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SIERRA

THE SIERRA CLUB BULLETIN

MARCH/APRIL 1984

VOLUME 69/NUMBER 2

FEATURES

- 32 THE DEMOCRATIC CANDIDATES & THE ENVIRONMENT *Staff Report*
38 REPRIEVE FOR MINNESOTA'S WOLVES *Odean Cusack*
43 CONDITIONING THE WOLF TO KILL
45 CHOOSING YOUR DREAM SLEEPING BAG *Mike Scherer*
50 HOW TO CLEAN AND CARE FOR YOUR NEW BAG
54 A TALK WITH DENNY SHAFFER *Staff Report*
59 WILDERNESS WHITEWATER RAFTING *Ron Watters*
61 A RAFT OF RIVERS TO RUN
62 WET BEHIND THE EARS: Whitewater and Children *Carl Trost*
78 SIERRA CLUB FINANCIAL REPORT
93 SIERRA READER SERVICES

DEPARTMENTS

- 7 LETTERS
9 NEWS
12 POLITICS
12 TROUBLE DOWNSTREAM: Migrating Cranes Force a Showdown on Platte River Water Projects *Martha W. Gilliland*
19 BLIND AMBITION: Impounding Carolina Wetlands *Jane Lareau*
29 CRISIS AT KESTERSON: Wastewater and Wildlife in California's Central Valley *Representative George Miller*
64 OBSERVER: SCOPE—The Club Gears Up for Election '84 *Bob Irwin*
74 SIERRA NOTES
83 FOR YOUNGER READERS: Pond Life *Tom Adams*
86 BOOKS
86 *The Pathless Way: John Muir and American Wilderness*, by Michael P. Cohen *Ann Ronald*
88 *The Marsh Lions: The Story of an African Pride*, by Brian Jackman *Harry Middleton*
90 *A Desert Country Near the Sea*, by Ann Zwinger *Peter Wild*
95 BRIEF REVIEWS
102 QUESTIONS & ANSWERS

COVER: The last significant wolf population in the Lower 48 is confined to the wilds of northeastern Minnesota. For more on this threatened species, turn to page 38. Portrait by Dugald Stermer.



Platte River Showdown, page 12.



The Democratic Candidates, page 32.



Choosing a Sleeping Bag, page 45.



Denny Shaffer Interview, page 54.

Sierra (USPS 495-920) (ISSN 0161-7362), published bimonthly, is the official magazine of the Sierra Club, 530 Bush St., San Francisco, California 94108. Annual dues are \$29. Members of the Sierra Club subscribe to *Sierra* through their dues. Nonmember subscriptions: one year \$10; three years \$28; foreign \$14; single copy \$2. Members may purchase additional one-year subscriptions for \$8 (send to 530 Bush St., Attn: Subscriptions). Second-class postage paid at San Francisco, Calif., and additional mailing offices. Copyright © 1984 by the Sierra Club. Reprints of selected articles are available from Sierra Club Information Services.

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AN AUTHOR RESPONDS

Sierra has published three letters regarding my article in the July/August, 1983, issue ("Tips for the Older Backpacker"). One was from a physician who had tried the techniques I described and found that they worked. The other two letters were from critics.

To the critic who did not believe that my husband and I could carry so little pack-weight without leaving out essentials, I can say only that perhaps my definition of "essentials" is different from his. I suggest he withhold his skepticism about the walking techniques I recommended until he has tried them.

The other critic properly noted that skipping breakfast is a bad idea and that water and calories should not be limited. The manuscript I submitted to *Sierra* did not advocate skipping breakfast, although changes introduced in the editing process made it appear that I did. The article as written merely suggested that delaying breakfast until after an hour or two of hiking would permit the available oxygen to be used for climbing instead of for digestion. Nowhere in the article did I state that either water or calories should be limited.

Shirley Blumberg,
Mammoth Lakes, Calif.

BIGHORN CONTRETEMPS

I appreciate the Sierra Club's efforts to preserve endangered and stressed wildlife populations, and I think we need to raise our collective voice to prevent abuse of our natural resources. However, there is a need, too, to cooperate with properly constituted authorities wherever possible, for otherwise we run the risk of negating a potentially beneficial outcome in the long run.

A case in point is the Club's objection to California's proposed legislation for removing the Nelson bighorn sheep from the "protected" list and putting the species under management of the California Department of Fish and Game. (January/February, 1984, page 8.) The caption that *Sierra* ran beneath a photo of the Nelson bighorn stated that "hunting is no way to manage a sensitive species in decline." Clearly, your intention was to imply that an open hunting season will immediately be declared on the bighorn if A.B. 1548 is passed.

The placing of any wildlife species under the management of the state Department of Fish and Game brings to bear a broad range of management practices, including studies of habitat conditions, populations of wild and domestic animals, man's impact, etc.,



and the application (based on these studies) of habitat improvement, closing of areas to livestock grazing, restrictions on resource development, and rearing and transplanting of certain birds and animals. Money and qualified manpower are required if the desired objectives are to be accomplished. A.B. 1548 provides such resources in the case of the Nelson bighorn, and does not permit the sheep to be hunted.

Too much of what I see coming from certain factions in the Sierra Club is emotional response to issues, when instead we need to be aware of the true quality and capability of the natural ecosystem and to apply carefully planned scientific management principles. To work to defeat a potentially beneficial bill (without which we will undoubtedly see the total extinction of the bighorn from even more ranges) is not a wise policy for the Club to pursue.

Robin I. Welch
Berkeley, Calif.

A.B. 1548's herd-adjustment provisions could in fact lead to sport hunting of the Nelson bighorn, according to Mark Palmer, chair of the Sierra Club's Northern California Wildlife Committee. The bill was unanimously opposed by the Club's wildlife chairs around the state. Palmer notes that the Club is actively pursuing alternative measures to prevent extinction of the Nelson bighorn.

THE RIGHT PERSPECTIVE

From the report on the highlights of the Sierra Club's International Assembly that appeared in the September/October, 1983, issue of *Sierra*, it would appear that nothing occurred to justify the event being described as "international." In fact, members of the Club's International Committee and the staff of our International Earthcare Center were pleased by the Assembly's emphasis on conservation matters of international concern.

First, thanks to the Man and the Biosphere Programme of UNESCO, the central gathering point of the Assembly was decorated with posters depicting the world's eco-

systems. Second, several Sierra Sessions focusing on international environmental concerns—such as pesticide misuse abroad and protection of the marine environment—were well-attended, as was a general session on the International Program conducted by former International Vice-President Nicholas Robinson. Finally, in the eyes of many the highlight of the week's activities was the address to the entire Assembly by Noel Brown, chief of the United Nations Environment Programme's New York liaison office.

While the presence of the 1984 presidential candidates undoubtedly did underscore the national theme of the Assembly, it did not justify your report's inattention to international activities. It is my hope that future *Sierra* features on "international" Sierra Club events will present a more accurate picture than was the case last year.

Sanford Tepper
Secretary, Board of Directors
Chair, International Committee
Eugene, Ore.

LES IS MORE?

In the "News" section of the January/February, 1984, issue, readers were asked to write to their representatives in support of Rep. Henry Waxman's (D-Calif.) bill to control acid rain (H.R. 3400). I'd like to know why you failed to mention, let alone recommend, H.R. 4483, sponsored by Rep. Les Aspin (D-Wis.). Aspin's bill would result in tax penalties for any noncomplying power plant while giving the same environmental result as the Waxman bill.

Sierra should at least have made a comparison between the two bills and explained why one is recommended over the other. The struggle for a clean environment is much too serious for environmentalists to be divided on any issue.

Jim Boubonis
Kenosha, Wis.

*Sierra Club staff with responsibility for clean-air issues feel that Rep. Waxman, as chair of the House Subcommittee on Health and the Environment, is especially well-positioned to guide his legislation through to passage. Furthermore, Rep. Aspin's bill was introduced too close to the deadline for that issue of *Sierra* for us to have prepared a thorough comparison of the two bills.*

TORPEDOING THE DAMS

It was great to read "The Battle for Brumley Gap" in the January/February, 1984, issue of

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Sierra. It did my heart good to see that at least one battle against an environmentally damaging dam has been won.

Unfortunately, there have been too many failures. One that bothers me still is the North Fork Dam, on the North Fork of the San Gabriel River in central Texas. Land was taken from a ranch my family used to own to make that dam and (subsequently) Georgetown Lake. The North San Gabriel is one more river lost to "progress," but maybe we can look back on it someday as an environmental battle of the Alamo, a tragedy paving the way to our ultimate triumph at a battle of San Jacinto down the road. Let's have more Brumley Gaps and fewer North Forks.

Henry Peck
New Carlisle, Ohio

"The Battle for Brumley Gap" very forcefully tells how a group of ordinary citizens can win when they join together.

About 15 years ago we were suddenly faced with an upstream flood-control project. When we organized and resisted—the project was "necessary" only to keep the agency's employees busy—the people who'd dreamed up the project went back to their offices to look for easier pickings.

Many of us got acquainted with people we didn't know, and this resistance action helped cement a lot of friendships. Keep up the good work.

Burk Gilbreath
Mounds, Okla.

A TREKKER'S TOAST

Having just returned from six weeks in Nepal, I especially enjoyed Peter Cummings's article "Climbers & Porters in Nepal" (September/October, 1983). Dr. Cummings says in his final paragraph, "We may have something to learn from a hospitable land where theft is rare and personal violence almost unknown." I should like to add that my experiences in Nepal on several occasions (totaling five months in the country) have shown me what real civilization is: The Nepalese are some of the friendliest and most helpful, honest people on this Earth.

Dan De Kay
Bodega, Calif.

OVERSIGHT DEPT.

In our January/February issue we ran colorful photos of some of this season's innovative cross-country-ski gear. But we neglected to credit the helpful folks at Marmot Mountain Works in Berkeley, Calif., who provided *Sierra* with most of the equipment featured in the shot. (The Trak Top Competition Tuning ski was provided by REI, Berkeley.)

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Reagan Discovers the Environment

President Reagan mentioned five environmental issues in his 1984 State of the Union address, including acid rain, park acquisition, offshore oil leasing, funding for the Environmental Protection Agency, and the cleanup of Chesapeake Bay.

The President called only for further research on acid rain, in spite of the fact that many technical studies, including one by his own science advisors, have called for immediate action. (See "Acid Rain Controls: Is There a 'Sensible' Compromise?", November/December, 1983.)

President Reagan boasted of his request for \$175 million for parkland acquisition, but this sum represents only two thirds of the amount Congress appropriated last year. Meanwhile, Reagan was silent on other critical public-lands issues.

The administration announced its intention to modify the offshore leasing program. Environmentalists say they will wait for the specifics of the new program before deciding if it represents a significant step forward.

The President made much of the fact that he is requesting a greater increase in funding for the Environmental Protection Agency than for any agency except the Department of Defense. The proposed EPA budget would still be 10 percent less than it was in the last year of the Carter administration. The President turned down EPA Administrator William Ruckelshaus's plea to restore his agency's funding level to the \$1.35 billion it had received then.

While the President called for a program to clean up Chesapeake Bay, he continues to oppose significant changes in the Clean Water Act that would control nonpoint-source pollution throughout the country, the key factor contributing to the degradation of Chesapeake Bay.

Sierra Club President Denny Shaffer said the State of the Union speech "demon-

strates that the President has failed to provide the country with environmental leadership. When Americans across the country are calling for bold new initiatives to clean up our air and water and to protect our public lands, the President's response is neither bold, nor new, nor adequate."

Democratic Candidates Decry Acid Rain

Five hundred environmentalists from 30 states and Canada attended the Citizens' Conference to Stop Acid Rain held in Manchester, N.H., January 6 through 9. The conference, cosponsored by the Sierra Club, featured presentations by leading experts on acid rain, plus panel discussions, film programs, and speeches by six of the eight Democratic presidential candidates—Gary Hart, Ernest Hollings, Walter Mondale, Jesse Jackson, Alan Cranston, and John Glenn.

All the candidates who attended pledged support for strong acid-rain controls and blasted the Reagan administration for its inaction on the issue. They differed only with regard to the timetable, tonnage reduction, and funding mechanism for control of the emissions that cause acid rain.

Mono Lake Suit Dismissed

A federal district-court judge recently dismissed a Sierra Club lawsuit that sought to

protect water rights in the Mono Lake basin. According to Sierra Club Legal Defense Fund attorney Laurens Silver, the court took this action because the Department of the Interior has moved to assert federal water rights, the object of the suit. In dismissing the suit, the court left the door open for the Club to intervene in a related suit brought by the Audubon Society or to file a new suit if the situation deteriorates.

According to Silver, "Judge Karlton's decision is not a setback to our efforts to protect Mono Lake. The Club can still participate in the Audubon litigation, and the Department of the Interior has been made conscious of its duties in the Mono Basin. Interior knows that the Club and other groups are closely monitoring the lake, and if Interior does not follow through on its intentions, the Club will be back in court promptly."

Nuclear Industry Suffers Setbacks

The nuclear-energy industry was dealt a number of severe blows recently as construction was halted on three partially completed plants and a fourth plant was denied permission to operate.

The Marble Hill nuclear plant in Madison, Ind., was cancelled after \$2.5 billion had already been spent by Public Service Company of Indiana. The projected cost of the plant soared from \$1.4 billion to more than \$7 billion and threatened to bankrupt the utility.

In southern Ohio, Cincinnati Gas & Electric Company announced that the 97-per-





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cent-completed William H. Zimmer nuclear facility will be converted to a coal-burning unit because of uncertainty over obtaining an operating license. Such a conversion is the first attempted by a U.S. utility.

Work on the Limerick No. 2 reactor near Philadelphia was suspended for 18 months by the Pennsylvania Public Utilities Commission because its developer, Philadelphia Electric Company, could not continue to finance the project without outside help. As with the other cancelled plants, cost overruns have been substantial.

Perhaps the most stunning blow of all was delivered when the NRC denied the Commonwealth Edison Company permission to operate its newly finished Byron Power Station near Rockford, Ill., because of inadequate quality controls during construction.

Taken in sum, the events set two precedents: Never before have nuclear power plants been cancelled so close to completion and with so much money already invested, and never before has the federal government prevented a completed nuclear facility from operating.

These recent actions cast serious doubts on the continued feasibility of nuclear power as an energy source for the nation, and many experts believe that the nuclear industry's ultimate test will be the performance of existing facilities. "If we have a decade without serious mishaps, people will be much calmer," says Carnegie-Mellon economist Lester Lave. "But if there's another Three Mile Island, we can forget about the nuclear industry."

The Department of Energy, meanwhile, continues to predict an increasing influence for nuclear power, projecting that the number of reactors in commercial operation will increase from 75 to 125 by the year 2000 and that the share of electricity generated by the nation's nuclear plants will jump from 12.5 to 19 percent.

Anderson Urged to Halt Third-Party Campaign

In a letter signed by Phil Berry, the Sierra Club's Vice-President for Political Affairs, the Club joined a number of environmental, women's, and peace organizations in urging former Rep. John Anderson to abandon his plans for a third-party candidacy for the presidency.

The groups thanked Anderson for continuing "to speak out in support of many of the issues that we care most about," but added, "We believe, as you do, that it is imperative that Ronald Reagan be defeated. We are strongly convinced, however, that this is possible only with a concentrated,

single-focused, and unified effort behind a major party candidate. We will not support your candidacy in 1984 should you choose to run, and we strongly urge that you decide against such a race."

The groups asked Anderson for a meeting to discuss these concerns, but Anderson has responded that while he is indeed putting together a new party to run a candidate, he has not decided whether he himself will run, and therefore such a meeting would be inappropriate.

Berry expressed disappointment over Anderson's refusal to meet. "Our concern is not with John Anderson's personal qualifications for the presidency. It is with his decision to use a third-party vehicle, which can only split the forces seeking to replace Ronald Reagan. Whether he is to be the candidate of that party or not, we would still have liked the chance to discuss our objections to the strategy he has chosen."

High Court Okays OCS Leasing

The Reagan administration won a major victory in January when the U.S. Supreme Court ruled that the Department of the Interior could go ahead with its ambitious program of offshore oil and gas lease sales in California. "We're very disappointed by the Court's decision. It could lead to environmental disaster," said Bob Hatoy, the Sierra Club's Southern California/Southern Nevada Regional Representative.

In July 1982 the Sierra Club, other environmental groups, and the state of California filed suits in an effort to slow down Interior Secretary James Watt's massive offshore leasing program. A federal district court and the Ninth Circuit Court of Appeals ruled in favor of the Club, holding that sale of the leases would directly affect California's coast and that such leasing would thus have to be consistent with that state's coastal plans. In other words, the state could play a significant role in determining the timing and location of the leases.

The Supreme Court reversed these rulings. "The sale of OCS oil and gas leases is not an activity directly affecting the coastal zone," the Court majority said, "... and thus a consistency review is not required."

The Sierra Club will work with members of Congress to draft language to remedy the problem. Concerned readers can ask their representatives and senators to support legislation calling for a moratorium on offshore oil drilling in environmentally sensitive areas and to support efforts to strengthen the role states may play in protecting their coasts from offshore oil and gas leasing. □

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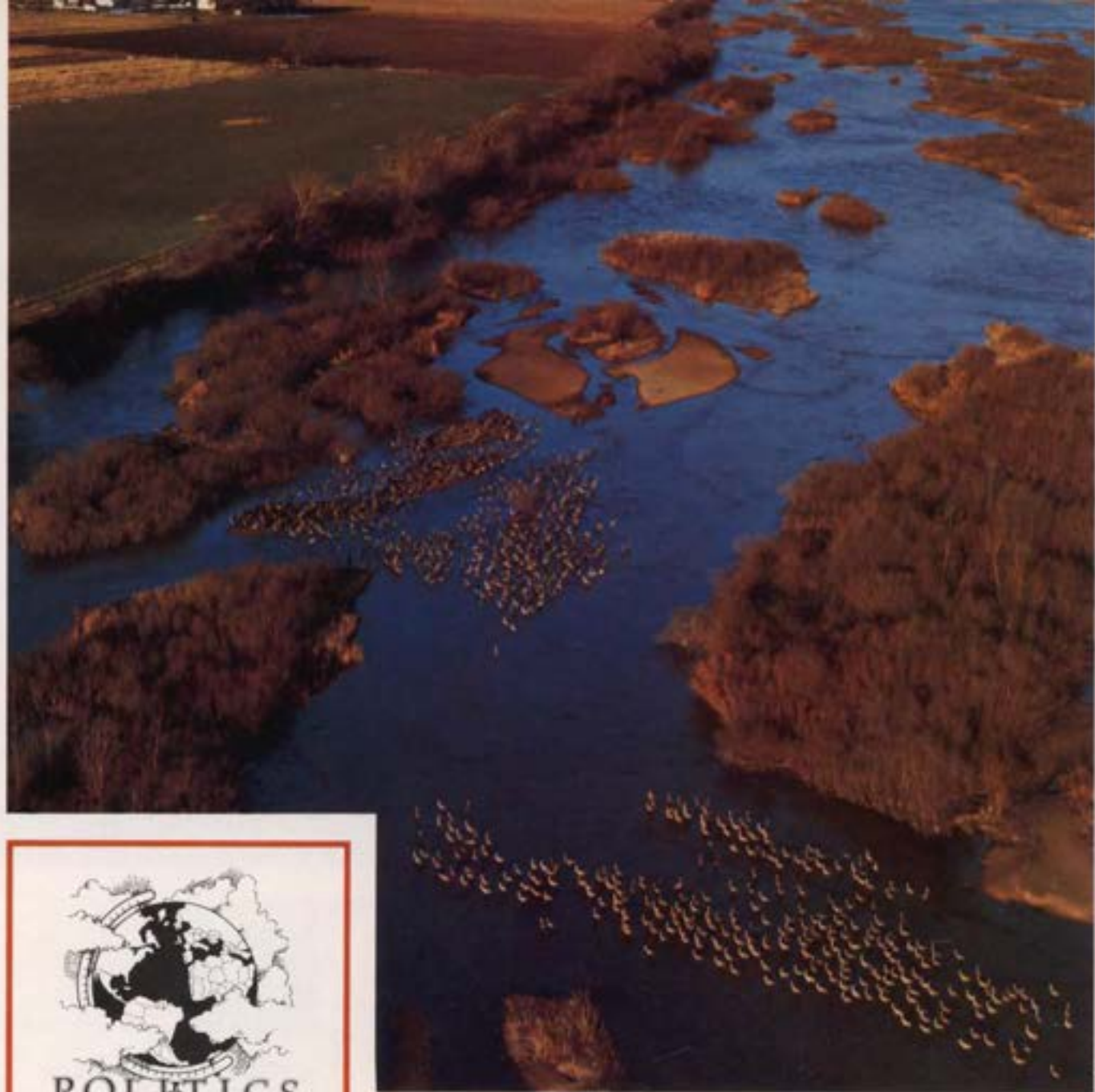
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Roosting on the barely submerged sandbars of the Platte River, sandhill and whooping cranes are safe from predators during a stopover on their long migration from New Mexico to Canada.

TROUBLE DOWNSTREAM

Migrating Cranes Force a Showdown on Platte River Water Projects

MARTHA W. GILLILAND

HIGH IN THE ROCKY MOUNTAINS of Wyoming and Colorado spring the headwaters of the North and South Platte rivers, which converge, hundreds of miles downstream, into the Platte River in central Nebraska. From there the Platte meanders eastward through a broad, shallow valley, finally entering the Missouri River just south

of Omaha. Decades of irrigation have resulted in a greening of the prairie in the Platte River valley; while the Platte is known to some Americans as the river "a mile wide and an inch deep," the river and its environs are considered by many in Nebraska, Colorado, and Wyoming to be their own Nile Valley.

A vehement debate over how the Platte's

remaining water should be allocated is now taking place. The conflict between environmental and water-development interests is intensifying, and the institutional and legal frameworks within which water policies traditionally have been formulated are no longer adequate. The future of the Platte River and of the wildlife it sustains will be determined in the next months as the states shape

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new systems for devising water policy and as federal environmental laws are re-authorized.

The river has been a tremendous boon to the region's agriculturally based economy. Several million acres of agricultural land are now irrigated with Platte River water. In addition, many of the towns and cities in the valley use the river's alluvial aquifer as a source of drinking water.

In quite different ways, however, the valley is abundant and generous to hundreds of thousands of lesser sandhill cranes, similar numbers of ducks and geese, and 80 percent of the world's whooping-crane population. Every February about 500,000 sandhill cranes fly from their wintering grounds in Texas and New Mexico to Nebraska's Central Platte Valley, a distance of about 600 miles. The valley's combination of exposed sandbars, nearby fields, and wet meadows provides an ideal ecological niche for the cranes, a place to rest, feed, and find a mate prior to flying farther north for nesting. The



Lesser sandhill cranes feed on wet meadows along the Platte River. Upstream development could destroy this critical habitat.

exposed sandbars provide safety from predators, while fields and meadows provide food.

As settlers and livestock moved into the Central Platte Valley around the turn of the century, river water was diverted for agriculture and hydroelectric power. A reservoir-and-dam system in Nebraska and Wyoming now regulates the river, and diminished flow has resulted in a narrowing of the river channel. As trees and shrubs have encroached on sandbars and wet meadows have become forests, crucial habitat for the sandhill crane has been lost.

Preservation of the remaining wildlife habitat will require maintenance of a substantial part of the existing river flow in the Central Platte Valley. Preserving the flow will be difficult, however, as the water policies of the states involved favor development. In Nebraska and Wyoming, maintenance of instream flow for wildlife habitat is

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not considered a beneficial use for water; therefore, water rights for instream flows are not obtainable. While Colorado law does permit maintenance of instream flows for wildlife habitat, competition for water among various users is intense.

Laws in these states do, however, promote water rights for agricultural uses, and pending water-rights applications would require more water than is now in the river. State hearings on these applications reflect the myriad conflicts between agricultural and environmental interests, among agricultural-project developers themselves, and between agricultural interests and the municipalities concerned about the quality of their water supplies.

The federal government is also on the scene. Under the Endangered Species Act a portion of the Central Platte Valley has been designated as "critical habitat" for the endangered whooping crane and bald eagle, and for the threatened least tern. This designation is further protected by Section 404 of the Clean Water Act, which provides protection for wetlands throughout the nation.

All interests have converged in the case of a dam and water-diversion project proposed for a South Platte River tributary in Colorado, a project that could affect crane habitat 250 to 300 miles downstream in Nebraska. In a legal dispute over the permit for the project, a federal district court in Colorado invoked the Endangered Species Act and the Clean Water Act in upholding the government's right to require that developers establish a mechanism for protecting crane habitat prior to project construction.

Adding to the controversy, Sen. Malcolm Wallop (R-Wyo.) is offering an amendment to the Clean Water Act, which is up for congressional reauthorization this year. His amendment is aimed at overturning the court decision and weakening the wetlands protection provided under Section 404. The Wallop amendment is likely to be the most controversial issue in the Senate debate over Clean Water Act reauthorization. Thus, the conflict between the states' water rights and federal environmental protection has been blown up to such proportions that federal laws as well as whooping cranes are potentially affected.

Throughout its history the Platte River has wandered through its three-state valley relatively unconstrained by geologic and topographic features. Seeing the river in the spring, observers in the late 1800s wrote: "It has the appearance of a great inland sea but was only three or four feet deep; it is hard to realize that a river should be running so near the top of the ground without any timber, and no bank at all; the... Valley of the Platte lay before us—for league after league, a plain as level as a frozen lake..." Summer

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viewers saw "nothing but a flat expanse of sand, stretching from a mile and half to three miles in width, and at many points not a drop of water is to be seen; at some points a silver thread, winding along the wilderness of sand, may be discovered, but it is not until the Loup Fork empties its waters into the Platte that it assumes the appearance of a river." These accounts portray a river that flooded in spring and early summer, that was intermittent in late summer and early fall upstream of its confluence with the Loup River, and that was essentially devoid of trees along its banks.

At present, reservoir releases control spring floods and increase flow during the summer irrigation season. Whether the proposed water projects will change flow patterns in the critical-habitat stretch in such a way that vegetation will increase and wet meadows will dry up depends on the cause of the vegetation encroachment. Some analyses suggest that spring floods formerly scoured the river channel, preventing seedlings from establishing themselves. Others suggest that it was the intermittent nature of the river that prevented the growth of vegetation. There are data to support each position. The effect of a diversion on the waterbird habitat, therefore, depends on the seasonal distribution of the diversion and on the amount and timing of the return flows. Hydrologists and ecologists are attempting to specify the impact of each proposed project, but scientific "proof" remains elusive.

Meanwhile, the state of Nebraska is breaking new ground in its approach to conflict resolution and to the shaping of new institutional and legal systems for determining water policy. Using the "adaptive environmental assessment process" developed by ecologists C. S. Holling and C. J. Walters, the state embarked on the Platte River Forum for the Future. People involved in the Platte controversy met in August 1982 to develop a computer-simulation model of the Platte River basin. The model includes various economic, hydrologic, environmental, agricultural, and municipal components that represent the values and interests of the concerned parties. In cooperation with workshop participants, scientists from the University of Nebraska and several state agencies spent the next year refining the model. The effects of one irrigation project and of maintaining river flow for waterbirds were demonstrated at a water-policy workshop in December 1983. While the effort has produced an improved appreciation for and an understanding of the conflicting viewpoints, it has not yet produced a tangible compromise.

Another attempt at settling the controversy was spawned by the Governor's Water Independence Congress, a 40-member com-

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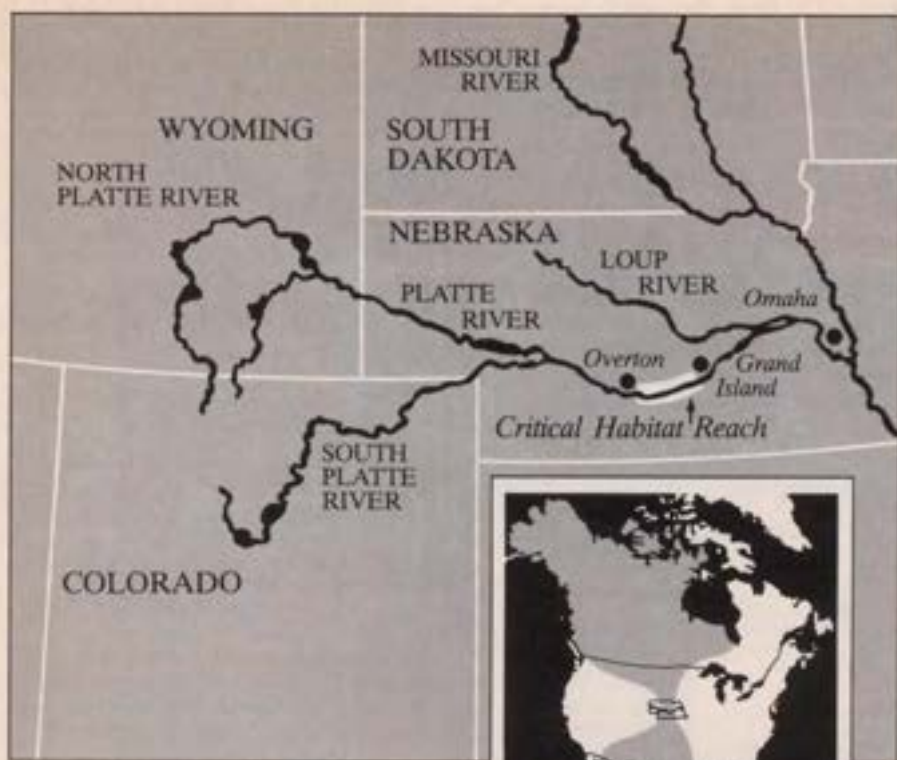
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Hourglass-shaped flyway (inset) underscores the critical role the Platte River plays for migrating cranes. Pressure from agricultural and municipal interests may lead Congress to rescind protection for the area.

mittee established in May 1983. The congress was charged with the development of "a comprehensive water policy" and "a political consensus" to "sustain a program of water planning, use, funding, and management." Of particular significance to the Platte River debate are the congress's recommendations, handed down in December 1983, that instream-flow rights for fish and wildlife be recognized in Nebraska law, that funding for water projects favor those that demonstrate water-conservation practices, and that environmental values be given more recognition in water-project decision-making.

Perhaps the most important recommendation of the congress has to do with the institutional framework within which water policies are determined. Traditionally, irrigation development has been in the federal domain, with planning and funding handled by the Bureau of Reclamation. Although a water right from the state was required, its acquisition was largely automatic. However, the water-development situation has changed dramatically. First, projects would no longer be built unless state and local governments pay a large part of the bill; second, as far as the Platte River is concerned, available water is nearly fully allocated. With the need to raise state and local tax monies for water projects comes the

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need to accommodate various values and interests at the state level. Recognizing this fundamental shift, the congress recommended that a water agency be shaped from existing state agencies and commissions, and that its director be appointed by the governor; that the agency be given the authority to resolve conflicts over water projects before water rights are granted; and that it evaluate projects on the basis of water-conservation and environmental criteria as well as economic ones. These recommenda-

tions went to Nebraska's state legislature in January 1984, and if they become law, the future of the Platte River is likely to be decided within this new framework.

The conflict over the Platte River is sometimes described as a birds-versus-people issue, with "people" being interpreted in terms of the economic return that comes to the state from irrigated lands. While conservation and environmental criteria are beginning to gain equal footing with development and agricultural considerations, the Nebras-

ka legislature recently passed a resolution urging the Department of the Interior to remove the "critical habitat area" designation for the Central Platte Valley.

The future of the Platte is uncertain, and fractious interests will undoubtedly continue to validate the old proverb, "Whiskey is for drinking, water is for fighting."

Martha W. Gilliland is an associate professor in the department of civil engineering at the University of Nebraska at Omaha.

BLIND AMBITION

Impounding Carolina Wetlands

JANE LAREAU

NO THREAT TO COASTAL wetlands is as complicated and deceptive as that of impoundments—the diking and flooding of vast tidal wetland areas for duck hunting and, on occasion, for aquaculture. There is increasing pressure from private interests in South Carolina to impound these critical wetlands, reducing even further the limited habitat

that serves as feeding and nursery grounds for 65 percent of the commercial fish in United States waters, as well as for untold numbers of other marine species.

Impoundments, if managed carefully, provide attractive waterfowl habitat; they also can produce certain desirable aquaculture products, such as shrimp and blue crab. But debate arises over the wisdom of alter-

ing and destroying wetlands considered to be among the most productive and beneficial habitats on earth—wetlands that are already heavily pressured and decreasing in acreage—simply to improve the quality of duck hunting on a few private properties.

