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SEPTEMBER/OCTOBER 1981
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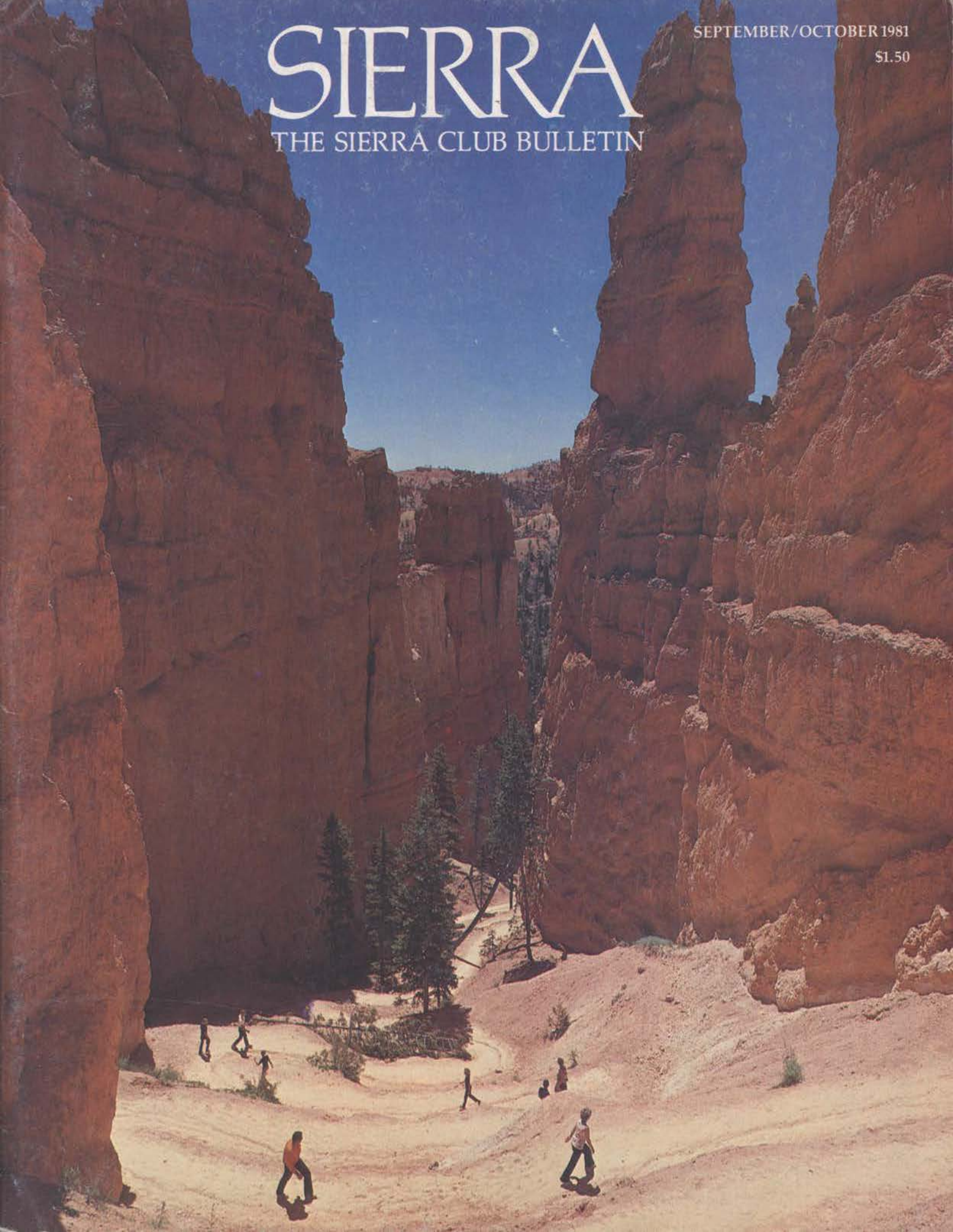

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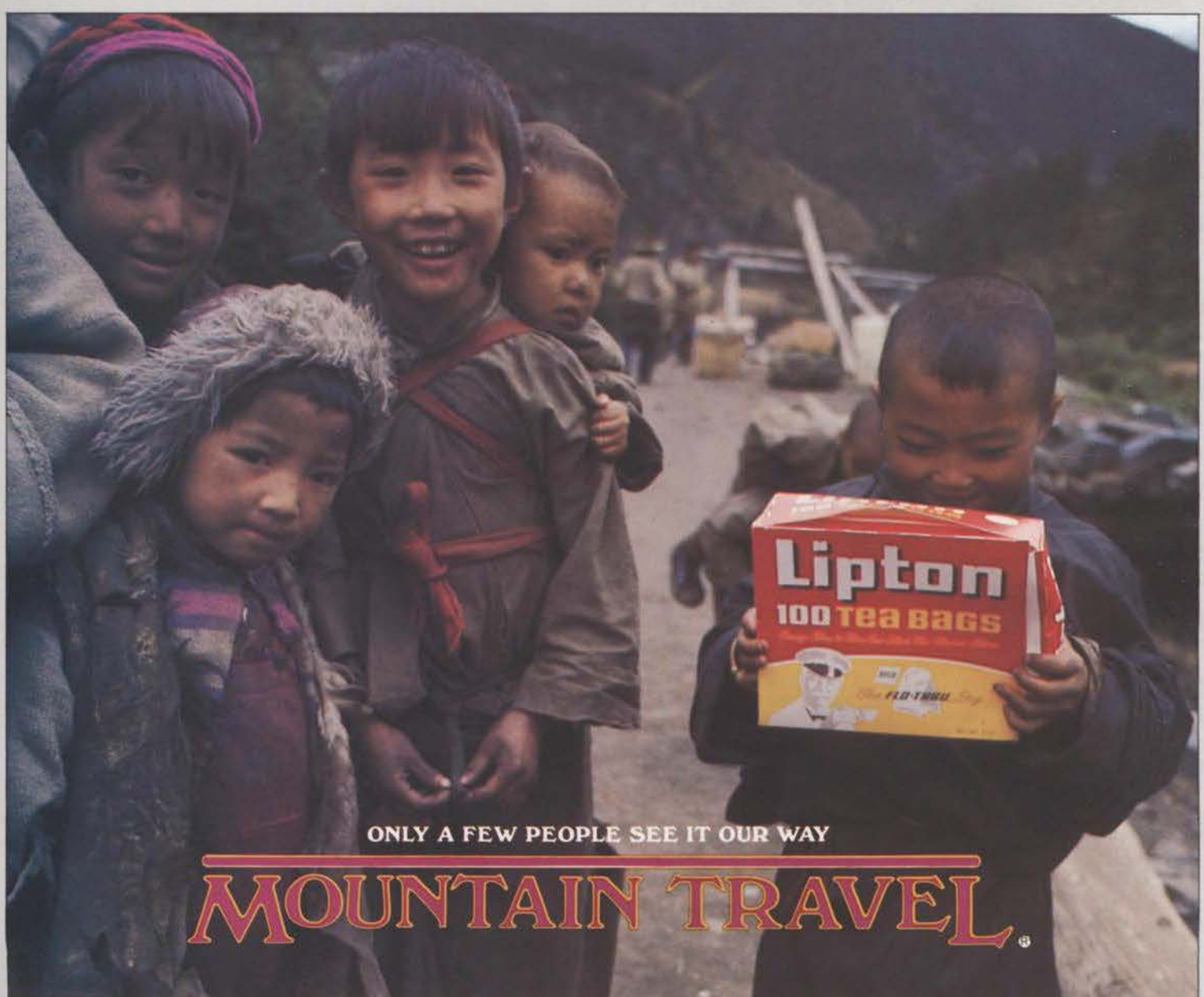

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Tibetan children near Liu Baxiang, China/Leo LeBon

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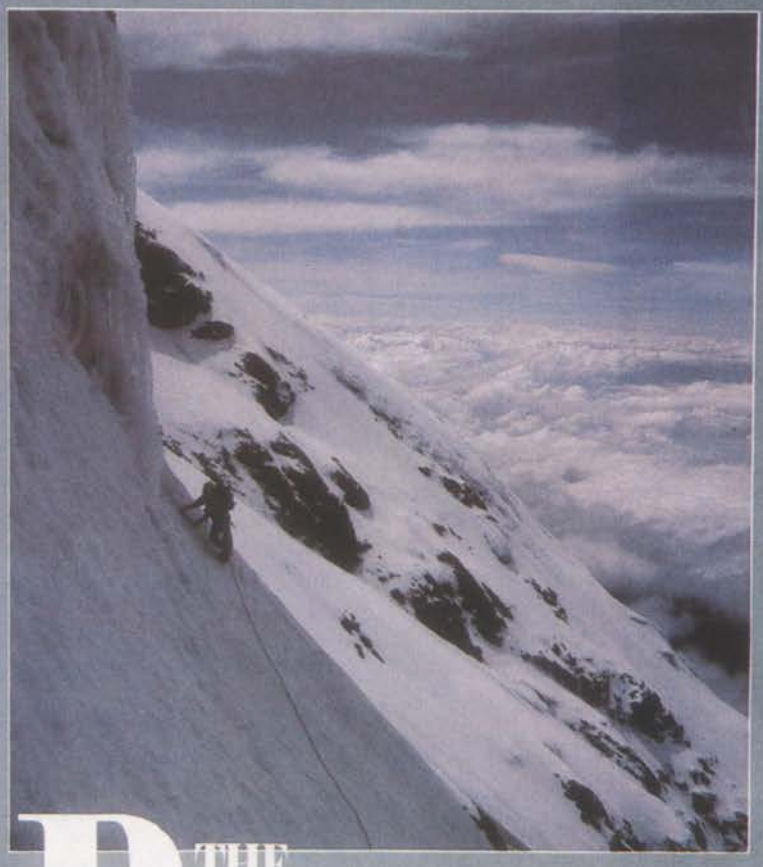
SEPTEMBER/OCTOBER 1981 **VOLUME 66/NUMBER 5**

Cover: Eroded rock formations dwarf the people walking on the switchbacks of the Navajo Trail in Bryce Canyon National Park, Utah. Photo by DeWitt Jones.

In January 1978, two men depart
for Africa and the dream of Kilimanjaro.
Three weeks later, one returns.
The Breach is the nightmare of the other.



