its official cosponsorship by a number of federal agencies, the conference will be short on speechifying and long on down-to-earth exchanges of practical ideas for involving city people in doing something about making their neighborhoods livable. The conference's other major sponsors are the National Urban League and the Urban Environmental Conference and Foundation, Inc. Some 1000 grass-roots urban and environmental leaders will meet in a joint effort to find ways of ridding cities of pollution, blight and decay; of preserving or restoring open space; and of generally providing a healthful and pleasant environment.

The Sierra Club's concern for the total environment is as old as the Club itself. Clean air, clean water, the scenic beauty of forests, mountains, streams and shorelines—all of these environmental values have for years been defended by the Club, for the urban as well as the wild areas of the continent. While its principal thrust remains the preservation of wild places, the Sierra Club's prominent role in the Detroit conference publicly demonstrates its commitment to working to make the city a decent environment for all of its people.

That commitment, which in the last decade has grown apace with the spreading blight of urbanization, has tended to make some longtime Sierra Club members uncomfortable. They seem to feel themselves on some strange, unfamiliar trail. Yet even those who live in remote, sparsely settled areas have come to realize that it is a path the Club must pursue. Late last summer a letter arrived in the *Sierra* editor's office from one such member. A reader of some 40 years' standing, 86-year-old Courtland Olmstead of Riverside, California, wondered if Sierra Club members were "forgetting the way we were"—the way it was when his father had taken him as a toddler by shoulder pack into the back country of "meadows, creeks, tangled woods, deep canyons and mountain peaks." He went on to wonder, too, whether they also might need a reminder of "what made most of us members of the Sierra Club in the first place."

Olmstead's reminder was a clipping of a short piece he had written for *Palm and Pine,* the newsletter of his (San Gorgonio) chapter, which encompasses a vast region of desert and mountains east of Los Angeles. It starts out:

> "If you would know a man—walk with him.
>
> "Not on a busy street with traffic lights and noise, but in open space, under blue skies marked by floating clouds, on a steep trail up a mountain, sharing hand-holds on a rocky ridge, under trees with armpit-high ferns, . . . "

And his prose-poem ends with:

> "If you would know a man, walk and talk with him, or, better still, be silent with him in the open spaces of back country, while you both absorb your share of that heritage given us to preserve for those who later may wish to follow."

Olmstead and others like him, who "remember how it was" realize the clock cannot be turned back. They know, however, that something must be done to stop the desecration of the wilderness by vandals and litterers—spawned largely by our environment-blind urban "culture." Another Sierra Clubber who remembers is Ann Williams, a long-time columnist for *The Roadrunner*, newsletter of the small (730-member) Kern-Kaweah Chapter at the southern, high-desert end of the San Joaquin Valley. In her testimony last November at an Air Pollution Control Board hearing in Bakersfield, California, she recalled that when she came to the valley 34 years earlier "in the white heat of summer, the only obstruction of our view of the great, baking mountains was the shimmer of heat waves. Autumns were brilliant and crisp, and in the spring a carpet of wildflowers could easily be seen from one side of the valley clear to the other." She went on to say that with growing despair she had watched the quality of air "deteriorate to its present horrendous state" and added:

> "If I were a young parent trying to decide where to settle and make a beginning, no salary offer, no business opportunity, no conceivable fortune in the world would induce me to raise my children here in this bowl of toxic soup, this basin of slop that was once a beautiful valley."

Both Williams and Olmstead in their still wide-open territories have witnessed the accelerating impacts of urban growth. The impacts on those of us who must live in large metropolitan areas have become even more "horrendous"—and most Sierra Club members do live in such places. During my boyhood in a suburb only eight miles from downtown Boston, an area that had been developing for 300 years, there were still some few neglected wild places for kids to explore. Today there are none. As the pressures on the air, water and land mount, at some point the urban environment suddenly goes critical. The congestion, the fumes and smog, the channelized and covered creeks, the noise, the litter and garbage, the lava-like spread of asphalt. Too much. The city becomes unlivable, and the same urban cancer metastasizes and spreads to the suburbs and beyond—even to Yosemite Valley, the Green Mountains and Hawaii's beaches. Many Sierra Club members realize that fact; also that it is time we join forces with those who suffer the most from our diseased urban environment—the workers in its industries and the jobless, often despairing residents of the inner city.