South Carolina has close to 27 percent of the remaining tidal marshlands along the East Coast. Out of a total of some 500,000 acres, approximately 70,000 have already been impounded. Half of these impoundments are under state control; the remainder are actively owned. Forty-one percent of the wetlands around the Santee Delta are impounded, as are 22 percent of those around St. Helena Sound. Virtually all of the other estuaries in South Carolina are also impounded to some extent.

Most of these impoundments are hold-

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overs from the rice culture of the 1700s and 1800s, as practiced on the many plantations that studded South Carolina's coastal river system. When rice culture was abandoned for economic reasons in the mid-1800s, most of the impoundments were abandoned in consequence, and left to fall into disrepair. As the dikes eroded, the impounded areas—once forested but since logged—succeeded to productive wetlands.

Over the years, the remaining impoundments became recognized as exceptionally good waterfowl habitat. An intense culture and tradition evolved around duck hunting in the South Carolina coastal region (known as the Lowcountry) as wealthy businessmen recognized the value of the region for both business promotion and personal use. No small amount of political business, then and now, has been conducted in a duck blind, and a certain favorable status is accorded those who own impoundments teeming with waterfowl (and those invited to hunt them). As a result there is competition among some landowners to attract an ever-decreasing number of ducks to certain impoundments and away from certain others, necessitating intense waterfowl-management practices. It is this competition to "get the ducks" that has inspired the most recent applications for impoundment.

Moreover, the state of South Carolina shows a growing interest in exploring aquaculture as an industry. It is generally viewed there as economically promising (though virtually no one has made a living off it yet) and environmentally safe (depending on what type of land is being used). Margaret Davidson is director of the South Carolina Sea Grant Consortium, an organization of the state's major universities and government agencies involved in coastal and marine research. Says Davidson, "With its 180 miles of coastline, large expanses of salt-water and freshwater areas, and thousands of acres of agricultural lands suitable for pond construction, South Carolina is a prime area for the development of aquaculture as a supplemental source of fish and shellfish products. The state has the potential to become a major center for aquaculture activities in the United States."

Research on aquaculture is being conducted at the new James M. Waddell, Jr., Mariculture Research and Development Center in Bluffton, S.C., with other state- and federally supported scientific centers concentrating on aquaculture in small, controlled upland ponds or tanks.

Opposition to impoundments in the state is not directed toward these carefully controlled scientific ventures, but rather toward the applications of private citizens who want to impound large expanses of open wetlands for duck hunting, under the guise of practic-

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ing aquaculture. Because the term "aquaculture" has a noble ring to it, applicants can apply for permits to impound areas for "scientific research" while submitting management plans devised expressly to create waterfowl habitat.

Two significant impoundment applications have been approved by the South Carolina Coastal Council, the official body responsible for protection of the state's coastal resources. One permit, issued to C. E. Graham Reeves of Annandale Plantation in Georgetown County, would allow 660 acres of the fertile Santee Delta to be impounded. The permit was immediately challenged by conservationists because, though it purported to be for marine biological research and aquaculture, the intention was in fact to manage the wetland acreage for duck hunting, as testimony in the appeal hearing later showed.

The second permit, issued to Jack Maybank of Charleston County, was to impound 820 acres of coastal marsh on the South Edisto River. The intention again was to create duck-hunting habitat, but a secondary management plan for aquaculture was thrown in as an afterthought to make the application more palatable to the Coastal Council.

Maybank's permit was appealed by the South Carolina Chapter of the Sierra Club;



Duck hunting, not some new interest in aquaculture, appears to be the leading motive behind recent requests for permits to impound South Carolina's coastal wetlands.

Reeves's by the League of Women Voters (LWV), the Natural Resources Defense Council, and the state's attorney general, with the Sierra Club providing financial support to the LWV. The Reeves case is now before the South Carolina Supreme Court. The Coastal Council voted to uphold the Maybank permit, but has not yet issued its

findings of fact or conclusion of law. The Sierra Club is waiting on their issuance before it decides whether to appeal to the courts.

"The Sierra Club's position is simply that wetlands are among the most productive ecosystems in the world and that there is no proven use that man could put these lands to

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that would supersede what they do when left as they are," says James S. Chandler, Jr., the Sierra Club's attorney in the Maybank case. "We are not arguing against duck hunting or aquaculture here; that is not the point. The point is that this is too valuable a public resource to be squandered this way."

The Club also based its appeal on the fact that the South Carolina Coastal Council is violating its own policies, regulations, and management program by permitting the impoundments. Coastal Council policy states: "Impoundments of previously undisturbed saline and brackish-water marshes shall be discouraged, as these areas are among the most valuable and productive of our coastal wetlands." (Controversy surrounds the word "previously," because many of the lands at issue were once impounded; however, they function now as open wetland, and the loss of productivity would be exactly the same. Historically, when the council has determined that a wetland area was not "previously undisturbed," it has felt no compunction about allowing it to be impounded.)

The Reeves suit was filed on the same premises as the Maybank case, but it additionally charges that the land in question belongs to the public. In South Carolina, land below the mean high-water mark—and that includes most tidal wetlands—is consid-

SIGHTINGS



Tennessee Valley Authority Director S. David Freeman recently addressed the Ohio Chapter's Miami Group on "Alternatives to Nuclear Energy"—a subject of particular interest in light of the problems facing the region's Zimmer Nuclear Power Station. Left to right in the photo above: D. David Altman, chair of the city of Cincinnati's Environmental Advisory Council; Judith M. Schultz, professor of environmental studies at the University of Cincinnati; the TVA's Freeman; and Bill Hutchinson, vice-chair of the Miami Group.

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ered public and is held in trust by the state, unless ownership can be proven back to a king's grant or valid state grant. In most cases this is not possible to prove, because court records were burned or lost during the Civil War. (The defendant in the Maybank case was able to prove ownership, however.) So the legal questions being asked are: "Can a person alter land, grow a crop on it, and sell it for profit when the land belongs to the public? Are the resources held in an impoundment the property of the state, or of the person claiming benefit from the impoundment?" The attorney general maintains that the land belongs to the public and that the defendant has no right to alter it, to block public access to navigable streams on it, or to deny the public access to the resources in the area.

As the cases wind their way through the legal system, a number of people with large coastal landholdings are watching, according to coastal biologists. Because the cases will set precedents, their outcome could encourage the impoundment of vast acreages of irreplaceable South Carolina wetlands under the pretext of "practicing aquaculture," and opponents would have little recourse against the trend.

The federal government has its own permitting process, administered by the Army Corps of Engineers under the authority of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. But once the state permitting agency, the Coastal Council, has made its decision, it is very difficult to get a reversal at the federal level, largely because it is the Reagan administration's policy that the states be allowed to manage public resources.

The fight against the impoundments is a difficult one for local scientists and conservationists because their proponents can make convincing arguments for them. It is difficult for the lay person to perceive the danger in something that can produce blue crabs and shrimp larger than those harvested from the sea; that can accommodate thousands of ducks and wading birds; and that even provides habitat for eagles, otters, and alligators. What exactly, one is tempted to ask, is the problem?

"The problem is that one type of productivity is exchanged for another, with vested interests deciding how a scarce resource will be used, based on economic, political, and even emotional factors," says Steve Gilbert, a biologist with the U.S. Fish and Wildlife Service. "You're taking a diverse and productive habitat out of commission and replacing it with a highly specialized habitat so you can grow one or two 'crops' for a profit, or simply for sport hunting. We are not knowledgeable enough yet about either system to make such a long-term, irrevocable

judgment about such a valuable resource."

The productivity of the open marsh has been well documented. Whether fresh, brackish, or salt water, the marshes annually produce tons of organic matter that supports the intricate food chain. "As marsh grass decomposes, it is colonized by bacteria and fungi and becomes a very rich food," says Dr. Charles Biernbaum, associate professor of biology at the College of Charleston. "Probably half the vegetation grown on a saltmarsh leaves it as detritus, and this represents a very large quantity of material."

Most coastal and marine species are dependent either directly or indirectly on this organic material and on free access to it, says Biernbaum. "They also depend on the marshes as their nursery grounds, including marine species normally found in deep water as adults. The marshes produce food for over-wintering waterfowl and other wildlife, such as otters, clapper rails, killifish, marsh periwinkles, mussels, fiddler crabs, and mud snails—to name just a few."

Wetlands also have important roles to play in erosion control, water-quality improvement, flood control, and water storage. "The marshes' potential for performing tertiary waste treatment for society has been shown to have values running into the tens of thousands of dollars per acre, provided they are left in their natural state," says Dr. William H. Herke, a fisheries scientist from Louisiana who has studied impounded areas.

"When a section of marsh is impounded, it is diked off so there is no longer a normal interchange of organic material with the system outside," says Harvey Geitner, another Fish and Wildlife Service biologist. "The construction of dikes is in itself an incredibly destructive process that can permanently remove 100 acres of marsh at a time. Impoundments can range in size from 25 to 1,000 acres and more, removing vast amounts of material from the food chain. Too many impoundments could have a disastrous effect on the many species that depend on the estuaries for a constant source of nutrients and for important nursery habitat."

Management techniques for attracting waterfowl to impoundments vary, depending on the location of the impoundment and the type of waterfowl desired. Usually the owner must "draw down" his impoundment in early spring through a system of gates that makes use of the fluctuating tides. Draw-down may be followed by disking, burning, grazing by stock animals, or application of herbicides that decimate the natural flora and fauna. The impoundments are flooded about six weeks later, usually at a gradual pace over a period of two to three months. These techniques encourage the growth of

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introduced and natural food plants for waterfowl, but slow the processes natural to wetlands and reduce the access of marine animals to nursery grounds during critical summer months. Visitation by waterfowl and wading birds is increased, and selected species of fish and invertebrates can survive and even flourish within the less-competitive closed system. However, few are known to reproduce in such a modified environment, and whatever the techniques produce is not shared with either the natural system or the public.

The "aquaculture" aspect of the private management of such systems is usually just an ancillary activity, consisting of harvesting whatever happens to be caught in the impoundment that is edible or salable.

"Truly intensive impoundment aquaculture management is a horror story for everything but the species being managed," says FWS biologist Gilbert. "When an impoundment is managed for one species, it has to be 'managed against' that species' predators." Chemicals are used to kill predator fish and undesirable grasses; waters are kept too deep for wading birds to use, and raccoons, alligators, and otters are regarded as potential menaces requiring "control." Ironically, proponents point to this very accumulation of plant and animal life as proof that impoundments are good for the environment.

Instead of the daily ebb and flow of water and nutrients natural to an open system, there is erratic draining and flooding, which dumps the accumulated organic material into the estuary at irregular intervals. "It is doubtful the natural system can assimilate this or use it efficiently in any way at all," says Biernbaum. "The timing of the discharge is critical. Some impoundment proponents claim that organic material is released into the natural system during drawdown and at other times of periodic release, and so the natural system supposedly does have access to it. The problem with this is that the release of material might not coincide with the natural release; animals or organisms thus may not get their necessary quantity or type of food at the time they need it. This is especially important during the reproduction and development of species that utilize the detritus directly or indirectly as food."

Another concern of impoundment opponents is that artificially designed systems cannot equal natural ones in their inhabitants' resistance to outbreaks of disease and parasitism or to natural disasters. "Estuaries have existed for countless centuries, through which time organisms have been evolving life patterns and responses to environmental factors that are to their maximum advantage," says fisheries expert Herke. "This has been an extremely slow process, but it has brought forth a mar-

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Ultimately, the productivity of even the enclosed system is completely dependent on how well it is understood, and on the assumption that it will be managed properly and consistently. There are many notoriously neglected impoundments in South Carolina, according to state and federal wildlife biologists who see them during site visits and flyovers. "If a person is serious about wanting to practice aquaculture in this state, there is no need to impound additional wetlands at this time," says Charles Beardon, director of the Office of Conservation and Management for the South Carolina Department of Wildlife and Marine Resources. "There are already enough impoundments that are not being managed properly or producing what they are capable of in terms of aquaculture, waterfowl habitat, or the natural system."

The issue is highly controversial in the state, and a great deal depends on the outcome of the two court cases. The 18-member Coastal Council has approved both impoundment applications, and without the strong backing of a judge's decision, conservationists and concerned scientists fear the council will continue to favor those applicants wishing to impound coastal wetlands, basing their decisions less on environmental consequences than on other factors. (One member of the council leases a duck blind from Graham Reeves for \$1,000 a year.)

Currently, the National Oceanic and Atmospheric Administration's Office of Sea Grants, under the administration of the South Carolina Sea Grant Consortium, is conducting a massive study, comparing brackish-wetland impoundments with adjacent unaltered systems to assess the types and levels of productivity in each case.

The Sierra Club asked the Coastal Council, after the Reeves appeal was filed, for a moratorium on all impoundment permits until all legal questions were answered and until scientists were able to answer some of the questions about relative productivity between closed and open wetland systems. The council refused, issuing the permit for Maybank not long after the Club's request was filed.

If the courts do not rule in favor of the conservationists and scientists, it will represent a victory for the concept of private gain

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at the public's expense. Opponents of short-sighted impoundment applications will find their only recourse through the ballot box. It will be necessary to organize a grassroots movement in South Carolina, to systematically replace pro-impoundment members of the Coastal Council, as they come up for

reelection, with people who have a better understanding of and appreciation for the resources at stake.

Jane Lareau, a member of the South Carolina Chapter's executive committee, has a special interest in coastal and forest issues.

CRISIS AT KESTERSON Wastewater and Wildlife in California's Central Valley

REPRESENTATIVE GEORGE MILLER

WHEN FEDERAL water-management experts planned the Kesterson National Wildlife Refuge in California's Central Valley, they visualized it as part of a 5,900-acre marshland supporting a wide variety of birds and fish. Now, nearly 30 years later, their dream of a thriving wildlife preserve is turning into an ecological nightmare.

The Central Valley, a broad alluvial plain running for hundreds of miles through the center of the state, is composed of the sediment from millions of years of river runoff and oceanic deposit. Irrigated largely by underground aquifers, the valley in its natural state was host to an array of wildlife that lived in the freshwater marshes, grasslands, and rangelands that spread out from the San Joaquin River.

Shortly after the Gold Rush, those with an eye toward development observed that a stable supply of surface water could transform the region into an agricultural heaven.

That water supply was provided by the federal Central Valley Project and the California State Water Project; since the 1930s, billions of dollars have been spent constructing and operating a series of dams, reservoirs, and canals. The once-diverse ecosystems of the valley have been plowed under; agriculture is now the state's leading industry, and California is the nation's leading agricultural state.

Along with the water projects go hundreds of millions of dollars in subsidized benefits to the irrigators: low water rates, huge discounts, and long repayment periods for interest-free loans. The cheap water encouraged the overplanting of low-quality lands and the wasteful use of water resources; as a result, water users are generating unforeseen quantities of wastewater, much of it heavily polluted by pesticide residues and salts as well as by hazardous materials that occur naturally in the valley sediments. Beneath the fertile farmland are clay layers that prevent adequate drainage



As straight as an arrow and almost as deadly, the San Luis Drain separates the evaporation-pond complex (seen here to its left) from the natural wetlands of Kesterson National Wildlife Refuge.

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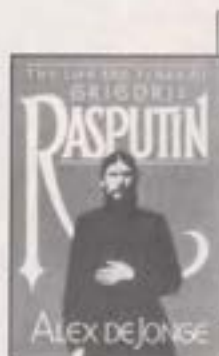
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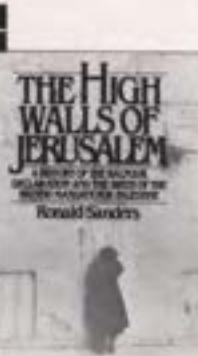
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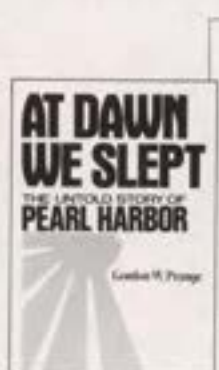
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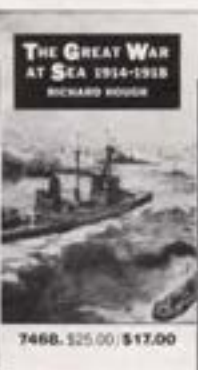
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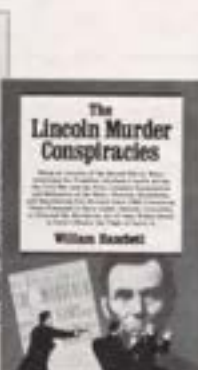
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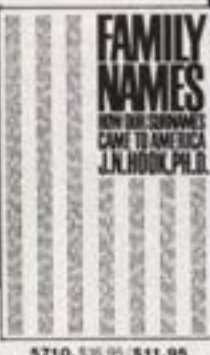
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of the irrigation water, so that water planners have had to devise not only a means of transporting water to valley farms but also a complex and costly method for removing wastewater from the farmland.

To remedy the wastewater problem in the Central Valley, the federal Bureau of Reclamation designed the billion-dollar San Luis Drain to carry the polluted water 190 miles north to the Sacramento/San Joaquin Delta, an ecologically fragile habitat for migratory birds and fish that feeds into San Francisco Bay. To date, only the portion of the drain extending from the rich farmland in Kings County to the current terminus, Kesterson Reservoir, has been completed.

Shortly after the San Luis Drain began dumping tens of thousands of acre-feet of drainage water into Kesterson Reservoir in 1980, the U.S. Fish and Wildlife Service (FWS) noticed that conditions at the refuge were not as they should be. Prior to the delivery of drain water, Kesterson supported many types of fish, including largemouth and striped bass, catfish, carp, and mosquito fish. Now only mosquito fish can be found, and they contain extraordinarily high levels of selenium, an element that, in large quantities, has been linked to embryonic mortalities, gross abnormalities, and cancer in fish and waterfowl. According to the FWS, the mosquito fish sampled at Kesterson in 1982 contained "among the highest levels of selenium that have been reported in living fish." Since that time, even-higher levels of selenium have been found in the mosquito fish from some ponds.

Last September additional tests were conducted at Kesterson. According to the FWS, "Full-strength drain water is toxic to test fish in two days and to invertebrates in one day." The agency also noted "an extensive fish kill over a large part of the drain from unknown causes."

Fish are not the only victims of the drain water's contaminants. In the spring of 1983, the Patuxent Wildlife Research Laboratory conducted a study of birds nesting at Kesterson. According to the FWS, "A high incidence of abnormal embryos and chicks of several species of aquatic birds was noted."

Scientists compared birds nesting at Kesterson with those at the Volta Wildlife Area, situated about 10 miles away. Unlike Kesterson, Volta is not fed by agricultural drain water. Coots, ducks, and grebes at Kesterson were found to have several times as much selenium in their livers as those at Volta. Selenium in breast muscles was 700 to 800 percent higher among Kesterson's birds, high enough to cause concern that hunters might be exposed to excessive selenium levels if they were to consume the wild birds.

Most shocking were the findings of em-

Continued on page 76

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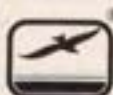
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T THE DEMOCRATIC CANDIDATES & THE ENVIRONMENT

The 1984 presidential election is eight months away, but the campaign is already in full swing. The announced Democratic candidates have crisscrossed the nation speaking out on environmental issues—acid rain in New Hampshire, wilderness in Colorado, the nuclear freeze in Iowa, offshore oil leasing in California. In addition to their recent statements on the environment, most of the candidates have records as elected officials.

The following summaries of the candidates' environmental records are drawn in large part from *Presidential Candidates for 1984: Their Records and Positions on Energy and the Environment*, published by the League of Conservation Voters (LCV). Other information was taken from interviews, speeches, position papers, and biographical materials. These summaries do not reflect preference for any one candidate, nor will the Sierra Club make any endorsement during the primaries. The summaries simply provide information about each candidate's stand on several priority environmental issues, including clean air, clean water, toxic waste, public lands, and energy.

A complete edition of the League of Conservation Voters' candidate profiles is available for \$6 from the LCV office (320 4th St., N.E., Washington, DC 20002). Membership in the LCV is \$18 annually and includes comprehensive voting charts reflecting the environmental records of senators and representatives of both parties as well as the complete profiles upon which the following summaries have been based.

REUBIN ASKEW

Former governor of Florida [1971-1978]

Because Reubin Askew has never been elected to national office, his record on the full range of environmental issues is not as clear as those of the other presidential aspirants. But for most of the 1970s, Askew guided the development of the fastest-growing state in America. His tenure was characterized by strong concern for environmental protection, and on many issues his hard work and strong leadership were largely responsible for the passage of progressive legislation.

AIR POLLUTION. In his League of Conservation Voters interview, Askew noted that acid rain is a serious national problem,

and he spoke of the immediate need to set a challenging goal for the reduction of sulfur-dioxide emissions. Although unwilling to commit himself to a specific plan for such reductions, he has suggested that financing come mainly from a surcharge on utility bills, with some supplementary funding from government; he has also mentioned possible financial incentives to industry.

WATER POLICY. One of Askew's first acts as governor was to convene a state conference on water management, from which emerged legislation that gave Florida one of the best water-management systems in the region. The Water Resources Act, supported by Askew, provided the framework for an integrated state water policy.

Askew also played a personal role in what was probably the number-one priority of central Florida environmentalists in the 1970s—the defeat of the proposed Cross Florida Barge Canal. In his

Illustrations by Kim Caldwell

LCV interview, Askew criticized traditional cost/benefit analyses used in current water-management planning and cited "the need for a national water policy."



PUBLIC LANDS. Perhaps Askew's greatest personal effort was devoted to passing a \$240-million state bond issue allowing the state to purchase recreational and environmentally threatened land, which led to the establishment of new state parks and 80 miles of public beaches. Askew also supported the successful effort to stop construction of a jetport in the Everglades, and has contributed to the continuing fight to stop phosphate mining in the Osceola National Forest.

Askew was the first governor to initiate strong coastal-protection legislation. He supported the enactment of Florida's Coastal Zone Management Act and helped create coastal construction set-back lines to control beach erosion.

Askew opposes President Reagan's deletion of wilderness study areas (WSAs) and says he would increase wilderness designations as President.

ENERGY. In his LCV interview, Askew pointed to the need to "reconsider the use of nuclear power in this country . . . to get a handle on the hazardous wastes they create," and he stated that "this country must make a serious commitment to renewable energy resources and conservation."

ALAN CRANSTON

Senator from California

L.C.V. RATINGS: 1982 (71%); 1981 (80%); 1979-80 (78%); 1977-78 (85%); 1975-76 (84%); 1973-74 (81%); 1971-72 (92%); 1970 (92%)

In announcing his candidacy for the presidency, Alan Cranston said that arms control would be his number-one priority if elected. He later listed four key issues that he would concentrate on as President: peace, jobs, the environment, and education.

Even though he does not sit on the major environmental committees, Cranston has often taken the initiative and worked behind the scenes and on the Senate floor to improve legislation.

AIR POLLUTION. Cranston had a perfect record during the four years of struggle that culminated in the 1977 Clean Air Act revisions, voting in favor of strict protection for such pristine areas as national parks, as well as for strict automobile emission standards. However, he supported the coal-conversion bill in 1980, allowing industries and utilities that switch from oil to coal to increase their sulfur-dioxide emissions. Cranston has said he favors cutting sulfur-dioxide emissions in half within six years, largely through implementation of a strong energy-conservation program. In the past he has cosponsored two significant pieces of legislation in this area: the Mitchell bill (S. 145, which calls for a 10-million-ton reduction in sulfur-dioxide emissions over 10 years) and the Hart-Stafford bill (S. 769, which calls for a cutback of 12 million tons of emissions over 15 years).

WATER POLLUTION/TOXIC WASTE. Cranston backed a strong Toxic Substances Control Act in the mid-1970s, and he also voted three times in 1982 for more money for the EPA Superfund for toxic-waste cleanup. Cranston had a perfect record on amendments associated with the reauthorization of the Clean Water Act in 1977. He has consistently voted for environmentally sound water-

pollution legislation, including generous federal grants to states for construction of sewage-treatment plants.

ENVIRONMENTAL FUNDING. Cranston has an excellent voting record on funding levels for environmental regulatory agencies and on the issues affecting the power and authority of such agencies to implement environmental laws.

PUBLIC LANDS. Cranston has been an outspoken critic of the Reagan administration's environmental policies in general and those of former Interior Secretary James Watt in particular. He was a leader in opposing Watt's original appointment and one of only 12 senators to vote against Watt's confirmation. Cranston has worked for many years to add environmental safeguards to federal offshore oil and gas leasing programs on the outer continental shelf, and he stopped Watt from leasing huge tracts off the California coast.

Over the past decade, Cranston has been a major Senate leader on a variety of wilderness and parks issues, including the Alaska National Interest Lands Conservation Act (ANILCA).

ENERGY. Cranston has a perfect record on energy issues and has initiated many important renewable-energy projects. As a member of the Banking Committee, Cranston supported the establishment of the Solar and Conservation Bank to offer loans to homeowners, and he also supports grants to help the poor weatherize their homes. He has supported mandatory energy-efficiency standards for autos, buildings, and industrial pumps and motors.

Cranston has consistently supported strict environmental safeguards for the operation of existing nuclear power plants; he has also opposed additional subsidies for the nuclear-power industry.

During the Carter years, in committee and on the Senate floor, Cranston voted to scale back authorization of the \$20-billion Synthetic Fuels Corporation. However, he opposes current efforts to deauthorize the corporation along with its spending authority.

WATER PROJECTS. Cranston has a weak record on this major issue. He has supported many controversial water projects, including the Tennessee-Tombigbee Waterway and the Dickey-Lincoln Dam. However, he has consistently voted against exempting water projects from such environmental laws as the Endangered Species Act and the National Environmental Policy Act.



JOHN GLENN

Senator from Ohio

L.C.V. RATINGS: 1982 (71%); 1981 (56%); 1979-80 (53%); 1977-78 (76%); 1975-76 (43%)

John Glenn has a generally good record on clean water, wetlands and coastal protection, toxics, worker health and safety, and public lands, and he has been a leader on nuclear nonproliferation. He has a poor record on clean air and development of synthetic fossil fuels.

AIR POLLUTION. During the critical debates culminating in the Clean Air Act Amendments of 1977, Glenn opposed environmentalists on six out of seven Senate floor votes. Glenn voted four times to weaken or delay auto-emissions standards. He voted in favor of a proposal to allow power plants upwind of national parks and wilderness areas to exceed Clean Air Act standards 18 days per year, but did oppose an even worse amendment to virtually eliminate all special air-quality protections for these still-clean areas. In 1980,

Glenn supported the coal-conversion bill. Glenn has now come out in favor of a mandatory 8-million-ton reduction in sulfur-dioxide emissions over the next 11 years in the eastern United States; he proposes that the cost of achieving these reductions be financed by a fee on all fossil-fuel-generated electricity in the 31-state area east of the Mississippi.

WATER POLLUTION/TOXIC WASTE. Senator Glenn supported passage of the strong Toxic Substances Control Act of 1976, and in 1982 voted three times to increase spending for the toxic-waste Superfund. He wrote to former EPA Administrator Anne Gorsuch to protest the agency's lifting of the ban on dumping liquid hazardous waste in landfills, and cosponsored legislation to expedite the identification and regulation of potentially hazardous waste.

Glenn had a perfect voting record during the Senate's last debate over the reauthorization of the Clean Water Act in 1976-1977, backing generous federal grants for construction of sewage-treatment facilities.

ENVIRONMENTAL FUNDING. In 1981, Glenn voted against a floor amendment to limit Reagan's proposed 21-percent cut in EPA funding to 10 percent. However, in 1982, Glenn voted against further cuts in research funding for the EPA. Late in 1981, Glenn also voted against cutting important Interior Department programs

5 percent beyond the administration's original request. In his LCV interview he said he favors adequate funding for and strict enforcement of our environmental programs.

PUBLIC LANDS. Glenn strongly opposed former Interior Secretary Watt's proposal to sell federal lands, and he cosponsored the Wilderness Protection Act of 1982, which was designed to stop Watt from issuing oil and gas leases in wilderness areas. He also voted for a moratorium on Watt's sale of coal leases on public lands at bargain-basement prices. As

President, Glenn told the LCV, he would permit energy leasing on public lands "only when the value of the resource very, very clearly outweighs the estimated damage and impact" on the environment.

Glenn has supported the environmental position on all the recorded Senate floor votes on parks, wilderness areas, and wild and scenic rivers, including those on Alaskan lands, Redwood Park expansion, Idaho wilderness, and designation of the New River as a Wild and Scenic River.

ENERGY. Glenn has an inconsistent voting record on energy issues, although he has greatly improved in recent years. He is currently a cosponsor of the comprehensive Solar Energy, National Security and Employment (SENSE) Act.

Glenn opposed Reagan administration efforts to make major cuts in the budget for research and development of renewable energy resources; however, when he first came to Congress, Glenn voted against increases in this budget. In addition, Glenn voted for the Synthetic Fuel Corporation, and although he eventually changed his position, at one time he supported the Clinch River Breeder Reactor.

WATER PROJECTS. Glenn's record on water projects has been erratic. He has voted for four highly destructive water projects—the Tennessee-Tombigbee Waterway, the Garrison Diversion Project, the Dickey-Lincoln Dam, and the Tellico Dam. However, he has voted three times since 1980 to reduce overall spending for federal water projects, and he backs the concept that beneficiaries of water projects should share in their costs.

GARY HART

Senator from Colorado

L.C.V. RATINGS: 1982 (66%); 1981 (72%); 1979-80 (73%); 1977-78 (93%); 1975-76 (72%)

With assignments on the Environment and Public Works Committee, Hart has been an effective leader in many important environmental battles, and has recently introduced several strong environmental bills. Indeed, with the exception of some water projects, Hart's efforts are almost always aimed at strengthening environmental legislation.

AIR POLLUTION. Hart worked to strengthen the Clean Air Act in 1977, and he has been a major national leader on clean-air issues as a member of the critically important Environment and Public Works Committee, on the Senate floor, and as chair of the National Commission on Air Quality from 1977-1980. Although he has sometimes been criticized for compromising too much, his leadership on many clean-air battles has been outstanding. Hart is a cosponsor with Sen. Robert Stafford (R-Vt.) of a new acid-rain bill calling for the largest reduction in sulfur-dioxide emissions of any congressional proposal (12 million tons over 15 years).

WATER POLLUTION/TOXIC WASTE. During the Clean Water Act reauthorization debates in the mid-1970s, Hart consistently supported all major provisions of the act, including federal construction grants for sewage treatment. However, in some cases Hart has not supported clean-water concerns that conflicted with federal dam projects.

Hart sits on the committee that has jurisdiction over toxic substances, and he has consistently supported a strong Toxic Substances Control Act, the Resource Conservation and Recovery Act, and the Superfund. Recently, Hart introduced two major initiatives to increase funding for toxic-waste disposal. Although Hart says he opposes federal away-from-reactor storage of nuclear waste, he voted for it in 1983 as part of a package deal on the waste issue that he was instrumental in negotiating.

ENVIRONMENTAL FUNDING. Hart has been a leader in committee and on the Senate floor in fighting President Reagan's proposed cuts in EPA funding. He has also voted against cuts in Interior Department programs.

PUBLIC LANDS. Hart has shown significant leadership on important park and wilderness issues, working to protect and extend the National Wilderness Preservation System and the Wildlife Refuge System. Hart's leadership was crucial in seeing that a Colorado wilderness bill was passed in 1980. This bill, one of the largest for any state, has become a model for other RARE II wilderness legislation.

Hart was also among the first senators to cosponsor ANILCA, and he worked closely with Sen. Paul Tsongas (D-Mass.) to push the bill through Congress.

ENERGY. Hart has been among the most active congressional leaders in support of solar energy, playing a critical role in the 1978 enactment of tax credits for residential and commercial investments in solar technology. Currently a cosponsor of the SENSE Act, Hart has worked to expand federal research assistance for renewable energy sources and has led many fights to cut off subsidies to the nuclear power industry. He has also worked to improve safety



standards for the mining of uranium and the operation of nuclear power plants. Although he is a cosponsor of a bill to deauthorize the Synthetic Fuels Corporation, he continues to support oil-shale development.

WATER PROJECTS. Hart's otherwise strong record falters on the issue of federal water projects. He has frequently supported destructive water projects, including the Dickey-Lincoln Dam and the Garrison Diversion Water Project.