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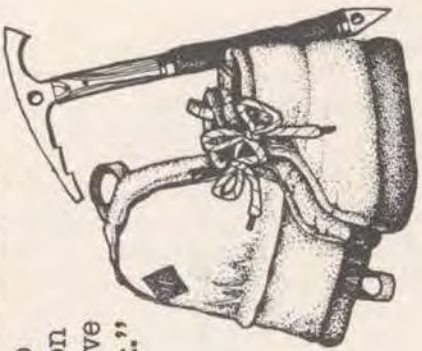

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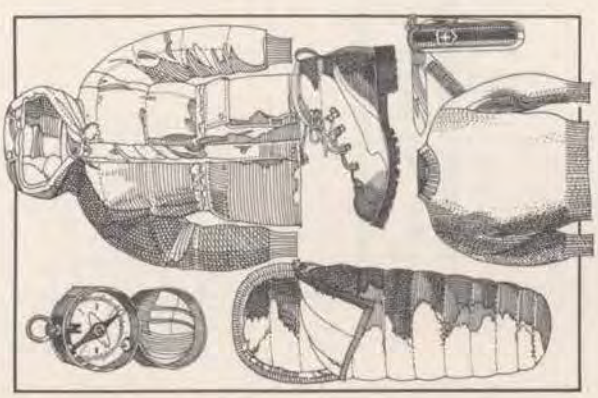

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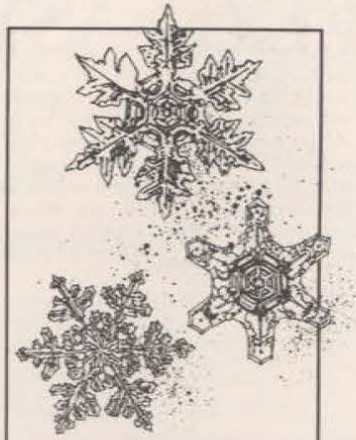

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Alaskans Say Thanks

In his "Observer" column in the May/June *Sierra*, Bob Irwin mentioned that we were soliciting funds from chapter members to help complete our 1981 conservation lobbying program in the state legislature. More important, he generously suggested that folks elsewhere in the country also consider contributing.

A number of people in the "Lower 49," as well as in Canada, took up Bob's suggestion. To date we have received $350 from outside Alaska. Together with more than $1100 contributed by Alaskans, it has helped us wrap up this legislative session.

I've tried to write notes personally to everyone who pitched in, but to anyone I missed, as well as to *Sierra*, Bob Irwin and everyone else who has given so much to help Alaska: a very large *thank you* from those of us who live here.

Paul Lowe
Chair, Alaska Chapter

Watt's True Power

In the July/August issue you reprinted a cartoon from the *Philadelphia Inquirer*. It showed oil derricks covering the "Ronald Reagan National Forest."

While the theme of the cartoon accentuates the destructive actions of James Watt, please note that our national forests are under the U.S. Department of Agriculture, and that James Watt, as Secretary of the Interior, directs the activities of the National Park Service.

James G. Barrett
Seattle, Washington

The editor replies:

Right you are. Watt, however, chairs the Reagan-created Cabinet Council on Natural Resources and the Environment. It oversees environmental issues in all executive-branch agencies. From this position Watt is able to persuade other departments and agencies to pursue policies according to his perception of President Reagan's priorities. He has stressed that he will actively be leading the effort to increase cutting on the national forests, as well as mineral, oil and gas leasing (including in wilderness areas). He has also used this "super-Cabinet" role to take the lead in Reagan's opposition to the Law of the Sea Treaty and in numerous other issues.

Reed, Reagan and Watt

Although I appreciated Nat Reed's criticism of James Watt and his policies in the July/August *Sierra*, I was amused by his amazement at Watt's "aberration" in the face of Reagan, whom Reed refers to as a "notable environmentalist." Has he never heard Reagan's famous statements that the chief source of air pollution is trees, that conservation is "doing without" and that "if you've seen one redwood, you've seen them all"? Decreased environmental and consumer protection, lack of true support for women's and minorities' rights, the cutting of social programs with unprecedented increases in military spending and tax cuts that favor the rich—all show us who the administration does and does not represent.

Larry E. Compton
Glendale, Arizona

Errata

In the July/August *Sierra*, there is a very apt cartoon from the *Los Angeles Times* captioned "Bureau of Land Management's Land Management Plan" (in which every state is for lease). Unfortunately, the cartoonist inserted a third state in the area occupied by Georgia and Alabama, making the total 51.

This illustrates an important point: in our worthwhile and much-needed efforts to save grand lands in Alaska, California and the Rockies, we tend to lose sight of the needs of the people in long-settled, long-developed places such as Alabama and Georgia. Alabama, for example, cries out for public lands because the public owns only 4.5% of the state, and designated wilderness totals a minuscule 1% of that. Birmingham is currently losing the battle for clean air, while the Corps of Engineers plans more dams in Georgia's part of the Appalachians.

Jim Redwine
Birmingham, Alabama

Editor's Note:

An error in transcription caused *Sierra* to publish incorrect information in the July/August interview with Daniel Yergin. In the article, Mr. Yergin referred to King Hubbard, head of the U.S. Geological Survey. Actually, the reference was to M. King Hubbert, a geophysicist of great distinction who worked for the Survey but was not its head.

THE FIRST KEY VOTES OF THE 97TH CONGRESS

THE 97TH CONGRESS has now been in session long enough to indicate its direction on issues related to the environment. At press time there had been votes on four issues that our Sierra Club lobbyists considered especially important. *Sierra* presents the information so you can determine how closely your congressional representative's votes match conservation interests. Capital letters indicate the correct vote.

GL The first column is the House's May 7 vote on the first budget resolution, the Gramm/Latta (Reagan administration's) version of the budget. It contained more cuts in social and environmental programs than the Jones (the Democrats') version. All Republicans and 63 Democrats (mostly from the South—the so-called "Boll Weevils") voted for the Gramm/Latta budget, which passed 253 to 176. This vote is interesting primarily in contrast to the next two.

y (yes) was a vote for this unsatisfactory budget.

N (No) was a vote against the Gramm/Latta budget.

T The second column is the July 23 vote on the Pritchard-Edgar Amendment to the Energy and Water Appropriations Bill. It would have cut all funding for the expensive, environmentally damaging Tennessee-Tombigbee Waterway. Unfortunately, it was narrowly defeated, 208 to 198. See if your representative voted to cut social and environmental programs (yes on Gramm/Latta, first column) and then voted *for* a money-wasting waterway.

Y (Yes) was a vote to cut funds for the waterway.

n (no) was a vote to let the funds go through.

C The third column shows the July 24 vote on the Coughlin Amendment to the Energy and Water Appropriations Bill. It would have cut funding for the expensive, dangerous and unnecessary Clinch River Breeder Reactor. Unfortunately, the amendment failed, 206 to 186. See if your representative voted to cut spending on social and environmental programs ("yes" on the Gramm/Latta budget, first column) and then voted *for* this expensive project.

Y (Yes) was a vote to cut the Clinch River Breeder Reactor's funds.

n(no) was a vote to let the funding go through.

I The fourth column shows the July 17 vote on the Dannemeyer Amendment that would have cut funding for enforcement of automobile inspection and maintenance programs. Representative Dannemeyer tried to tack this provision onto the appropriations bill for the Environmental Protection Agency, but the House turned it down 184 to 177. This was the first test—and it was a victory—of the ongoing effort to protect and improve the Clean Air Act.

y (yes) was a vote to damage the Clean Air Act by cutting funding for enforcement of automobile inspection and maintenance.

N (No) was a vote to keep the funds and protect air quality.

What You Can Do

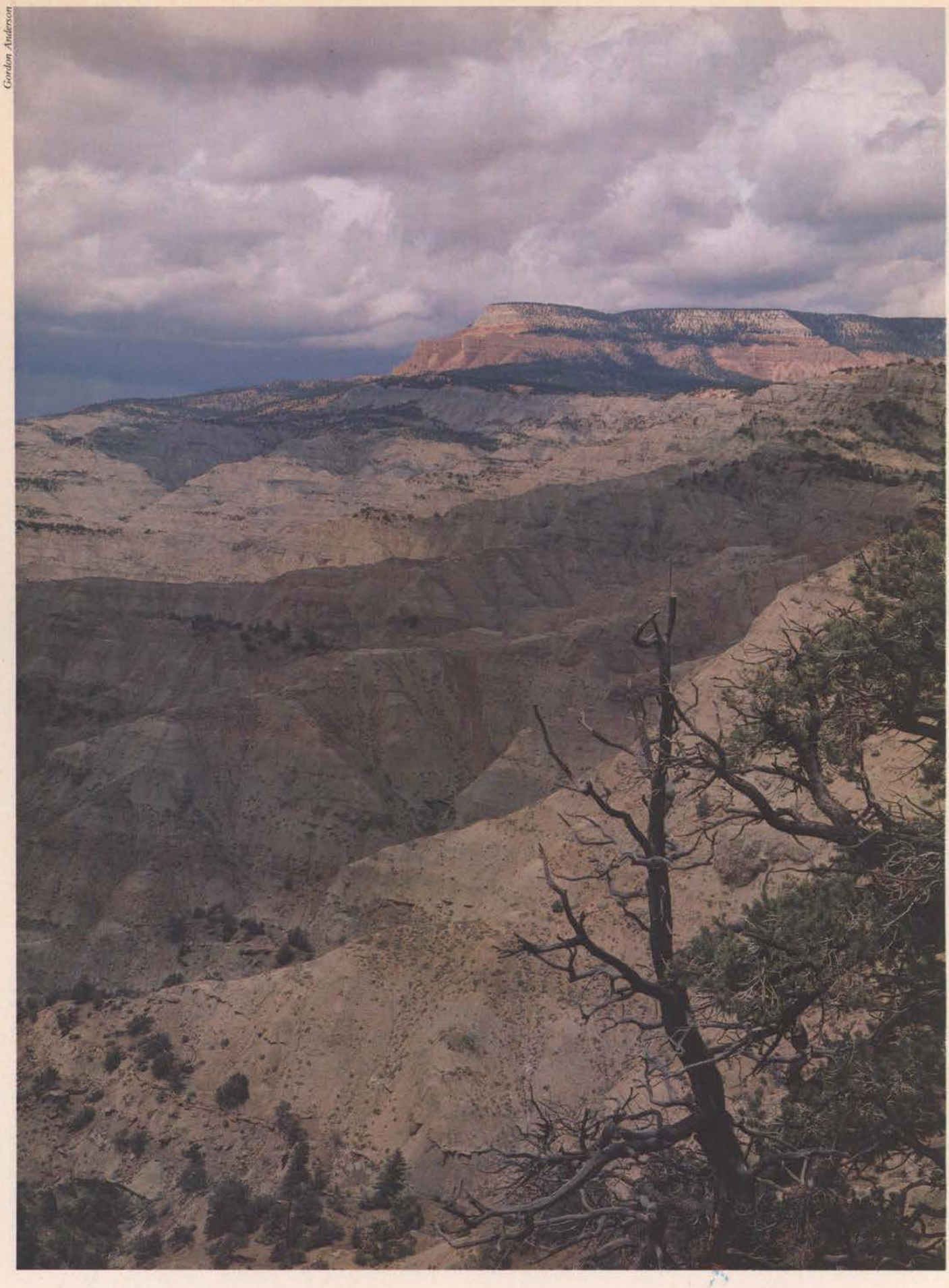
Write to your representative and say what you think about these votes. (Remember, praise and support are just as important as criticism, and polite expression of disappointment is more effective than criticism.) If your representative voted to fund the Tennessee-Tombigbee Waterway or the Clinch River Breeder Reactor, write a letter to your local paper's editor pointing out the environmental consequences of these votes. This is even more important if the vote in the Gramm/Latta column was a "yes."