Two of the people aware of the need

to revitalize cities and enlist the support of their inhabitants are Ruth Bowers of the Connecticut Chapter and Bill Zoellick of the Oklahoma Chapter. Bowers, the editor of her chapter's newsletter, *Quinnetukut*, pointed out in a recent editorial that escape from the problems of the city no longer lies across the old frontiers. Instead, she said, today's new frontiers lie within the cities' own boundaries, and today's challenge lies in taming the urban wilderness and revitalizing the cities so that they can be "made to become appealing environments in which to work and live." Zoellick, in "Environmentalism and the Working Class," a thoughtful article in the *Oklahoma Sierran*, observes that it is "imperative that the environmental movement . . . be reshaped so that it makes sense to a larger proportion of the populace . . . and [so that it learns] how to talk to the man in the street." The reason it now fails to do both, he argues, is twofold. First, most environmentalists are more affluent and thus "insulated from the pressures that are the daily concern of the working man," an insularity that "produces a kind of insensitivity to the problems faced by most of the population." Second, their generally higher degree of formal education often leads environmentalists to assume they know what is best for society—including the worker, whose opinion they don't bother to consider.

A broad popular base is important for the environmental movement, Zoellick continues, because its root concerns involve society's values, which are not subject to scientific analysis but are decided by political action. Aside from the obvious advantage of numbers when it speaks from a much wider and numerous population base, the environmental movement will gain the advantage of having on tap a vast pool of practical skills and talent for developing and carrying out "appropriate technologies" to provide energy and other necessities in the diversified, scaled-down, environment-protective economy of the future. Such an economy not only will need highly educated scientists and engineers, says Zoellick, but it will "also depend on a large, well-dispersed supply of farmers, welders, mechanics, plumbers, carpenters, electricians and other tradespeople."

Practicality and the nuts and bolts of working to make cities livable will set the tone of the April conference. While its main thrust will be to bring environmentalists and "urbanists" together to exchange ideas and work out ways of revitalizing cities at the grass-roots level, one serendipitous spinoff could be to open the way for increased cooperation with urban blue-collar and labor union people on other environmental issues, according to Judith Kunofsky, one of the Club's staff members working on the conference.

Many chapters and groups already have been working with minority, labor, and neighborhood groups in cities in their areas. An excellent roundup of urban environmental achievements by local Sierra Clubbers was published in most chapter newsletters late last fall. It was written by Neil Goldstein, the Club's representative in New York and a member of the conference's steering committee. Among the grass-roots successes were: the Boston Harbor Islands State Park, Delaware River pollution cleanup in Philadelphia, saving of a canyon in downtown San Diego's Balboa Park, keeping a freeway out of Overton Park in Memphis, the Save-the-Bay campaign in San Francisco—and many more.

Community cleanups and pick-and-shovel conservation projects have been carried out by local Sierra Club groups and chapters in all parts of the country. One example is the planting of redwood trees in city parks by the San Mateo Group of the Loma Prieta Chapter, south of San Francisco. Included in its program was the distribution of redwood seedlings to householders. At least eight chapters now run Inner City Outings (ICO) programs, which introduce youngsters and adults from varied ethnic and racial backgrounds to the wilderness experience. The first such program was started by the San Francisco Bay Chapter in 1971. If you are interested in organizing such a program in your group or chapter, write to Sandy Knapp, chairman of the National ICO Subcommittee, at Club headquarters. You might also ask him to add your name to the mailing list to receive the subcommittee's newsletter, *On the Loose*.

By the time this issue of *Sierra* reaches you, the urban environment conference will be only about a month away, and most of the delegate slots and workshops will have been filled. On the chance that there may be some openings, especially for people with grass-roots experience on urban environmental problems, you may want to get in touch with Judy Kunofsky at Club headquarters. Do it soon; time is short. If you do not plan to attend the conference but can furnish some examples of successful urban environmental actions on the local level, please send them on to Kunofsky.