ERNEST HOLLINGS

Senator from South Carolina

L.C.V. RATINGS: 1982 (62%); 1981 (46%); 1979-80 (44%); 1977-78 (57%); 1975-76 (42%); 1973-74 (33%); 1971-72 (42%); 1970 (51%)

Fritz Hollings's role on key committees has often been an asset to environmentalists, though his Senate floor votes have, in general, been mediocre.

For years Hollings has been the major Senate leader working to protect the coastal and ocean environments through a strong Coastal Zone Management Act and other laws, but he has often voted against clean-air measures and in favor of crash programs to commercialize synthetic fossil fuels.

The biggest issue in Hollings's presidential campaign is his call for a freeze on overall domestic spending by the federal government, along with a 3-percent cap on increases in Pentagon spending. Such an overall plan does not specify which programs will be cut;

but if Hollings had his way, most environmental programs would probably be spared.

AIR POLLUTION. Hollings has a poor voting record on the Clean Air Act Amendments of 1977. In 1980 he voted in favor of the coal-conversion bill. However, Hollings is now a cosponsor of Sen. Mitchell's acid-rain bill. And he told his LCV interviewers that some years ago, as a member of the Appropriations Committee, he backed the granting of tax credits for installation of coal scrubbers to reduce emissions.

WATER POLLUTION/TOXIC WASTE. Hollings's record on toxics legislation is erratic. Though he voted against a 1972 amendment to require premarket testing of all chemicals, he did support passage of the Toxic Substances Control Act of 1976. As a member of the Budget Committee he supported a \$60-million increase for the Superfund, and voted for it twice on the floor in 1982. Yet he opposed a more modest floor amendment to add \$30 million to an appropriations bill that same year.

Hollings has a fairly good record on the various issues covered under the Clean Water Act. He has generally favored a strong federal funding commitment to help states pay for expensive sewage-treatment facilities.

ENVIRONMENTAL FUNDING. On both the Budget and Appropriations committees, Hollings has been an ally on key efforts to restore funds for the EPA, the Interior Department, and other important federal environmental programs.

PUBLIC LANDS. Hollings has a perfect record on parks, wilderness, and wild and scenic rivers legislation, including votes on ANILCA, Idaho wilderness, Redwood Park expansion, and the designation of the New River as a Wild and Scenic River. Recently,

he twice backed a moratorium on Watt's public-land coal-lease sales, and cosponsored the Wilderness Protection Act.

ENERGY. Hollings sponsored legislation in 1976 to establish a program of grants and loans for energy conservation. However, he has a mixed record on floor votes on renewables. Hollings is now a cosponsor of the SENSE Act.

WATER PROJECTS. Sen. Hollings has a generally weak record on water projects, supporting many environmentally destructive projects, including the Dickey-Lincoln Dam and the Tennessee-Tombigbee Waterway. He voted against cuts in the bloated budget for water projects in 1980 and 1981, though in 1983 he voted to transfer \$200 million from water projects to construction grants for much-needed sewage treatment plants.

JESSE JACKSON

Illinois

In recent years, Reverend Jackson has served as national president of Operation PUSH (People United to Serve Humanity), a Chicago-based civil-rights and economic-development organization that he founded in 1971.

Because he has not held elective office, there is little in Jackson's career or record to indicate his positions on key environmental issues. However, in a January 6, 1984, speech before the Citizens' Conference to Stop Acid Rain (in Manchester, N.H.), Jackson called for "a complete reversal of existing environmental policy." Specifically, Jackson stated that he favors:

- reauthorization of the Clean Air Act;
- reauthorization and strengthening of the Clean Water Act, and passage of the Safe Drinking Water Act;
- prompt elimination of toxic-waste sites and "aggressive enforcement" of the Superfund program;
- the phasing-out of existing nuclear power plants and an end to construction or licensing of new ones.

In addition, Jackson said, he is "in complete opposition" to any attempt to attack the national park system in Alaska. Conservationists assume he was referring to S. 49, the sport-hunting bill sponsored by Alaska Sen. Ted Stevens (R).

With regard to acid rain, Jackson said he supports H.R. 3400, introduced by Rep. Henry Waxman (D-Calif.), which calls for reducing sulfur-dioxide emissions through imposing controls on the nation's 50 largest polluters, but would modify the bill "by insisting on a net 12-million-ton reduction." The Waxman bill would impose a kilowatt-hour tax on all electricity generated from nonnuclear sources; Jackson would modify this portion of the bill also, imposing the tax on all electricity generation regardless of its source.



GEORGE MCGOVERN

Former senator from South Dakota [1962-1980]

L.C.V. RATINGS: 1979-80 (65%); 1977-78 (83%); 1975-76 (76%); 1973-74 (80%); 1971-72 (74%); 1970 (79%)

Because George McGovern entered the presidential race relatively late, his environmental record has not been studied in depth, nor



had he been interviewed by the LCV by the time this summary was prepared. However, he had a fine environmental record while in the Senate.

In 1969, McGovern sponsored the National Environmental Policy Act, and in 1973 he sponsored the Forest Environmental Management Act. As a senator, McGovern supported ANILCA, the Clean Air and Clean Water acts, strong stripmining regulations, expansion of the wilderness system, and the liberalization of legal standing with regard to those who bring citizen suits to protect the environment. He did differ with environmentalists in his support for costly water projects, including the Dickey-Lincoln Dam and the Oahe Diversion Project.

In environmental position papers published recently, McGovern has outlined his current stands on key conservation and energy issues.

AIR POLLUTION. While in the Senate, McGovern voted in support of four of the seven 1977 Clean Air Amendments, but was absent for the other three votes. In 1980 he voted in favor of the coal-conversion bill. McGovern endorsed both the 1983 New Hampshire acid-rain resolution and S. 769 (the Stafford bill), which set ambitious goals for sulfur-dioxide reduction. McGovern has stated that he believes more stringent emission controls can be achieved by improved cooperation between the public and private sectors.

WATER POLLUTION/TOXIC WASTE.

McGovern advocates a stronger federal role in the management of toxic waste. He has stated that the EPA and other regulatory agencies must "adhere to the letter and the spirit of the laws of the land" and "strictly enforce" the Resource Conservation and Recovery Act, the Toxic Substances Control Act, and the Superfund. McGovern also supports increased federal funding for research aimed at ameliorating the current inadequate and dangerous methods of hazardous-waste disposal.

McGovern favors a greater financial commitment to achieve the goals of the Clean Water Act, in particular to control the problems associated with nonpoint-source pollution, loss of wetlands, and stream contamination.

ENERGY. According to the 1980 LCV election report, McGovern was a "leader on nuclear power, authoring amendments for a moratorium and for a state veto over nuclear-waste storage. He supported local efforts to control uranium mill tailings and to publicize the problems with synthetic fuels."

In his position paper, McGovern expresses his support for development of alternative sources of energy and stresses in particular the economic feasibility of large-scale commercial programs for developing renewable energy. McGovern also advocates direct federal loan assistance to those working to commercially develop renewable energy.

WALTER MONDALE

Former Vice-President and senator from Minnesota

L.C.V. RATINGS AS U.S. SENATOR: 1975-76 (76%); 1973-74 (78%); 1971-72 (92%); 1970 (80%)

Walter Mondale had a fine environmental record as a senator in the early to mid-1970s. However, he did not serve on the important environmental committees and was not a leader on most issues.

AIR POLLUTION. Mondale was a cosponsor of the original Clean Air Act in 1970. He opposed efforts in the Senate to delay auto-emissions standards and to kill Clean Air Act protection for such still-clean areas as national parks. Mondale has not endorsed any specific acid-rain legislation, but has called for a 50-percent reduction in sulfur-dioxide emissions (calculated by conservationists to be equivalent to 10 million to 12 million tons per year), with costs "fairly shared" among the lower 48 states through the mechanism of a self-financed trust fund. He has emphasized, however, that large polluting utilities ought not to pass their cleanup costs along to consumers.

WATER POLLUTION/TOXIC WASTE. While Mondale is well versed on many environmental issues, he speaks with most conviction on toxics and pollution issues, and he has a consistently good record in this area. In 1972, Mondale voted in favor of requiring premarket testing of all new chemicals, and in 1976 he supported passage of the Toxic Substances Control Act. Although Mondale was not in the Senate when the Superfund was enacted, he supports extension of the Superfund to cover compensation for victims of contamination by toxic waste.

Mondale was a leader in Congress in working to protect America's lakes and their wildlife against death from eutrophication caused by phosphates. He was a lead sponsor of the Clean Lakes Act and supports federal aid for construction of sewage-treatment plants.

ENVIRONMENTAL FUNDING. Mondale was not in the Senate for recent votes to cut environmental-agency budgets, but he has been critical of these attempts and proposes to restore "as quickly as possible [environmental] agencies to skilled professional management and give them the resources they need to implement the various laws."

PUBLIC LANDS. Mondale's Senate record on public lands is quite good. He was active in passing legislation to create new parks, recreation areas, and wildlife refuges in his home state of Minnesota. As Vice-President, Mondale helped get Democratic leadership in Congress to move ahead on legislation to expand the Boundary Waters Canoe Area.

ENERGY. During his last years in the Senate, Mondale supported increased federal funding for research and development of solar and other renewable-energy resources. Recently he has voiced support for increased funding in this area and for changes in the tax rules that discourage investment in energy conservation and renewables. He also advocates lowering the costs of alternative energy sources by increasing the market for them in a variety of ways.

While Mondale was Vice-President, the Carter administration actively supported massive subsidies for development of synthetic fossil fuels and the creation of an Energy Mobilization Board. Mondale has recently indicated that he leans toward abolishing the Synthetic Fuels Corporation, while he continues to support research in this area.

WATER PROJECTS. As a member of the Senate Finance Committee, Mondale resisted efforts to reform federal water policies and had a mixed record on water issues, voting in favor of many unsound projects, including the Dickey-Lincoln Dam. In his LCV interview Mondale said he favored stopping the most destructive projects, but that he would include western political leaders in any such decisions. □



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REPRIEVE FOR MINNESOTA'S WOLVES

Saved from sport-hunting by a recent court ruling, the last free-roaming wolf population in the Lower 48 still faces a host of management problems.

ODEAN CUSACK

THE HOWL OF THE GRAY WOLF, once the North American continent's supreme predator, is seldom heard in the lower United States today. The wolf is, in fact, largely extinct—the victim of westward expansion and the resulting loss of habitat and of an extensive poisoning and hunting campaign (waged by the U.S. government) that succeeded in eliminating the species from 99 percent of its former range in the lower 48 states.

But in northeastern Minnesota, where dense forests provide suitable habitat, and where ample deer herds still supply adequate prey, an estimated 1,200 wolves roam free, protected as “threatened” by the federal government under the 1973 Endangered Species Act (ESA).

The future of these last survivors, however, is far from certain. Their coexistence with farmers and livestock in this sparsely populated region is the crux of a bitter controversy between environmentalists—who wish to ensure the species' continued protection under federal law—and some local residents and politicians, who demand that responsibility for management of the wolves be returned to the state.

In 1982 the Department of the Interior proposed to return control of the species to Minnesota, and to



Canis lupus, a spectacularly misunderstood animal hounded nearly to extinction in the U.S., is slowly making a comeback—aided by court rulings reaffirming its protection under the Endangered Species Act.





The lone wolf of legend is in fact a social creature that travels, hunts, and feeds with its fellows in a pack. This bonding instinct is also seen in the wolf's relative, the domestic dog.

allow both a sport-hunting season on wolves and a subsequent national and international commerce in wolf pelts. This management plan was essentially identical to an earlier version that had been rejected by the Carter administration. But the political climate changed, and this wolf-harvest proposal found a receptive audience in the Reagan Interior Department.

Because the gray wolf is a threatened species in Minnesota, the state receives federal funds for management of the population. However, any management plan must be in compliance with regulations outlined in the ESA and must facilitate the eventual recovery of the species and its ultimate removal from the list. Noting that "the state of Minnesota . . . has indicated that it will not devote substantial resources to a wolf-management program unless the plan contained [sic] the flexibility to permit a carefully controlled taking of wolves by the public," the U.S. Fish and Wildlife Service (FWS) issued its proposed regulations amendment on July 14, 1982. Public hearings were held in Minneapolis and in the northern town of International Falls in August, and written comments were accepted until mid-September. Nearly a year later, on Au-

gust 12, 1983, officials of Minnesota's Department of Natural Resources (DNR) announced that the Interior Department had turned management of Minnesota's wolves over to the state. DNR Commissioner Joseph Alexander immediately declared a "sport kill" of 50 wolves for the 1984-85 winter season, and said that thereafter a quota of kills would be in effect (perhaps as many as 160), based on estimates of the wolf population.

But the state-level management program was immediately put on hold pending a U.S. district court ruling on an injunction brought against then-Interior Secretary James Watt and the Fish and Wildlife Service by a coalition of 12 environmental groups (including the Sierra Club). On January 5, 1984, Judge Miles Lord ruled against the Interior Department's management plan. Brian O'Neill, attorney for the coalition, had argued that two ESA regulations disqualified Interior's plan: First, it is illegal to have a sport season on a threatened species; second, because the Interior Department is charged by law to do all within its power to increase the populations of threatened and endangered species, and because the current regulations have the purpose of decreasing the number of wolves, they are therefore illegal.

Judge Lord's decision stymies Interior and state plans for the time being, but the issue is hardly resolved. [Editor's note: At

press time Interior had yet to file an appeal.] Prohunting sentiment runs high, even among those charged with the wolf's protection. In supporting the state management plan, the Fish and Wildlife Service outlined four reasons for recommending the current proposal. First, a thinning of the wolf population in areas where livestock depredations have been recurring would effectively allot more of the wild prey resident in these areas to each of the remaining wolves, and thus would reduce depredations. Second, proximity to humans has decreased the wolf's fear of man, and thus a sport season is needed to reinstall its fear. Third, it is in the best interests of the wolf for the state of Minnesota to be actively involved in its conservation, because of the "manpower and resources" of the state DNR. Finally, the proposed harvest would contribute to the success of a plan to recolonize the species in adjacent suitable habitat. These assertions, however, are vigorously challenged by environmentalists, who claim that the FWS proposal is not based on scientific data or wolf biology and that it directly contradicts the spirit and letter of the ESA.

At present, predator control is the responsibility of FWS wildlife biologists L. David Mech—perhaps the best-known wolf ecologist in the world—and Steven H. Fritts. Targeted at specific offending animals, the program, initiated in 1979, was designed to reduce livestock losses while destroying the

minimum number of wolves possible. With the exception of a considerable increase in depredation that occurred in 1981, livestock losses have remained relatively stable, and the highly successful program has resulted in the killing of only 56 wolves. More important, perhaps, the team has been the first to compile documentation of the actual extent to which domestic animals are preyed on by wolves in the state. The data have led Fritts to the conclusion that "wolf depredation on livestock in northern Minnesota is not as serious as generally believed. A small percentage of the farms in the wolf range are affected annually, and a minute fraction of the livestock in the area is killed by wolves. In fact," he adds, "the low incidence of depredation is remarkable in view of the proximity of wolves and livestock in an area where husbandry practices predispose many herds and flocks to depredation by wolves."

The wolf's range in Minnesota encompasses some 77,000 square kilometers, mostly wilderness, but including close to 12,000 farms, the majority of which raise livestock. Through 1980 the highest number of farms suffering depredation by wolves in a given year was 17, and the highest ratios of livestock kills claimed were .45 cattle per thousand and 1.18 sheep per thousand. Most depredation occurred on farms near the south and west perimeters of the wolf's range. In 1981 a surge in depredation occurred mainly in a select region, involving mostly sheep and turkeys—highly vulnerable prey that, Fritts says, are often killed in excessive numbers. But the predator-control team successfully removed several important wolves in the area, and Fritts reports that losses returned to their generally low levels in 1982.

Fritts has identified several factors that contribute to an exaggerated view of depredation by wolves. Missing animals are traditionally assumed to be wolf victims. Similarly, cows thought to be pregnant are released to graze in the woods; if one of them returns without a calf, wolves are automatically blamed for the newborn's death. However, pregnancy testing is not widespread in northern Minnesota, particularly on the small farms that border wolf territory. Fritts relates a recent example in which a farmer claimed 60 calves were lost to wolves; only four losses could be verified. The following spring a pregnancy test revealed that of the 150 animals the farmer thought were pregnant, 40 were not. "Because most of these cows were in the herd the previous year," says Fritts, "the very existence of at least some of those 60 calves can be questioned."

Damage caused by dogs and coyotes is often attributed to the wolf, possibly because the farmer cannot distinguish among the signs left by the three canids. According

to Fritts, at least 10 percent of the complaints lodged against wolves should have been directed at coyotes—which, in his opinion, pose a greater overall threat, especially to sheep and turkeys, than do their lupine cousins. (Incidentally, the environmental assessment filed with the FWS proposal states that in areas where the wolf population decreases, the coyote population will increase.) Further, a compensation program that pays up to \$400 for each animal killed by wolves biases some farmers toward blaming the wolf. No compensation is paid for livestock killed by dogs and coyotes. The fund itself, originally set at \$100,000, illustrates how the issue has been overstated. Amounts claimed average about \$20,000 a year, most of which has been paid to a few farmers whose farms have been the sites of recurring predation. "The wolf gets blamed for more than its share," concludes Fritts.

Finally, the predator-control team has determined that depredation of livestock is not, by itself, a necessary consequence of farming near wolf territory. "Most wolves do not kill livestock even when that food is available," says Fritts, "and many instances of depredation by wolves seem to be related to animal-husbandry practices." Thus, a random harvest would do little to reduce depredation unless it involved a virtual purge of Minnesota's wolf population. "At present," concludes Fritts, "there is no evidence that a successful depredation-control program must include taking large numbers of wolves. To do so without capturing the offending ones probably does little to alleviate the problem." He would, however, prefer to put more effort into reducing the size of current depredating packs. (See "Conditioning the Wolf to Kill," page 43.)

Although the Mech/Fritts program is generally acceptable to environmentalists (who feel it is humane and within the spirit of the ESA) and farmers (who can speak for its effectiveness), there are dissenters. "It's not totally satisfactory," says Bob Neuenschwander, a state legislator from the International Falls area. Targeting specific animals is "unrealistic" and "impractical," he claims. Neuenschwander, a businessman whose medley of interests includes a taxidermy firm and a Canadian fur-buying license, considers the wolf a clear and present danger. "You bet it is," he says, "and if you lived here, you'd think so too. They [defenders of the wolf] want the citizens of Minnesota to harbor a population of timber wolves just so we can say we have them." Criticizing environmentalists for "blowing the sport-hunting provision out of proportion," Neuenschwander says the major issue is states' rights. "We want the state to regain control of the timber wolf so it can be managed like other wildlife species. This is an area in

"While some may place value on the wolf because of its fur or simply as a game animal, the Endangered Species Act has given the wolf a status much more important—it is a protected animal that all must seek to conserve. If this is not done, the result is obvious. There will simply no longer be a wolf/human conflict, for there will be no more wolves."

U. S. District Court Judge Miles W. Lord



In the contiguous United States, the gray wolf (*Canis lupus*) occurs only in the portion of northeastern Minnesota delimited on this map. (Source: *The Mammals of Minnesota*, by Evan B. Hazard; University of Minnesota Press, 1982.)

“Congress has now mandated that each person who would slay the wolf must stay his hand.... An increased ‘war on wolves’ in northern Minnesota will not be permitted under the law.”

U. S. District Court Judge Miles W. Lord

which we feel we’ve done a pretty competent job. Those who are vocal about not turning the matter over to the state don’t live in the state.”

Begging to differ is wildlife educator Karlyn Atkinson Berg, who moved to Minnesota in 1973 specifically to study wolves in their natural environs and to work in educational programs geared to enhance their survival. She is now regional coordinator for the North American Wildlife Park Foundation, a center for the study of wolf and bison behavior. Known statewide as an ardent conservationist, Berg has consistently opposed all efforts to return wolf management to Minnesota. “How can the state properly manage the species when it refuses to recognize the wolf as endangered or threatened?” she asks. Nor does she acknowledge the state’s competence with other species. “They have no program for coyotes,” she points out, “which confuses protection efforts for wolves.” Further, she charges, the state has a poor record in enforcing current federal statutes. The number of wolves killed illegally is disturbingly high—as many as 250 a year—and it is often done with blatant defiance. (In 1978 the heads from two such kills were dumped at the office of a newspaper.) Only two wolf-killing cases have brought convictions to date, and the fines imposed, \$250 and \$500 respectively, are far below the \$20,000 maximum fine the law allows for killing a member of an endangered or threatened species.

Although the controversial proposal suggests that classifying the wolf as a game species will promote respect for it, and thus reduce the carnage, Berg again vehemently disagrees. Minnesota DNR statistics indicate that for every two deer killed legally in the state, three deer may be killed illegally. In 1981 the legal take was 101,000; thus the projected number poached could be as high as 151,500. “In one year,” notes Berg, “25,000 deer were killed illegally before the season even opened.

“Antiwolf sentiment and illegal killing of wolves in northern Minnesota are based on deep-seated emotions and will not be changed by setting a limited season for hunting the species,” she insists. “A limited take coupled with legalized traffic in wolves and wolf pelts creates a market and therefore an incentive for an increased illegal take of wolves.”

Neuenschwander says he personally considers the wolf “threatened,” but adds: “With a healthy, out-of-proportion herd right across the Canadian border, can they ever really be considered endangered?” Concerning illegal kills, he states simply that he “hears rumors” but has no firsthand knowledge of such action. Environmentalists consider Neuenschwander a relative

moderate on the issue: The man he defeated in the primary, Irv Anderson, an 18-year veteran of the state legislature, campaigned with a 1964 photograph of himself flanked by four dead wolves.

As for the FWS assertion that wolves have become less afraid of humans, Berg says: “Nonsense; there’s no evidence to support that.” On the other hand, Neuenschwander says he knows of “many, many instances of very close calls” between man and wolf. “They have a right to be here, just like we do,” he says, “but in reasonable numbers. When it gets out of hand, it’s got to be controlled. If something isn’t done soon, something terrible is going to happen.”

Finally, although the FWS proposal claims that the wolf harvest would aid recolonization of the species, the agency’s own environmental assessment flatly denies it. “Killing of wolves may decrease [their] dispersal and therefore reduce chances of wolf colonization in new areas of Minnesota as well as in adjacent Wisconsin and Michigan. Generalized killing may reduce dispersal more than would selective removal of entire packs,” indicates the report.

According to the ESA, any wolf-management program must include measures that would aid recovery of the species. The initially proposed 50-wolf quota, in the opinion of biologist Fritts, would not severely jeopardize the current population. However, no scientific data exist to suggest that such a harvest would help it, either, and environmentalists have justifiable fears that 50 wolves would be only the beginning of a virtual war on the animals in the state. At the public hearings, Berg reports, “they were already complaining about the low quota and the restrictive zones.”

Of course, the larger implication of the proposal concerns the ultimate future of the Endangered Species Act itself. If the rules can allow the wolf to be changed from a threatened to a game species, a dangerous precedent is set for the next species ill-fated enough to cross paths with humans. In summary, Berg observes: “The present predator-control program complies with the spirit and letter of the Endangered Species Act. It is efficient, effective, and legal. Why change a program that works so well?”

The most recent relevant legal ruling—the district court decision handed down on January 5—was a victory for those who share Berg’s opinion. Whether the conservationist point of view will be sustained throughout a possibly lengthy appeal process remains to be seen. □

*Odean Cusack has a special interest in science, animals and the environment, and related topics. She is coauthor of *Pets and the Elderly* (Hayworth Press).*

Conditioning the Wolf to Kill

FISH AND WILDLIFE SERVICE BIOLOGIST Steven Fritts has identified some six Minnesota wolf packs that habitually prey on domestic animals. The large majority of wolves do not do so, in spite of the abundance and proximity of this likely prey. In Fritts's opinion, some event triggers the initial predation and acquaints the wolf with the sight, smell, taste, and availability of livestock as a potential food source. Certain animal-husbandry practices prevalent in Minnesota probably contribute to this learning experience.

"It is possible that many wolves that ultimately kill livestock receive their first taste at a carcass dump," suggests Fritts. Although Minnesota's Livestock Sanitation Law requires that dead animals be burned or buried, many farmers find it more convenient to simply drag a carcass to the edge of the pasture, leave it where it falls, or heap it on a carcass dump. A 1979 FWS survey revealed that 63 percent of 111 farmers questioned admitted to these convenient but improper practices, which encourage wolves and coyotes to frequent the site of an easy meal.

"Depredation of cattle is fostered by pasturing stock in extensive woodlots or brushy areas and allowing calving to take place in such areas or even in remote, open pastures," says Fritts. "These practices also make it difficult to keep track of the herd and determine the causes of mortality." The chances of a wolf/livestock encounter and subsequent predation are thus enhanced.

However, once predation occurs, the wolf may relay this information to its pack and offspring. "Preying on livestock appears to be a culturally transmitted behavior," says Fritts. The wolf is a highly intelligent animal, and wolf society is characterized by cooperation among pack members. Pups learn necessary survival and social skills from their elders, which suggests that livestock predation may be a learned behavior as well.

Current federal law prohibits the killing of wolf pups, so those trapped near a farm troubled by wolves are usually released in the vicinity of their pack, a practice that angers the victimized farmer. Fritts believes that a more equitable long-term solution would be to also allow the humane disposal of the pups. But he points out: "If chronically depredating packs were to be eliminated, it's likely that other wolves eventually would initiate depredations at some of the farms with poor husbandry practices. Therefore, the ultimate solution to depredation must include modification of farm-management practices."

For the farmer whose range adjoins wolf territory, Fritts offers this advice: "First, properly dispose of all carcasses. Do not permit baiting of bears to take place in your pasture, and don't allow any meat or garbage to be left there. Adjust calving and lambing sites so they are as close to buildings as possible. And keep an adequate check on your herd's size and its whereabouts, so that if depredation does occur, it can be verified."

Fritts also thinks that for sheep ranchers, whose flocks graze in open pasture, a livestock-guarding dog might prove beneficial. Although use of these breeds, such as the Komondor and Great Pyrenees, is not widespread in this country, they have a



Newborn wolves may be fed and tended by various adults—not only by their parents. The physical contact and warmth associated with these activities helps strengthen the pups' bond to the pack.

history of successful protection in Europe, and preliminary results from a pilot project that involved placing the dogs on American farms in areas of high coyote density appear most promising. (See "Guarding Dogs: So Sheep May Safely Graze," September/October, 1983.)

Other nonlethal control methods are currently being investigated. One consists of placing flashing or strobe lights around a problem farm. Another involves taste-aversion studies that associate the taste of livestock with the nasty (but harmless) taste of lithium chloride. Results to date have been inconclusive, but Fritts urges continued experimentation with these and other nonlethal methods of predator control.

No single panacea will solve the wolf problem in Minnesota to the satisfaction of all concerned, but a combination of humane control, enlightened husbandry methods, and further scientific study can provide solutions equitable to both the farmers and the wolves. If we are willing, we can coexist with the wolf with minimal intrusion by either side. Perhaps the biggest question is: Are we willing?—O.C.

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But it is one of life's small tragedies that the perfect sleeping bag does not exist. And because buying a sleeping bag is always going to involve making some tradeoffs, it's important to assess your priorities before you buy. Above all other considerations, a sleeping bag must keep you warm in the coldest weather you expect to meet. After warmth, the high-priority questions are those of cost, life expectancy, weight, and packed size.

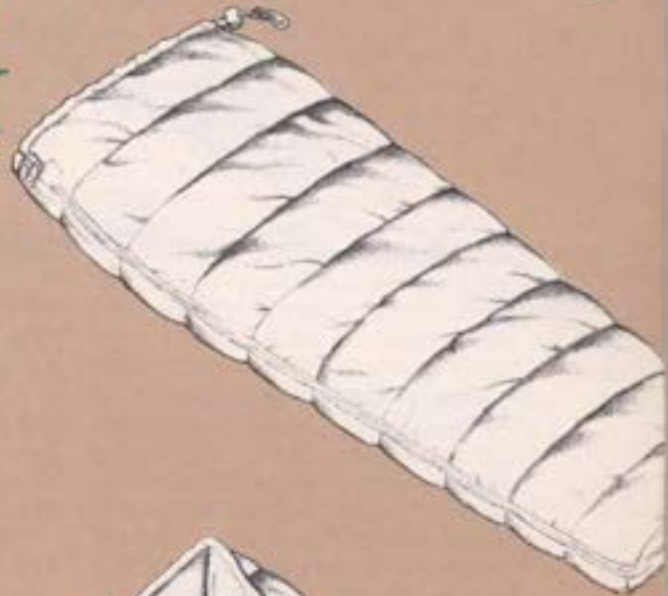
Obviously, how cold you get is related to the temperature of the materials you are in contact with, such as the ground and the surrounding air. The lower the temperature, the faster you lose heat. If you lose heat faster than your body produces it, you will feel cold. Under such circumstances, insulation is needed.

Ann Weaver, a researcher and product developer for 3M, stresses that "insulation has no heat-producing qualities of its own; rather, it simply helps the body to retain the heat it produces. The rate of heat loss goes down as the thickness of the insulation goes up. A sleeping bag that is twice as thick as another will be twice as warm, all else being equal." As a sleeping bag is used and its insulation mats down, it will become less warm—though not in direct proportion. If a Polar Guard bag, for instance, is matted to 60 percent of its original thickness, it can still retain up to 75 percent of its original insulating potential. (There is a bonus of up to 15 percent in warmth because the insulation is denser when it's matted.) For all the insulations used in new (unmatted) sleeping bags, comparable thickness equals comparable warmth—again, if everything else is the same.

Thickness is a sleeping bag's major attribute. A bag's overall design and its features are intended to ensure the uniformity of the bag's thickness around you. Properly designed, any type of sleeping bag can be made warm enough simply by making it thick enough.

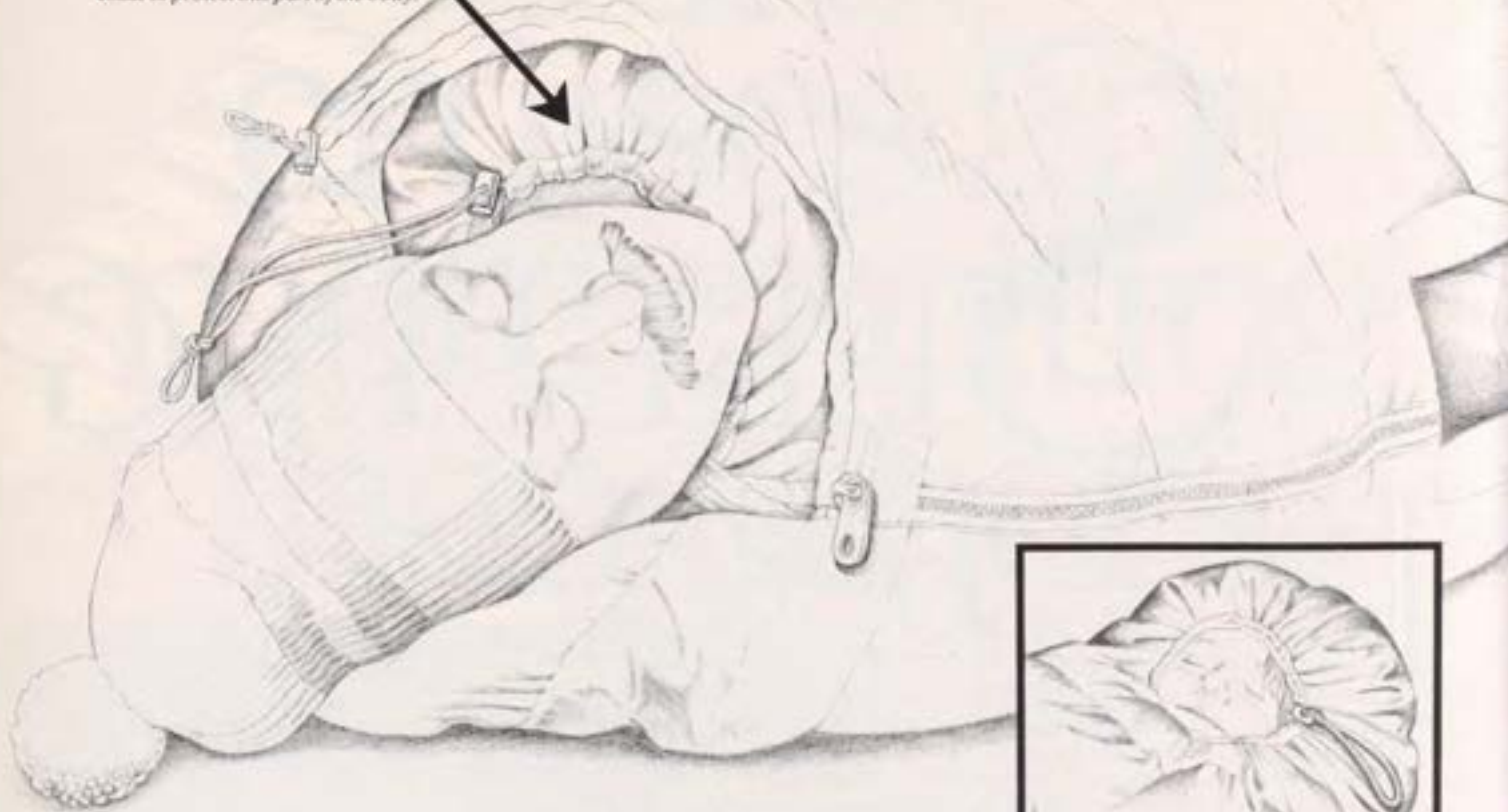
Heat can be lost in four ways: by conduction, convection, evaporation, and radiation. No one way to lose heat is intrinsically faster or worse than any other; heat will be lost fastest by the easiest path available to it.