Symbols used in this table

Y = a "yes" vote for the conservationist position.
y = a "yes" vote against the conservationist position.
N = a "no" vote for the conservationist position.
n = a "no" vote against the conservationist position.
a = absent; includes "paired" representatives absent together because their votes would cancel each other out.
f = freshman, not a member of Congress for the vote.
p = voted "present" (a non-vote).
x = Speaker; votes only in case of ties.

	GL	T	C	I
ALABAMA				
D Bevill	y	n	n	a
R Dickinson	y	n	n	a
R Edwards	y	n	n	N
D Flippo	y	n	a	y
D Nichols	y	n	n	y
D Shelby	y	n	n	y
R Smith	y	n	n	a
ALASKA				
R Young	y	n	n	y
ARIZONA				
R Rhodes	y	n	n	a
R Rudd	y	n	n	y
D Stump	y	n	n	y
D Udall	N	n	Y	N
ARKANSAS				
D Alexander	N	n	n	y
D Anthony	y	n	n	y
R Bethune	y	n	Y	y
R Hammerschmidt	y	n	n	y
CALIFORNIA				
D Anderson	N	n	n	N
R Badham	y	n	n	a
D Beilenson	N	Y	Y	N
D Brown	N	n	Y	N
R Burgener	y	a	a	y
D Burton, J.	N	Y	Y	N
D Burton, P.	N	p	Y	N
R Chappie	y	a	a	y
R Clausen	y	n	n	y
D Coelho	N	n	n	N
D Danielson	N	Y	Y	N
R Dannemeyer	y	Y	n	y
D Dellums	N	Y	Y	N
D Dixon	N	n	Y	a
R Dornan	y	a	Y	y
R Dreier	y	Y	n	y
D Dymally	N	a	a	y
D Edwards	N	Y	a	N
D Fazio	N	n	Y	N
R Fiedler	y	Y	n	y
R Goldwater	y	n	n	y
R Grisham	y	Y	n	y
D Hawkins	N	n	n	N
R Hunter	y	n	Y	y
R Lagomarsino	y	Y	n	y
D Lantos	N	Y	Y	N
R Lewis	y	a	a	N
R Lowery	y	Y	n	N
R Lungren	y	Y	Y	y
D Matsui	N	n	Y	N
R McCloskey	y	Y	Y	a
D Miller	N	Y	Y	N
D Mineta	N	n	Y	a
R Moorhead	y	Y	n	y
D Panetta	N	Y	Y	N
R Pashayan	y	n	n	y
D Patterson	y	n	a	N
R Rousselot	y	Y	a	a
D Roybal	N	n	Y	N
R Shumway	y	n	n	y
D Stark	N	Y	Y	N
R Thomas	y	n	n	a
D Waxman	N	Y	Y	N
COLORADO				
R Brown	y	n	Y	N
D Kogovsek	N	n	n	N
R Kramer	y	n	n	y
D Schroeder	N	Y	Y	a
D Wirth	N	n	Y	a
CONNECTICUT				
D Cotter	p	a	a	a
R DeNardis	y	Y	Y	N
D Gejdenson	N	Y	Y	N
R McKinney	y	Y	Y	N
D Moffett	N	Y	Y	a
D Ratchford	N	Y	Y	N
DELAWARE				
R Evans	y	Y	Y	N
FLORIDA				
R Bafalis	y	Y	n	y
D Bennett	y	n	n	N
D Chappell	y	n	n	y
D Fascell	N	n	Y	N
D Fuqua	y	n	n	N
D Gibbons	y	n	a	a
D Hutto	y	n	n	y
D Ireland	y	n	n	y
D Lehman	N	n	Y	N
R McCollum	y	n	n	a
D Mica	y	n	n	a
D Nelson	y	n	n	a
D Pepper	N	n	n	N
R Shaw	y	Y	Y	y
R Young	y	Y	n	a
GEORGIA				
D Barnard	y	n	n	y
D Brinkley	y	Y	Y	y
D Evans	y	n	n	a
D Fowler	N	Y	Y	N
R Gingrich	y	Y	n	y
D Ginn	y	n	n	y
D Hatcher	y	n	n	y