Two Sierra Club Honorary Vice-Presidents Pass Away

Newton Bishop Drury (April 9, 1889-December 14, 1978) dedicated his life to serving the public through his outstanding conservation work. He helped found the Save-the-Redwoods League in 1919 and the California State Park Commission, which he served as executive secretary from 1929 to 1940. In 1940 he was appointed director of the National Park Service and served with distinction until 1951, when he returned to California; until 1959, he was chief of the California Division of Beaches and Parks. From 1959 until his death he served successively as secretary, president and finally chairman of the board of directors of the Save-the-Redwoods League. Mr. Drury was a Club member for 49 years. His leadership and devotion to preserving the nation's great scenic resources brought him widespread recognition as one of the nation's most distinguished conservation leaders.

Harold E. Crowe (June 22, 1895-January 7, 1979), long-time Sierra Club leader, was a medical doctor and dedicated conservationist. A Club member since 1933, Mr. Crowe served as vice-president for two years and was president from 1951 to 1953. He is fondly remembered for his great generosity, his good fellowship and his subtle and playful wit, which enlivened many Sierra high trips. □

Guest Opinion

Controlling the Institutions That Govern Our Daily Lives

The Power of Transnational Corporations

RAYMOND J. SHERWIN

Raymond J. Sherwin is a superior court judge in Solano County, California, and a past-president of the Sierra Club.

THE BATTLE TO recapture and preserve a decent environment involves enlisting public support and then overcoming institutional obstacles. The most conspicuous obstacles are governmental, such as the Senate structure that enabled one man to frustrate the enactment of a bill to protect the public interest in Alaskan federal lands. Eventually, we expect this kind of a barrier to yield to the pressure of the democratic process. But there is another kind of power—private, secretive, autocratic and, very possibly, even greater than the government.

Anyone who lives in one of the democracies prizes personal freedoms, diversity of life styles, and the relative facility with which new ideas may be promoted, be debated, and be adopted or rejected. We like to think, too, that in addition to freedom, we have some say over the institutions that set the parameters of our destinies.

It is axiomatic that protecting such intangibles and the institutions that maintain them requires eternal vigilance, for destructive ideas may surface as readily as constructive ones, and the very nature of freedom of communication precludes censorship. There is also the dilemma that any notion may seem good to one person and bad to another.

It is not surprising, therefore, however ironic it may be, that the politico-economic entities known as transnational corporations have achieved their greatest development from a base in free societies or that these, our most conspicuous and influential progeny, have demonstrated such extraordinary potential for good or for evil. More powerful than many third-world nations, wealthier than some industrialized countries and more ubiquitous than any other institution, public or private, the transnationals are capable of immense contributions or incalculable harm.

On the positive side, no other form of organization has achieved such centralized control of global operations or had the vision to achieve such capability. The global companies have developed enormous systems for producing, transporting, distributing and selling goods. In some cases, they have averted brushfire wars because it has been in the interest of the companies and their power has been sufficient to constrain the nominal heads of state. Finally, their very size has allowed economies that make available more and better goods, services and jobs.

On the debit side, the most devastating conduct of global corporations has been the corruption of public officials and the manipulation of public policy by their undue power and influence. Governments have toppled as bribery and extortion have been disclosed. The administration of laws has been warped, twisted and rendered inequitable by overt lobbying as well as by more sinister conduct. During Truman's presidency, anti-trust prosecutions against petroleum companies were stifled and tax laws were interpreted to enable the same companies to escape paying income taxes, even to this day. Later, during Nixon's administration, dealings tantamount to bribery blocked the application of antitrust laws that would have prevented ITT's acquisition of the Hartford Insurance Company.

In international operations, developing countries have been drained of capital, deprived of tax revenues, stripped of natural resources, suffered degradation of their lands and had their populations divided by the creation of elites at one end of the social structure and of new lows of poverty at the other. These same emerging countries have been used as dumping grounds for goods that are obsolescent or illegal in stronger nations, such as military hardware and persistent pesticides or other hazardous chemicals.