Conduction is the type of heat loss you experience when you sit on cold marble. Air in fact makes a very poor conductor of heat, if you can keep it still. **Convection** is the circulation of air from hot to cold. (Convection on a global scale is responsible for the earth's weather, as air circulates between hot and cold regions.) Wind chill is a convective process. "What this means," explains Fred Williams, founder of Moonstone Mountaineering, "is that all modern sleeping bags rely on the



The three main shapes of sleeping bag on today's market: mummy (top), semi-mummy, and rectangular. Because the first two types are tapered toward the foot end, they tend to be lighter than rectangular bags. For the same reason they are often more heat-efficient, because there is less interior space to be warmed by the bag's heating unit—namely, the person inside.

One area especially vulnerable to heat loss in colder weather is the top of the shoulders. Some high-quality sleeping bags feature a collar to protect this part of the body.



conveniently low heat-conductivity of air. The insulating materials used in sleeping bags simply prevent the air from moving around and producing significant convective heat loss." Air that has been stabilized by insulation is called "dead" air. Even though dead air is not completely still, it passes heat much more slowly than do the air gaps around the person inside the bag or the free air outside the bag.

Radiation and evaporation are the other ways in which heat is lost. Radiative losses are the heat-energy losses resulting from the emission of infrared light. Infrared light cannot be seen by the eye, but it can be felt by the skin. "Heat rays" from a hot but dry frying pan are an example of infrared losses. All matter loses heat this way, to an extent dictated by its temperature and physical properties. According to Williams, up to 15 percent of the body's total heat loss can be due to radiation, as when a person sleeps outside in a sleeping bag on a clear, cold night. Any physical barrier—such as a tent, tarp, or tree—will slow down radiative heat losses. Later in this article, we'll take a look at some materials that greatly retard such losses.

Evaporation of moisture from anywhere inside a sleeping bag can cause significant

cooling, especially in dry environments. The rate of evaporative heat loss can vary greatly, because it depends on how wet you are, how dry it is outside, and the breathability of your sleeping system. If you are wet, and the air is cold and dry, it's possible you won't get a warm night's sleep until you dry out.

The "cold sweats" are caused by evaporative heat loss. Even cold skin tries to remain moist by sweating. When perspiration evaporates, it takes a significant amount of heat with it, and your skin responds by sweating more—completing a very cold cycle. "City" feet—those accustomed to the high humidity inside shoes—seem to be especially susceptible to the cold sweats. Use of a completely nonbreathable liner called a vapor barrier will prevent evaporative heat loss and condensation. (See "The No-Sweat Way to Stay Warm," March/April, 1983, page 75.)

There are two fundamentally different types of sleeping-bag insulators: the goose or duck downs, and the synthetic fills, primarily polyesters. Functionally, the biggest difference between them is that down is worthless when wet, while the synthetics—right down to the very cheapest—lose almost none of their insulation value when wet. So, the first question you must answer about your needs is, how wet do you expect your sleeping bag to get? If you raft, kayak,

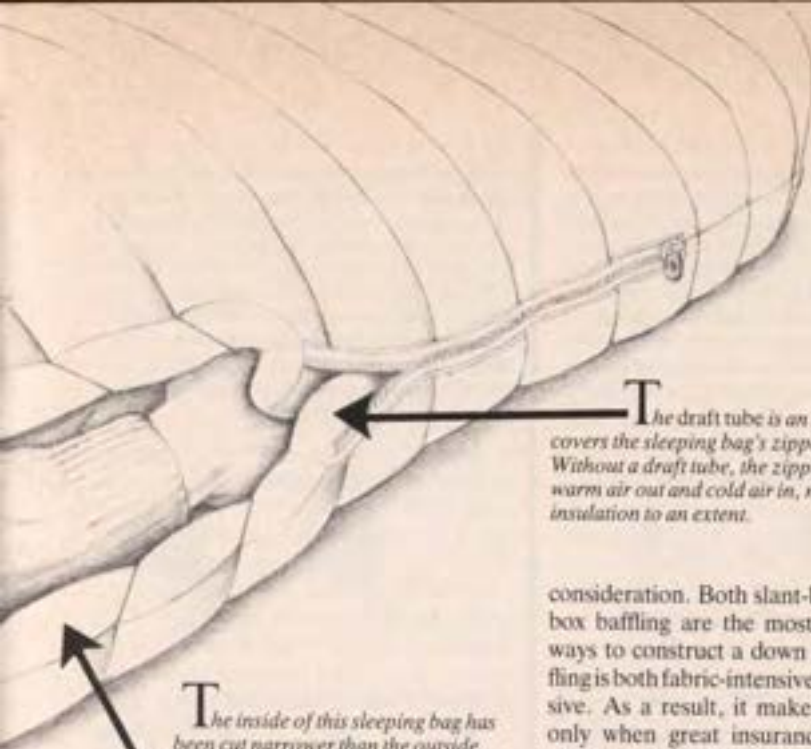


A built-in hood offers the most warmth for the weight of any sleeping-bag feature. Many campers will take a hat along to combat the loss of heat through the top of the head—but an insulated hood does a much better job of covering the neck and face.

or backpack in the Olympics with a very condensation-prone tent, you almost certainly need a sleeping bag with synthetic filler.

Not everyone has such stringent requirements, however. Other factors need to be addressed. For instance, not all synthetic sleeping bags are the same. To evaluate the nitty-gritty of sleeping-bag insulation, we need to look at the usual construction techniques as well as the available insulators.

The construction differences among sleeping bags fall into two categories: differences in how the insulation is held (so it doesn't move around, and so the bag doesn't fall apart) and differences that improve thermal efficiency and comfort.



The inside of this sleeping bag has been cut narrower than the outside. Differential cutting improves a bag's heat-retention capability by helping prevent the flattening of insulation by angular body parts.

The draft tube is an insulated flap that covers the sleeping bag's zipper on the inside. Without a draft tube, the zipper would leak warm air out and cold air in, nullifying the bag's insulation to an extent.

consideration. Both slant-box and straight-box baffling are the most weight-efficient ways to construct a down bag. V-tube baffling is both fabric-intensive and labor-intensive. As a result, it makes its appearance only when great insurance against down movement is required (such as in some expeditionary bags, and in the foot sections of many lighter bags). The use of V-tubes in a sleeping bag's foot section is a feature you should check for, especially if you get cold feet easily.

Synthetic sleeping bags are built quite differently. Mark Erickson, head designer at The North Face, explains: "Synthetic insulators—PolarGuard, Quallofil, or whatever—differ significantly from down. Synthetic fills come in rolls, like fabric, while down comes in bags. The designer of a synthetic bag works with layers of raw insulation, and must secure them inside the bag in a way appropriate to the strength of the fill being used. Chopped-fiber insulators, for instance, need to be quilted directly to the inner or outer fabric, or to reinforcing materials, called scrim. It takes careful design to make chopped-fiber bags that will resist shredding during normal use. Stabilization of synthetic fills is the name of the game, because once the insulation has moved away from an area, causing a cold spot, it's not going to migrate back."

Several types of sewing techniques are used in synthetic sleeping bags. By far the most common and least expensive technique is sewn-through quilting. The insulation is simply sandwiched between the inner and outer fabrics. For chopped-fiber insulators, the maximum allowable spacing between stitch lines is about eight inches; any more, and there is serious risk of damaging the insulation. Continuous-filament insulation needs quilting infrequently. Spacing stitch lines any closer than 18 inches apart is done more to appeal to consumer tastes than to take advantage of any real benefits the practice may offer. (Most people are visually programmed by down bags to associate quality with close stitch lines.) Remem-

ber, just as with quilted down bags, all the stitching is cold—a fact that should relegate sewn-through bags to warmer climates or harder-than-average individuals.

Synthetic bags for near-freezing and below-freezing temperatures are much lighter and more comfortable (and more expensive) if they are of *offset-quilted* construction. A refinement for even colder weather comes when another layer of insulation is inserted between the inner and outer layers. Here, chopped-fiber insulators require scrim. Middle layers of continuous-filament fibers need no extra stabilization. They are stable enough as unquilted "floating" layers that are sewn only on their edges.

THE VALUE OF A SLEEPING BAG IS A difficult-to-define subjective judgment. Most people, though, will probably find their best bargain determined by the relative values they assign to the bag's cost, usable life, packed size, and weight.

No one can predict how long a particular product will last you. The usable life of one insulation relative to another is perhaps the best way to talk about the life of a sleeping bag. If we can say that a bag that costs \$50 will become unacceptably cold in about half the time that a certain \$75 bag will, we have said something meaningful about the relative cost-effectiveness of those two bags. But some other factor might overrule a choice for the \$75 bag that lasts twice as long. If the less expensive bag were much smaller and lighter, a great many bicyclists, climbers, and backpackers would probably opt for it anyway.

Because it is important to talk about usable life even though hard facts are few and far between, I have drawn on a large number of opinions from retailers and consumers. This is delicate business. Please keep in mind that these are "soft" figures about *relative* usable lifespan, not dogmatic absolutes.

In addition to the life expectancy of the insulation, we will also be looking at the costs, packed sizes, and weights of a few bag designs that are *typically* made with that insulation. Thus, when we discuss inexpensive insulation, we are also talking about fewer features and simpler construction techniques.

Synthetic Fills. "100-percent synthetic" denotes the least-expensive insulation. It is found almost exclusively in quilted, rectangular, "slumber party" bags that cost less than \$20. Heavy fabrics decorated with ducks or sailboats are the norm here. Even six-pound bags are for distinctly above-freezing temperatures and lose much of their thickness very fast, especially if acrylic is a significant component.

"100-percent polyester" insulation is usually much longer-lived than "100-percent

Down is a very different material from synthetics, so it should come as no surprise that down bags are constructed differently than synthetic bags are. This is because "down can flow like a fluid inside a bag," explains Paul Kramer, chief architect of Sierra Designs' products. [Editor's note: Sierra Designs has no connection with the Sierra Club.] "What we do with down bags is sew a shell that has many baffled compartments inside it. Once it's sewn, we blow a precisely measured amount of down into each compartment—enough so the down's natural expansion will fill the shell to bulging. If a down bag looks full and puffy in the store, if its compartments are well-sealed *and* the manufacturer is using a quality down, you can be pretty sure cold spots won't develop until the bag enters old age."

The baffling used in down bags is of four basic types. *Sewn-through* (or "quilt") construction is used in a great many inexpensive down bags. Single-layer quilt construction has no insulation at the stitching, making those places cold spots. Double quilting in a down bag is virtually unknown in the American marketplace, although it can sometimes be found in products from overseas. In general, double quilting is heavy, because it uses a great deal of fabric.

Slant-box baffles are the industry norm. According to Kramer, during the formative years of the backpacking market a prejudice against *straight-box* baffles came to be accepted as conventional wisdom. Now, with more-sophisticated materials available and cooler heads prevailing, slanting the baffles is more of a traditional than a practical

synthetic." It is found in quilt-construction rectangular bags designed for use in moderate climates. They cost from \$20 to \$50 and weigh at least 4½ pounds (usually much more). Rolled size is about 15 inches in diameter by 20 inches long.

Dacron Hollofil 808 is a polyester batting composed of fibers two inches long with a hole running their length. This insulation product has been designed to meet quality controls required by DuPont, the company that owns the 808 name and that manufactures the raw stock. Because of this, 808 outlasts "100-percent polyester" by about an even factor of two. Rectangular bags with lighter fabrics and quilt construction that are suitable for near-freezing temperatures weigh about six pounds, and roll up to about 15 inches in diameter by 20 inches long. Cost is \$30 to \$50. Because 808 is the first uniform product on our list, let's use its life as a standard for the rest. Let's say that an 808 bag that has been treated in some standard way lasts 3½ years before we retire it from the conditions for which we bought it. Mind you, it's not worn out *per se*; it just isn't warm enough anymore. At 3½ years of life for some \$40, Hollofil 808 is the least expensive synthetic insulation over time.

Dacron Hollofil II is similar to 808, but its fibers are 2½ inches long and have a silicone finish. As a result, sleeping bags filled with DHI are softer and more compressible than 808 bags. Weight is a tad less than 5½ pounds for a sewn-through rectangular design used at around-freezing temperatures. It should stuff to about 10 inches in diameter by 24 inches long and cost from \$55 to \$75. With the same relatively light fabrics, an offset-quilted rectangular bag would weigh closer to 4½ pounds for \$11 more. A semimummy bag with offset quilting would weigh a little less than four pounds, cost from \$70 to \$100, and stuff into a sack about 10 inches in diameter by 19 inches long. On our relative-lifespan scale, DHI would last about 3½ years.

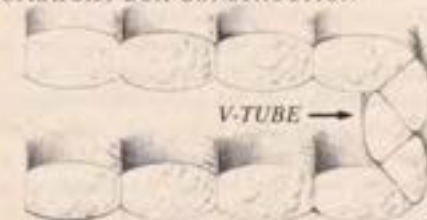
PolarGuard is currently the only continuous-filament polyester fiber. It is silicone-treated for loft, softness, and stuffability—just as the other "high end" insulations are. Also like their synthetic cousins, PolarGuard fibers are crimped, sawtoothlike, to give them their loft. However, PolarGuard is somewhat more heat-sensitive than the other synthetics. Above 140 degrees Fahrenheit, PolarGuard filaments start to lose their crimp and the insulation goes flat. So if your sleeping bag must be stored in the hot trunk of your car, pick another insulation. (Temperatures above 140°F may damage any synthetic. Only an unstuffed down or feather bag will weather such conditions easily.) An offset-quilted semimummy bag in lighter nylons (good to around freezing) will weigh

To help prevent cold spots from developing inside an expensive down sleeping bag, manufacturers strive to maintain the integrity of each compartment inside the bag's shell so the down won't travel. These baffled compartments are most often of the slant-box type, although straight-box baffles have their advocates too. V-tube baffling makes a bag heavier and more expensive, but it can be a desirable feature, especially in the foot sections of cold-weather bags.

SLANT-BOX CONSTRUCTION



STRAIGHT-BOX CONSTRUCTION



about 3½ pounds, cost \$80 to \$130, and pack into a bag 10 inches in diameter by 18 inches long. Relative lifespan is about four years. An "improved" PolarGuard has recently come out, but no details were available at press time.

Quallofil is DuPont's top-of-the-line insulation. Its fibers are three inches long, have four holes in them, and feature a wavier crimp than other synthetics do. When used without scrim, it is the most stuffable—and warmest for the weight—of all the synthetic fills. A semimummy bag such as those we have been comparing will cost \$80 to \$130. It gets into a sack 10 inches in diameter by 17 inches long, weighs a smidge less than 3½ pounds, and has a relative life of about four years.

Down is the underplumage of ducks and geese. It is not a feather; it's much more like a puffball—a radiating riot of multibranching hairs. Being a natural product, it can vary enormously in quality. Federal law requires that anything labeled "100-percent down" may contain no more than 20 percent feathers (including small amounts of other things), 10 percent down fiber (broken down), and no less than 70 percent down. Unfortunately, this standard is not sufficient to distinguish between utterly wretched down and down of superb quality.

Much ado is made about goose down versus duck down. Presumably, a genetic difference is somehow responsible. "That's a common misconception," says Marty Werthaiser, president of the American Down Association. "Actually, the quality of

Sleeping bags insulated with synthetic fills are put together differently than down bags are. Although it is equally important to stabilize the fiber of choice to prevent cold spots, the varying strengths and lengths of different fibers dictate different construction techniques. Sewn-through quilting is the commonest and least-expensive technique, used for bags that will see most of their duty in warm climates. Offset quilting provides a much more uniform insulating layer than sewn-through designs do.

SEWN-THROUGH QUILTING



OFFSET QUILTING (DOUBLE)



a down has more to do with the maturity of the bird and how the down was handled. The only intrinsically less-desirable down available is white duck down, but it's poor only because special feeds are producing birds that are routinely harvested at six weeks. The maturity and size of the bird greatly affects the loft of the down. Loft is a measure of the fluffiness and resiliency of the down. It tells you how warm the down is for its weight. The way the down is treated is what can literally make or break it. If it is handled or processed roughly, even a strong, mature down can be broken into down fiber. Feathers that can make it into a high-loft down are fine; they're light feathers. But a down with high fiber content is going to have a life expectancy that is significantly shorter."

Good or bad down can come from anywhere. Erase from your mind any notion that "100-percent-pure northern prime white goose down" is any better than "100-percent down." If it is better down, it's not better because of the name. Remember, some of the world's most sought-after down comes from black ducks—eiderdown. (In America, however, most duck-down bags you'll find are primitively constructed. This is because their perceived value is lower here, due to a pervasive notion that goose down is somehow superior.)

The loft of down is measured in terms of the volume it will fill per ounce. This is called the down's "fill power." A typical goose down has a loft of about 550 cubic inches per ounce. The costs for down go like this: 500-

fill, \$45 a pound; 550-fill, \$49 a pound; 600-fill, \$58 a pound. Since a sleeping bag made with a down of high fill power needs less down to provide a given level of warmth, the relative costs are: \$49 worth of 500-fill (17.6 ounces) is as warm as \$49 worth of 550-fill (16 ounces), which is as warm as \$53 worth of 600-fill (14.5 ounces). There is a *tendency* for downs of higher fill power to be longer-lived, but the down must be a quality product—and fill power is not a direct measure of quality. Ultimately, you are trusting the sleeping-bag manufacturer.

A goose-down bag using 550-fill power down will weigh about 2½ pounds if it is a semimummy design good to near-freezing temperatures. Cost will run from \$150 to \$200. Packed size is about 10 inches in diameter by 10 inches long. The relative lifespan of down ranges from six to eight years for good down and nine to twelve years for excellent down.

AFTER ITS thickness, the *shape* of a sleeping bag can have a lot to do with its warmth and weight. Larger bags are roomier—but, like bigger houses, they need more insulation (or hotter heaters) to keep their occupants warm. Because you are the heater, you will need more insulation thickness in a larger bag than in a closer-fitting one. Hence, not only must you carry more weight just because the bag is bigger, but you carry more weight because the insulation must be thicker too.

A sleeping bag that is too long for you can be a source of excess weight. Most “regular length” bags are made for people 5’10” or taller. Five to 10 percent of the bag’s weight could be saved if the bag were offered in a 5’6” version. Admittedly, the bag you want may not be available in a short length. In that case, complain. Maybe in the future the manufacturer, noting a demand, will produce a shorter bag.

If the inside of a sleeping bag is smaller than the outside, the bag is said to be “differential-cut.” Winter bags, especially, need significant differential cutting. Refinements include cutting the inside of the bag so its length (as well as its width) is smaller than the outside. With thick synthetic bags the differential cutting of each insulation layer is extra-effective and extra-efficient. A lower bag weight is also a byproduct of differential cutting. A down bag may weigh only a fraction of an ounce less, but a synthetic bag could save as much as three ounces.

There may be such a thing as too much differential cut. A radically differential-cut bag will have an interior that does not drape or settle over the contours of the sleeper. As a result, there will be larger air gaps around the sleeper to increase convective heat losses. You need to get inside any bag you’re

considering buying to decide how the bag drapes with you in it.

Fabrics. A discussion of fabrics could go on forever, so here are some brief words. Pay attention to the feel of the fabric used inside the bag, because crisp or sticky linings are going to feel a lot worse with dirt ground into them. Fabric weight can be a big factor if cotton flannels, ducks, or other extra-rugged fabrics are used. Sleeping bags need very little tear or abrasion resistance, so heavy fabrics are overkill.

Down bags can have their wind- and wet-environment performance enhanced greatly by waterproof/windproof breathable fabrics such as Gore-Tex. Do not expect bags covered with these fabrics to be completely rainworthy. Zippers leak (and seam sealant cracks and leaks) with age. But a bag with a Gore-Tex exterior is a lot better than the sponge that regular down bags become when exposed to tent condensation. Some Gore-Tex laminates are more breathable than “downproof” nylons, so they can help reduce condensation within the insulation layer. But remember: More than any other factor, it is the thickness of the insulation that limits a sleeping bag’s breathability.

Radiant-heat-barrier fabrics (such as Texolite, Orotherm, and Silverstreak) are also available to improve a sleeping bag’s performance. These products cut heat losses due to radiation dramatically and provide up to 20 Fahrenheit degrees of extra warmth for very little weight (around six ounces). When used as a continuous lining inside a bag, Texolite and Orotherm have little breathability, and therefore derive part of their warmth from their vapor-barrier effect. Practically speaking, this means that while the bags are more useful at lower temperatures than their unlined counterparts, they easily become too warm and moist at higher temperatures. To use these bags, you have to be willing to unzip them when they get hot. Not all radiant barriers are used in the same way or have the same abilities or limitations. You will need to seek some guidance from the manufacturer.

Features. A sleeping bag’s features are often relevant to its overall weight-efficiency and comfort. For example, you would have to sleep on top of the zipper to prevent drafts if your bag did not have a draft tube. Colder nights require a more refined draft-tube choice than moderate climates do. If you can, make sure your draft tube hangs from the top of the bag down over the zipper. Draft tubes that have to fall *up* to cover the zipper are nearly useless. For very cold conditions, make sure that the place where the draft tube is joined to the bag is not a thin spot. In cold weather, you might enjoy double draft tubes (one from the top, one from the bottom) or double zippers.

Double zippers can make a very versatile and cozy bag if they’re done right. Sewing two zippers into a sleeping bag, airlock style, can leave a gap between the zippers that is uninsulated and that is, in fact, quite a cool and breezy place. So a double-zipped sleeping bag for cold weather needs at least one draft tube between the zips. Because they add three to five ounces of extra zipper, double zippers may not be the most weight-efficient way to close a bag, unless the bag is designed to exploit a warmer-than-average zipper area.

Built-in hoods are another warmth feature, because the head is a runaway heat-loser. When checking hoods, be sure to get into each bag and close the hood all the way down. Then reach outside the bag (through the partly open zipper) and see if the hood has much thickness around your head. Many hoods have their insulation pulled flat



Although down—from ducks or geese—is a superwarm insulator for its weight, it has a few disadvantages. Primary among these is that down becomes virtually useless when it gets wet, losing almost all of its loft (that is, its fluffiness and resiliency). Synthetic fill materials such as Hollofil, Quallofil, and PolarGuard are generally far more moisture-resistant than down, but again a tradeoff is involved, because synthetic-fill bags tend to have shorter useful lives than do well-constructed down bags.



against the head, and therefore are considerably less warm than they should be. Contoured hoods are usually very good about this, as they are essentially differential-cut.

If the tops of your shoulders get cold during the night, you may find that a collar is valuable indeed. Collars weigh from one to seven ounces, depending on their lavishness and insulation type.

Systems. A sleeping system is a collection of liners and/or overbags to help push your sleeping bag past its usual warmth limitations. The simplest sleeping system is a sleeping bag and a liner. The liner could be a vapor barrier, which will permit you a comfortable night’s sleep at temperatures about

How to Clean and Care for Your New Bag

BUYING A SLEEPING BAG can be a complicated and difficult process. With such a wide variety of styles and manufacturing techniques to choose from, you'd be well-advised to become an informed consumer—which calls for a lot of checking into such details as quilting, batting, baffles, and scrim. It should come as welcome news, then, that the care and cleaning of sleeping bags is very simple.

The best method for cleaning any sleeping bag is simply to wash it. Use a front-loading commercial washer, cold or lukewarm water, and a mild soap. (Down bags may come out extra-nice if a "down soap" is used.) No matter which soap you use on a down bag, give the bag a second run through the wash for a super-thorough rinse.

Synthetic bags should be drip-dried, though they can be fluffed in a tumble dryer on very low heat. Down bags, if drip-dried, will have their down hopelessly clumped. So tumble-dry a down bag on low heat. It should take about three hours. If you are drying a large bag in a small home dryer, you should transfer it to a large industrial machine for the last hour, so it can attain full loft. Clumping should not be a problem, but if it happens, you can run your hands through the bag and gently break up the clumps. Then return it to the dryer for a short fluffing.

Do not dry-clean any sleeping bag. Dry-cleaning hurts synthetics by attacking their component resins and by stripping away the silicone finishes of the best synthetic insulators. Dry-cleaning severely cuts the life of a down bag by stripping the down of its fats and oils, resulting in oxidation and loss of resiliency. The bag will look lovely when it first comes back from a dry cleaner. But stuff the bag a few times, and cold spots will start to appear—because the down is no longer able to loft back to its original volume.

Between-trip care is simplicity itself. Put the bag where it will remain cool and uncompressed. Storage bags are available, though I prefer to let mine graze on top of my bed.—M.S.

15 degrees lower than with the bag alone. Cost is \$20 to \$30, and weight is five to ten ounces. The liner could be nylon-covered Texolite, worth about 20 degrees of extra warmth, costing about \$85, and weighing 13 ounces (10 degrees' worth of radiant barrier plus 10 degrees' worth of vapor barrier). A thin, insulated inner bag could provide 30 degrees of extra warmth for one or two pounds; the cost would be between \$80 and \$130, depending on whether the bag is synthetic or down.

If you are a winter camper, putting one full-fledged bag inside another could save you the expense of a winter bag. Usually this means you will need a semirectangular bag for warm climates and a mummy bag to go inside it that is good for around-freezing temperatures. To make a two-bag system as efficient as it can be, you need to find two bags that do not duplicate each other. This is the crux of a two-bags-for-three-climates system. It is hard to find two light bags that are for very different temperature ranges. Careful shopping is a must. Remember, too, that an outer bag is heavier for the warmth than an inner bag is, so there will be a temptation to buy a down outer bag. But a down outer bag will need significant protection from the tent's condensation, so a Gore-Tex bivy bag will be necessary (\$70 to \$130, 14 to 20 ounces), or the bag must have a Gore-Tex exterior (\$70 to \$90, with weight change ranging from zero to an additional four ounces).

NOW LET'S EXAMINE sleeping bags from a strict cost-versus-life standpoint. Dacron Hollofil 808 is the clear winner, at about \$11.50 per year for a simple rectangular bag good to near-freezing temperatures. Next is excellent down, at about \$20 per year for a full-feature bag; then come Dacron Hollofil II and good down, at about \$23 per year for fairly sophisticated models. Next come Quallofil and PolarGuard, at about \$27 per year for full-feature bags. Therefore, if weight is not a factor, construction features are not important, and you want the most warmth for your dollar, 808 is your best buy.

Everything changes if saving weight is a priority. The lightest sleeping bags are excellent down bags. They weigh in at about 2½ pounds for a bag good to about freezing. Next up is good-quality down, at 2½ pounds. In descending order the others are: Quallofil, at a bit less than 3½ pounds; PolarGuard, at 3½ pounds; DHII, at a little less than 4 pounds; and 808, at 6 pounds. If you can afford the initial expense, a down bag of excellent quality will weigh the least, pack the smallest, and last a very long time.

Water and down are bad news. If you think your bag will be subjected to signif-

icant wetness, and you will not be able to dry it out, then either PolarGuard or Quallofil will be your best choice for the weight. (If you are a hard user, make that just PolarGuard, because of its stable continuous filaments.) There is one more option for moist conditions: a Gore-Tex-exterioed sleeping bag filled with excellent-quality down. Such a bag will never be rainworthy, but it will remain lofty and warm under very damp conditions.

Just how important is a collar? Again, it depends. Collars are for winter, early spring, and late fall. In more moderate climates you can take the \$10 a collar might cost and be warmer investing it in insulation or a draft tube. Draft tubes should be considered non-optional unless the bag is so big that its top and bottom close over the zipper. Hoods are welcome whenever a hat won't do it alone.

The expense of any of the top-of-line insulators may be a hardship for more modest pocketbooks. If this is true for you, you will be best served by a well-constructed HFI or 808 bag. As I mentioned earlier, most bags made with these materials are pretty basic. Careful and diligent shopping will be necessary.

Temperature Ratings. These are meaningless numbers you'll hear bandied about by manufacturers and buyers alike. They are so easy, so clean, and so misguided. Every human heater is different every night, depending on mood, diet, dampness, fatigue, and a long list of other factors. Likewise, each night is a unique condition: a blend of the temperature, humidity, wind, cloud cover, and so on. Maybe a temperature rating will get you looking at the right two or three bags a company makes, and maybe it won't.

When looking at sleeping bags, draw on your personal knowledge of what has worked for you in the past. If you are inexperienced, you will need to talk with salespeople and get their recommendations. You may want to ask them what kind of sleeper they are and what kind of bag they use. Get a number of opinions before you make up your mind, and remember that every recommendation is a guess.

The way you sleep at home can be important. If you like to sleep in an all-pervading warmth, then you are a cold sleeper and should try to err on the warm side. If you like your skin slightly cool while you sleep, then you are a warm sleeper who can get away with a cooler and lighter bag. Sufficient warmth during sleep is a valuable commodity. So plan for the bad, and your experiences will always be good. □

Mike Scherer reports frequently on outdoor equipment. His most recent article for Sierra was "How to Choose Outdoor Clothing" (March/April, 1983).

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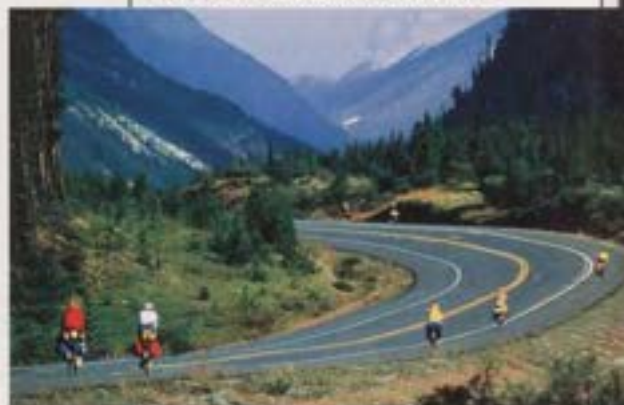
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SIERRA: *These years of the Reagan administration have certainly been eventful. Ms. Burford and Mr. Watt have come and gone; now Mr. Clark is Secretary of the Interior. But has anything changed as far as the administration's environmental policies are concerned? What do you think you could say right now about the state of the environment?*

SHAFFER: This administration is very hostile to environmental protection. That won't change until President Reagan goes or changes his policy. But fortunately, there are more people thinking about the environment than ever before, partly because the administration has kept it front-page news. As far as the quality of the environment in the country is concerned, it clearly depends on which piece of it you're looking at. Toxic wastes are on peoples' minds—it's a problem that is literally boiling up out of the ground in their backyards.

As far as land use is concerned, we've

done well in establishing national parks, the state parks, and the wildlife refuges. But they're clearly under attack by this administration. None of it is permanent. We're okay now, but I'm not confident that we will be next year. On pollution issues, it's an uphill fight, but we're probably holding our own.

Where we are clearly losing is in the long-term leasing of mineral resources. I think that is where this administration has had unparalleled success: in turning natural resources over to private hands—whether it's coal or offshore drilling leases. In my judgment, this administration's environmental legacy will be that it's taken all this natural wealth and put it in private hands.

SIERRA: *The Sierra Club has become much more political in recent years. In your travels, have you determined how grassroots environmentalists are taking to this increased political activity?*

SHAFFER: Getting involved in political ac-

tivity was recognized as necessary by the Sierra Club's grassroots members as well as the national leadership. It was not a matter of some folks sitting in a room and deciding it was a good idea and then sending a memo to everyone in the field. The Club doesn't operate that way. The enthusiasm for political involvement has been overwhelming, particularly among many of our newmembers.