	GL	T	C	I
D Jenkins	y	n	a	y
D Levitas	y	n	Y	N
D McDonald	y	Y	n	y
HAWAII				
D Akaka	N	n	n	N
D Heftel	N	n	Y	N
IDAHO				
R Craig	y	n	n	y
R Hansen	y	a	n	y
ILLINOIS				
D Annunzio	N	n	n	N
D Collins	N	Y	n	a
R Corcoran	y	Y	n	a
R Crane, D.	y	Y	Y	y
R Crane, P.	y	Y	Y	y
R Derwinski	y	Y	n	y
R Erlenborn	y	Y	n	y
D Fary	N	Y	n	N
R Findley	y	n	Y	y
R Hyde	y	Y	Y	N
R Madigan	y	Y	n	y
R Martin	y	Y	a	y
R McClory	y	Y	n	N
R Michel	y	Y	n	y
R O'Brien	y	n	n	y
R Porter	y	Y	Y	y
D Price	N	n	n	N
R Railsback	y	Y	Y	N
D Rostenkowski	N	n	n	a
D Russo	N	Y	n	N
D Savage	N	a	a	N
D Simon	N	n	Y	a
D Washington	N	Y	Y	N
D Yates	N	Y	Y	N
INDIANA				
D Benjamin	N	n	n	y
R Coats	y	Y	n	y
R Deckard	y	Y	Y	N
D Evans	y	n	n	y
D Fithian	N	Y	Y	a
D Hamilton	N	Y	Y	y
R Hiler	y	Y	Y	y
R Hillis	y	Y	n	y
D Jacobs	y	Y	Y	N
R Myers	y	n	n	y
D Sharp	N	Y	Y	N
IOWA				
D Bedell	N	Y	Y	N
R Evans	y	Y	n	y
D Harkin	N	Y	Y	N
R Leach	y	Y	Y	N
D Smith	N	n	n	a
R Tauke	y	Y	Y	a
KANSAS				
D Glickman	N	Y	Y	a
R Jeffries	y	Y	n	y
R Roberts	y	Y	n	a
R Whittaker	y	Y	n	N
R Winn	y	n	n	a
KENTUCKY				
R Hopkins	y	Y	Y	y
D Hubbard	N	n	n	y
D Mazzoli	y	a	n	a
D Natcher	y	n	n	N
D Perkins	N	n	n	y
R Rogers	y	n	n	y
R Snyder	y	n	Y	y
LOUISIANA				
D Boggs	N	n	n	N
D Breaux	y	n	n	N
D Huckaby	y	n	n	N
R Livingston	y	n	n	N
D Long	N	n	n	N
R Moore	y	Y	Y	N
D Roemer	y	n	n	N
MAINE				
R Emery	y	Y	Y	a
R Snowe	y	Y	Y	N
MARYLAND				
D Barnes	N	Y	Y	N
D Byron	y	n	n	y
D Dyson	y	n	n	y
R Holt	y	n	n	a
D Hoyer	f	n	Y	N
D Long	y	n	n	N
D Mikulski	N	Y	Y	N
D Mitchell	N	a	Y	a
MASSACHUSETTS				
D Boland	N	Y	Y	N
R Conte	y	Y	Y	N
D Donnelly	N	n	Y	N
D Early	N	Y	Y	N
D Frank	N	Y	Y	N
R Heckler	y	Y	Y	N
D Markey	N	Y	Y	N
D Mavroules	N	Y	n	y
D Moakley	N	a	Y	N
D O'Neill	x	x	x	x
D Shannon	N	Y	Y	N
D Studds	N	Y	Y	N
MICHIGAN				
D Albosta	y	n	Y	a
D Blanchard	N	Y	Y	N
D Bonior	N	Y	Y	N
D Brodhead	N	Y	Y	N
R Broomfield	y	Y	Y	y
D Conyers	N	n	Y	N
D Crockett	N	n	Y	N
R Davis	y	Y	n	y
D Dingell	N	Y	Y	N
R Dunn	y	Y	Y	y
D Ford	N	n	n	a
D Hertel	N	Y	Y	y
D Kildee	N	Y	Y	N
R Pursell	y	Y	Y	N
R Sawyer	y	Y	Y	y
R Siljander	y	Y	Y	y
D Traxler	N	n	Y	N
R Vander Jagt	y	Y	n	y
D Wolpe	N	Y	Y	N
MINNESOTA				
R Erdahl	y	Y	Y	N
R Frenzel	y	Y	a	y
R Hagedorn	y	n	n	y
D Oberstar	N	n	Y	N
D Sabo	N	n	Y	N
R Stangeland	y	n	n	y
D Vento	N	Y	a	N
R Weber	y	Y	Y	N
MISSISSIPPI				
D Bowen	y	n	n	a
D Dowdy	f	n	n	y
R Lott	y	n	n	a
D Montgomery	y	n	n	y
D Whitten	N	n	n	N
MISSOURI				
R Bailey	y	a	n	y
D Bolling	N	Y	a	a
D Clay	N	Y	Y	N
R Coleman	y	n	n	N
R Emerson	y	n	n	y
D Gephardt	N	Y	Y	N
D Skelton	y	n	n	y
R Taylor	y	n	n	y
D Volkmer	y	n	n	y
D Young	y	n	n	a
MONTANA				
R Marlenee	y	Y	Y	y
D Williams	N	n	Y	N
NEBRASKA				
R Bereuter	y	Y	n	N
R Daub	y	Y	n	y
R Smith	y	n	n	y
NEVADA				
D Santini	y	Y	a	a
NEW HAMPSHIRE				
D D'Amours	N	a	Y	N
R Gregg	y	Y	Y	a
NEW JERSEY				
R Courter	y	Y	n	a
D Dwyer	N	n	n	N
R Fenwick	y	Y	Y	N
D Florio	N	Y	a	a
R Forsythe	y	Y	n	N
D Guarini	N	n	Y	N
R Hollenbeck	y	Y	n	a
D Howard	N	n	Y	N
D Hughs	N	n	Y	N
D Minish	N	Y	Y	N
R Rinaldo	y	Y	n	N
D Rodino	N	Y	Y	N
D Roe	N	n	n	N
R Roukema	y	Y	n	N
R Smith	y	Y	Y	N
NEW MEXICO				
R Lujan	y	n	n	N
R Skeen	y	n	n	y
NEW YORK				
D Addabbo	N	n	n	a
D Biaggi	N	n	a	a
D Bingham	N	Y	Y	N
R Carman	y	Y	Y	y
R Carney	y	n	n	y
D Chisholm	N	n	Y	N
R Conable	y	Y	n	y
D Downey	N	a	a	N
D Ferraro	N	Y	Y	N
R Fish	y	Y	Y	N
D Garcia	N	n	a	N
R Gilman	y	a	Y	y
R Green	y	Y	Y	N
R Horton	y	n	a	a
R Kemp	y	a	a	a
D LaFalce	N	n	Y	N
R LeBoutillier	y	Y	n	y
R Lee	y	n	n	N
R Lent	y	Y	n	y
D Lundine	N	Y	Y	a
R Martin	y	Y	a	N
R McGrath	y	Y	Y	y
D McHugh	N	Y	Y	N
R Mitchell	y	Y	Y	N
R Molinari	y	Y	Y	N
D Nowak	N	n	Y	y
D Ottinger	N	Y	Y	N
D Peyser	N	Y	Y	y
D Rangel	N	n	Y	N
D Richmond	N	Y	a	a
D Rosenthal	N	a	a	N
D Scheuer	N	n	Y	N
D Schumer	N	Y	Y	N
D Solarz	N	Y	Y	N
R Solomon	y	Y	n	N
D Stratton	N	n	n	N
D Weiss	N	Y	Y	N
R Wortley	y	n	Y	y
D Zeferetti	N	n	n	a
NORTH CAROLINA				
D Andrews	y	n	n	N
R Broyhill	y	Y	n	a
D Fountain	y	Y	n	N
D Hefner	N	n	n	y
R Hendon	y	n	a	y
R Johnston	y	Y	Y	y
D Jones	N	n	n	a
R Martin	y	Y	a	y
D Neal	N	Y	Y	N
D Rose	N	n	n	a
D Whitley	N	n	n	a
NORTH DAKOTA				
D Dorgan	N	n	Y	N
OHIO				
D Applegate	N	Y	Y	y
R Ashbrook	y	n	n	y
R Brown	y	n	a	y
D Eckart	N	Y	Y	N
R Gradison	y	Y	Y	a
D Hall	y	Y	Y	N
R Kindness	y	n	n	y
R Latta	y	a	n	a
D Luken	y	n	Y	y
R McEwen	y	n	n	y
R Miller	y	n	n	y
D Mottl	y	Y	a	a
D Oakar	N	n	Y	N
R Oxley	f	n	n	f
D Pease	N	Y	Y	N
R Regula	y	n	n	y
D Seiberling	N	Y	Y	N
D Shamansky	N	Y	Y	N
R Stanton	y	Y	Y	N
D Stokes	N	n	n	N
R Weber	y	Y	Y	y
R Williams	y	n	Y	y
R Wylie	y	a	Y	N
OKLAHOMA				
R Edwards	y	n	Y	y
D English	y	n	n	y
D Jones	N	n	n	N
D McCurdy	N	n	Y	N
D Synar	N	Y	Y	N
D Watkins	N	n	n	y
OREGON				
D AuCoin	N	n	Y	N
R Smith	y	Y	Y	y
D Weaver	N	Y	Y	N
D Wyden	N	Y	Y	N
PENNSYLVANIA				
D Atkinson	y	Y	n	y
D Bailey	N	n	n	y
R Clinger	y	Y	Y	y
R Coughlin	y	Y	Y	y
R Coyne, J.	y	Y	n	y
D Coyne, W.	N	Y	n	N
R Dougherty	y	Y	n	y
D Edgar	N	Y	Y	N
D Ertel	N	n	Y	y
D Foglietta	N	Y	Y	N
D Gaydos	N	a	a	y
R Goodling	y	Y	Y	y
D Gray	N	n	a	N
R Marks	y	Y	n	y
R McDade	y	n	Y	N
D Murphy	N	Y	n	y
D Murtha	N	n	n	y
R Nelligan	y	Y	n	y
R Ritter	y	a	Y	y
R Schulze	y	Y	n	y
R Shuster	y	n	n	y
D Smith	f	f	f	f
D Walgren	N	Y	Y	y
R Walker	y	Y	n	y
D Yatron	y	Y	Y	y
RHODE ISLAND				
R Schneider	y	Y	Y	N
D St. Germain	N	n	Y	a
SOUTH CAROLINA				
R Campbell	y	n	n	y
D Derrick	y	Y	n	a
R Hartnett	y	Y	n	y
D Holland	y	n	n	a
R Napier	y	n	n	y
R Spence	y	n	n	y
SOUTH DAKOTA				
D Daschle	N	n	Y	N
R Roberts	y	a	a	y
TENNESSEE				
R Beard	y	n	n	y
D Boner	N	n	n	N
D Bouquard	y	n	n	a
R Duncan	y	n	n	y
D Ford	N	n	n	N
D Gore	N	n	n	N
D Jones	y	n	n	y
R Quillen	y	n	a	a
TEXAS				
R Archer	y	Y	n	y
D Brooks	N	n	n	y
R Collins	y	Y	Y	y
D de la Garza	N	n	n	y
R Fields	y	n	n	y
D Frost	N	a	a	N
D Gonzales	N	n	p	N
D Gramm	y	n	n	y
D Hall, R.	y	n	n	y
D Hall, S.	y	n	n	y
D Hance	y	n	n	N
D Hightower	y	n	n	y
D Kazen	N	n	n	y
D Leath	y	n	n	y
D Leland	N	Y	Y	N
R Loeffler	y	n	n	y
D Mattox	N	a	a	N
D Patman	N	n	n	y
R Paul	y	Y	Y	y
D Pickle	N	n	n	N
D Stenholm	y	n	n	a
D White	y	n	n	y
D Wilson	y	n	n	y
D Wright	N	n	n	y
UTAH				
R Hansen	y	a	a	y
R Marriott	y	n	n	y
VERMONT				
R Jeffords	y	Y	Y	N
VIRGINIA				
R Bliley	y	n	n	y
R Butler	y	Y	n	y
D Daniel, Dan	y	n	n	y
R Daniel, R.W.	y	Y	Y	y
R Parris	y	n	n	y
R Robinson	y	n	n	a
R Trible	y	n	Y	y
R Wampler	y	n	n	y
R Whitehurst	y	Y	n	y
R Wolf	y	Y	n	y
WASHINGTON				
D Bonker	N	a	Y	N
D Dicks	N	n	n	N
D Foley	N	n	n	a
D Lowry	N	Y	Y	N
R Morrison	y	n	n	y
R Pritchard	y	Y	a	N
D Swift	N	Y	Y	N
WEST VIRGINIA				
R Benedict	y	n	Y	a
D Mollohan	N	n	n	a
D Rahall	N	n	Y	a
R Staton	y	n	Y	y
WISCONSIN				
D Aspin	N	Y	Y	N
R Gunderson	y	Y	Y	N
D Kastenmeier	N	Y	Y	N
D Obey	N	Y	Y	N
R Petri	y	Y	Y	y
D Reuss	N	Y	a	N
R Roth	y	Y	n	a
R Sensenbrenner	y	Y	Y	y
D Zablocki	N	n	n	N
WYOMING				
R Cheney	y	n	a	y



Gordon Anderson

THE HIGH PLATEAUS

WALLACE STEGNER

Allen Livingston

THE SKYLINE HERE is special: not the toothed peaks of the Rockies, not the worn, contorted shapes of the Great Basin ranges, not the long, level, cliff-edged mesas of the Southwest, but raised horizons bounding both sides of the broad Sanpete and Sevier valleys—whale-like shapes, gently undulating, with rounding knobs and promontories. The higher slopes, on this late September day, are patched with golden aspen; along parts of the rim are intimations of fir forest.

Brought here blindfolded, I would know I was in the desert West by the smell of sage and dust and brittle weeds. Given a glimpse of the ground, I would know from the raw earth and the tufted, clumpy vegetation—bunch grass, bunchy sage, bunchy junipers, the bunchy yellow-flowering rabbitbrush whose profusion is a sure sign of overgrazed range—that I was west of the 100th meridian. Allowed to see the sky, I might guess from the darkness of its blue and the whiteness of the cumuli that float across it that I was in Montana, Idaho, Colorado, Wyoming, New Mexico or Arizona. But give me the briefest look at the horizons and I would know I was in Utah, in the high plateaus.

Nowhere else in America are such great blocks of nearly level strata lifted so high above broad, deep valleys. Nowhere else would we see forests along such lofty rims. Reaching southward from the end of the Wasatch Mountains in three chains, widening and gaining altitude as they go, the plateaus are as high as many western mountain ranges, but they know no timberline. The Aquarius, for example, is forested all across its 11,600-foot summit, well above what would be timberline in the Colorado Rockies of the same latitude.

From almost anywhere along their western edge, they are so plain that it takes a while to see that they are also grand. Captain Clarence Dutton, their first and best student, remarked in *The High Plateaus of Utah* (1880) that "if one third of the stuff in the Sevier Plateau, east of Circle Valley, had been used to build a range of lively mountains, they would have seemed grander and possessed what no palisade can ever possess—beauty and animation." From many vantage points they show none of the level crests and bold cliffs that would reveal them to be unmistakable plateaus. They loom without asserting themselves. Once I drove my aunt, fresh from Iowa, through the Sevier Valley where the Sevier Plateau rears 5600 feet over the town of Richfield in one unbroken wall, its last 2000 feet sheer lava cliffs, and my aunt, good soul, was reminded of the bluffs in the county park in Fort Dodge.

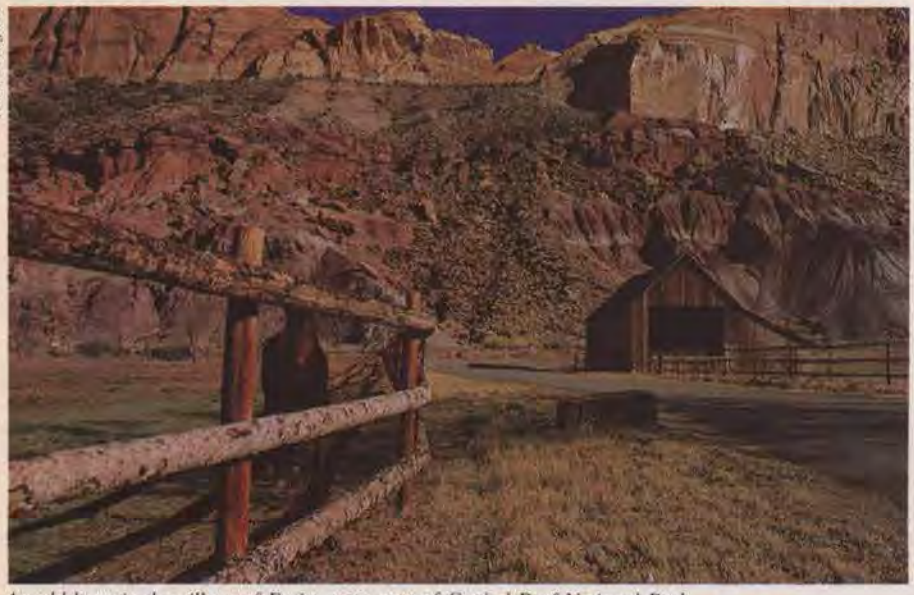
The Aquarius Plateau (left) and Wasatch Plateau (above) show the grandeur and variety of Utah's country.