From an environmental viewpoint, the growth of transnational corporations represents yet another layer of power available to our traditional adversaries. It is a rare environmental crusade that has not been opposed by business organizations. Efforts to secure pure air, pure water, a natural coastline, park or wilderness, the conservation of energy or the production thereof by benign means all have been fought tooth and nail by big business, usually including transnationals either directly or through subsidiaries.

Why should this be so? The reason is that the intractable goals of business are profits and growth. Corporations are governed by relatively small management groups with little, if any, control by stockholders. Under the laws of states that charter them, such controls as exist relate to financial accounting to the stockholders. Consequently, few efforts by stockholders to influence corporate policy in other dimensions have been successful.

The result is an enforced amorality. It may well be that there are people at the helm of such enterprises who are sickened by the devastation caused by large mining operations, clearcutting, fumes from burning fossil fuels and the deaths resulting from errant chemical compounds. But what can one or a few such persons do? Remedies cost money, and a corpo-

If we are to preserve more than the illusion of self-government, external controls are essential.

ration whose costs mount relative to another's may wither and die from want of customers, investors or lenders.

It should be clear that if we are to preserve more than the illusion of self-government, external controls are essential. On an international scale, especially with regard to the weakest of the developing nations, imposing such controls will not be easy. There is not only the power and presence of the transnational companies themselves to confront, there is the mental set, the inertia, of the U.S. Department of State or of the foreign services in other countries. These agencies are accustomed to assuming the obligation to promote business interests nominally identified with their countries. They are not easily persuaded that the chartering of a corporation by any particular state has little meaning in terms of reciprocal identification or loyalty on the part of the company. The lessons learned from the relationships of Exxons's ancestor, Standard Oil of New Jersey, and ITT with German industries during the Nazi regime have made little impression. Thus, the position of the United States at the Organization for Economic Cooperation and Development (OECD) meetings convened to develop a code of ethics for transnational business operations, and at the proceedings of the United Nations commission on transnational corporations working to similar purpose, has been and remains weak, at best.

Still there are reasons to hope that positive controls are possible. The United States is currently led by a President of high moral purpose who has given priority to environmental concerns, especially through an able Secretary of the Interior. Public opinion polls tend to show a widespread, deep distrust of business management. Again, transnational companies chartered by other countries are now more numerous, if not larger, than their United States counterparts.

Several concepts have led to the development of effective tools for combating environmental injury in the United States that could be adapted to the international arena. To require environmental impact statements as a condition of licensing or financing through international financial institutions would mean that any major development would face intense scrutiny. Elementary rules regarding the use of commons, air or ocean, would inhibit destructive practices. International ground rules limiting foreign-office assistance to irresponsible enterprises could prevent undesirable projects before they got started.

No doubt other ideas will come along. But it is high time to put on our thinking caps and encourage all ideas that show promise of retaining the useful attributes of transnational corporations while permitting us to retain essential control of the institutions that govern our daily lives. □

Peak 1® Trail Notes

"I carried a Peak 1 pack 2,900 miles..."

Carolyn Hoffman, North Country Trail Hiker
(Endorsed by International Backpackers Association)

"I really grew attached to that Peak 1 pack.

"From Crown Point, N.Y. to the Badlands of South Dakota, I carried it about seven months along the North Country Trail. And except for a stretch through Ohio covered by bike, that pack was with me every step.

"I'm fairly tall and tough to fit. But in no time, I had the Peak 1 adjusted so it fit better than any pack I had ever carried. And I've carried quite a few.

"Adjustment was easy, with all those slots in the frame and the Peak 1 Lash-Tabs™. I could fine-tune it for varying loads, from sixty pounds down to thirty.

"Once, the temperature dropped to 18° below... inside the tent, and the pack was outside. But no problem.

"After all those miles in all kinds of weather, the frame and the pack itself are ready for more.

"The Peak 1 stove came through too.

We used it the last part of the trip, after another stove had died. The Peak 1 put out a lot of heat. It worked better in the wind. And it really adjusted. Even down to a simmer. I wish we'd had it all the way."