But we've got a ways to go, for it's a difficult concept. When you're involved in legislative lobbying, for example, you can take a pretty pure stance—you're for clean water and clean air, and you fight for them. But all candidates are imperfect. We must keep in mind why we're involved. We're involved to elect the best possible candidates for particular offices, from the point of view of what they will do for environmental issues, and to do it in such a way that we have access to them after the election is over.

SIERRA: *When we endorse candidates, do we endorse them only from our knowledge of their environmental stands? Must we also take into account their foreign policy or economic stands, for example? Or city issues, if it's a local election?*

SHAFFER: We endorse candidates based on their environmental records. We're not in the business of evaluating candidates on the basis of their records on other issues. There are other people who know those issues, and they judge accordingly. We stick to our area of expertise.

SIERRA: *If a candidate takes an unpopular stand on other issues but is good on the environment, can we endorse that candidacy and still retain our credibility?*

SHAFFER: Of course we can. We're endorsing the individual's environmental record.

SIERRA: *Will the Club endorse a presidential candidate?*

SHAFFER: Yes. Perhaps not in the primaries, but certainly in the general election.

SIERRA: *How will the endorsement be made? Will the Board of Directors decide at its September meeting?*

SHAFFER: Each endorsement is made by the Club entity having jurisdiction over that particular area. For example, in a statewide race, normally the chapter would make the endorsement. The exception, of course, is California, which has multiple chapters. Obviously, when it comes to the campaign for the presidency—which is the sole national race—the only elected Club entity that cov-

A TALK WITH DENNY SHAFFER

As his second term draws to a close, the Club's President reflects on the state of the environment and the health of the Sierra Club.

ers the whole country is the Board of Directors. So it makes that decision.

SIERRA: *And that will be at the September meeting?*

SHAFFER: It could be then, or even before then . . . whenever it's appropriate.

SIERRA: *When we endorse a candidate, what form does the endorsement take?*

SHAFFER: The endorsement and the work we do varies from candidate to candidate, depending on the needs in a particular race. First you have to understand that if you're going to be involved, it will be with candidates who are less than perfect. Second, you cooperate with the candidate to do what needs to be done. In one congressional race you might need to provide "people power" for phone banks, for example. Maybe the leadership of the Club in that area would much rather do something different, but it's important to be aware of the needs of a particular candidate.

SIERRA: *Does the candidate let the Club know what is needed?*

SHAFFER: If the Club activists ask for and are open to this guidance. And they ought to be.

SIERRA: *Do we contribute money to candidates' campaigns?*

SHAFFER: We do raise money through SCCOPE, our political-action committee (PAC), and we put money directly into campaigns. This is important, because it is the way candidates have traditionally viewed PACs as having power. However, the candidates we've endorsed and worked for have learned that there's a new way of evaluating power, and that is in terms of the kind of people support that can be provided. We're certainly not going to be a major player in the dollar-and-cents game in politics, any more than we've been in lobbying. We're not effective in lobbying because we hire a lot of lobbyists; we're effective because we have 350,000 sophisticated, effective members who know how to communicate with representatives and senators and be heard, and how to focus and activate the public. We are effective in electoral politics not because we come up with a large amount of money. We're effective because of the volunteers involved. That's the kind of organization we are. And the candidates are figuring out that we're providing a real service to them.

This is something, frankly, that excites me philosophically. In national elections the country is moving more and more toward

candidates who are creations of the media—who have lots of money, a good agency to put together the best TV commercials, and lots of exposure. I think it's kind of exciting that the Sierra Club is bringing people back into the process. People are honest-to-God walking neighborhoods and talking to people about candidates and answering questions. This sort of thing can do nothing but good for the democratic process.

SIERRA: *But we do have to play the game to an extent and contribute some funds to candidates. How do we get these funds, and who decides how much to give to whom?*

SHAFFER: We get contributions in the form of donations specifically to SCCOPE. There's a National SCCOPE Committee, chaired by Dick Fiddler, with representatives from around the country serving on it. Some decisions are made at this level, but each chapter has its own committee, and decisions are made at that level also.

SIERRA: *There's some perception that the Sierra Club is anti-Republican and will endorse only Democratic candidates. Of course, that's not true. Can you speak to that?*

SHAFFER: One of the worst things that could happen to us would be to wed ourselves to one party or the other. There is a dedication on the part of the Club leadership that it won't happen. We're endorsing more Democrats right now because of the violently anti-environmental position of the Reagan administration, but I don't know that that will keep up much longer. Of course, some Republicans are excellent environmentalists. We gave a high Sierra Club award to Sen. Robert Stafford of Vermont this year, for his fine record.

SIERRA: *What about our more traditional wilderness priorities during this election year? Will they take a backseat?*

SHAFFER: Electoral politics is just another way of moving our traditional agenda. It's a different way of going about doing it. For example, in my own state of North Carolina, we now have two traditional wilderness fights. Jim Hunt, the governor, is a candidate for the Senate, and he's been very helpful with wilderness in North Carolina. Jesse Helms, the incumbent, has shown no

enthusiasm for endorsing the state wilderness bill, although it's passed in the House with the support of the entire state delegation. He's talking about what we refer to as "hard release language," which says that what is not in that bill will forever not be wilderness. He's also introduced a Great Smoky Mountains Wilderness bill to counter the bill we support. So what is the biggest wilderness battle in North Carolina right now? I think the answer is, Who's going to be senator? So, the traditional agenda is still there. We're finding a new way of working for it.

SIERRA: *But will we still be working on particular issues?*

SHAFFER: Yes, we're having some major successes, and now for the first time since the

Reagan administration has been in office, we find ourselves somewhat on the offensive legislatively. I think we're on the offensive on clean water and clean air, and on the bill that covers toxic wastes. There's an excellent chance that small generators of toxic and hazardous wastes will be brought under the law. We're going to pass some wilderness bills.

SIERRA: *I know you've been traveling a lot these last two years. Can you tell me your impression of the state of the Sierra Club?*

SHAFFER: I don't think it's any secret that I have spent more time tending the institution of the Sierra Club than others who might be President. I think that's a primary role of the President and of a Director, to preserve and protect the institution of the Sierra Club. This organization is approaching 100 years of age, and has been effective all that time. It's important to keep building that institution, so that 100 years from now it will still be doing good works. That is what I have on my mind constantly.

The institution of the Sierra Club is stronger than it has ever been before. That is not to suggest that there are not a lot of things that need to be done, but we're working on most of them. Right now, for example, we're looking at the relationships among Club entities. How does the national organization relate to chapters, and how do chapters relate to the national organization? Without our strong, perceptive leadership, we could become a federation of chapters



rather than the organization we now are. That could seriously diminish our power as a political force in this country.

We also now have a professional membership-development department. When I chaired the National Membership Committee seven years ago, there wasn't one staff member whose primary role was getting members in the Sierra Club. Also, there was no clarity in how the volunteer Directors ran the organization or managed the professional staff. What was their responsibility, and how did it work? The Club is a volunteer organization, and the power quite literally lies with the volunteers through the volunteer Board of Directors. They can do whatever they choose to do within the law. But

WE must let people know what we do, how we do it, and what it feels like to be part of the Sierra Club.

historically, there was not much clarity in how this meshed with the staff. For example, the Board even hired some of the Club's employees. They hired a Controller and said to the Executive Director, "Here's your new Controller; we hope you get along well together." That's a system we've outgrown. Now we have an Executive Director who is charged by the Board to run the staff part of the organization. We actually have a Planning Committee and a Vice-President for Planning, and the staff works closely with him. We all agree on what we are trying to accomplish. Our staff has specific goals to meet, for which they're held accountable. There's a reporting system in place.

We have a good budget system too. It used to be that staff put together a "wish list," and the Board tried to make a balanced budget. They lacked detailed knowledge with which to test the numbers, and they made their decisions in the fishbowl of a national meet-

ing. It didn't work very well, which isn't surprising. It didn't work then with a \$6-million budget, and it would be totally impossible with a \$22-million budget. So now we have a budget system. The staff takes responsibility for putting together a balanced budget, and they commit to performing to it. The Board reviews and sets the budget, after making any changes they wish. The responsibility for the budget's contents is that of the Board of Directors. There is accountability.

The point of all this, of course, is that there has been a great strengthening of the institution of the Sierra Club. We've gone from 150,000 members to 350,000 members, and from a \$5-million to a \$22-million budget. At the same time, we've maintained that balance of control in the hands of the volunteers and the grassroots—strengthened it, in fact.

SIERRA: Yes, our membership has grown considerably. But many nonprofits have had trouble during these years of economic recession, and I wonder what the trends are now in our own membership. Has our membership growth been holding? Also, some organizations talk about ideal size, meaning that increasing numbers may become unwieldy. Do we ever think about the question of ideal size?

SHAFFER: Oh, yes, we're thinking about it. But we should never make a decision based on whether it would be difficult to manage a large organization. What a terrible way that would be to go about that decision. It seems to me that the question is what size the organization should be to be most effective in achieving its goals.

Before I chaired the National Membership Committee, the Board went through a very serious debate about ideal size and made a decision of 200,000 or so members. It was sort of based on the thought that we would then be the third-largest environmental organization, after the National Wildlife Federation and the Audubon Society. Everyone said we should be that big, but there was no plan and no staff to implement it if we had one. Now we have a membership-development staff to lay out such a plan, and I'm hoping we will soon grapple with this question of size.

Then the question for the Club will be, what resources are we willing to put in to achieve such growth? Some folks are pretty naive about membership growth. They think that somehow it just happens. Certainly the Reagan administration's policies made membership in the Sierra Club more attractive to a lot of people, but we must not lose sight of the fact that we had letters in

everyone's mailbox asking them to join the Sierra Club just when James Watt made them angry. And that wasn't a coincidence. We mailed 6 million pieces of mail asking people to join the Sierra Club. So to suggest that this was a spontaneous thing misses all that. We've now got an organization of volunteer membership chairs in every group and chapter, all working actively with the national Membership Committee.

But back to the question of how big we should be. I think more in terms of geographic distribution. I would really like to have a Sierra Club group in every city and town in the United States of 50,000 or more people. Then we could deal with the local issues, with the city councils and the county officials and planning departments. How many people would that translate into? I don't know—maybe half a million.

SIERRA: What's happening with our membership now? I gather we're not growing as fast as we were a few years ago.

SHAFFER: That's correct, we're not. We're returning to more normal growth as far as membership is concerned. We have 350,000 members, and well over 100,000 have been members for a year or less. Now we have the problem of renewing all those new members who haven't yet developed the loyalty to the Club that long-term members show. But if we plan for it, I think we can have a slow but continuous membership growth for a reasonable period of time. However, we cannot rely on a crisis theme. There most certainly is a crisis—and it will last as long as President Reagan is in office. I fear—but it's almost impossible to get people to believe in a four-year-long or eight-year-long crisis. Again, that's a strong reason for developing more regional groups. Those members get to know each other, work together on local issues, go on outings, enjoy themselves. They'll be more likely to renew.

SIERRA: With our membership leveling off somewhat, how do we go about attracting new members if there isn't an environmental crisis for them to respond to?

SHAFFER: We must let people know what we do, how we do it, and what it feels like to be part of the Club. A public-relations effort is important in this respect, as it is important for local and national leadership to provide the same message in other ways. The Club is ideally structured to be effective. We don't hold all the power in Washington or in New York or in San Francisco. We let people around the country have the action, to be part of the decision-making process. We

trust them to work within the guidelines we've all agreed upon.

SIERRA: Yes, but the question I'm asking is how we attract the general public to become members. If there's no crisis, how do we continue our growth?

SHAFFER: Any growth is dependent on keeping the members we have. And we can do a lot to keep those members. Then we must add the new members who will continue to be attracted to the Sierra Club if they know what we do, how effective we are, and what it feels like to be part of the Club.

SIERRA: What do you think the Club needs to maintain its strength and vitality?

SHAFFER: First, being a member of the Sierra Club ought to be fun. It is to me. If I weren't enjoying it, I would have stopped by now. Second, I think the Club needs strong leadership. Some chapters have a lot of emerging new leadership. The people who are the leaders in those chapters enjoy Club work and see the training of new leadership as a primary part of their responsibility. Their responsibility is not just to do a job in the Club, but to train a replacement. In some chapters, though, that's not the case. There are chapter leaders who have served on the ExCom for a number of years, and the only question each year is which of those long-time members is going to be the chair and which will be treasurer.

SIERRA: So the Club needs new blood and new enthusiasm?

SHAFFER: And that enthusiasm stems from the role-model leaders set. In some chapters the leaders enjoy their Club work and welcome new leadership. In others they insist they must do it themselves and grit their teeth and go on. An example: I don't want to be President any longer. Two years is fine. I think if a Club leader has had a job more than three years, it's probably been too long—and I say that knowing full well that I was Treasurer for four years. It was probably one year too long. The Treasurer we have now, Phil Hocker, is emphasizing different things and brings new vitality to the job.

SIERRA: How can we bring about this kind of vitality?

SHAFFER: It comes about by helping our leaders see that what they do, how they talk, and the way they think will be replicated in the new leadership. If they see that the only way you can be a leader in the Club is to argue or put people down, then people think that's what a chapter chair does. But if

people see a chapter chair who is clearly enjoying what's going on, who is clearly willing for people to share the responsibility, then those people will have a different understanding of what Club leadership is really like. They'll become that kind of leader.

SIERRA: You'd say, then, that enjoyment would be a key factor.

SHAFFER: And satisfaction—the excitement of the people, the goals, the successes. The International Assembly is a good example. It was almost instant history for those people who attended. We really are a Club, and I think we need

to keep doing the kinds of things that help us all feel our potential. Everyone I talked with came away with a kind of excitement. People saw the leaders of the Sierra Club having a good time, learning, talking, and listening. They saw that everyone was human. They listened to long-time leaders like Lewis Clark and Ed Wayburn talk of our history. They sat around talking with each other, sang together with John Denver, and worked together, and it was enjoyable.

SIERRA: Will we have another Assembly?

SHAFFER: Oh, I hope so. It's the human kind of things that need to be stressed. It's why people join clubs. A number of people joined the Sierra Club because they wanted to find people with the same kinds of value systems, so they could enjoy their experiences together. I'd like to see us have assemblies on a regional basis. I think we have to think more and more of ways to bring the people of the Club together, to learn skills and have a good time, to learn the heritage and feel the potential.

SIERRA: Do we provide any training for chapter chairs?

SHAFFER: We do not. We put so little of our resources into training and leadership development. We need to do more things like our Grassroots Effectiveness Project. The volunteer and staff leaders who work as enablers have the potential to get more things done than do the people who simply try to do everything themselves. Right now we're making some mistakes in hiring of chapter staff, where we hire someone to run the

FIRST

being a member of the Club ought to be fun. It is to me. If I weren't enjoying it, I would have stopped by now. Second, I think the Club needs strong leadership.

office or to lobby. We should hire chapter staff as enablers, to organize the volunteers themselves to run the offices and to lobby. There is not in this national headquarters, as far as I know, anyone whose primary responsibility it is to raise the leadership skills of the Club volunteers. It's not viewed by some people as fighting the battle. I think we're reaching a size where we're coming face-to-face with this dilemma. With Director Marty Fluharty's leadership, we've now begun to think about finding a formal way to raise the leadership skills of our people. It's vitally important.

SIERRA: So our strength comes from leaders encouraging other leaders to step forward.

SHAFFER: Yes, and it's hard to do that. Part of me is going to be glad not to be President, and part of me is scared to death to walk away. Things I've worked on are not going to get the same attention after my presidency. The next President will have other priorities, and the Sierra Club will be stronger for it.

SIERRA: How good is our financial position now? Have we done well with our new members' money?

SHAFFER: The Sierra Club has traditionally made a decision to walk a fine line fiscally at the national level. We are not an organization that puts aside our income in investments for some later time. We use our resources to fight the battle. We received a great upsurge in these resources with the advent of the Reagan administration, and we believe that people wanted us to do battle with Reagan's policies and to bring them to a

I'VE learned again the value of the democratic process. Like most of us, I've always believed in it theoretically, but I've had some impatience with it at times too. It seemed to me I knew what needed to be done and wanted to go ahead and do it, instead of having all these meetings.

halt where we could. So we did this and spent just about all the money that had come to us in that period of time.

I have worked for a number of years trying to get us to have a bit more fiscal security. Frankly, I was one who put forth the idea of promoting Life Memberships. That money goes into the endowment fund and provides income and net worth for the Club forever. We're getting big, and the bigger we get, the more we need to have resources to fall back on. People who are joining as Life Members know that they are putting their \$750 into a reserve fund, one the Club will never spend. It's a great opportunity.

One of the serious problems the Club has had is for the leadership to understand that the Club must budget a surplus each year. One of the questions we hear almost every meeting is why the Club budgets a large surplus. There's only one answer to that, and it's simple: We need to pay the bills. We must have cash to operate. Signs now indicate we may have some cash-flow problems soon.

Generally speaking, though, the management of the Club is superb. We really do avoid the major kinds of problems. And we get so much for each dollar. Ninety percent of the work is done by volunteers, people who don't get paid. It's marvelous to run a business where the help doesn't get paid in dollars. That's why the money goes so far.

SIERRA: *The Board recently decided to purchase a building in San Francisco for its national headquarters. Could you say something about that decision and how it fits in with the Sierra Club's priorities?*

SHAFFER: The Club has been around since 1892, and we've been paying rent most of

that time. What we've got to show for it is a pile of rent receipts. But now we're looking at the possibility of buying a building through a limited-partnership offering. The intent is to provide us with a permanent home that will be much less expensive over the long term. At some point we'll have a building that will be paid for, and we'll no longer have to pay rent. This is something the Club would never have thought about a few years ago. We wouldn't have been equipped to deal with this level of management. To put together a package like this—finding a building, converting it to offices, and getting the funding—is a kind of big-time corporate activity the Club is now able to attempt.

SIERRA: *What will you do next for the Sierra Club?*

SHAFFER: I've no doubt that the Club will forever be an important part of my life. I believe there is great wisdom in the way the Club now structures the presidency—in limiting the length of time anyone can do it to a year or two. It's not anything any human could do for a much longer period of time.

SIERRA: *What do you mean by how the office is structured?*

SHAFFER: We devote precious little of our resources to support the presidency. There's no one to write a speech for the President. If there's going to be a media interview, the preparation for that interview is left up to the President. Only in the last year has there been real assistance on correspondence, and it was almost a revolutionary idea that the President should have someone helping with his mail. There's not a structuring of any

kind of support system for the Club officers to match their levels of responsibility.

SIERRA: *Would you like to see this change? Do we need more staff, perhaps an assistant to the President?*

SHAFFER: Yes, I think it has to change. But Sierra Club volunteers are hesitant to ask. You see, the presidency was a full-time job when Ted Snyder was President six years ago. And look how we've grown since then. Just adding SCCOPE increased the President's workload by something like 25 percent. If we are to continue with volunteer presidents—and we should—they must have more support.

SIERRA: *This interview will be printed just before you leave your office as President. Would you like to say something about these past few years and what you've learned?*

SHAFFER: I came to the Board with a feeling of great admiration and respect for the institution and for the people who make up the Sierra Club. I leave the presidency with a great strengthening of those feelings. There is no finer group of human beings than the folks who make up the Sierra Club. Frankly, they've become like my family. But there is no way people will give a major part of their lives to an organization unless it is one like the Sierra Club.

I've learned again the value of the democratic process. Like most of us, I've always believed in it theoretically, but I've had some impatience with it at times too. It seemed to me I knew what needed to be done and wanted to go ahead and do it, instead of having all these meetings. The Sierra Club must continue to pick its Board of Directors and officers democratically, as well as continuing its present system of choosing national priorities. We change that at our peril.

SIERRA: *So this has been a good experience for you?*

SHAFFER: Except for raising my family, I have never done anything so exciting or so rewarding. I'm a small businessman from a medium-size town in North Carolina. No organization but the Sierra Club would have given me this opportunity. We never ask how much money you make, what degrees you have, who your family is—we just give opportunities to those who care very deeply, who will work and get things done. You really can become a national Sierra Club leader and influence Club policy, which in turn influences the country's policies. I'm very grateful to the Sierra Club for the opportunities it's given me. □



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Robert Whitman

WILDERNESS WHITEWATER RAFTING

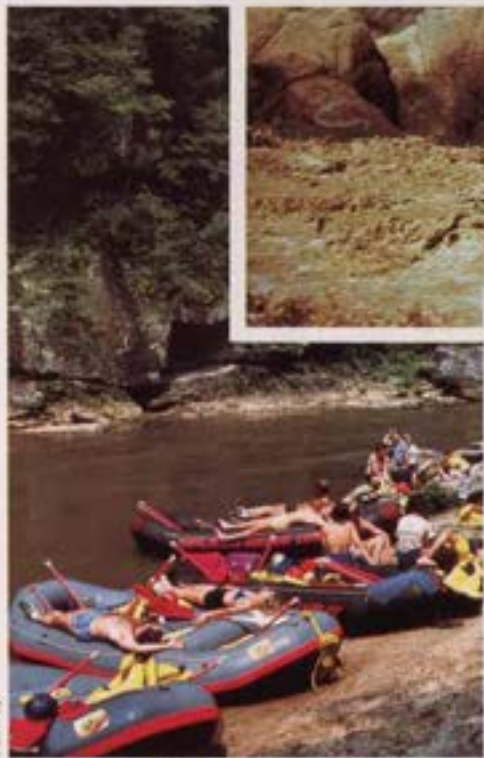
RON WATTERS

I PUSHED AWAY FROM THE BANK, and our raft slowly drifted toward the edge of the rapids. From my position in the stern, I watched as my two companions backpaddled, slowing our forward momentum. Their heads strained upward as they searched for a path through the maze of boulders and whitewater ahead.

The current suddenly quickened, and the raft slid down a V-shaped patch of smooth water. At the tip of the V we slammed into the first crashing wave of the rapids. Kelly and John paddled furiously forward to break through the wave while I made quick, wide sweeps with my paddle to keep the raft straight. Water broke over the raft and drenched all of us. The pace was hectic now—paddling first right . . . then left . . . then back right, through foaming waves and past exposed boulders.

We passed a boulder on the left, then dropped deep into a depression below a huge boiling wave. The raft stopped, then quivered, one side rising up. I thought for a moment it might flip, but it spun around backward and washed down the remaining tail waves, unscathed.

We didn't finish that run in the best of style—we were running backward, and our raft was filled with water—but we cheered and slapped each other on the back, happy to be through another major rapid on our



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Whitewater rafting intersperses periods of tranquil relaxation among moments of high excitement and adventure. This contrast is at the heart of the sport's appeal.

two-week trip down Idaho's Salmon River.

That was 12 years ago. Since then I've run the river many times, but the excitement I get from river-running has changed hardly at all. I still feel elation after a run through a lively rapid, and I continue to experience a sense of tranquility and wonder while drifting on the peaceful water between rapids.

It's this combination of opposites—excitement and tranquility—that makes river-running such an attractive way to explore the outdoors. Once you've acquired some basic knowledge and skills, North America's whitewater rivers will be open to you. (See "A Raft of Rivers to Run," opposite.)

No matter where you go to run rivers, you have a choice of rafting styles. One option—the one I used on the Salmon—is to go as part of a *paddle raft* crew. In this style, everyone in the raft uses canoe paddles; working together, the paddle crew maneuvers the raft through each rapid. The other option is to go as an *oar raft*. In this style, a wood or metal frame is lashed to the top tubes of the raft to provide a secure base to which oars can be attached. In an oar boat, one person works the oars while the others in the raft ride as passengers.

Both methods have their specific advantages and disadvantages. In a paddle raft, everyone participates cooperatively, helping to get the raft down the rapids. For difficult whitewater rivers, however, everyone on the paddle crew must be experienced both as individuals and as practiced members of a group used to working together. In an oar raft, one experienced river-runner can easily lead a group of inexperienced people, because he or she is the only person handling the oars. Also, the oar boat can be designed to carry large amounts of overnight camping gear, while the paddle boat's storage capacity is more limited.

If you do a lot of river-running, you'll want to try both oaring and paddling. At Idaho State University, where I direct the Outdoor Program, we incorporate both styles in a river program organized for handicapped individuals. Most of the disabled who still have the use of their upper bodies prefer to run the river as part of a paddle-boat crew, because that way they all can actively participate. The more severely handicapped ride as passengers in oar boats. Though unable to paddle, they still experience the thrill of running rapids while they travel through relatively wild areas. (The experiences of a handicapped participant on a Sierra Club-sponsored rafting trip down Oregon's Rogue River are recounted in "My Side of the River," *Sierra*, July/August, 1983.)

There are several avenues you can follow if you're interested in learning how to raft safely and intelligently. The first thing I'd suggest is that you read as much as you can

about the subject. While "home study" is not a real substitute for hands-on training by a qualified instructor, it's a good way to learn some of the basic terminology rafters use, and to get a feel for the flavor of the sport.

Another approach you can use is to enroll in one of the whitewater schools found throughout the United States and Canada that offer a variety of courses to help you get started on the right foot. Most of the rafting books and magazines you'll run across include the names of various schools around the country; also, a number of schools advertise in *Sierra* and other conservation and outdoor-recreation magazines. If quite a few schools are located in your area, check around to see if you can learn which ones are especially well-regarded.

A NUMBER OF SIERRA CLUB chapters conduct rafting trips, and several chapters have river-touring sections that often include well-organized rafting groups within them. One chapter, San Francisco Bay, has had a river-touring section since the early 1950s. Carl Trost, who heads that 500-member section now, notes that "many participants in our rafting group come to our classes even though they've been rafting before, because having been out on the river, and having seen all that's involved, they're interested in learning how to do it right."

This raises the question of whether it's possible to learn rafting skills on your own—from the school of hard knocks, as it were. Unfortunately, that phrase all too often literally describes the experiences of people who take to the river before they've developed the skills required to navigate whitewater safely. If you're determined to learn on your own, it's absolutely essential that you *take your time*. Start on the easiest water you can find, and work up very, very slowly. Take many one-day trips before you even consider an overnighter. Get as much advice as you can from experienced rafters as you work your way up. Learn to recognize when the river you're learning on is at high flow, and stay away from it at those times. On your own, it may well take you a couple of years before you'll be able to handle a raft safely in whitewater.

There's really no need to learn rafting by yourself, particularly if you have access to a whitewater school or an educational program such as that run by the Bay Chapter. As Carl Trost points out, there are many advantages to taking part in such a program. "You learn safety tips, and how to do things right. You meet people with interests similar to your own, and you can take advantage of a pool of information. You learn about equipment and technique from users rather than from salespeople. And instead of setting out

blindly down a river, you can go on trips with leaders who know the water because they've been down it before."

Charlie Wood, who runs the chapter's 60-member rafting group, echoes Trost's enthusiasm. "We sponsor formal whitewater-rafting training classes," he says, "but we also offer further informal training on fun trips, short one-day and two-day trips, and on extended wilderness trips. Safety is emphasized, and our members help novices learn how to raft as safely as possible."

Wood thinks the formal training class is a good way for a beginner to get started. "Lots of the experienced rafters turn out to help instruct the novices, and to pass along river lore. We teach the fundamentals of rafting in a classroom at first, but within four or five weeks our people are out on Class III whitewater, practicing the skills they've learned." (A word about those other whitewater "classes": The natural elements that make whitewater what it is—the intensity of its rapids, the slope of the riverbed, the size and distribution of boulders in the river's course—are taken into account when stretches of river are ranked in Classes I through VI according to the guidelines adopted for North America by the American Whitewater Affiliation. These rankings—Class I is the easiest water, Class VI the toughest—are quite general, and are subject to change as conditions vary; but they at least give a boater some indication of what to expect—and what degree of skill he or she must bring to a given river.)

The Bay Chapter's rafting group provides raft and equipment rentals on a group basis for students in its formal training classes. A fee is charged for the training—between \$125 and \$165 for the five weeks, depending on how much of their own professional-quality equipment students provide. "All of our other trip activities," says Charlie Wood, "require rafters to own or rent rafts themselves, or to join forces with a raft owner they may have met at one of our meetings."

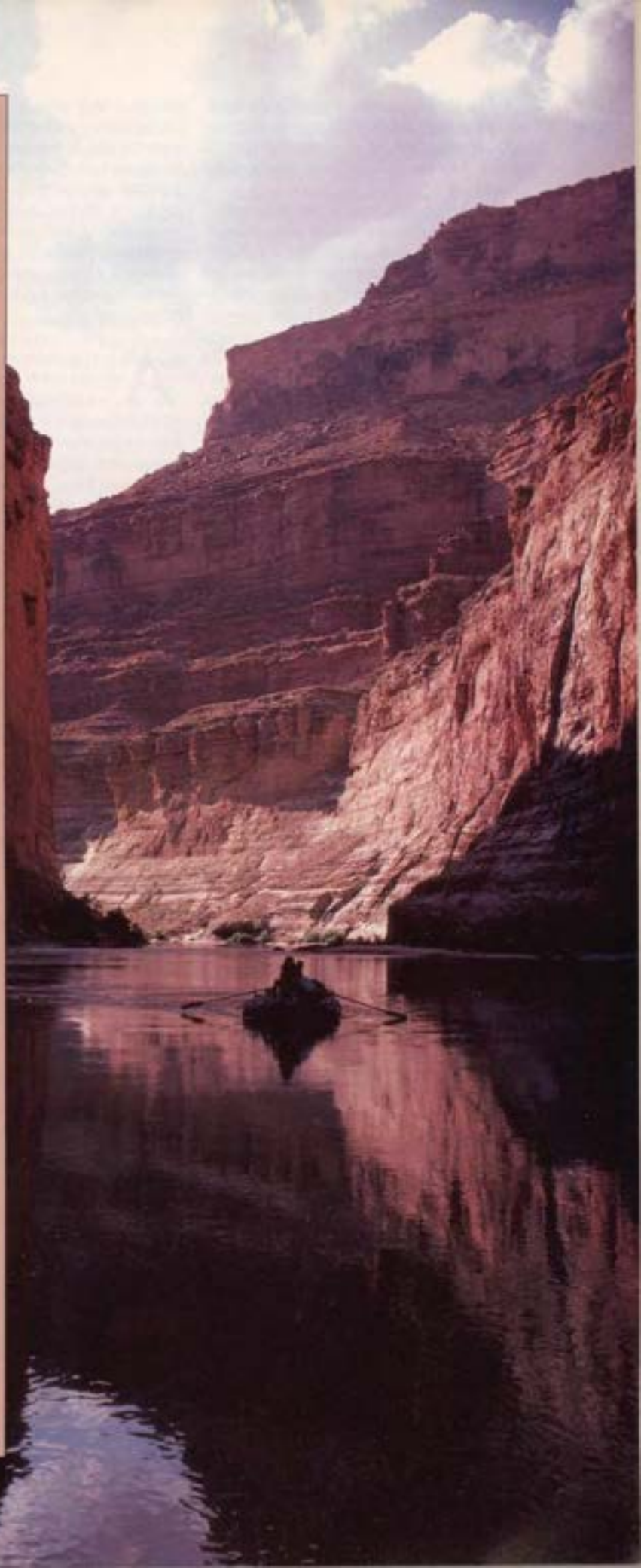
Some of the group's trips are scheduled ones, announced to the membership in the river-touring section's publication, the *Paddlers' News Bulletin*. But the rafters have trips going all the time on their own, and word gets around about these through an informal network. One-day and weekend trips are made on the closer rivers—the Eel, Tuolumne, Trinity, Kings, and American, among others. During January and February, members keep busy planning (and obtaining permits for) wilderness trips on such exciting western rivers as the Middle Fork Salmon and the Grand Canyon of the Colorado. Wood estimates that one applicant in ten will be fortunate enough to get a permit to raft the Salmon. Those receiving permits

A Raft of Rivers to Run

Not every one of the waterways listed below is wild enough to be considered a true whitewater river. Conversely, not all stretches of every river mentioned here are safely navigable by raft; some whitewater is suitable only for kayaks or canoes, and some can't be run at all. Also, many of the most popular rivers require permits, to be applied for months or even years in advance. These are some of the many reasons why you should carefully investigate any stretch of river you're thinking of running *before* you set out.