Nothing now reminds me of Fort Dodge. This is country where I spent the summers of my adolescence, and what I see is enriched by geology, history and memory. Standing by the car in the autumn sun I can feel, like a radiation, the aloofness with which this country greeted human intrusion; and like the warmth of a stone on which the sun has shone for a long time, the effect it has had on its settlers. The plateaus remain aloof and almost uninhabited, but the valleys are a collaboration between land and people, and each has changed the other.

The map we spread out on the hood is the product of 200 years of white exploration and occupation, plus uncounted centuries of Indian use. Utes, Spaniards, mountain men, Mormons and government scientists have all contributed to it. The Utes left their names on the Pávant, Tushar, Markágunt and Paunságunt plateaus, on valleys such as the Sanpete, on such towns as Koosharem and Paragonah. Few Spaniards' names remain, either from the Escalante expedition or from the Spanish Trail that was heavily traveled between 1829 and the 1850s; but the Sevier River is a corruption of their Rio Sevéro, and their passage is recorded in places such as Spanish Fork, Escalante, and the Virgin River. Nephi, Moroni and Mt. Nebo take their names from the *Book of Mormon* and the Bible; Mormon hierarchs and pioneers gave their names to St. George, Burrville and Cannonville. Frémont is all over the map, as a town, a river and a pass, but Jedediah Smith, who was far more important in the exploration of the region, is uncommemorated. Mormon settlers exercised their right to be conventional in such placenames as Richfield and Mt. Pleasant, and the equally God-given right to be earthy in Hell's Backbone, Cohab Canyon, and Mary's Nipple and Molly's Nipple. (Mary and Molly may have been the same lady, but if so she was some lady: the parts for which

"High Plateaus" is taken from American Places, *by Eliot Porter, Wallace Stegner and Page Stegner, to be published by E. P. Dutton in October.*

she is remembered are more than a hundred miles apart and of greatly different size.) The Powell Survey and U.S. Geological Survey parties of the 1870s and 1880s left on the map a Secretary of War (Mt. Belknap), a Secretary of the Interior (Mt. Delano) and many government scientists (Mt. Hilgard, Mt. Dutton, the Henry Mountains). They also left on many features names that would not likely have sprung to the lips of Ute, Spaniard or Mormon (the Aquarius Plateau, the Waterpocket Fold, Smithsonian Butte).



Allen Livingston

An old barn in the village of Fruita, now part of Capitol Reef National Park.

Unloading history on my patient wife as we turn off U.S. 89 and up the Fairview Canyon road across the Wasatch Plateau, I retrieve from the attic of my skull the fact that it was exactly 204 years ago to the day—September 23, 1776—that Fathers Escalante and Dominguez came down Spanish Fork Canyon into Utah Valley. The map of the expedition's wanderings that was made by Bernardo de Miera y Pacheco first established this country within the known world, and put Great Salt Lake, though inaccurately and by hearsay, in approximately its proper place. After Escalante, the region was unreported for half a century, until Jedediah Smith made his first exploration down along the western rim of the plateau country (the eastern rim of the Great Basin, on the route essentially followed now by Interstate 15) in 1826. He came again the next year. Beginning in 1829, New Mexican muleteers carried blankets and woollens along the Spanish Trail to California, and drove great herds of horses and big California mules back to Santa Fe. We will meet the Spanish Trail on the other side of the Wasatch Plateau.

After a few miles, our road is dirt, and we have it to ourselves. The fishing season is over, the hunting season not yet begun. The fall colors that in Colorado or New Mexico would have people out in aspencades have lured nobody up here. The two pickups we meet are obviously locals on local business. We pass a ski ranch, half-finished, deserted, with no visible lifts—a poor-boy project. Then we turn a corner and are engulfed in sheep, a moving, blatting mat of wool and black faces, pushed along by three dogs and two riders and followed by an RV, the modern descendant of the old-time sheepwagon.

To John Muir, sheep were hoofed locusts. The West has suffered from their sharp hoofs and nibbling lips, and parts of the world are deserts because of them. Yet here they seem right. They revive some echo of Old Testament pastoralism; they confirm our taste for the unchanging. I recall the envy I used to feel when, at spring and fall times of moving the flocks, Mormon schoolfellows got out of school to spend important days "down to the herd." Similar vacations at beet-thinning time never intrigued me, but sheep had in them something adventurous, touched with the romance of movement and wild country.

Under the slopes that glow red, gold and apricot, whose fabric of little whiteboled trees twinkles and flaws in a wind so clean and chilly it waters the eyes, Mary and I are both reminded of a time years ago in the Pindus Mountains on the border between Greece and Yugoslavia. It was this same fall season, yellow leaves were turning the air to gold and the Vlocks, migratory shepherds, were bringing their sheep and goats down from the mountain pastures. They immobilized us as we are immobilized now; we sat and let them flow around us and past. The Vlocks were picturesque, as these Mormon herders are not. They had their women and children with them, and the women spun yarn on twirling spindles as they walked. But these Mormons are weathered in the same way, as weathered as stones. Their eyes meet ours with the same careful incuriosity as they pass in their ancient pastoral routine. With no more than a change from Levis to some other costume, they could be Vlocks or Baktiaris; they could step back 2000 years, or into other countries and other mountains, and be at home. Give them another 100 or 200 years in isolation and they might even be picturesque.

On top of the Wasatch Plateau, above 9000 feet, the air is the kind that automobile tourists expect only on mountain passes. But there is no pass here, there are no peaks around us, only a rolling, grassy plain edged with rounding ridges covered with aspen and ponderosa pine. If this plain were in Nebraska, the horizon would spread to the limits of vision established by the earth's curvature. If it were in Montana, it would lift to the blue of distant mountains. But here we have the sense that just beyond any ridge the edge drops away. We are literally on a roof. It feels wonderfully high, open, sunny and big. The wind blows off no contiguous land, but straight out of the sky.

Along the top, which is barely six miles wide, wriggles a dirt trail ambitiously called Skyline Drive. Though tempting, it is obviously not designed for rented city cars. So we bear off southeastward, and soon we are in a canyon, descending. Huntington Creek makes its appearance: the walls rise, a strong red. Through a gap to the east we catch glimpses of pale desert mottled with cloud shadows. Then within a half hour we are down, and leveling out. Looking back, we see the plateau as a towering red rim—no trouble recognizing it as a plateau from this side—broken by the wide canyon we have just emerged from, and farther south by the canyon of Ferron Creek. Southeastward, across Castle Valley, the San Rafael Reef marks the edge of the San Rafael Swell—Robber's Roost country.

Now two vignettes, one of the past, one of the future, face one another across the road. On the left a pond formed by a dirt dam, and on the pond white ducks and mallards—wild and tame coexisting comfortably—and at the end, under cottonwoods worn smooth by rubbing stock, a pair of horses sleeping away the afternoon with their heads across each other's necks and their broom tails switching flies. On the right of the road, a power plant into which a conveyor belt carries coal direct from the mine mouth. From a tall stack, smoke trails across the desert sky. The local history, the local dilemma: Castle Valley in a nutshell, the mountain West in a nutshell.

This Huntington plant is not big. Neither is the Hunter plant at Castle Dale, a few

miles down the valley. Together, they probably represent neither a significant source of jobs for local people, nor by themselves a serious threat to the environment, nor an alarming intrusion on the integrity of the valley towns. It might be possible to justify both of them as appropriate technology, though I would hate to argue the point with Ed Abbey. It is the 3000-megawatt monsters that can't be justified, and the drawing boards are full of them.

This road, Utah 10, is an intramural road. All the cars and trucks wear Utah plates and red Utah dust. But there are signs of change. Castle Dale has an elaborate new motel. Ferron and Emery, cowtowns when I knew them, villages with pole corrals, are still cowtowns, but two signs on the outskirts of Ferron seem significant. One says *Town Zoned—Building Permit Required.* The other says *Green River Ordinance Enforced.* In a place like Ferron, zoning can have been made necessary only by migrant construction workers with trailers—perhaps the ones who built those power plants. And the Green River Ordinance, which puts constraints on vagrants and peddlers, is never enforced against locals. The town fathers may have read some handwriting on a wall.

Now, below Emery, Interstate 70 comes in from the east, and at once we are no longer intramural, but in the company of California, Michigan, Tennessee. I-70 has put us back on the tourist track, and also on the track of history. Just here, two branches of the Spanish Trail joined. From the crossing of the Green River, now Greenriver, Utah, one came across the San Rafael Swell on the approximate line of I-70. The other, which Captain J. W. Gunnison chose when he made his 1853 railroad survey along the proposed Central Route to the Pacific, turned northwest from the crossing as far as the Price River, then bent left and came south through Castle Valley, as we have just done. From this junction here, the united trails went up over Wasatch Pass, between the Wasatch and Fish Lake plateaus, and down Salina Canyon to the Sevier Valley (one variant reached the Sevier by way of Fish Lake, Grass Valley and East Fork Canyon), and thence up the Sevier to Dog Valley, where it broke down into the Great Basin near Paragonah. Once out in the desert, travelers faced 500 harsh miles with only a few watering places such as Las Vegas before they could look down into the green of the Los Angeles basin.

It was never a road for wheels nor a route for rails, but it was a trade route of the first importance, "the longest, crookedest, most arduous pack mule route in the history of America," as its historian Le Roy Hafen says. Across 1200 miles of mountains, plateaus and deserts it linked the two areas of Spanish settlement in the West, and as an extension of the Santa Fe Trail it was a transcontinental route before any other. Until the Mexican War broke up Spanish isolation, and the Gold Rush redirected travel out the Platte-Bear-Snake-Humboldt line, this unlikely thoroughfare swarmed with summer activity.