Find out more about Carolyn Hoffman's experience...and Peak 1. Send for free *North Country Trail Notes:*

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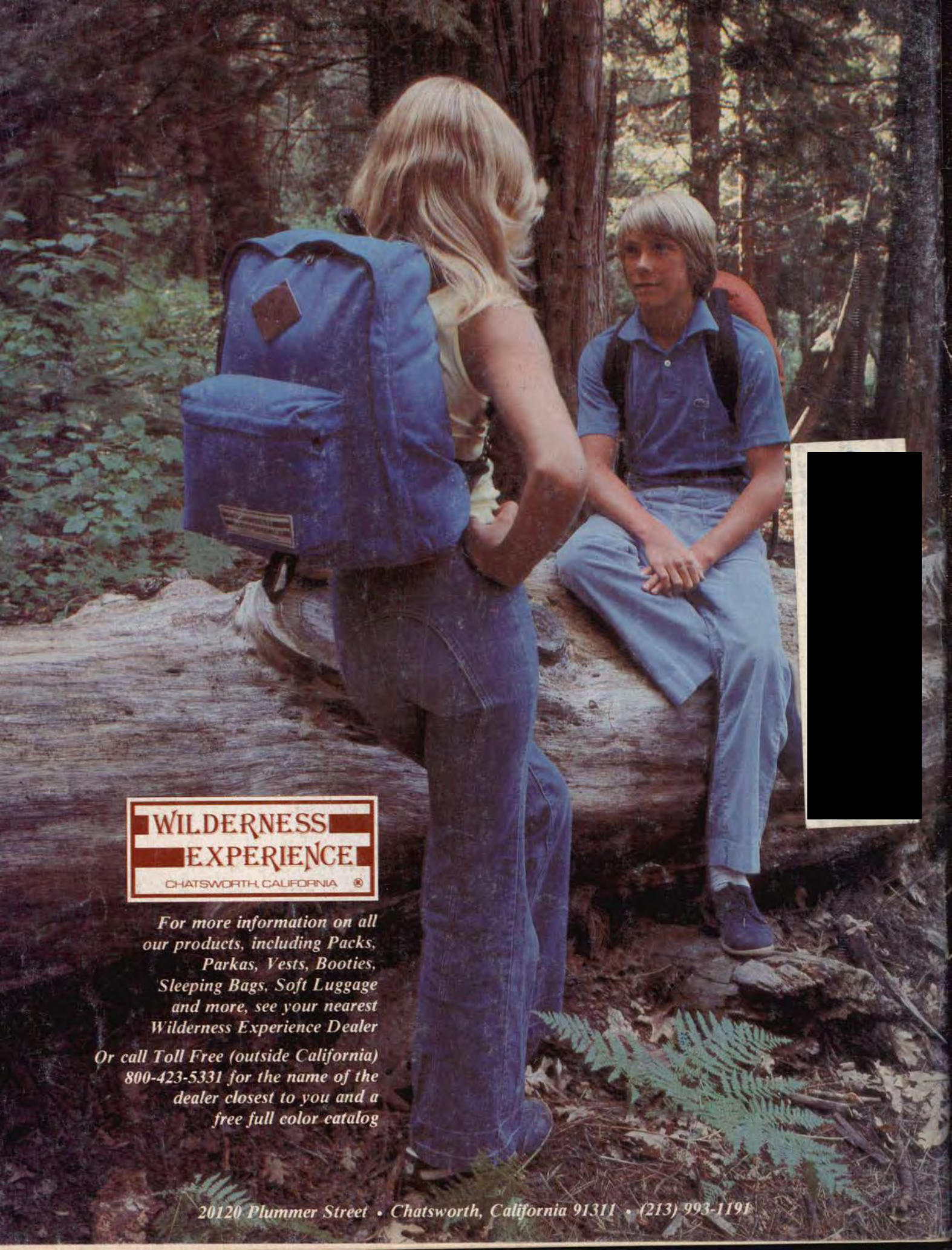
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