UNITED STATES

<i>Alaska</i>	<i>Michigan</i>	<i>Vermont</i>
Copper	Black	West
Forty-Mile	Presque Isle	<i>Virginia</i>
Gulkana	<i>Minnesota</i>	Rappahannock
Kenai	Big Fork	<i>Washington</i>
Swanson	Upper Mississippi	Ouinault
<i>Arizona</i>	St. Croix	Skagit
Colorado	<i>Missouri</i>	<i>West Virginia</i>
Gila	Current	Cheat
Salt	Jacks Fork	Gauley
San Francisco	<i>Montana</i>	New
Verde	Flathead	<i>Wisconsin</i>
<i>Arkansas</i>	Madison	Flambeau
Big Piney Creek	Smith	Namekagon
Buffalo	<i>Nebraska</i>	Peshigo
Kings	Niobrara	Wolf
<i>California</i>	<i>Nevada</i>	<i>Wyoming</i>
American	East Fork Carson	Greys
Eel	<i>New Mexico</i>	Upper Snake
Feather	Rio Grande	CANADA
Kern	San Francisco	<i>Alberta</i>
Kings	<i>New York</i>	Athabasca
Klamath	Never sink	Hay
Merced	Upper Hudson	Peace
Sacramento	<i>North Carolina</i>	Wapiti
Salmon	Nantahala	<i>British Columbia</i>
Smith	<i>North Dakota</i>	Upper Columbia
Trinity	Little Missouri	Fraser
Tuolumne	<i>Oklahoma</i>	Stikine
Yuba	Glover	Thompson
<i>Colorado</i>	Illinois	<i>Manitoba</i>
Animas	<i>Oregon</i>	Gods
Arkansas	Deschutes	Hayes
Colorado	Grande Ronde	Red
Dolores	John Day	<i>New Brunswick</i>
Eagle	Owyhee	Miramichi
Gunnison	Rogue	St. Croix
North Platte	<i>Pennsylvania</i>	<i>Ontario</i>
San Juan	Youghiogheny	Abitibi
Yampa	<i>South Carolina</i>	Quetico
<i>Georgia</i>	Chattooga	Wanapitci
Chattooga	<i>South Dakota</i>	Winisk
Chauga	Little White	<i>Quebec</i>
<i>Idaho</i>	<i>Tennessee</i>	Mattawin
Bruneau	Buffalo	Metabetchouan
Salmon	Obed	<i>Saskatchewan</i>
Selway	<i>Texas</i>	Churchill
Snake	Rio Grande	<i>Yukon</i>
<i>Kentucky</i>	<i>Utah</i>	MacKenzie
Cumberland	Colorado	Yukon
<i>Maine</i>	Green	
Allagash	San Juan	
Dead		
St. John		
<i>Maryland</i>		
Savage		



often invite others who weren't so lucky to go along with them. The section requires that all members of a scheduled trip be qualified for the hazards characteristic of the river being run.

One thing people learn from a responsible course in whitewater basics is a sense of respect for the river. That's why it's important, especially if your training has not enabled you to consistently navigate rivers of Class III or greater difficulty, to test out your raft and equipment on a slow-moving river before you tackle significant whitewater. I'm speaking from hard-won experience here, because I made the error of not checking out my equipment before my own first multiday trip. We flew in to a river deep within a wilderness area, far from any road. On the first rapid, a strong pull on the oars snapped both oarlocks. Our boat spun helplessly around in circles, careening off of rocks, for the remainder of the rapid. Fortunately, we'd carried along a couple of canoe paddles as a precaution, and with them we managed to run the boat as a paddle raft, limping off the river several days later.

Extra clothing, overnight equipment, and other gear should be carried in waterproof bags, available from river-supply com-

panies, which also sell special watertight plastic cases to protect valuable items such as cameras and binoculars. Be sure to run a quick test to make certain the bags and cases you buy are really waterproof and watertight. Fill the bag or case with water. No water should leak from the container. In particular, check the seams and the top closure. If a bag or case leaks, take it back to the store and have it replaced—or buy another brand.

AS A RESPONSIBLE USER of rivers, you should strive to be as self-sufficient as possible. For this reason, another item you'll want to carry with you—even on day trips—is a repair kit. If you have an equipment problem, such as a ripped raft, you should have the materials and tools on hand to take care of it. Once you've assembled your kit, make sure it's with you at all times, tied down securely to the raft. You may not need it soon—but you will need it someday, and it will prove invaluable.

A repair kit, no matter how complete, will not meet all of your needs in case of an emergency on the river. The most common emergency—someone being tossed out of a raft during its passage through a tough rapid,

or falling overboard when a raft flips or capsizes—requires that each passenger wear a lifejacket *at all times* while on the water. The need for this practice was dramatically illustrated on the Chattooga—the southeastern river made famous by the film *Deliverance*—when it was found that seven of eight people who died on that river in one short stretch of time had been wearing no lifejacket at all, while the eighth had merely draped the jacket over his shoulders.

Not all lifejackets, however, are suitable for whitewater. When you're shopping for one, check the Coast Guard tag on the inside of the jacket, and be sure to select only a Type I, Type III, or Special Commercial Whitewater Type V model. *Stay away from Type II lifejackets.* A common Type II lifejacket looks like a horsecollar, with a tube behind the neck and two tubes that run down the front of the chest. This jacket is completely inadequate for whitewater, as it can slip off in the turbulence. Make sure any lifejacket you purchase—whether it's a Type I, III, or V—fits snugly. Sloppy-fitting lifejackets can be pulled off your body by the powerful currents characteristic of rapids. (See "Wet Behind the Ears," below, for some further comments on lifejackets.)

Wet Behind the Ears: Whitewater and Children

CARL TROST

IF YOU'RE INTERESTED IN RAFTING WITH YOUR FAMILY, it isn't necessary to own a raft or to invest in expensive equipment. Trips ranging from an afternoon's outing to a week's vacation can be shared with friends or arranged through commercial guides. In fact, a commercial outing is a very good way to begin, to develop the enthusiasm that each family member must have, free of technical and logistical concerns.

There are experienced boaters who plan wilderness trips as family vacations, selecting rivers that are suitably safe for the youngest members of the group. However, it is not inconceivable that a family could learn river-running on their own. This should involve strong motivation on the part of all members, inspired perhaps by previous river trips and a commitment to learning the sport properly. If the parents are learning rafting at the same time, there is one further requirement: Children should be close to the age at which they could take up river-running on their own.

If you're planning a wilderness vacation, the do-it-yourself approach would presume that your family has enjoyed the sport on at least a casual but continuing basis for a summer or two before an extended trip is contemplated. You'll have practiced river-running techniques on one-day trips on well-known, popular, and forgiving rivers where help, if needed, is readily at hand. As a next step, waterproof packs, tie-down skills, and river-camping savvy would have been tested on short, overnight trips.

Judging from the extreme youth of some of the children I have seen on rafting trips, I can only conclude that their parents had no understanding of what can happen to a raft even on the gentlest

river. A raft capsize is sudden and often unexpected. The rafters are momentarily plunged under water, and may even be trapped underneath the raft. In swift water, people are quickly swept apart and carried downstream separately. Many amateur rafters do not understand how important it is to have several rafts in their party, so that people and equipment can be rescued quickly. If a young child were to swallow water during a capsize, it would be essential to have support boats on the scene immediately. (The American Whitewater Affiliation publishes an excellent safety code. For a free copy, send a self-addressed, stamped envelope to the AWA at P.O. Box 1261, Jefferson City, MO 65102.)

Seemingly gentle rivers can have their hazards, including weirs, brush, fallen trees, or bridge pilings around which a raft can "wrap." One father who knew an "easy" river well from previous trips lost a two-year-old child when the family's large, stable craft

Children can enjoy river-rafting if proper attention is paid to their instruction—from the twin standpoints of safety and technique. No child should raft a river that he or she can't safely swim.



Another hazard—less obvious than drowning but potentially as deadly—is hypothermia, a dangerous lowering of the body's temperature caused by wind and cold in combination with wetness. The best way to deal with hypothermia is to prevent it by wearing good-quality river clothing and carrying extra clothing with you on the raft. For wet conditions, wool and pile clothing are probably the best choices. (Never wear cotton, as it remains wet for a long time and loses all its insulating properties.) Both wool and pile retain their insulating values even when wet. Pile also has the extra-important ability to dry quickly; sometimes the wearer's own body heat is sufficient to do the trick. However, pile does have one disadvantage: It's the heaviest of the synthetics, and when it's wet it makes swimming difficult. You'll certainly want to investigate the pros and cons of every natural and synthetic material used in river clothing before making your purchases.

Even the most efficient fabrics will be of little value in defending against hypothermia if they're not used in combination with a garment that will protect you against the insidious and rapid cooling effect of wind. The best choice here is a paddling jacket or

rain jacket, plus a pair of rain pants. Of course, these will also help keep you dry.

Should you become so enthusiastic about river rafting that you decide to buy your own raft, you'll end up paying between \$600 and \$2,000 for a good-quality model. That may sound like a lot of money, but a well-made raft will last for years. Today, virtually all rafts are made of a synthetic fabric (such as nylon or Kevlar) treated with a waterproof coating (such as Hypalon or neoprene). Among the brands favored by experienced rafters are Achilles, Avon, Campways, Rogue, and Maravia.

Whether you raft rivers during the cold season or during warm, sunny days in July, you will be able to take multiday trips through some of North America's great wild areas. What's more, rafts can carry all you'll need to travel in relative luxury. All camping equipment—tents, sleeping bags, pads, warm clothing, food—is placed in waterproof bags and lashed to tubes or tied to the raft's frame, so it isn't sitting on the floor. (Baggage on the floor is the leading cause of torn and ripped rafts, far ahead of such natural river hazards as rocks and other obstructions.) On rafts with frames designed for them, coolers with fresh vegeta-

bles and meats can be carried. In addition, many river-runners have found that the versatile dutch oven enables them to prepare a variety of tasty dishes.

Sounds downright luxurious, doesn't it? Still, river trips aren't for everybody. James Watt, early in his tenure as Secretary of the Interior, took a river trip down the spectacular Grand Canyon of the Colorado. In widely publicized remarks, Watt said he was glad to have the helicopter come in and take him out, because things were getting boring.

I suppose there will always be some people who get bored on a wild ride through challenging rapids. They're the same people who will feel anxious to return to the city rather than stay to watch multihued canyon walls drift by, or listen to the lovely tune of a canyon wren, or eat a delicious, hearty meal around a campfire at night. But there are also those of us who yearn for such memorable experiences, and wilderness river-running is an immensely enriching way to satisfy those yearnings. □

Ron Watters directs the Outdoor Program at Idaho State University in Pocatello. He is a member of the American Whitewater Affiliation's board of directors.

was capsized by a hydraulic that occurred on that river only rarely, when an irrigation ditch discharged into the main stream.

How do you determine when a child is ready to be taken on a river? The following tips can help you make that decision.

- No matter how unlikely it seems, the possibility of a capsizing or other river problem must never be discounted. Therefore, your child should be a good swimmer, should enjoy the water, and should be able to swim under water.
- Do not rely on a so-called "lifejacket" to save the life of a very young child (or any nonswimmer, for that matter). While some form of protective flotation garb is essential, lifejackets have decided limitations. First of all, in wildwater, even a good swimmer with a good-quality life vest must be prepared to go under water, sometimes for extended periods. Coast Guard labeling to the contrary, jackets "designed to turn the unconscious wearer face-up" will float some people face-down in flatwater; in white-water, the claim may be meaningless. Further, while a buoyant, doughnut-shaped collar around the neck would appear to ensure a face-up position, this is not always the result.
- A child should be made to understand that the life vest is to be worn at all times while on the river. Parents should consider extending the rules about wearing life vests and playing on or about the raft to apply to those periods of time spent beached for lunch, swimming, or camping. Outdoor-safety rules in general—not just water-safety rules—need to be enforced, and the age of each child balanced against the risks involved.
- Most rafting fatalities occur when a single raft is carrying inexperienced rafters down an unfamiliar, infrequently traveled local stream. If the raft capsizes under these circumstances, it becomes a matter of every one for himself, with no support rafts nearby to recover people or equipment. The problem is compounded when boaters neglect to wear life vests, or when they fail to recognize such hazards as high flow levels, cold water, brush,

fallen trees, bridge pilings, weirs, dams, falls, and reversals.

Know your river. Learn rafting skills with a club or group, preferably with leaders who can teach you the rivers. There is a wide variety of classes and books that teach rafting skills.

- Commercial rafting companies usually specify a minimum age of seven or eight years for people signing up for a trip on a large raft rowed by a professional guide. These guides know their rivers intimately, and the older companies generally have excellent safety records. However, a word of caution is in order. When booking reservations months in advance, commercial companies are often locked into a schedule that includes the peak of the spring runoff period—and runoff can flow much higher than expected. In my opinion, families and first-time rafters would do well to reserve early and avoid the most critical weeks.
- Many rafters rely on the six-step International Scale of River Difficulty to an extent that was never intended. A river cannot be described by a simple number, and assigning that number to it is a very subjective matter. For this reason the American Whitewater Affiliation recommends that the rafter on an extended wilderness trip be prepared for a river one class higher than its rating. When young children are involved, I would tend to make that margin of skill two classes higher. Thus, the truly experienced amateur able to control a raft on a Class III or IV river could probably take a child several years younger than seven or eight on wilderness rivers of Class I or II.

For rivers of Class III or higher, I suggest this rule of thumb: If your child is not old enough to jump in and swim in it, that child shouldn't be running it. One commercial guide who specifies a minimum age for each river in his repertoire sets the limit at around age eight for Class III rivers, and 14 years for Class IV.

Carl Trost chairs the river-touring section of the Sierra Club's San Francisco Bay Chapter.



Jerry Lieberman, national membership chair (left front), makes a point to Jim Dockery, North Carolina chapter chair, during the chapter's recent SCCOPE workshop. In the background, Club President Denny Shaffer confers with chapter SCCOPE Chair David Wallace.

SCCOPE

THE CLUB GEARS UP FOR ELECTION '84

BOB IRWIN

66 SHOULD THE SIERRA CLUB be involved in elections?" Eight years ago this was a thorny question within the Club. But even those advocating the jump into electoral politics didn't anticipate the speed and enthusiasm with which the Club's volunteer leadership greeted this move. This election year finds the Club with literally hundreds of experienced political activists, and we are reckoned among the major political players in the country.

The vehicle for our electoral involvement is the Sierra Club Committee on Political Education (SCCOPE). Its eight-person na-

tional committee, appointed by the Club's Executive Committee, is responsible for endorsing federal candidates, overseeing compliance with campaign regulations, and planning the Club's electoral strategy. Most chapters have in addition set up chapter SCCOPEs to take care of state and local elections.

If our commitment was tentative in 1976, our stance for the 1984 elections is aggressive. Here's how Executive Director Mike McCloskey addressed the issue last September: "Unless we join forces . . . to get them out of office, we may be stuck with four more years of an administration totally irrespons-

ble to environmental protection. Now is the time to change this. . . . Strategies must be hammered out. Staff must be expanded to meet the new demands. New volunteer leadership must be recruited. . . . We must be in a position *this winter* to start helping candidates get ready for 1984."

Responding to this summons, chapters have begun to make preparations in earnest. In North Carolina, for instance, a special mailing was sent out to chapter and group leaders across the state, inviting them to attend the North Carolina Chapter's SCCOPE Political Action Workshop in Winston-Salem on Saturday, January 14.

On the eve of that meeting—Friday the 13th, wouldn't you know—a nasty, highway-glazing ice storm swept in. That night found Club President Denny Shaffer, Chapter Chair Jim Dockery, and Holly Schadler, SCCOPE coordinator from the Club's Washington, D.C., office, stranded in Durham, 75 slippery miles from Winston-Salem. Happily, on Saturday the ice melted, and they (along with some 70 other intrepid Sierrans) made it to the workshop on time.

After the workshop, on Sunday, Jim Dockery was exuberant. Not only had the turnout been great, but a lot of high-quality work was accomplished. Holly conducted an hour-and-a-half session: first on the national SCCOPE program and then on how chapters might organize their SCCOPE efforts—assigning duties, endorsing candidates, recruiting volunteers, raising money, and performing other necessary tasks. She too had been impressed by the enthusiasm of the group and by the high level of their questions and comments. Holly attributes the North Carolina Chapter's success to its 15 groups—more than there are in any other chapter. Chairman Dockery concurred: "We've had a long-standing enthusiasm for forming additional groups. It has expanded our corps of able leaders and provided an active Sierra Club voice and presence in the many and varied regions of our state."

After Holly's session, President Shaffer reviewed the Club's increasing involvement in electoral politics. He told the workshop audience that in 1984 the nation's number-two race will be in North Carolina—moderate Democratic Gov. Jim Hunt against the reactionary chairman of the Senate Agricultural Committee, Jesse Helms. It is a race, Shaffer said, important to every environmentalist in the country. He also described a meeting with Hunt's campaign director, who eagerly sought Sierra Club help for the campaign ahead.

Terry Garren, an aide to Democratic Rep. Jamie Clarke (who, with strong support from Sierra Club members in his wilderness-rich district, was able to unseat the Watt-type incumbent in 1982), then gave

some practical pointers on what makes for a successful campaign. Among his list of campaigning musts were: voter surveys, or polling; targeting of special precincts or groups of voters; techniques for "touching" the voters; use of paid media (print, radio, TV); and developing a strong corps of volunteers.

Toward the end of the workshop its leaders and participants drew up a list of jobs-to-be-done priorities. The first was to bring the chapter and group SCCOPE teams up to full strength. Meanwhile, each of the 15 groups was to compile two lists: one of persons to contact in the media (and of the members who'll do the contacting), and one of writers of letters to the editor. It was also agreed that each group would (1) step up the recruiting of volunteers for SCCOPE tasks and (2) have its SCCOPE committee seek out candidates in its area for possible endorsement. Finally, workshop participants agreed that the Sierra Club, as an overall strategy, should do all it can to point out the enormity of Sen. Jesse Helms's miserable environmental record. All in all, quite an agenda! And, says Dockery, everyone—including himself—was excited and fired up as they left for home.

While she was conducting her part of the Winston-Salem workshop, Holly Schadler could not help but be impressed, she said, by the amount of political savvy shown by many of the participants. Small wonder, for in the 1982 elections the North Carolina Chapter had endorsed and campaigned for three congressional candidates: Steve Neal and Charlie Rose in addition to Jamie Clarke. They all won!

Many other chapters, too, worked hard in those elections. It was the first time there had been an opportunity to challenge the Reagan administration's disastrous environmental policies at the polls. And for the first time, the Sierra Club engaged in electoral politics in a big way. Earlier, in 1980, Club endorsement of a few California legislative candidates had been approved on a trial basis. In February 1982 the Club made its first-ever federal-level endorsement: of Rep. Sidney Yates (D-Ill.). By November it had backed 153 candidates for the House and 15 for the Senate, in addition to 10 gubernatorial candidates. When the votes were tallied, the victory scorecard read, respectively: 121, 11, and 9—for an overall success rate of 80 percent.

The 98th Congress had scarcely been seated when preparations began for SCCOPE '84. A task force of staff and volunteers met and analyzed the Club's 1982 election effort and drew a number of lessons from it. Later, at its March 5 and 6 meeting, the all-volunteer National SCCOPE Committee tightened its own structure and drew up its program for 1983-1984. In April it mailed a

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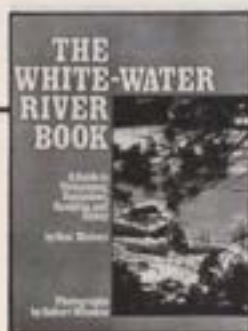
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report on its plans and progress to all chapter chairs and SCCOPE committees. That act in itself corrected the two great weaknesses of its 1982 campaign: not getting started early enough and poor communications with chapters. Now SCCOPE was making a major shift in strategy: Less money would be spent for direct cash contributions to campaigns, while more would go toward organizing and promoting electoral activities that would help build the Club's grassroots structure—by far its most valuable chip in the political game.

The Volunteer Training Program was launched to quickly prepare grassroots leaders and activists for roles in the 1983-1984 program. Carol Lee Baudler was put in charge. A Regional Vice-President from the Midwest, the North Star Chapter's SCCOPE chair, and a new member of the National SCCOPE Committee, Baudler has long advocated more training for volunteers. She and headquarters staff members—particularly Ceil Dickenson and Political Education Director Carl Pope—immediately set to work devising training workshops and contacting chapters for potential participants. The first program, with five sessions, was held in July at the International Assembly at Snowmass. Four regional workshops—the first three in October in Denver, St. Louis and Washington, D.C., and the last in San



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Francisco between November 4 and 6—graduated more than 200 chapter SCOPE leaders, who, like Jim Dockery in North Carolina, returned home to conduct training sessions of their own. The Club paid 60 percent of travel expenses, supplied necessary materials for all participants, and provided staff persons to run the workshops. (For an in-depth account of how one of these workshops operated, see "Learning the Fine Art of Lobbying" in the January/February, 1984, issue.) Club financial support to most chapter-level workshops is limited to contributing materials and staff.

In addition to the workshops, SCOPE is experimenting with two new political strategies this year. The first, the Issue Blitz, is an attempt to force presidential and other candidates for federal office to take strong stands on important environmental issues. SCOPE asked the chapters to submit proposals explaining how an important issue in their state or region could be dramatized and how much it would cost to do so. Grants of up to \$10,000 were made available by the national organization. In June four states and the issue for each were chosen: Florida, clean water; Iowa, hazardous waste; New Hampshire (part of the New England Chapter), acid rain; and Tennessee, hazardous waste.

The Florida Chapter is using its \$8,000

SIGHTINGS



The Sierra Club Follies were a high point of the Circus Weekend activities surrounding last November's Board of Directors meeting. As part of the fun, Lewis Clark (left) led the audience assembled at San Francisco's Church of Notre Dame des Victoires in a spirited singing of "The Sierra Club Song," accompanied by Mary Halley on guitar and Sandy Tepfer (who leaped up spontaneously to join the performance) on harmonica. The first verse and the refrain of "The Sierra Club Song"—to be sung, tradition has it, to the tune of "The Whiffenpoof Song"—appeared in the "Questions & Answers" column of the January/February, 1984, issue of Sierra.

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The other chapters' projects also are well under way. One that attracted international attention was New Hampshire's Citizens' Conference to Stop Acid Rain, held in Manchester January 6 through 9, at which six Democratic presidential candidates appeared. (See related "News" story, page 9.) The conference was cosponsored by the Sierra Club.

Increasing the Sierra Club's participation in delegate selection for the 1984 Republican and Democratic conventions is the second of SCOPE's experiments for this election. In a *Sierra* editorial ("It's Time to Get Started!", November/December, 1983), Denny Shaffer stressed the importance of the Club's getting involved in delegate selection and of members becoming delegates if they can. SCOPE chose eight target states—Arizona, California, Minnesota, Missouri, Oklahoma, South Carolina, Texas, and Washington—in which to conduct workshops funded by Club-arranged foundation grants. Participants have been learning the inner workings of political parties, caucuses, and conventions. Those who do become delegates, in Denny's words, "will be working side by side with elected officials and political leaders, building lobbying relationships vital to our future efforts." No official delegate elections or caucuses had been held by the time this issue of *Sierra* went to press, but informal word has it that the Club has been quite successful in getting its members onto the slates that each candidate will be supporting.

Candidate endorsements and campaigning remain SCOPE's main business. They form the agenda for most chapter and group workshops. The 1984 endorsement guidelines and procedures got early workouts in two major races last November, and both chapters' choices lost. Disasters? No, for both SCOPE chairs agreed that even in defeat there were some strong pluses. In the Washington state race for the late Henry Jackson's Senate seat, Democratic Rep. Mike Lowry lost to Republican Gov. Dan Evans, whom the Cascade Chapter's Mike Gillette describes as a good man with an acceptable environmental record. "Internally," says Gillette, "the process of deciding which candidate to back was good for us. A lot of people were involved in the debate. A full, unedited interview with each



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man ran in our newsletter. Our choice was tough but fair. Politically, too, we came out about even. Lowry's still in his safe seat in the House, and by supporting him we rewarded him. And we are still on good terms with now-Senator Evans."

The Delta Chapter's then-SCOPE chair, Michael Halle, characterized their endorsement of Louisiana's Republican Gov. Dave Treen as a great victory for the chapter despite the fact that Treen was defeated for reelection by the flamboyant and popular Democratic challenger, Edwin Edwards. "We and all environmentalists in the state feel that our efforts were worthwhile. Because we stood by our friend," Halle said, "we gained the respect of politicians and the public at large. The experience has been a positive one for us. The campaign got a lot of people involved—even my mother! We now are able to speak for all other friends of the environment here. As for Edwards, we can talk with him, but we still don't know his environmental stand. He did, however, withdraw his earlier plan to delay for six months the startup of the new state Department of Environmental Quality."

Candidate endorsements are not made lightly. Each must have a two-thirds vote of at least two Sierra Club entities. In federal races the entities are the chapter ExCom and the National SCOPE Committee; for state-wide races, the chapter ExCom and chapter SCOPE committee. The rules are different for California on the state level because it has 13 chapters; there the Club's California Legislative Committee and the two Regional Conservation Committees get into the act along with the chapters.

SCOPE is a multifaceted program, and its full story can't be told in the space allotted here. For more information, contact your local SCOPE committee. Also, the Sierra Club Organizer's Library (530 Bush St., San Francisco, CA 94108) will mail you, in return for \$5, a copy of the new 202-page *Sierra Club Handbook on Election Politics*, which includes SCOPE's *Compliance Guidelines* (telling you how to comply with all federal and state legal requirements). The *Compliance Guidelines* alone may be ordered from Information Services at the same address (first copy free; each additional copy \$1.50) if your chapter's SCOPE chair has run out of them.

TWO NEW MEMORIAL FUNDS

Stuart Avery, a longtime Sierra Club member and volunteer, died on January 14. He remained active on behalf of conservation and wildlife preservation until the very end. Those who knew Stuart will feel his loss, as

will the many beneficiaries of his devotion to the environment and its inhabitants.

To help carry out the work that was of lifelong importance to him, two memorial funds have been established: The Sierra Club Foundation Avery Wildlife Fund (to which tax-deductible gifts may be made) and the Sierra Club New England Avery Fund

for Wildlife and Habitat (where nondeductible gifts may be directed). Memorial gifts to the Foundation fund should be sent to the Sierra Club Foundation (530 Bush St., San Francisco, CA 94108). Gifts to the New England fund should be sent to the Sierra Club's New England Chapter (3 Joy St., Boston, MA 02108).

WILL COLBY REMEMBERED

On January 14, 60 people gathered in the Sierra Club's William E. Colby Memorial Library to honor the man for whom the library is named. The program, "Remembering Will Colby," was presented by the Friends of the Colby Library in conjunction with an exhibit on the early Club leader, Dick Leonard, the Sierra Club's Honorary President, was the featured speaker.

Colby joined the Sierra Club in 1898 and worked closely with John Muir in the early battles to protect the Sierra. He served on the Board of Directors from 1900 to 1949,

two of those years as President and 44 as Secretary. As Secretary, Colby's range of responsibilities made him in effect the Club's first Executive Director. In 1901 he founded the Club's outing program, and for the next 29 years he led the famous High Trips into the Sierra, Cascades, and Rockies. (Dick Leonard was just one of the many young people whom Colby "hooked" on wilderness through the outing program. He hiked with Colby, helped him manage the outings, and served with him on the Board. (For more on Leonard, Colby, and the Club's



The reminiscences of oldtimers such as Vee A. Krysiak (above left) amused those attending the William E. Colby memorial program, including History Committee Chair Ann Lage, Honorary President Dick Leonard, and Club Librarian Barbara Lekisch. Among those present were Judge Leon J. David (below left), husband of one of Colby's nieces; Mrs. Ruth Colby, wife of Will Colby's son, Henry; and her grandson, Miles Thomas McKee.



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*Nina Eloesser, Jr. (left), listens as her mother
 recalls Sierra Club outings enjoyed in the
 company of Will Colby.*

early years, see "Dick Leonard: 45 Years
 of Club Leadership," July/August, 1983.)
 Shortly after Colby's death in 1964 the Club's
 library was rededicated in his name, and in
 1966 the Colby Award was established as the
 highest honor one can receive for service to
 the Club.

After the group listened to selections
 from Colby's oral-history tapes—including
 stories of early crises on the trail, such as
 whether women should be allowed to climb
 mountain peaks in bloomers—the program
 was opened up to the audience. Longtime
 Club members spoke fondly of Colby and
 the magic of the High Trips. They told tales
 of first ascents, "Colby miles" (which are
 much longer than the statute variety), broken-
 down packtrains, and Colby's campfire
 sermons on wilderness etiquette and the
 Club's mission.

The gathering was a memorable one. It
 gave the oldtimers the opportunity to share
 their memories and their wisdom, and en-
 couraged all of us to appreciate the wealth of
 our Sierra Club heritage.—Victoria Wake

ANNUAL DINNER

The Sierra Club will hold its annual dinner
 on Saturday, May 5, at the Sheraton-Palace
 Hotel in San Francisco. The social hour will
 begin at 5:30; dinner ceremonies will com-
 mence at 6:30, and dinner will be served at
 7:00. Honors and awards will be presented
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per person. Please send your check and a stamped, self-addressed envelope to: TICKETS, Sierra Club, 530 Bush St., San Francisco, CA 94108. Requests should arrive at the Club's main office by Friday, May 4. For further information, call the Sierra Club executive office at (415) 981-8634, extension 500.

ELECTION UPDATE

By the middle of March, all eligible Sierra Club members should have received their ballots for the Board of Directors election. Ballots must be returned to the National Elections Committee (P.O. Box 2178, Oakland, CA 94621) and must arrive no later than noon on Saturday, April 14, 1984.

This year there were no candidates who submitted enough signatures on petitions by the December 30, 1983, deadline to qualify for addition to the ballot. The eight candidates selected by the Nominating Committee are: Jerry Lieberman, Michele Perrault, Robert Howard, Sally Reid, Richard Cellarius, Joe Fontaine, Carroll Tichenor, and George Shipway. Five of the eight will be elected to serve on the Board.

Election results will be announced at the end of April.



PHOTO-CONTEST REMINDER

There's less than a month left to enter Sierra's Fifth Annual Photo Contest. All entries must be postmarked by midnight, April 1. For a list of this year's categories and complete instructions for submitting photos, see page 157 of the January/February, 1984, issue.

First and second prizes will be awarded according to merit in each category. In addition, a grand-prize winner will be selected

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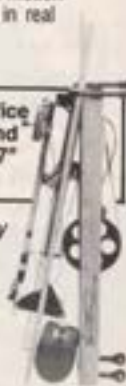
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that will not be—as it has been in years past—a prizewinner in one of the regular categories. The grand prize is really two prizes: a Nikon FG 35mm SLR camera with 50mm f/1.8 Nikon lens and a sleeping bag/liner

combination (rated to -45 degrees) from Because It's There. First prize in each category: a pair of 9x25CF Nikon binoculars. Second prize in each category: a pair of high-quality sunglasses from Vuarnet-France.

SIERRA NOTES

• A handsome exhibit case, designed by Herb Cofman for the William E. Colby Memorial Library, has been purchased through a donation to the Sierra Club Foundation by the Mother Lode Chapter. The donation was made in memory of Mike Misura (1963-1981).

William E. Colby was the subject of the inaugural display at his namesake library. The exhibit, sponsored by the Friends of the Colby Library, was prepared by Victoria Wake, Information Services Manager. Colby family photographs on display were loaned by Mr. and Mrs. Henry V. Colby.

Complementing the Colby Library's extensive collection of books, pamphlets, photographs, and memorabilia by and about Colby are three gifts to the library: an Ansel Adams portrait of Colby (circa 1930) presented by Lennard Livingston of Yuba City, Calif.; a letter from Colby to Hasse Bunnelle of Santa Barbara, Calif. (longtime Club staffer and author of four Sierra Club Books) about the origins of the Sierra Club cup; and an Appalachian Mountain Club regulation cup, upon which the Sierra Club cup was modeled.

• The Sierra Club Foundation was recently awarded a \$30,000 grant (from a donor who prefers to remain anonymous) for Inner City Outings (ICO), the Sierra Club's community-outreach program. The grant will help ICO meet many of its goals for 1984, including direct support to new groups (two have recently been established, one in Houston and another in Cincinnati), the sponsorship of regional conferences to foster the development of the program, and the production of a leaders' manual.

There are now 15 ICO groups nationwide—in San Francisco, Sacramento, San Jose, Los Angeles, Denver, El Paso, Houston, Oklahoma City, Chicago, Cleveland, Cincinnati, New Orleans, Washington, D.C., Philadelphia, and New York.