I would like to have been a magpie in a piñon, to spy on one of those camps of New Mexican muleteers. I wish I could have sat on some rimrock to watch one of those enormous herds of horses and mules, sometimes thousands of animals in a herd, streaming eastward. Sometimes they were driven by others than their rightful owners. The Ute chief Walkara, his brother Arrowpeen and the technologically unemployed mountain man Pegleg Smith were all notable horsethieves on the Spanish Trail in the 1840s. All brought their stolen herds to the sanctuary valleys among the high plateaus. I like to think they may sometimes have refreshed them in Circle Valley, where later would be born another highly publicized thief who made equally good use of that difficult country. A Mormon boy christened George LeRoy Parker, he was known professionally as Butch Cassidy.

Interstate 70 carries less colorful traffic than the Spanish Trail used to, and is far tamer and less beautiful than the primitive Fairview-Huntington road over the Wasatch Plateau. In Salina Canyon we are overtaken every few miles by double-van coal trucks doing 70 downgrade. The town of Salina, which Dutton a hundred years ago called a "wretched hamlet," was better than that when I knew it—was actually a pleasant little irrigated sugarbeet-and-alfalfa-growing oasis like the other Sevier Valley towns. Now it has lost its virginity to the boom. We try four motels before we find a bed. Across the road, while we carry in our bags, a helicopter settles down in a whirlwind of dust and noise and disgorges men in khaki. Phillips Petroleum, the motel clerk says proudly, part of a seismo crew exploring across the valley, in the Pávant. The girl who sells me a couple of beers is so busy trying to catch their eyes that she forgets to give me my change.

All evening, all night, the coal trucks whip past. Five mines have opened in Salina Canyon since the Interstate was completed. Our tax dollars at work making things nice for the energy companies. The trucks haul to Delta, on the Western Pacific out in the desert, or to Salt Lake, Las Vegas, even Los Angeles. Musinia Peak, the flat-topped white landmark knob that crowns the southern end of the Wasatch Plateau, may look down on those speeding behemoths as imperturbably as it once looked down on Spanish mule trains, Ute slavers, government geologists and Mormon train robbers, but we are not so philosophical—we have not learned Aldo Leopold's trick of thinking like a mountain. We are up very early, eager to be gone.

Our escape route takes us back up Salina Canyon for a few miles, among the coal trucks. Then we turn off up the Gooseberry, into the Fishlake-Manti National Forest, and are all by ourselves. There is no other car on this dirt road, though we see a couple of trailers asleep by the creek—perhaps boomtime squatters of the kind that Ferron has zoned itself against. Color begins to appear on the slopes tilted ahead of us, the Fish Lake Plateau lifts steeply. The higher we go, the rougher and more beautiful it becomes. The roof is like that of the Wasatch Plateau, an eroded, rolling plain bounded by low ridges patched with aspen and ponderosa. As we switch back and forth, still climbing, the scattered aspen color consolidates itself into dense planes and slopes of gold, peach-red and orange. Behind us, Musinia Peak climbs with us, swimming up as serenely as the moon. The distance is filled with long tabular shapes. Ahead, seen and lost again behind promontories, are Mt. Terrill, Mt. Hilgard and Mt. Marvine, all about 11,500 feet high, and to the right is the stern rim of the Fish Lake Hightop, the flat summit of the plateau, higher than any of the residual peaks. When we get out and stand in the morning quiet, high above the colored slopes and level with a redtail hawk that has warmed its wings and begun to soar, I find myself trying to *breathe* like a mountain.

There is no best season for the Fish Lake Plateau. Gorgeous as it is in September, it is just as gorgeous in early July, high spring, when these meadows are so dense with flowers that every step crushes dozens. The botanist who worked with Dutton's survey party at the end of the 1870s identified more than 900 species of plants up here, and the first time I drove Mary over this road, 47 years ago, the only part of the high pastures not a flower garden was the ruts of the trail. We went for miles to a soft multitudinous tapping, the sound of flower heads in the trail's crown knocking against the bottom of the car.

For a good while this superlative mountain is as we remember it and want it. Then, coming down toward the Mt. Terrill ranger station, we meet a seismo crew drilling holes beside the road. That ominous touch is succeeded by a pastoral one—hundreds of fat Herefords, Black Baldies and Red Baldies grazing along Frying Pan Flat. Above them is the high blue fair-weather sky that even

steers must appreciate. Behind them the Hightop slopes steeply up through gold of aspen to black-green of fir before it stands on edge in lava cliffs. Around the flat, as visually striking as Christo's nylon and a good deal more functional, goes a line of snake fence: outdoor sculpture, folk art.

In Seven Mile Creek, sunk among meadow grass and thinly fringed with willows, I used to catch a lot of trout, sometimes in channels hardly more than a yard wide. It looks as if one still could. I am grateful to the

Lee Foster

Wallace Stegner.

Forest Service for having kept this part of the plateau without visible deterioration or change. But the future is being prepared. Trees have been cut in preparation for the widening of the road, and as we come down past Johnson Reservoir, into which Fish Lake flows and in which the Frémont River begins, graders are tearing up stumps and moving dirt.

I look across the reservoir somewhat bemusedly. Somewhere in the mud of its bottom are two pairs of hip boots well on the way to becoming fossils. Fifty years ago, in the company of a boy who later became a USC quarterback, I tried to walk across the reservoir bottom in a time of deep drawdown. Slime and quicksand welcomed us in to the tops of our boots, and it was all we could do to work out of the boots and half crawl, half swim to solid ground. I still remember that long stocking-footed walk up the rocky road to the lake.

Now it seems almost as long, driving, as it did then walking, for everything is being butchered and improved. When we stop to take pictures of the golden slopes perfectly reflected in the still waters of Widgeon Bay, we find the shore littered with dead fish. The girl in the store at the public boat ramp, new since my time, says that Fish and Game has just poisoned the reservoir to kill off the junk fish, the product of dumped bait buckets, and that some of the poison seeped back into the foot of the main lake. But next year, she says happily, the trout fishing will be super.

Maybe. I remember when it was *really* super, when Johnson Reservoir gave up big natives and native-rainbow crosses, and when I could wade into the main lake off our dock just at dusk, and fishing a wet fly, white miller or silver doctor, hook big rainbows coming in close to feed. I remember history, too, especially the account written by Lieutenant Brewerton, who came east along this variant of the Spanish Trail with Kit Carson in June 1848. Carson was carrying dispatches from California to Washington, and he had in his saddlebags, like a time bomb, the April 1 issue of the *California Star*, reporting the discovery of gold at Sutter's mill. That was the news story that set off the Gold Rush, but it is not the reason I remember Brewerton's narrative. Something else: the big lake trout were spawning in Twin Creeks, as I have seen them spawning, and the Utes camped there were shooting them with arrows. They sold a good many to the Carson-Brewerton party before the whites discovered that they could go to the creeks and kill their own with clubs.

I drive slowly along the shore, looking for our old cottage, but somehow miss it. They must have changed the alignment of the road. It should be in plain sight, for it stood in the edge of the aspens within a hundred feet of the water. I drive back, taking a diversion through a new campground, but still can't find our place. Not until we stop at Fish Lake Lodge, once called Skogaard's, do I get an explanation. All the cottages along there were bulldozed out some years ago to clear the way for the sewer system. The man who tells me this tells me also, with a commiseration that seems half pride, what that cottage would be worth now if we still owned it.

I doubt that I would want to own it now. Nor do I covet any of the expensive-looking summer homes that have replaced the old shacks along Twin Creeks. I liked this place better when it was limited, simple and austere, without sewers, running water or fishing that had been improved by poison. I liked it when muskrats still dug in the bank by our dock, and when, once or twice a summer, a mountain lion would come down and steal the fish hanging on nails in the unscreened porch where I slept.

Any return is a journey across both space and time. Driving along the top of the low, treeless Awapa Plateau, aiming for the gap between Thousand Lake and the Aquarius, I find my memory as busy as a squirrel digging up acorns. My first trip into this country was in 1924, pretty primitive times, in the company of my scoutmaster and his son. The scoutmaster, an Episcopal missionary to the Mormons, died a disillusioned man, without converts, but in the backcountry he was an enthusiast. Also he was a pipe smoker. Coming around the corner of Thousand Lake Mountain, as we are coming now, with the Red Gate cliffs on the left and Rabbit Valley around us and the white domes of Capitol Reef showing ahead and the profile of the Aquarius high and dark on the right, he made a sudden, excited gesture with the pipe in his left hand. The wind blew the coal out of the pipe and up his sleeve, setting his armpit afire. His son and I died laughing and were buried just here, where the road dips down toward the canyon of the Frémont and the lost village of Fruita.

Fruita used to be one of our favorite places—a sudden, intensely green little valley among the cliffs of the Waterpocket Fold, opulent with cherries, peaches, and apples in season, inhabited by a few families who were about equally good Mormons and good frontiersmen and good farmers. Over the years it has also been sanctuary for a number of enthusiasts with the atavistic compulsion to hole up in Paradise, people who, like Zane Grey's Lassiter, put a bloody hand to the balancing rock and rolled it down to block away the world.

One was Doc Inglesby, who at the beginning of the 1930s sold out his business, the Salt Lake-Bingham stage line, and came down here to be a rockhound, run a little motel and listen to the singing of the cliffs. He was a little round gnome with a little round belly and a little round cocker spaniel that he used to carry on the pommel of his saddle when he rode around exploring undiscovered canyons, measuring unnamed bridges and hunting jasper geodes. His passion for the country was as explosive as gasoline: he could scare you to death calling your attention to a sunset or the light on a

cliff. I hope the sunsets are good where he is now, and the ledges red.

Another was Charlie Kelly, a considerable Mormon-eater, the author of several basic books on Utah's frontier history, especially its outlaws, and the first (honorary) superintendent of the Capitol Reef National Monument. He was a good historian and a good companion. Requiescat. He too deserves an Eternity of red ledges.

A third was Dean Brimhall, whose father had been president of Brigham Young University and who had spent much of his mature life in the Department of Commerce in Washington. Related by blood to half the Mormon hierarchy and by marriage to the other half, he was a sadly lapsed Saint, as antagonistic to the Church as he was devoted to the geology and ethnology of the plateau country. In the early 1940s, when he and his wife, Lila, were visiting us in Vermont, he wished aloud that he knew of some place in Utah as quiet, remote and peaceful as our Vermont farm. I suggested Fruita, and the next I knew he had gone down there, fallen in love and bought a piece of land, with a log cabin, a grove of big Frémont poplars and an orchard. Before long he built a house, before much longer he was living in it most of the year.

By the time of his death in 1974, Dean had become the greatest student of the plateau region since the Powell Survey quit working there. He knew every crack and canyon, every arch and natural bridge, every petroglyph and pictograph within 150 miles of the Capitol Reef. With great labor he brought in scaffolding and set it up in remote canyons to photograph cliff murals that constitute the finest body of native American art north of Mexico. Some of these Mary and I have seen *in situ*; most of them we know from studying color transparencies in Dean's Fruita house—the usual deer, elk, bighorn sheep, square-headed men, hands, the records of how the people who lived in these canyons a thousand years ago responded to their surroundings, and one pictograph in particular that seemed to all of us the quintessential statement of life among the Anasazi. Life-size, painted in ocher on a clean pink cliff, it shows a man standing stiffly with his hand outstretched. Growing from the hand is a tree. In the tree, unmistakable, done with love, is a hummingbird.

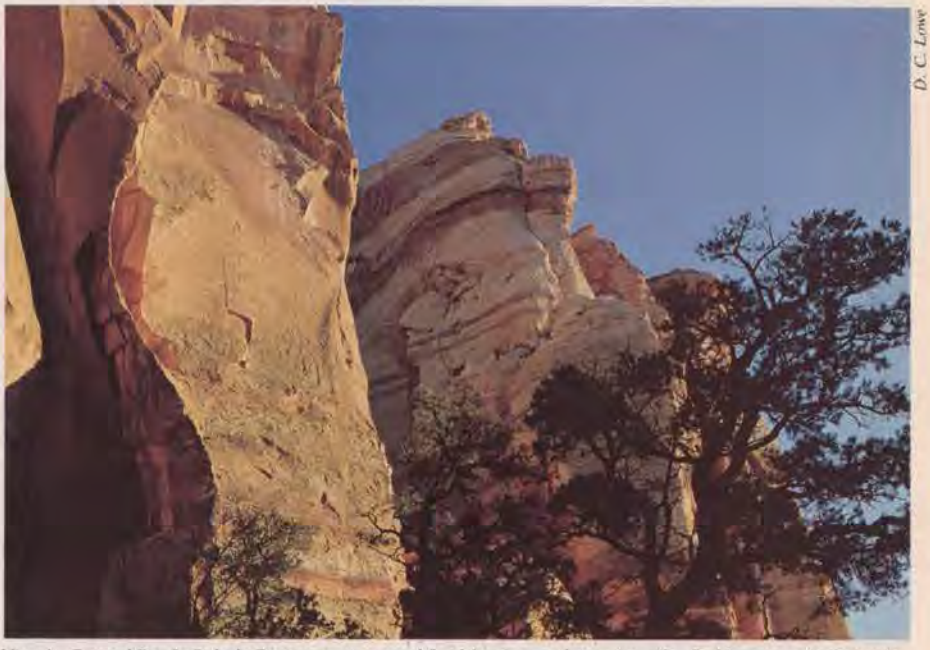
Whenever we were within 300 miles of Fruita, we used to stop. At first we stayed with Doc, later with Dean. If Dean happened to be away, we camped in his orchard. Now, we know, Doc's old motel under the big poplars, fenced with slabs of ripple-marked sandstone, has been cleared away and the land leveled to make the park's picnic ground. Dean's house is now the house of the superintendent. Not even Lurt Knee's Sleeping Rainbow Lodge is open, for the National Park Service has bought up all the in-holdings, as it should have. So we will have to stay outside the park at the Rimrock, spectacularly perched on a stone ridge between the Reef and the Aquarius, with 360° view. Mary who is tired, is content to sit and look at it. I go in and spend a couple of hours talking to Eugene Blackburn.

Much can be learned from a man like Blackburn, whose memory goes back almost as far as mine, and who has watched all the changes. Though he still has a farm in Bicknell, he has worked for the Park Service for nine years, managing the camp and picnic grounds and running the water treatment plant, and his native attitudes have been tempered by friendly contact with the feds. In his relaxed local voice, without a flat "a" in it—he says *squar* and *thar* like a character out of the Leatherstocking Tales—he fills me in on what has been happening since the Reef was upgraded from a national monument to a national park in 1971.

I am an interested listener, for I was involved in that upgrading. In 1961, when I was working as a special assistant to Secretary of the Interior Stewart Udall, I came through here with Joe Carithers, from the secretary's office, and Bates Wilson, then superintendent of Arches National Monument, later superintendent at Canyonlands National Park. We picked up Dean Brimhall and the then-superintendent of the Capitol Reef National Monument, Bill Kruger, and spent a good many days running up and down the Waterpocket Fold and through the Cathedral Valley and the South Desert, looking at areas that might go into an enlarged and enhanced park. We anticipated local objections, for the feds are often looked upon as absentee landlords in Utah, and because one cattleman whom Dean and I encountered in the state liquor store in Torrey took one look at us and puckered up his mouth as if he had tasted something nasty. "Washington men," he said. "I think I'll go over and get me two boxes of shells, one for the elk and one for the God damn Washington men."

But that attitude, according to Blackburn, was not widespread and did not last. Most cattlemen had already overgrazed their (publicly owned) range and were going broke. The national park seemed then, and seems now, a reasonable compromise with Progress. Living up to its obligation to provide for "use without impairment," it protects country that the local people find good to live in, as tourists find it good to visit. It brings outside money into a county whose 1970 population of less than 1500 people is as many as the oases of this stone desert can support. It provides a few steady jobs. And it keeps out worse things, or has so far.

Under much of this country, in the Green River beds, are strata of low-sulphur, high-BTU coal, and there are many companies eager to exploit it. The first power plant proposal, the Kaiparowits, was killed in 1976, some said by Robert Redford, who was hanged in effigy in Kanab for his efforts. The second, the Intermountain Power Project, or IPP, was sited for the Escalante Basin within eight miles of the boundary of Capitol Reef National Park. Cecil Andrus, as Secretary of the Interior, forced a resiting of that one because it would inevitably have polluted the air of the park, which under the



D. C. Lowe

Now in Capitol Reef, Cohab Canyon was named for Mormon polygamists who fled here to escape arrest.

Clean Air Act should be protected Class One air. Now the IPP, which will be the largest coal-fired plant in the United States, is being built at Lynndyl, at the edge of the Sevier Desert, where presumably there is less for it to spoil.

But the generations of energy proposals succeed one another like fruit flies. The Union Pacific and thirteen other companies want to mine the Kaiparowits, the largest unexploited coalfield in the nation, and surrounded by national parks. The Allen-Warner Valley plan included a huge strip mine at Alton, four miles from Bryce Canyon National Park, a 500-megawatt coal-fired plant in Warner Valley, seventeen miles from Zion, a 2000-megawatt plant north of Las Vegas, and two slurry pipelines to serve them—pipelines that would mine the water table as ruthlessly as the draglines mine the coal. The long-range projections, at their peak, foresaw 21,300 megawatts of electricity, six coal-gasification plants, a strip mine in the Henry Mountains four miles from the boundary of Capitol Reef, and another large coal mine in the Paria Amphitheater very close to Bryce.

One way or another, these grandiose plans are aborted. The EPA blocked the Warner Valley plant because of the danger to Zion's air quality. Pacific Gas and Electric and Southern California Edison, the two principal partners in the Allen-Warner Valley proposal, withdrew their applications for permits when projections of electricity needs in California and Las Vegas fell. It looks as if most of the threats are either killed or reduced. I would like to know how local people feel about that.

Blackburn guesses they feel pretty good. At first they wanted the jobs and the tax base and the economic boost, but as the arguments went on they discovered that the proposed plants would pay no local taxes, being on BLM land, and that first-phase jobs would go mainly to migrant construction workers, and second-phase jobs to outside technicians. As for the power, that was going elsewhere anyway. Why, Blackburn asks, should southern Utah tear up the country and bring in beer parlors and roughnecks and whores, and disrupt the towns and dirty the air, just to light Las Vegas?

They are better off without the plants. Pipe irrigation makes water go further than it used to. Young people still leave home to find work, but that is nothing new, and at least now the towns are no longer losing population. The park pumps steady life into the local economy. Visitation increases. The latest wrinkle is foreign tourists, in buses or rented RVs, who make the circuit from Arches and Canyonlands through Capitol Reef, Bryce, Zion and Grand Canyon. He saw one the other day with a banner on it: "We are French. Please Help Us to See America."

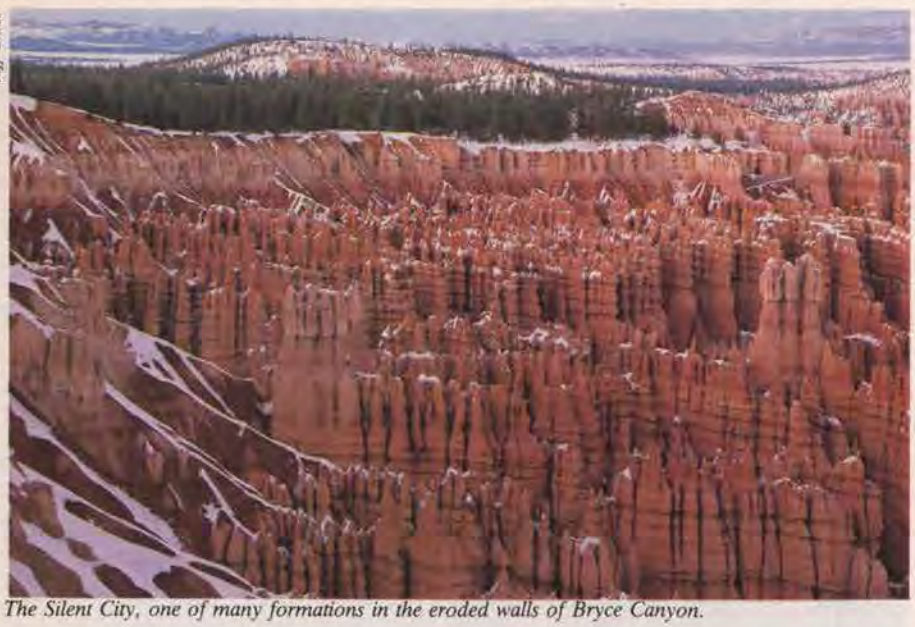
All in all, Blackburn gives the Park Service good marks. His only complaint is that when they started to face-lift the place they tore down the old Chesnutt store. Old store like that, with a hand-cranked gas pump out front, that's practically archaeology. That would interest tourists, especially foreigners.

I agree. Capitol Reef would be richer if the Chesnutt store had been kept. The land is not complete without its human associations. The Chesnutts were living folklore, survivors of the frontier. I would go a long way to have one of Mother Chesnutt's breakfasts again, with peaches and cream, hot biscuits, corned elk, and eggs baked in the oven in a muffin tin. A menu like that might be as good a souvenir for a French tourist as a Kodachrome slide of Cohab Canyon, named for polygamists who hid out here in the 1880s from U.S. marshalls trying to serve warrants for unlawful cohabitation.