• Banyan Tree Books has reissued Sierra Club member Ernest Callenbach's *Ecotopia Emerging*, the "prequel" to his influential *Ecotopia* (published in 1975). *Ecotopia Emerging* describes how an ecologically conscious nation (formerly northern California and the states of Oregon and Washington) came to secede from the United

States in 1980. (*Ecotopia* is a country where recycling is mandatory and universal, downtown office towers have been converted to apartment buildings, and the national bird is the egret.) *Ecotopia Emerging*, unavailable for some time, can be ordered for \$7.95 through Bookpeople (2940 7th St., Berkeley, CA 94710). *Ecotopia* itself, which has sold 250,000 copies in eight languages, is available from the same source for \$4.95.

• Sierra's Designer, Bill Prochnow, has contributed to *The Oceanic Society Field Guide to the Gray Whale* (Legacy Publishing Co., 1850 Union Street, #499, San Francisco, CA 94123; \$3.95). Prochnow rendered the series of maps that pinpoint ideal observation sites for watching the whales as they migrate from Alaska down to Baja California.

• Sierra Club Books has reprinted David Raines Wallace's *The Klamath Knot* in a paperback edition (\$8.95). The book was awarded the prestigious John Burroughs Medal in February; the formal presentation of the award will be made on April 2 at the American Museum of Natural History in New York City.

• A second edition of the "Conservationist's Guide to National Forest Planning" has been made available. The booklet, now titled "National Forest Planning," summarizes environmentalists' concerns about the 190 million acres of U.S. national-forest lands and describes the National Forest Management Act planning regulations that touch on those concerns. The new edition discusses a number of important regulations changes made by the Reagan administration. The cost of the booklet is \$1 to Club members and nonmembers alike, plus 25¢ for postage, from Sierra Club Information Services (530 Bush St., San Francisco, CA 94108).

Other items available from Information Services include: a "Clean Water Directory" prepared by the Club's Clean Water/Toxics Campaign Steering Committee, describing federal laws now in place to protect clean water and listing all members of those Senate and House committees with jurisdiction over such legislation (50¢); "Implementing the Nuclear Waste Act: Where Do We Go From Here?" (15¢; 10¢ for Sierra Club mem-

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bers); and a Sierra Club International Earthcare Center fact sheet on "The Law of the Sea" (25¢; 15¢ for members).

• Sierra recently received two awards for excellence in graphics. "Birds in Our Belfry" (March/April, 1983), illustrated by Dugald Stermer (whose portrait of the gray wolf is this issue's cover), was cited by *Communication Arts* magazine, while our May/June, 1983, cover—depicting the Hoh rain forest in Olympic National Park—won an award from the American Institute of Graphic Arts.

• The following text is excerpted from a letter written by John Muir to California poet and writer Charles Warren Stoddard in 1872. The original was donated to the Club's William E. Colby Library by Edward Peterson of Culver City, Calif.

Yosemite Val., February 20

Dear Stoddard,

I have been claiming you for a friend for a long time although a few miles of air has separated us . . .

Hitherto I have walked alone. I shall rejoice in you as companion but remember that in that case "a vagabond shalt thou be." Moreover you must not hope that I can teach you, I am only a baby slowly learning my mountain alphabet. But I can freely promise that nature will do great things for you. I know little of men yet I venture to say that half our best teachers are manufactured—so ground & pressed in the mills of culture that God cannot play a single tune on them.

I am glad to learn my friend that you have not yet submitted yourself to any of the mouldy laws of literature—that your spiritual affinities are still alive & unsatisfied. Come then to the mountains & bathe in fountain Love. Stand upon our Domes & let spirit winds blow through you & you will sing effortless as an Eolian harp. . . .

*Ever your friend,
John Muir*

• It's not too late to sign up for some terrific foreign trips organized by the Sierra Club's Outing Department.

The following trips still have space available (they're coming up soon, though, and won't be advertised again): England's West Country and South Wales (Trip #790; June 1-13); West Wales and Southern Ireland (Trip #805; June 15-27); the French Alpine Spine (Trip #810; July 1-15); Peru and Bolivia (Trip #795; June 18-July 11); Sherpa Country Trek, Nepal (Trip #785; April 30-May 26).

See the January/February, 1984, *Sierra* for details about these trips and a complete listing of all 1984 Sierra Club Outings. □

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KESTERSON RESERVOIR

Continued from page 31

bryonic deaths and mutations at Kesterson. Among coots, 8.8 percent of egg embryos contained abnormalities. Among other birds the percentage was also high, ranging from 4 to 6.8 percent.

Grebes had the highest incidence of in-egg mortality—60 percent—while coots were almost as high. Coots also had a very high level of hatched birds with gross abnormalities, including missing or misshapen eyes, feet, legs, and wings. More than 42 percent of Kesterson's coots registered these abnormalities, which is significant because they are the birds resident in greatest number at the reservoir. Among ducks, grebes, and stilts, the levels of deformities ranged from 10 to 17 percent, all high enough to cause concern among scientists.

State and federal water officials are well aware of the crisis. To complement the 20-some studies now being conducted by various experts on the connection between drainage effluents and the wildlife kills and mutations, a major four-year study by the Fish and Wildlife Service has just been announced. And the Bureau of Reclamation recently made public its plans to burn vegetation at Kesterson to discourage nesting and to reduce contamination of wildlife that feeds on the selenium-laden growth. In December, following conferences that documented the dangerous effects of the contaminated drainage water, the bureau announced further plans to discourage nesting altogether.

Originally, the San Luis Drain was intended to serve about 100,000 acres of valley land. Today it is draining less than 8,000 acres. But farmers and the Bureau of Reclamation intend to expand that to perhaps 500,000 acres, much of it low-quality land that will generate far more salts, selenium, metals, and other contaminants than anyone ever planned for. The total runoff could eventually reach nearly 400,000 acre-feet a year, a virtual ocean of effluent moving through the valley, filling up wildlife marshes and ultimately discharging into the Delta and San Francisco Bay.

For many years, wildlife and environmental activists and hunters and fishermen have questioned the plan to extend the drain the additional 160 miles to the Delta. Massive pumping by state and federal water projects, in order to send fresh water to valley irrigators and Southern California cities, has already contributed to the reduction of fish

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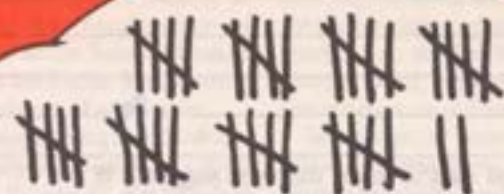
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populations to 20 percent of their historic levels. Now, it is feared, further damage to Delta fisheries and the contamination of such sensitive areas as the Suisun Marsh, a major stopover on the Pacific flyway, could result from the discharge of wastewater.

While publicly maintaining that the drain, and especially its discharge point, are open to further study, Bureau of Reclamation officials have already decided that the Delta is the suitable terminus. David G. Houston, the director of the bureau's Mid-Pacific Region, recently acknowledged that his "intent is to obtain the necessary permit and funding for the completion of the San Luis Drain for ultimate discharge into the Sacramento/San Joaquin Estuary in the vicinity of Chipps Island." The Bureau of Reclamation has even circulated a proposal for a massive public-relations campaign to promote the expanded San Luis Drain—long before any congressional review or public hearings on the project have been scheduled.

There are alternatives to the San Luis Drain, though many irrigators may not find them equally attractive, because they mean higher costs. Better water conservation, including drip irrigation and transportation by closed pipe—rather than by open, unlined trenches—would drastically reduce the amount of irrigation water required, as would setting aside marginal, low-productivity lands, which demand huge volumes of water to irrigate crops and to leach the soil.

Other alternatives, including purification and evaporation of wastewater, using runoff for power-plant cooling, and cautious discharges into the Pacific Ocean rather than into the Delta, must be more seriously considered by state and federal water planners.

Serious as the current situation is, proposed developments could significantly worsen the plight of wildlife along the entire Pacific flyway and in other California rivers and streams. The salts, pesticide residues, and naturally occurring elements (such as selenium) that today are pouring into Kesterson are a small fraction of the amount that will be discharged under pending irrigation scenarios.

Within the next few months, government agencies and Congress will make decisions that will seal the fate of wildlife and the environment for decades. Those decisions include the expansion of existing water and irrigation projects, the authorization of billions of dollars in new projects, and long-term commitments of water to controversial irrigators.

Enough has been sacrificed and subsidized. The federal government must take a strong leadership role in assuring that the shortsightedness that led to the crisis at Kesterson is not repeated elsewhere. □

Representative George Miller (D-Calif.) is a leading critic of federal irrigation subsidies.



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SIERRA CLUB FINANCIAL REPORT

FISCAL YEAR 1983

Pursuant to the provisions of sections 6321 and 6322 of the California Corporations Code, the following information is furnished as an annual report:

The Club's complete financial statements for the fiscal years ended September 30, 1983, and September 30, 1982, together with the report of Touche Ross & Co., independent accountants, are available on request from Sierra Club headquarters at 530 Bush Street, San Francisco, California, 94108.

The membership list of the Sierra Club is on file at the Club's headquarters at 530 Bush Street, San Francisco, California, 94108.

There are no transactions to disclose that constitute a conflict of interest involving directors or officers; no member has voting power of 10% or more.

The books of account and minutes of meetings of the Board of Directors are available for inspection by members on written request at the Club's headquarters at 530 Bush Street, San Francisco, California, 94108.

December 6, 1983
Board of Directors
Sierra Club
San Francisco, California

We have examined the combined balance sheets of the Sierra Club and subsidiary as of September 30, 1983 and 1982, and the related combined statements of revenues, expenses and changes in fund balances, changes in financial position and functional expenses for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and other auditing procedures as we considered necessary in the circumstances.

In our opinion, the combined financial statements referred to above present fairly the financial position of the Sierra Club and subsidiary at September 30, 1983 and 1982, and the results of their operations and the changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Touche Ross & Co.
Certified Public Accountants

TO THE MEMBERS OF THE SIERRA CLUB:

Melville's Ishmael cried out for "Time, Strength, Cash, and Patience!" The Club has abundant reserves of all but the third.

The Sierra Club's fiscal 1983 budget projected adjusted revenues of \$18.4 million, excluding Life Memberships, and expenditures of \$17.9 million, leaving \$561,000 budgeted to increase the Club's current net worth.

When the books for the year were closed, revenue had reached 118% of fiscal '82 revenue, but at \$17.5 million it achieved only 95% of our ambitious forecast. Expenditures were tightly managed and close to budget, but with income falling short of predictions, a loss on current operations of \$358,900 resulted, the Sierra Club's first operating loss since 1978.

Thanks to the generosity of many new Life Members and a Board transfer, the Endowment Fund had its best year ever, growing \$399,400 to total \$1,707,900. This is an excellent sign for the Club's long-term strength. The Board has recently taken steps to increase the security of the Endowment Fund to ensure that it fills its role in the Club's future.

However, after two years with no bank loans and with liquid reserves on hand, the Club ended fiscal 1983 with a debt to the Endowment Fund (now fully repaid) and \$500,000 in notes outstanding. In addition to the excess of expenditures over income, cash had been consumed by capital purchases, by investment in the Club's new headquarters, and by growth in outstanding accounts receivable—money we were eventually bound to get, but didn't have in hand. The Sierra Club's cash management problems are not unique, and the officers and administration of the Club are taking steps to address them. It is vital that this program of improving our cash-flow control be continued to completion.

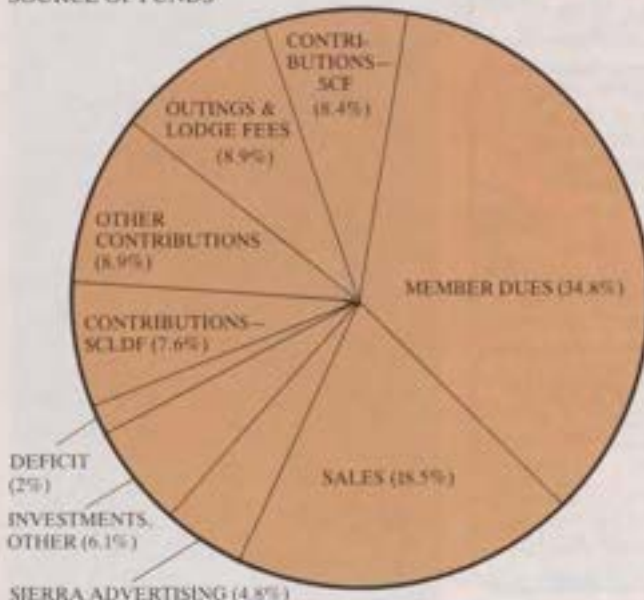
Fiscal 1983 was a year of good growth... just not as much as we had hoped. Our task will always exceed our means. Thanks to your support, we persevere!

PH

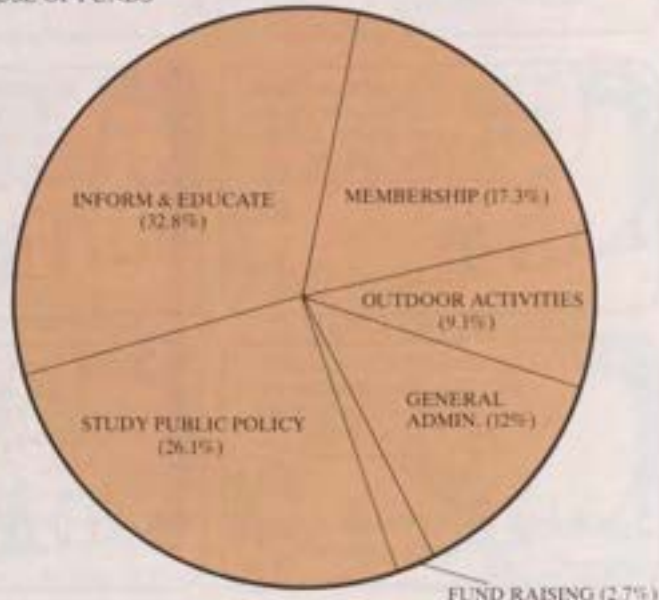
Philip M. Hocker, Treasurer
Jackson Hole, Wyoming

SIERRA CLUB FISCAL YEAR 1983

SOURCE OF FUNDS



USE OF FUNDS



SIERRA CLUB & SUBSIDIARY COMBINED BALANCE SHEETS

ASSETS

	September 30	
	1983	1982
CURRENT ASSETS:		
Cash	\$ 86,500	\$ 255,900
Trade accounts receivable, less allowances for returns of \$70,000 (Note A)	962,600	443,000
Other receivables, less allowances for doubtful accounts of \$30,000 and \$40,000	331,400	280,400
Grants receivable	230,000	126,000
Inventories (Note A)	933,000	923,400
Advances, less allowances of \$60,000 and \$36,700 (Note A)	404,600	517,300
Prepaid expenses	439,000	527,100
TOTAL CURRENT ASSETS	3,387,100	3,053,100
INVESTMENTS (Notes B and E)	1,536,400	1,434,000
PROPERTY AND EQUIPMENT (Notes A and C)	906,000	1,008,400
ADVANCES TO AFFILIATES (Note D)	90,000	—
TOTAL ASSETS	\$5,919,500	\$5,495,500

LIABILITIES AND FUND BALANCES

	September 30	
	1983	1982
CURRENT LIABILITIES:		
Bank overdraft	\$ 162,700	\$ 135,200
Note payable to bank (Note E)	400,000	—
Other note payable (Note E)	100,000	—
Accounts payable	1,826,300	1,634,800
Current portion of obligations under capital leases (Note F)	43,900	38,600
Accrued expenses	470,500	526,200
Deferred revenue (Note A)	308,200	424,300
TOTAL CURRENT LIABILITIES	3,311,600	2,759,100
OBLIGATIONS UNDER CAPITAL LEASES (Note F)	63,300	107,300
FUND BALANCES (Notes G and H):		
Unrestricted	799,900	1,144,000
Endowment	1,707,900	1,308,500
Restricted	36,800	176,600
	2,544,600	2,629,100
TOTAL LIABILITIES AND FUND BALANCES	\$5,919,500	\$5,495,500

See notes to combined financial statements.

SIERRA CLUB & SUBSIDIARY COMBINED STATEMENTS OF CHANGES IN FINANCIAL POSITION

	Year Ended September 30	
	1983	1982
	Total	Total
Financial resources were provided by:		
Excess (deficiency) of revenues over expenses	\$(358,900)	\$109,700
Add items not requiring working capital:		
Depreciation and amortization	241,600	212,700
Loss on disposal of property and equipment	3,700	4,800
TOTAL RESOURCES PROVIDED FROM (USED IN) OPERATIONS	(113,600)	327,200
New life memberships	274,400	230,900
Proceeds from sale of property and equipment	2,500	5,000
TOTAL RESOURCES PROVIDED	163,300	563,100
Financial resources were used for:		
Acquisition of property and equipment	145,400	368,300
Purchase of noncurrent investments	102,400	297,300
Advances to affiliates	90,000	—
Reduction of capital lease obligations	44,000	38,600
TOTAL RESOURCES USED	381,800	704,200
DECREASE IN WORKING CAPITAL	\$(218,500)	\$(141,100)
Changes in components of working capital:		
Increase (decrease) in current assets:		
Cash	\$(169,400)	\$ 19,400
Trade accounts receivable	519,600	(243,500)
Other receivables	71,000	34,400
Grants receivable	104,000	(101,300)
Inventories	9,600	311,000
Advances	(112,700)	133,900
Prepaid expenses	(88,100)	291,000
	334,000	444,900
Decrease (increase) in current liabilities:		
Bank overdraft	(27,500)	(45,400)
Note payable to bank	(400,000)	100,000
Other note payable	(100,000)	—
Accounts payable	(191,500)	(430,100)
Obligations under capital leases	(5,300)	(4,600)
Accrued expenses	55,700	(223,300)
Deferred revenue	136,100	17,400
	(532,500)	(586,000)
DECREASE IN WORKING CAPITAL	\$(218,500)	\$(141,100)

See notes to combined financial statements.

SIERRA CLUB & SUBSIDIARY COMBINED STATEMENTS OF REVENUES, EXPENSES & CHANGES IN FUND BALANCES

Years ended September 30, 1983 and 1982

	1983			1982	
	Unrestricted	Endowment	Restricted	Total	Total
REVENUES:					
Member dues	\$ 6,236,900			\$6,236,900	\$5,759,700
Contributions and grants	2,661,900		\$1,790,100	4,452,000	3,902,300
Outings and lodge reservations and fees	1,589,800			1,589,800	1,502,200
Sales, principally publications	3,307,500			3,307,500	2,239,900
Royalties on publications	776,400			776,400	568,300
Advertising, investment and other income	1,183,900		800	1,184,700	851,100
	15,756,400		1,790,900	17,547,300	14,823,500
EXPENSES:					
Program services:					
Studying and influencing public policy	2,830,900		1,967,900	4,678,800	4,129,500
Information and education	5,829,400		52,300	5,881,700	3,996,700
Outdoor activities	1,582,300		38,800	1,621,100	1,492,200
Membership	3,093,200		—	3,093,200	2,846,700
	13,335,800		1,999,000	15,274,800	12,455,100
Support services:					
General and administrative	2,149,500		1,200	2,150,700	1,937,700
Fund raising	480,700		—	480,700	321,000
	2,630,200		1,200	2,631,400	2,258,700
	15,946,000		1,999,200	17,906,200	14,713,800
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENSES BEFORE ADDITIONS TO ENDOWMENT FUNDS					
	(189,600)		(169,300)	(358,900)	109,700
Additions to endowment funds—new life memberships		\$ 274,400		274,400	230,900
EXCESS (DEFICIENCY) OF REVENUES AND ADDITIONS TO ENDOWMENT FUNDS OVER EXPENSES					
	(189,600)	274,400	(169,300)	(84,500)	340,600
Fund balances at beginning of year—restated (Note I)	1,144,000	1,308,500	176,000	2,629,100	2,288,500
Interfund transfers (Note H)	(154,500)	125,000	29,500	—	—
Fund balances at end of year	\$ 799,900	\$1,707,900	\$ 36,800	\$ 2,544,600	\$ 2,629,100

SIERRA CLUB & SUBSIDIARY COMBINED STATEMENTS OF FUNCTIONAL EXPENSES Years ended September 30, 1983 and 1982

	1983					1982				
	Program Services				Total	Support Services		Total		
Studying and Influencing Public Policy	Information and Education	Outdoor Activities	Membership	General and Administrative		Fund Raising	Total			
Salaries and employee benefits	\$1,753,000	\$ 995,700	\$ 309,300	\$ 469,600	\$ 3,547,600	\$1,128,000	\$421,500	\$1,549,500	\$ 5,097,100	\$4,201,300
Outside services	111,400	943,500	560,900	402,600	2,018,400	214,200	409,200	703,400	2,721,800	1,975,900
Cost of sales, principally of publications	1,000	2,254,500			2,255,500				2,255,500	1,608,500
Mailing and office supplies	237,000	503,400	82,000	702,900	1,525,300	108,900	296,100	405,000	1,930,300	1,476,800
Legal services (Notes A and L)	1,402,000	22,600		400	1,425,000	11,000		11,000	1,436,000	1,167,100
Chapter dues allocations				1,121,200	1,121,200				1,121,200	1,054,700
Travel and meetings	382,000	153,800	149,000	11,600	696,400	223,900	27,200	251,100	947,500	718,400
Copying and printing	161,400	199,700	11,400	291,200	663,700	31,200	153,000	184,200	847,900	616,900
Rent and occupancy	179,700	153,100	68,600	40,800	442,200	171,200	30,100	201,300	643,500	585,400
Telephone	241,100	61,300	16,800	5,500	324,700	42,100	52,500	74,600	399,300	351,500
Royalties	100	347,400			347,500				347,500	217,200
Advertising and promotion	15,400	127,800	107,100	24,600	274,900	13,900	10,500	24,400	299,300	277,600
Depreciation and amortization	7,200	100	23,000		30,300	211,300		211,300	241,600	212,700
Lodge and outings field expenses			206,800		206,800				206,800	208,900
Contributions and donations	149,500		21,400		170,900	10,400		10,400	181,300	177,300
Insurance and interest	200	300	57,600		58,100	54,400		54,400	112,500	108,800
Amounts allocated to the Sierra Club Foundation						(51,500)	(981,400)	(1,032,900)	(1,032,900)	(427,000)
Other	57,800	118,500	7,200	2,800	166,300	(18,300)	2,000	(16,300)	150,000	181,500
	\$4,678,800	\$5,881,700	\$1,621,100	\$3,093,200	\$15,274,800	\$2,150,700	\$480,700	\$2,631,400	\$17,906,200	\$14,713,800

See notes to combined financial statements.

NOTE A—Organization and Summary of Significant Accounting Policies**Organization**

The Sierra Club is a nonprofit voluntary membership organization established to explore, enjoy and protect the wild places of the earth. The Club operates many public interest programs covering a broad range of environmental issues. The studying and influencing public policy program consists of staff and volunteers engaged in legislative and nonlegislative activities including lobbying, research, legal and policy development. Information and education includes the literary program of Sierra Club books, catalogs operations and Sierra, the Club's magazine. Outdoor activities include national and international outing programs consisting of approximately 250 trips annually. The membership program includes support and handling of 56 volunteer chapters and over 300 groups, and the development of a broad-based volunteer membership.

Basis of Presentation

The combined financial statements include the accounts of the Club and its wholly-owned subsidiary, Sierra Club Property Management, Inc. The combined financial statements do not include the financial activities of the Club's various self-directed chapter and group organizations.

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

Summary of Significant Accounting Policies

Allowances for publication returns are determined using historical return rates.

Inventories consist of publications and catalogue merchandise and are stated at the lower of cost or market. Unit costs for new books are based on paper, printing and binding charges only (manufacturing costs). Plant costs are amortized over unit sales for the first printing, but for no longer than the first twelve months of sales.

An allowance is provided against advances to authors for estimated losses resulting from unearned royalties.

Property and equipment are stated at cost at the date of acquisition of fair value at the date of gift or bequest. Depreciation expense is provided on a straight-line basis over the estimated useful lives (2 to 30 years) of the related assets.

The Club defers revenue from outings and grants until the period the trip is completed or the grant requirement is met.

Legal services performed on behalf of the Club by the Sierra Club Legal Defense Fund are recorded as contributions with equivalent amounts charged to expense (Note L).

All contributions are considered available for unrestricted use unless specifically restricted by the donor.

NOTE B—Investments

Investments are those of the Sierra Club Endowment Fund and certain restricted funds and are stated at amortized cost. It is the Club's intention to hold investments to maturity. No allowance for the decline in market value below cost is established unless there is a permanent impairment of value. The composition of investments by fund group is as follows:

	September 30, 1983		
	Endowment	Restricted	Total
Investments	\$1,532,300	\$ 4,100	\$1,536,400
Amounts due from unrestricted funds	175,600		
Endowment Fund balance	\$1,707,900		
	September 30, 1982		
	Endowment	Restricted	Total
Investments	\$1,293,800	\$136,200	\$1,434,000
Amounts due from unrestricted funds	10,700		
Endowment Fund balance	\$1,308,500		

Cost and market values at September 30, 1983 and 1982 were:

	1983	
	Amortized Cost	Market Value
U.S. government and federal agency bonds	\$1,529,300	\$1,541,600
Money market funds	4,100	4,100
Cash in savings account held for reinvestment	3,000	3,000
	\$1,536,400	\$1,548,700
	1982	
	Amortized Cost	Market Value
U.S. government and federal agency bonds	\$1,293,200	\$1,367,400
Money market funds	136,200	136,200
Cash in savings account held for reinvestment	4,600	4,600
	\$1,434,000	\$1,508,200

Investment income amounted to \$187,700 in 1983 and \$154,000 in 1982.

NOTE C—Property and Equipment

	September 30	
	1983	1982
Land	\$ 3,300	\$ 3,300
Buildings and leasehold improvements	482,400	435,300
Furniture and equipment	1,077,500	993,600
Leased equipment	261,900	261,900
	1,825,100	1,694,100
Less accumulated depreciation and amortization	(949,100)	(685,700)
	\$ 876,000	\$1,008,400

NOTE D—Advances to Affiliates

During the fiscal year ended September 30, 1983, the Club organized a wholly-owned subsidiary, Sierra Club Property Management, Incorporated. This subsidiary, as the general partner, has advanced \$90,000 to National Headquarters Associates, a California limited partnership. National Headquarters Associates was organized to purchase and rehabilitate a building in San Francisco for rental as office space. It is anticipated the Sierra Club will rent the entire building on a ten-year lease.

NOTE E—Notes Payable

The Club has available to April 30, 1984 a revolving line of bank credit which permits borrowings of up to \$1,000,000 at the bank's prime interest rate. Borrowings under this line of \$400,000 at September 30, 1983, are collateralized by investments (see Note B). No amounts were borrowed at September 30, 1982.

The other note payable is unsecured and bears interest at 3% below the prime interest rate.

NOTE F—Leases

Substantially all leases are for office facilities and equipment. Leases for computer equipment, system software and other equipment include options to purchase the leased assets at nominal amounts at the end of the lease. Accordingly, these leases are accounted for as capital leases.

Future minimum payments under all noncancelable leases with terms greater than one year at September 30, 1983 are as follows:

Year Ended September 30	Capital Leases	Operating Leases
1984	\$ 35,700	\$314,900
1985	55,700	306,900
1986	14,000	95,700
1987	—	41,800
1988	—	38,800
Thereafter	—	100,200
Total lease payments	105,400	\$808,300
Less amount representing interest	18,200	
Present value of lease payments	107,200	
Less current portion of obligations under capital leases	43,900	
Obligations under capital leases	\$ 63,300	

Rent expense for operating leases was \$376,800 in 1983 and \$304,000 in 1982.

NOTE G—Fund Balances

The following is a summary of fund balances:

	September 30	
	1983	1982
Unrestricted Funds:		
Invested in property and equipment	\$ 798,800	\$ 862,500
Other unrestricted funds	1,100	281,500
	799,900	1,144,000
Sierra Club Endowment Fund:		
Life memberships	1,218,500	944,100
Designated by Board for permanent investment	489,400	354,800
	1,707,900	1,308,500
Restricted Funds:		
Expendable	15,200	155,100
Nonexpendable	21,500	21,500
	36,800	176,600
	\$2,544,600	\$2,629,100

NOTE H—Interfund Transfers

During the fiscal year ended September 30, 1983, the Board of Directors authorized the following interfund transfers:

- \$125,000 representing a portion of the prior year's excess revenues for Unrestricted Funds to the Sierra Club Endowment Fund.
- \$29,500 from Unrestricted Funds to Restricted Funds representing restricted expenses incurred in excess of certain restricted fund balances.

NOTE I—Restatement of Fund Balances

During the year, the Club's legal counsel determined that life memberships amounting to \$1,218,500 and \$944,100 at September 30, 1983 and 1982, which previously were considered to be unrestricted should be restricted and included in endowment funds. In addition, the Board of Directors has designated \$489,400 for permanent investment, which is included in the Sierra Club Endowment Fund.

During fiscal year 1982, separate financial statements were prepared for the Sierra Club Committee on Political Education (SCOPE). In 1983, the Club has included SCOPE in its financial statements.

The 1982 financial statements have been retroactively restated for all of these transactions.

NOTE J—Income Tax Status

The Club has received rulings from the Internal Revenue Service and State of California Franchise Tax Board granting exemption from income taxation. Contributions to the Club are not deductible for tax purposes by the donor.

NOTE K—Pension Plan

The Club has a noncontributory defined benefit pension plan covering substantially all full-time employees who meet minimum age and service criteria. Voluntary employee contributions to the plan are permitted. Pension expense, which is funded currently, was \$146,800 in 1983 and \$88,700 in 1982.

A comparison of accumulated plan benefits and plan net assets as of the most recent valuation dates is presented below:

	October 1	
	1982	1981
Actuarial present value of accumulated plan benefits:		
Vested	\$214,800	\$163,300
Nonvested	75,000	43,400
	\$289,800	\$206,700
Net assets available for benefits	\$489,900	\$363,800

The weighted average assumed rate of return used in determining the actuarial present value of accumulated plan benefits was 7.50% for 1982 and 7.47% for 1981.

NOTE L—Contributions from the Sierra Club Foundation and Sierra Club Legal Defense Fund

The Sierra Club receives contributions from the Sierra Club Foundation and the Sierra Club Legal Defense Fund.

Contributions from the Sierra Club Foundation represent direct grants to the Club in support of programs that are nonlegislative in nature and totaled \$1,528,800 in 1983 and \$883,300 in 1982. In addition, the Sierra Club Foundation granted the Club proceeds of \$8,000 and \$126,600 from the sale of the Flora and Anzales Lakes property to support its publication program in 1983 and 1982, respectively.

Contributions from the Sierra Club Legal Defense Fund for legal services performed on behalf of the Club totaled \$1,566,200 in 1983, and \$1,118,100 in 1982.

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POND LIFE

TEXT AND PHOTOGRAPHS
BY TOM ADAMS

ANTON VAN LEEUWENHOEK, the Dutchman who helped develop the microscope, was the first person to see microscopic lifeforms. One day in 1674 he put a drop of pond water under his homemade lens and discovered a new, rich, and unexpected world.

Water, he found, is not just water—it teems with an assortment of plants and animals strikingly different from the plants and animals of the larger, more visible world. Microscopists who followed van Leeuwenhoek extended his work, and it gradually became clear that virtually all water, everywhere, is populated by many, many forms of microscopic life. Ordinary ponds, we know today, often contain hundreds of plant and animal species.

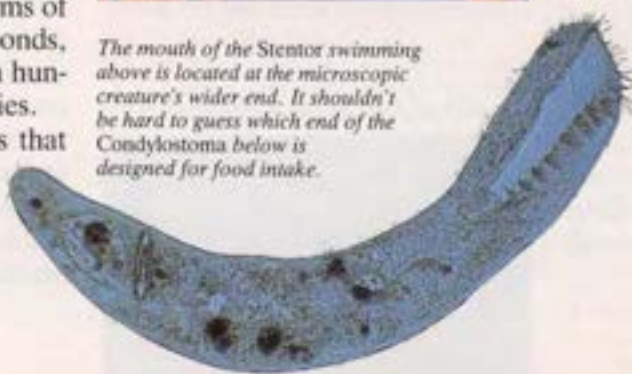
Our study of fossils tells us that some microscopic algae existed in the same forms we see today more than 3 billion years ago. That's



A typical pond "micro-scene": Tiny crustaceans and plants gather near the roots of a floating plant called duckweed.



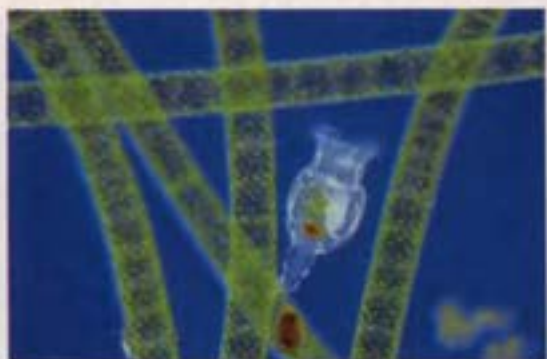
The mouth of the Stentor swimming above is located at the microscopic creature's wider end. It shouldn't be hard to guess which end of the Condylostoma below is designed for food intake.



more than 10 times as long as it's been since the first dinosaurs appeared, and roughly half the age of our planet. Even though most microscopic beings leave no fossils at all, we can be sure that the water a brontosaurus splashed through harbored bacteria, protozoa, algae, and many other microscopic life forms.

Van Leeuwenhoek spent many years of his long life collecting and observing the inhabitants of this new world. By making sketches of the organisms he saw, and by describing their behavior, he established guidelines for the hundreds of microscopists who came after him.

Van Leeuwenhoek was astonished by the diverse life forms he found in water. In a single collecting jar he would find not 5 or 10, but 50 or 100 species—some of them plants, others animals, and still others that could not clearly be classified as either plant or animal. Even today, the same sense of astonishment is felt by almost anyone who puts a few drops of pond water under the lens and sees dozens of creatures with bizarre shapes and



The wormlike nematode (above left) lives in the mud at the bottom of a pond, while the eggplant-shaped *Daphnia* (top right) floats freely in the water. Each has found its ecological niche, as has the rotifer (top center), which survives by eating the cells of *Spirogyra* algae. Another kind of algae, diatoms (below), have hard outer shells and distinctive shapes; this species, called *Tabellaria*, is joined end-to-end.

surprising colors darting, crawling, or floating about.

Each of the 30 or 40 groups of life in a pond contains numerous species, and it is probably impossible to count all of the species of microscopic things that inhabit even a small pond. As conditions in a pond change, some organisms vanish and others appear for the first time. Like starlings or earthworms on land, some pond organisms are very numerous; others are as scarce as condors or pandas.

One pond in New Jersey was the subject of a two-year biological inventory. The basic idea was to collect and identify everything that lived in the pond, which covers six acres. At the end of two years, 749 different organisms had been found, not including bacteria, fungi, or parasites. Only about 20 of the 749 were "big" organisms—fish, turtles, muskrats, water plants, and the like. All the rest—about 750 species, or 97 percent of the total—were microscopic. Many of these tiny organisms are eaten by larger animals, which filter them from the water or capture them in other ways. But many of them also fall prey to their microscopic neighbors.

One of the things that most puzzled early investigators was the behavior of microscopic organisms. They simply didn't act like smaller versions of larger plants and animals would be expected to.



Take the matter of eating. A one-celled protozoan swims up to a filament of an alga of the genus *Spirogyra*, clamps its "mouth" (a circular opening in its "skin") over one end of the filament, and starts digesting. The one-celled attacker isn't bothered by the fact that each cell of the alga may be larger than the protozoan itself; it just works its way along the filament, digesting one cell after another.

A tiny, pinkish worm called *Prostoma* occurs here and there in ponds. About a half-inch long, it glides along the bottom. At the front of its body are four black eyespots—or six, or sometimes five.

Prostoma hunts tiny insect larvae. When it bumps against one, a long,

muscular tube suddenly shoots forth from *Prostoma*'s body. The tube wraps around the victim, and a needle at the end of the tube stabs the victim repeatedly, delivering a poison. When the prey has succumbed, *Prostoma* consumes it.

Some protozoans settle down on a bit of underwater rock or wood and extend long, straight tentacles whose tips hold a powerful narcotic. A microscopic animal that swims into the tentacles is instantly paralyzed and held in place. Then the tentacles, which are hollow, begin to pump the insides of the victim's body down into the protozoan's own one-celled body. Soon only the empty skin of the victim remains; it is released and drifts away.

Another protozoan, called *Stentor*, uses a different method. Clinging to a surface, *Stentor* uses its hair-like cilia to whip up a tiny underwater current designed to pull other microscopic organisms toward it. Strong swimmers usually manage to pull away before it's too late, but many are caught by *Stentor*'s sticky mouth and are swallowed whole.

As long as the hunting is good and the living conditions are right, *Stentor* will remain clinging to its perch. If it swims off, it might fall into a similar trap set up by another animal. Freshwater mussels, which look much like clams, eat large numbers of protozoa. Some mussels have two tubes extending from between their shells.

Phacus longicauda is not only shaped like a leaf, but owes its green color to the pigment chlorophyll. Yet it is an animal, not a plant.





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One tube pumps water (and the protozoa in it) into the mussel's body, where the food is filtered out. The other tube pumps the water back out. A *Stentor* that gets caught in this powerful current has little chance of escaping.

Many other pond animals can gobble up a *Stentor*. And there are dozens of microscopic plants and animals that *Stentor* can eat in turn. In a pond with hundreds of microscopic species, trying to figure out who eats whom can be a very complicated business. But in a healthy pond, everything stays in balance.

Many organisms—such as *Stentor*—live in the shallow water near shore. But shallow water is not the same all around the pond. In one place, where it's shaded by a steep bank, there's not much sunlight. In another spot it's green with filaments of algae. In one corner, where a spring empties into the pond, the water temperature is always cooler than elsewhere.

Water organisms, big and small, are choosy about the environments they inhabit, just as animals and plants that live on land are. Some larvae of underwater insects, for example, need just the right water current to help them capture food. If the current is too slow or too rapid, they must live elsewhere. Some pond animals can't stand sunlight and must live under rocks or logs—a few kinds of protozoa are killed outright by direct sunlight. A pond, then, is not a single environment—it's a collection of small environments, all within the same body of water, and each related to every other.

The deeper water of a pond, away from shore, is very different from the shallow parts. The microscopic animals and plants that live here are usually more widely scattered. Their shapes are different too: Most have long spines projecting from their bodies, or else have bodies shaped like balloons. The purpose of both designs is to keep the organisms from sinking. Together these minute

creatures are called *plankton*. Many pond animals, including fish, feed by filtering plankton from the water.

Because they are so small, the microscopic inhabitants of a pond are very sensitive to changing conditions. Many are easily affected by various kinds of pollution. Flatworms, for example, are quickly killed by oil in the water. Iron and other metals dissolved in water are especially poisonous to many organisms, and wastewater from mines can kill almost all organisms, large and small, in streams and ponds. Overgrowth of bacteria in the water can remove much of the oxygen and cause many species to vanish. Although a healthy pond may hold from 500 to 1,000 kinds of plants and animals, a badly polluted pond will have far fewer—perhaps only 100.

One process by which water becomes polluted is called *eutrophication*. It works like this: People spread fertilizer on fields to make crops grow. When it rains, some of the fertilizer is dissolved and drains into streams and ponds. The chemicals in the fertilizer—nitrates and phosphates—make algae and other water plants grow much faster than they ordinarily would. In fact, they grow faster than the water animals can eat them.

As this happens, a pond starts to go out of balance. As it does, the algae and other plants sink to the bottom of the pond. If the process continues, the water becomes shallower and shallower and finally disappears, leaving dry land.

But when a pond is healthy, it is a delightful underwater world. The next time you visit a pond, remember that for every animal or plant you spot, there are many more that are too small for you to see. □

Tom Adams, a writer and photographer based in Lawrenceville, N.J., is interested in the collection, identification, and photography of freshwater organisms. His photomicrographs—most of which are taken with a microscope that has been fitted with an electronic flash attachment—have appeared in a number of publications, filmstrips, and textbooks.

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MEDITATIONS ON MUIR

ANN RONALD



The Pathless Way: John Muir and American Wilderness, by Michael P. Cohen. University of Wisconsin Press, Madison, 1984. \$25, paper.

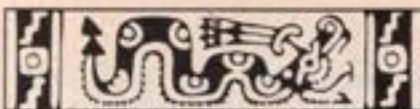
I WAS PLEASED ENORMOUSLY by *The Pathless Way*, a comfortable mixture of scholarship and warmth. The text is impeccably researched and logically argued; yet it reads as though the author not only cares intellectually about Muir's public and private ideologies but responds to them emotionally as well.

Michael Cohen talks of tracing Muir's footsteps through Tenaya Canyon; later, he explains that his book is an embodiment of the "serious meditation" he has done about Muir's thinking. He even details his own lifelong affinity with Yosemite, and justifies his decision to write a first-person dialogue with Muir's ideas instead of an objective personal narrative. But one can't call *The Pathless Way* an egocentric outpouring. Its author serves only as a touchstone, while the focus remains where it belongs, on John Muir.

The Pathless Way takes as its primary subject for examination the evolving philosophy of America's foremost conservationist. Beginning with Muir's first wanderings, his explorations of books, forests, and the wilderness, Cohen traces the apparent patterns of his thoughts. The book follows a historical chronology, but the author is far more interested in looking at the ways in which Muir molded his arguments than in enumerating biographical details. He takes for granted that the reader has a certain degree of familiarity with the subject—*The Pathless Way* should not be anyone's introduction to Muir—and he further presumes a knowledge of key 19th- and 20th-century conservation issues. Figures such as Clarence King and Gifford Pinchot, for example, placenames such as Mount Ritter and Hetch Hetchy, even such far-flung concepts as the theory of glaciation and the visual school of the picturesque are mentioned. But because Cohen is interested only in how such forces affected John Muir, they are neither described in detail nor analyzed.

For substance, and as his baseline, Cohen

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draws heavily on Muir's original journals, examining both the subject matter and the rhetoric. He sees Muir as a man in flux, a man who developed both intellectually and spiritually as he read further and hiked farther, a man then stymied by the contradictions of the 20th century. Particularly interesting to me were the differences Cohen found between Muir's private journal entries and the public essays he later created from the same materials. Here the reader distinctly sees those subtle shifts made for personal or political reasons: Muir influenced by his study of Louis Agassiz's disciplined scientific approach; Muir transformed by a moment of spiritual insight high on a lonely peak; Muir swayed by the nation's growing economic needs; Muir manipulated by the editorial arm of Robert Underwood Johnson; Muir caught up in the "secular pantheism" of the Sierra Club; Muir battered by an unexpected wave of tourists in the wilderness; Muir complaining that "my stock of cliff and cascade adjectives are used up, and I'm too dull to get new ones"; Muir as a man instead of a myth.

In tracing such fluctuations, *The Pathless Way* also exposes the obvious inconsistencies in Muir's arguments. He was never able to reconcile his public and private selves, especially as his fame spread, nor was he able to resolve one terrible paradox: that, by bringing people to the wilderness in order to call attention to its sanctity, one unavoidably destroys its pristine quality.

In sum, Muir remains an enigmatic man. But Cohen never pretends otherwise. He resists any temptation to create an artificial coherence; at the same time, he points out how Muir often boxed himself into foolish, categorical corners. One such labyrinth led to Sierra Club basecamps where, finally, too many people came to too few spots for too many days; another led to the formation of our national park system, dedicated to the service of industrial tourism. In concept these should have pleased, even delighted, John Muir. In reality, though, they helped destroy the pathless way.

Michael Cohen, like John Muir before him, takes the pathless way seriously. He sees it as an almost mythic route in a direction opposite to the thrust of material progress. "The truly pathless way is a spiritual journey and an unmapped landscape," Cohen writes, adding that "the experience of a wilderness and the wilderness itself are inseparable." Any other path is "a rut which leads downward to Man's fall." To read this interpretation of John Muir and the American wilderness is to step out of the rut and into a heretofore uncharted landscape.

And that is what distinguishes *The Pathless Way* from the myriad other books about John Muir. It strikes out in a new direction.

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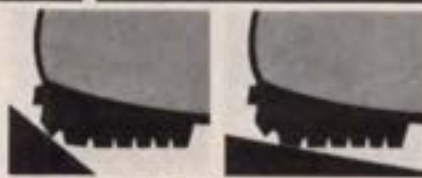
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By closely examining the texture of Muir's own words, by looking at his rhetorical postures, and by assessing the man's shifting styles and points of view, Cohen finds a new approach to Muir's intellect. He is able to isolate the paradoxes, the complexities, and the human wholeness that comprised his mentor's mind.

Ann Ronald is on the English faculty at the University of Nevada, Reno.

LIONS OF THE SPOTTED LAND

HARRY MIDDLETON

The Marsh Lions: The Story of an African Pride, by Brian Jackman; photographs and drawings by Jonathan Scott. David R. Godine, Boston, 1983. \$24.95, cloth.

BRIAN JACKMAN IS A WILDLIFE WRITER for *The London Sunday Times* and one of Britain's most distinguished nature writers. His work is noted for its wisdom and grace, its vivid style, and its keen perception of the natural world, without decoration or adornment. Jackman had long been interested in Kenya's wildlife and wanted to do a book on the subject.

Jonathan Scott is a superb wildlife photographer and artist. He too has a special fondness for Kenya's pristine wilderness areas and their magnificent wildlife. Scott had been in Kenya for some time photographing the abundant wildlife of the Maasai Mara National Game Reserve, especially its lions, and keeping detailed notes of his daily observations.

The two men met by chance at the Mara River Camp in 1978. They had much in common and soon became good friends. From their friendship and mutual passion for Kenya's wilderness and wildlife came this truly remarkable book.

Of the earth's ever-dwindling number of wild places, perhaps none is so fascinating, so diverse, still so richly abundant in native wildlife as Kenya's Maasai Mara National Game Reserve, 700 square miles of sweeping plains country in extreme northwestern Kenya where it borders Tanzania's Serengeti National Park. Hordes of wildebeest, giraffe, zebra, eland, impala, topi, kongoni, warthog, and gazelle still gather on the plains of the Maasai Mara. In lesser numbers, their existence still threatened by poaching and the spread of human settlement, are the elephant, cheetah, and rhino.



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In the language of the Maasai tribes, Maasai Mara means "the spotted land," an image derived from the cheetah's luxurious fur. The land is richly patterned with the essentials of life on the plains: "The rain and the grass; these were the fundamental elements on which the plains depended," writes Jackman. "The rain fed the grass and determined its growth, which regulated the numbers of herbivores the land could support. They in turn, according to their abundance, dictated the number of predators. So it had been since the Pleistocene; a precarious paradise, beautiful to behold both in its economy and complexity, stabilized by the extraordinary diversity of interacting life forms that maintained its continuity."

The history of the Maasai Mara has indeed been that of a "precarious paradise." In the years before and immediately after World War II its wildlife populations suffered severe exploitation. The plains were a favorite haunt of big-game hunters looking for trophy kills. After the war, Kenya's plains country was in such deplorable shape that steps were at last taken to save some of it. In 1948, 200 square miles of the Maasai Mara were set aside as a game reserve. Another 500 square miles were added in 1961, a year when only two lions were counted on the entire reserve. Slowly, most of the animal populations have recovered. Among them, the Maasai Mara lions came back stronger than ever. This is not to say, however, that the game reserve has been completely successful. Sadly, poaching continues to take its toll, especially among the rhinos, which had seen their number reduced to two animals when this book was published.

Jackman and Scott spent five years studying and observing the lion prides of the reserve, particularly those of the Mara Marsh and their near neighbors, the Miti Mbili pride. Both Jackman and Scott are excellent field naturalists. They go everywhere to observe the animals of the plains, letting us see and understand the marsh lions, the way and manner of their lives and their interdependence with every other creature on the plains. The view is immediate, from ground level and treetop, from the water's edge and deep within the lush grass. Jackman wrote his stirring account from his own first-hand observations, from Scott's incredibly exact notes, from bits and pieces of information gathered from drivers, camp managers, anyone who came in contact with

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the lions. More than 160 of Scott's splendid photographs accompany Jackman's text, bringing the narrative into even sharper focus.

This five-year study of the marsh lions is a story of upheaval, struggle, change—the dissolution of once-strong prides and the gradual formation of new ones. It began in 1978 with the disappearance and supposed death of the irascible "Old Man," the ruling male of the Miti Mbili. This left the pride's four lionesses and their cubs without a progenitor and a protector. The females are the nucleus of the pride. Upon them depends the pride's existence and continuity. With the deaths of the males (Dark Mane, the ruling male of the Mara Marsh pride, was killed at about the same time that Old Man disappeared), the matriarchal texture of the prides was in jeopardy. The Miti Mbili lionesses were no longer a true pride; the remaining Mara Marsh males had no females. But the next months and years saw the making of new alliances and the slow recovery of both prides. Like nature itself, the pride is not a static thing, but rather is alive and constantly changing.

Jackman's story of the lions' everyday life is at once panoramic and detailed. It follows the lions through the natural rhythms of rains and drought, lean times and times of plenty. In a lucid, vivid style, free of judgment or sentiment, he portrays not only the extreme complexities of life in the pride but the individual lions' various relationships with each other.

There are many good books on lions; surely this will endure as one of the finest portraits of the Maasai Mara and its wildlife, who so far continue to live much as they did since the first lions crouched in the thick grass, waiting for the heavy sound of the wildebeest crossing the treeless plains.

Harry Middleton is a frequent contributor to Sierra.

WANDERING THE OTHER CALIFORNIA

PETER WILD

A Desert Country Near the Sea, by Ann Zwinger. Harper & Row, New York, 1983. \$24.95, cloth.

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Elma Bakker

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slender peninsula hundreds of miles long paralleling its mother country, Mexico. It seems indeed the continent's stepchild. Little rain falls over its mountainous spines and desert valleys. Much to their chagrin, Ann Zwinger reminds us, the early Spanish conquistadores found few precious minerals to encourage settlement. The native Pericu Indians, a ragged lot, ate lizards and snakes. In 1782, Father Jakob Baegert, a Jesuit missionary, moaned over his assignment there, calling the place "a pile of stones full of thorns" unable to support either Indian or missionary on a level much beyond mean subsistence.

Victor Hugo's description of the desert as a place where God is and man is not may be something of a wishful exaggeration in Baja's case. Over the centuries the peninsula has suffered a number of invasions by people pursuing not so much spirituality as their own fantasies, the whirligigs of their minds projected onto the arid, seemingly empty landscape. The most recent of these invasions began 20 or 30 years ago. In Southern California they call the soldiers in this weekend army "Baja buffs." Whole families in dune buggies and customized four-wheel drives stream south on Friday night, to stream back late on Sunday, disheveled but goggle-eyed, as if they really had "seen the elephant." In the early 1960s the mindlessness of such comings and goings—and the litter left behind—caused naturalist Joseph Wood Krutch to rend his garments in *The Forgotten Peninsula* because "one after another the most accessible mountains and beaches [of Baja California] are turning into Coney Islands of horror. . . ."

But not all of the peninsula has been turned into a national sacrifice area by motorized foreigners. Because of its isolation, lack of resources, and ruggedness, the southern part remains much as it was a thousand years ago—sun-filled, sparsely inhabited, mostly roadless. For that, wilderness-lover Ann Zwinger can say, "Today is my birthday and I sit on a beach watching the Sea of Cortés ruffle in, trying to think all the deep thoughts appropriate to birthdays and failing utterly. Instead I contemplate the physics of wiggling toes in loose sand. A hypnotic surf wrinkles in, stutters out."

This quote exemplifies the peaceful tone of *A Desert Country Near the Sea*. Readers familiar with the author's previous works, such as *Wind in the Rock*, will recognize Zwinger's approach here as that of a sensitive naturalist quietly ruminating on the wonders found wherever her feet take her. Perhaps she's even more sensitive here than in previous books—for although Zwinger lives in the United States, over the years the southern end of the Baja peninsula has become "another home" for her. Having

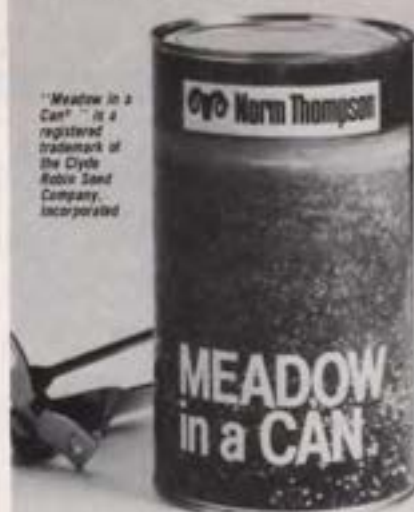
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found her wilderness milieu, she brings to it the sustained intensity that one often develops for an adopted country.

The organization of the book is relaxed, belying its rather forbidding subtitle, *A Natural History of the Cape Region of Baja California*. Zwinger takes us where she will—up into the sierra, wandering through farmyards, into villages, exploring Pacific beaches, and snorkeling over the limpid Gulf of California—turning over what she finds and talking to us much as (one feels) she talks to herself about what she sees.

Make no mistake, there is science here: the search for *Faxonia pusilla*, a tiny flower collected in 1893 by botanist Townshend Stith Brandegee, but never found again; talk of life zones; a discussion of the sea flea, a small amphipod that navigates along nighttime beaches by taking readings from the moon. But Zwinger is not a scientist driven to make earthshaking discoveries. Rather, she derives as much scientific and aesthetic pleasure as possible from whatever agreeable things serendipity sets in her path. If she doesn't reach the top of a mountain, fine. What she sees as far as she goes is what counts. If, setting out to collect shells from a distant cove, she gets the notion to idle along the way and wiggle her toes in a tidepool, that's fine too.

And we end up the beneficiaries of her intelligent dawdlings. For Zwinger surrounds her scientific explorations with much wider concerns for revealing the history, literature, and warmth of the local people. That, ultimately, is the virtue of this book: its holistic approach . . . botany set in its historical, anthropological, and human contexts.

As far as the search for that elusive flower goes, for instance, Zwinger begins by planning an ascent of Mt. San Lázaro, because she is goaded by a "curiosity to know what's growing up there that isn't growing down here." She starts, however, by taking us first to the *ranchito* of her Mexican guide. There she spends the night before the trek, watching *torillas* being made by hand, gossiping with La Señora, the rancher's wife, then curling up in her sleeping bag on the dirt floor, her head against the wicker wall. Parenthetically, one blushes a little at Zwinger's refusal when La Señora graciously offers her guest the one bed in the house. Zwinger's intentions are good—she has hiked in and doesn't want to soil the clean sheets—but in Mexico such a refusal borders on insult.

In any case, next day off they go, the guide in his sandals, Zwinger in her heavy boots. A ranch dog with a "haughty Egyptoid face" noses along as they cut the trail with *machetes* and botanize up the cliffs of San Lázaro. The outcome is a bit unexpected, and the story makes a fine adventure for an

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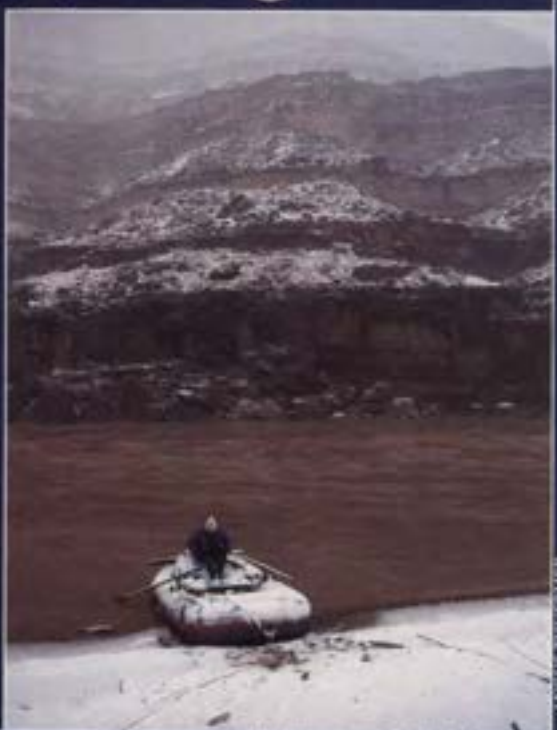
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Linda Sternberg on Utah's San Juan River

opener. But even here, when noting that "to say these mountains are remote is putting it mildly," the author has moments of foreboding. When she crushes a can after lunch and puts it into her pack, the guide nearly falls off the mountain laughing at the silly gesture. He has thrown his trash into some rocks. And she hears far-off explosions—the blasting from the road being built through these "inaccessible" mountains.

Back at sea level, husband and daughter initiate a reluctant, landloving Zwinger into snorkeling. As often happens, after the first few misadventures the novice becomes entranced: "The interface of water and air, a boundary I'd only seen from above, was a silken tent undulating in the underwater wind, gray-blue with moving ovals, a scrim through which light billowed. A small fish shinned up to the surface, popped the film, and slid back down again, all in silence. I was hooked." Hooked with her, we travel over the reefs, probing the lives of chubs, surgeonfish, and the fantastic Moorish idols of the tropical waters.

Readers with appetites whetted by volume's end will appreciate the meticulous notes pointing the way to wider studies. And finally, the illustrations—black-and-white photographs by Zwinger's husband, and the author's own delicate pencil sketches—continue to make Ann Zwinger's books on wilderness memorably her own.

Peter Wild's latest collection of poems, *The Peaceable Kingdom*, was published in January by Adler Books.

BRIEF REVIEWS

The Platte: Channels in Time (University of Nebraska Press, 1984; \$13.95) and *Cranes of the World* (Indiana University Press, 1983; \$37.50), both by prominent ornithologist Paul A. Johnsgard, may prove interesting reading to those who want to learn more about the Platte River and its migratory waterfowl. (See "Trouble Downstream" on page 12 of this issue.)

The Platte: Channels in Time tells the story of the Platte River ecosystem from prehistoric times to the present. While his emphasis throughout is on the river's natural history, Johnsgard also addresses possible future scenarios for the Platte. He notes that both major diversion projects being considered for the river "are directly the result of previous reckless use of the land's resources." Thus, he says, "it seems questionable whether a river should be destroyed simply to encourage and subsidize the very resource-management practices that initially produced the concerns." All in all, a readable and timely effort.

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write for the general public than it is a semitechnical exploration of crane biology and natural history for ecologists, ethologists, conservationists, and aviculturalists. Johnsgard presents extensive data on each major species of crane throughout the world—from Japan and Eurasia to the Platte River in Nebraska—and surveys the behavior and ecology of cranes as a family. Perhaps of greatest interest to the nonspecialist reader will be Chapter Eight, "Cranes in Myth and Legend," in which one learns that the crane was the inspiration for several letters in the Greek alphabet, that crane fat has been inserted into people's ears to treat deafness, and that the Chinese have traditionally viewed the crane as a symbol of longevity.

In a Patch of Fireweed, by Bernd Heinrich (Harvard University Press, 1984; \$18.50).

Part autobiography and part case study in the ways of field biology, Bernd Heinrich's latest essay into popular science (his *Bumblebee Economics* garnered much acclaim) takes the reader on an enriching journey, from the war-torn forests of Poland and Germany to a serene hilltop in Maine. Along the way Heinrich traces his development as a physiological ecologist and lover of nature. This is science with a human face, a tale compiled with humor, hard data, and anecdotes—and, yes, with its share of eloquence as well.

Above Yosemite: A New Collection of Aerial Photographs of Yosemite National Park, by Robert Cameron; text by Harold Gilliam (Cameron and Company, San Francisco, 1983; \$19.95).

"What John Muir would have given to see Yosemite from above!" So begins Harold Gilliam's introduction to this splendid collection of Robert Cameron's aerial photographs. It's fitting that Muir be mentioned at the outset—Muir, who spent years roaming the high country seeking to unlock the mystery of Yosemite's formation, who led the fight first to create a national park and then, over the damming of Hetch Hetchy, to keep it inviolate. What would he have thought upon seeing the valley first from 1,000, then 5,000, and finally 16,000 feet above Inspiration Point (as does the reader in three successive photographs)?

All the familiar monuments are here: El Capitan, Half Dome, Sentinel Rock. Yet all bear a freshness that comes from a radical change in perspective. And there is much of Yosemite that few have ever seen. Throughout, Gilliam's restrained text serves as an informative guide, and citations from Muir's writings about the area quicken our appreciation of Yosemite's "sublime mountain beauty." □



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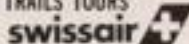
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QUESTIONS ? ANSWERS

Q I've noticed that environmentalists, for all their talk about solar energy, never strongly support building large-scale solar electricity plants. Why not? (RON LANCASTER, CENTRAL FLORIDA GROUP, ORLANDO, FLA.)

A Environmentalists indeed favor solar and other forms of renewable energy over the use of nuclear or fossil fuel sources where feasible. They and soft-path energy experts, however, have often expressed disapproval of large-scale solar electricity plants, which, they say, have many of the disadvantages of other centralized energy facilities. The experts argue that because most end-use of electricity is, like sunlight, freely dispersed, the use of small-scale, on-site solar units makes more sense. Large-scale plants make electricity from sunlight either by using it to generate steam to turn a turbine or by employing large arrays of photovoltaic cells, which convert sunlight directly into electrical current. That electricity must then be transported over wires for eventual domestic or industrial use. Each stage of the steam-turbine process is inherently inefficient, as is the distribution of electricity throughout the power grid.

Environmentalists generally advocate using the form of energy most appropriate to the need: passive or active solar systems for space and water heating, and small-scale photovoltaics for the generation of electricity. (See "The New Alchemy of Photovoltaics," November/December, 1983.) They do not oppose large-scale solar-electricity plants *per se*, but think rather that solar energy can be more efficient and less costly if it is tapped directly by the user.

Q: Whatever happened to Earth Day? (TONI BECKWITH, INDEPENDENCE, MO.)

A: Earth Day—April 22, 1970—has been called "the largest, cleanest, most peaceful demonstration in America's history." An estimated 20 million people participated in workshops, meetings, and marches that had the cumulative effect of making environmental quality a national issue seemingly overnight.

Sierra encourages its readers to take this opportunity to learn more about the Sierra Club and its activities. If you have a question you'd like answered, send it along with your chapter affiliation and address to *Sierra Q & A*, 530 Bush St., San Francisco, CA 94108. We will respond to as many questions as space allows.



Illustration by Ron Chan

The most recent significant nationwide observance of Earth Day we were able to find out about occurred on April 22, 1980—the tenth anniversary of Earth Day I. Indicative of how much change the intervening decade had wrought is the fact that a great deal of assistance in preparing for that anniversary observance was given by the Environmental Protection Agency. ("We don't have the funding to do that anymore," an EPA spokesperson in Washington, D. C., said when *Sierra* called to ask about current observances.) A number of conservation organizations also held observances, large and small, on or around that date.

Since then, it would appear, Earth Day celebrations have been coordinated mainly by local groups around the country. But this doesn't mean that the impetus behind the 1970 celebration has vanished. On the contrary, we've seen no indication that the level of environmental awareness in this country has moved in any direction but up in the last 14 years. In this context it's a little ironic that the major factor that would make another nationwide Earth Day so difficult to organize and mount—the astonishing diversity of environmental and conservation groups—is what continues to

give the movement as a whole its effectiveness.

Q: I'm concerned about air-pollution levels in this country, even though they're supposedly improving. How can I find a healthy place to live and raise a family? (MATTHEW ALLEN, LOS ANGELES, CALIF.)

A: You'll have no problem unearthing air-pollution data for communities around the country—there's a ton of it. But finding that kind of information in a simple, readable format that the nonspecialist citizen can make practical use of is another matter. Fortunately, a great many people share your concern, and a couple of books we located may help you narrow down your choices.

If you want to stay in a big city, consult *Finding Your Best Place to Live in America*, by Thomas F. Bowman, George A. Giuliana, and M. Ronald Mingé (Warner Books, 1983). The authors examine and compare a

number of metropolitan areas with regard to several demographic factors, including pollution levels.

If a medium-size city would suit you better, find a copy of *Where You Live May Be Hazardous to Your Health*, by Robert A. Shakman, M.D. (Stein and Day, 1979). This book presents information from more than 200 communities across the United States in simple tabular form. The data on air pollution include average annual levels of sulfur-dioxide emissions and suspended particulates in each location, and compare those figures to the commonly accepted "danger level," the U.S. standard of safety. The same is done for oxidant-pollution components—ozone, oxides of nitrogen, and hydrocarbons.

The Shakman book also lists factors other than pollution levels for each community, which could be helpful when you come to redefine your initial list of choices. For example, you may be attracted to Hilo, Hawaii, because the average annual level of sulfur dioxide there (in micrograms per cubic meter) is only 3, compared to the U.S. standard of 80—but you'll note both that allergenic grasses flourish on the island nearly year-round and that earthquake danger is rated "major."

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