From up on top one does not see the cliffs by which the Aquarius breaks down upon the Waterpocket Fold and the Escalante Basin. One looks over them, catching only glimpses of gashed red. But what one sees beyond! Northward, Thousand Lake lifts in tiered red cliffs to its dark lava cap. Northeastward, the colored desert stretches along the valley of the Frémont until it hazes out somewhere about Goblin Valley. Several thousand feet below us, the bloody welt of the Waterpocket Fold, crowned with calm white domes, runs nearly north-south until it too hazes out in the pinkish Navajo sandstone along Glen Canyon. Beyond the Fold, eastward across mazes of colored stone, rise the gray-green cones of the Henry Mountains, "Gothic superimposed upon Byzantine," a sharp contrast in both color and shape to the flat crestlines and predominant red of the surrounding desert. Beyond the Henrys the desert platform, barren, blistered, cut by cliffs and canyons, reaches almost to the edge of vision, to the rich red rims and cliff faces of Canyonlands, around the junction of the Green and Colorado. But above that desert rim rises another, farther outburst of Gothic—the peaks of the La Sals, laccoliths like the Henrys, high cones of snow. And if the light is right and the air clear, you can let your eye range beyond the La Sals into the remotest edge of sky, and incredibly, far beyond those far cones, you may make out other snowy crests, insubstantial as cloud: the La Plata Mountains, 200 miles away in Colorado. Dutton, who loved the Aquarius better than any place in the high plateaus, said it should be described in blank verse.

But we are disappointed. Today we cannot see beyond the Henrys. Dust, or some power plant? We cannot tell. But we remember that the last time we were in Canyonlands, particulates from the Four Corners plant 150 miles to the south made photography chancy and at times impossible.

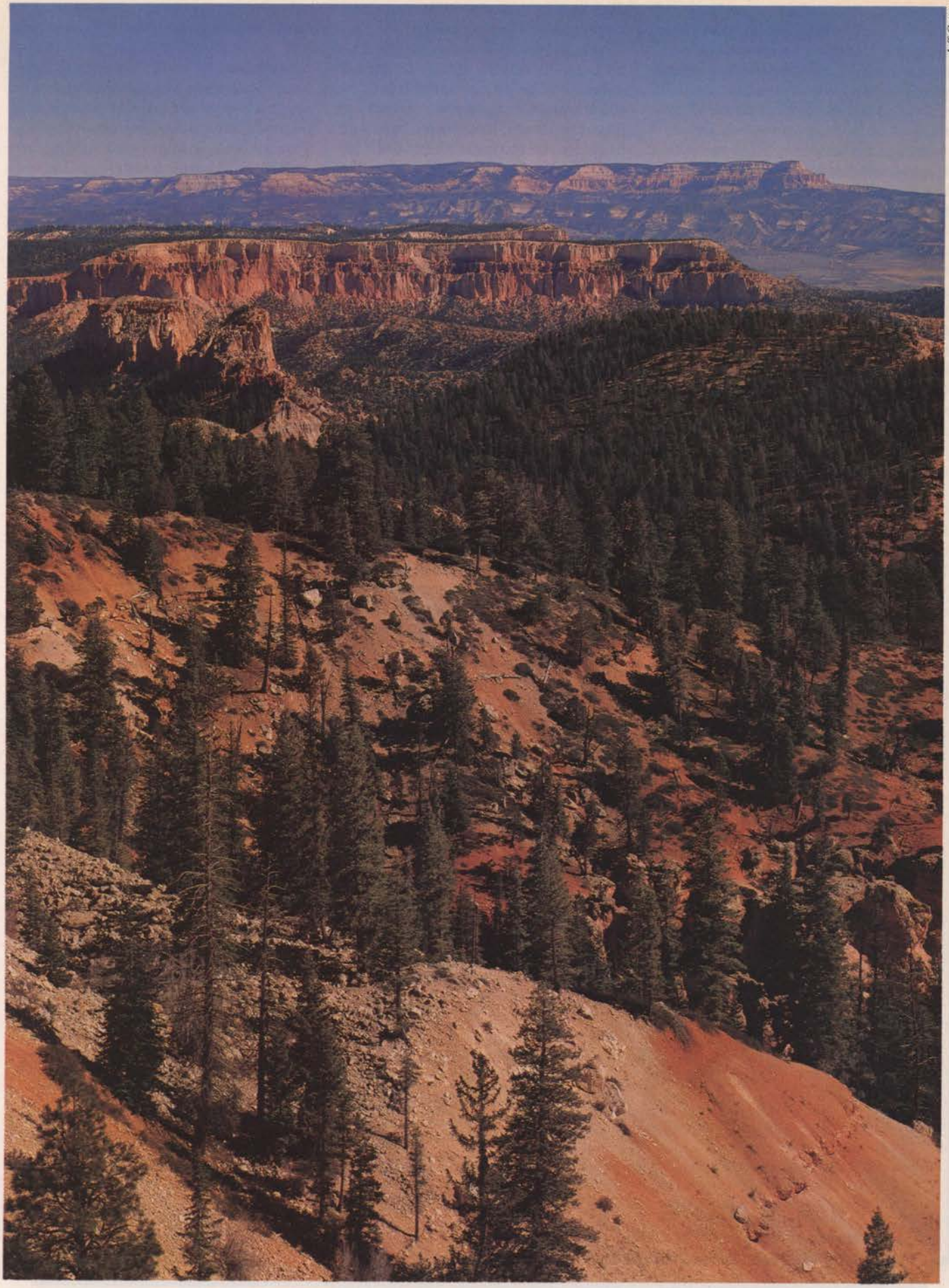
The trail to Escalante, once only a four-wheel-drive fire road, has been paved as far as Grover. I see by the map that it has been paved in from the other end, too, all the way to Boulder. That is change. Until about 1930, Boulder got its mail by packhorse. And other changes: every few miles, as we rock and lurch up the mountain, the Forest Service has tucked campgrounds into the



Jeff Gnass

The Silent City, one of many formations in the eroded walls of Bryce Canyon.

In the foreground, the Pink Cliffs of the Paunságuint Plateau. Behind them to the northeast lies Table Cliff, an outlying extension of the Aquarius Plateau.



Jeff Gnass

shelter of the Engelmann spruce, or among groves of aspen like pooled sunlight. As on Fish Lake, trees have been felled and graders have been busy. Improved to tourist standards, this once adventurous road will make a convenient shortcut between Capitol Reef and Bryce.

My feelings are mixed. I hate to see this lovely mountain overrun; and yet, because I have loved it a long time, I find myself fantasizing, lecturing to an imaginary bunch of tourists, French perhaps.

Smell that air? I ask them. That wonderful bitter tang is aspen. Bite a leaf and it puckers your mouth. Light a fire and you smell it in the smoke. The leaf junctures and stems are flattened contrary to the plane of the leaf, so that at the slightest breeze the leaves tremble. Father de Smet tells of French mountain men who thought the wood of the Cross must have been aspen, and that ever after, the leaves have quaked. The whiteness of the trunks rubs off. A gang boss can tell if his crew have been sitting on logs, just by looking at the seats of their Levis.

This is the gentle end of the plateau. The north end is higher, lava capped, rough with the chunks that give it its local name of Boulder Mountain, and full of lakes. Only jeeps up there. The trail we are following, once an Indian trail, was the route of Major Powell's brother-in-law, Almon Thompson, when he came through in 1871 trying to find a supply route to the mouth of the Dirty Devil (Frémont) River, where Powell had cached his boats the autumn before. Thompson's *entrada* was the last exploration in the Lower Forty-eight. His party was probably the first to see Bryce, though only from a distance. He saw and named Table Cliff. Mistaking the Escalante for the Dirty Devil, he tried to get down its side canyons, dug deep and twisty in the Navajo sandstone, to reach the Colorado. Eventually he decided he was on an unknown stream, named it the Escalante, and went on over the Aquarius, which he also named. From its top he got a good view of the Henry Mountains, seen earlier by Powell from the Colorado, but never visited. Crossing the Waterpocket Fold through magical, incredibly rough country, Thompson finally got to the Colorado down Trachyte Creek. His report makes a chapter in Powell's *Report on the Exploration of the Colorado River of the West*—required reading, along with Dutton's *High Plateaus of Utah* and *Tertiary History of the Grand Canyon*, for any tourist, American or European.

We pass through Boulder, now part of the accessible world, and the Hell's Backbone road, now sadly tamed, and cross the clear, shallow Escalante, and enter the town of Escalante, asleep under its cliffs. The Kaiparowits stretches its blade southward 50 miles to confront the dome of Navajo Mountain across Glen Canyon. Table Cliff towers over us on the north. We glimpse Bryce, miles ahead, a fire on the side of the Paunságunt. Three oasis villages, Henrieville, Cannonville, Tropic, and we climb the slope toward Ruby's Inn. There we meet the traffic from Panguitch and are once more on the tourist track. On the Paunságunt is a combined smell of resiny, sun-warmed pines and automobile exhaust as we enter Bryce Canyon National Park.

And sure enough, a bus pulls in behind us in the parking lot of Bryce Canyon Lodge. It is the one that Blackburn saw in Capitol Reef, apparently, for it wears a banner asking help in seeing America. Forty men and women pile out and rush to the crumbling brink of the Pink Cliffs, pointing, crying "Voila!" and "Regardez!" They need no help in seeing America. Some run down to the first loop of the Navajo Loop Trail to photograph their companions on the rim, who are in turn aiming cameras down at the trail. They are as noisy as the French used to think Americans, but nobody ever got more pleasure out of sight-seeing. Table Cliff, that noble

façade cut from the same Pink Cliffs as Bryce, but lifted 2000 feet higher, never had a more appreciative audience for its afternoon glorification. The red, white, yellow, violet and purple statuary of Bryce never stirred more excited comment. Bryce always seemed to me a trifle gaudy, and its names over-cute. These people respond as gushily as a bunch of Sunday Austrians on the Rax-alp: *"Ah, wie schön!"* By now most have gone on down the trails and are lost down among the passageways and colonnades and lines of hoodoos. Their voices float back like the talk of traveling geese, perhaps asking one another "What signifies *Peekaboo*?" "What is meant, *Alley Oop and Dinny*?"

Something new in the stone wilderness of southern Utah. And after we have spent a couple of hours walking the rim and the trails, and watching the changing afternoon light throw gargoyle and curtain wall into deep relief and play like a color organ on the brilliant cliffs, we go back to the lodge to arrange about a bed, and encounter a consequence of the European invasion. No room at the inn. We suspect that TWA, the concessioner in this park, has been offering package deals, selling air tickets along with park tours, and block-booking the rooms.

Well, our environmental conscience tells us that accommodations should be outside the parks anyway. But Ruby's Inn and two nearby motels are full too. We have to go clear to Panguitch, 20 miles, to find a room.

Business is good, obviously, and will remain good until the gasoline shortage comes finally home to roost. It is good all around the Golden Circle, four of whose five national parks are in Utah. The worth of that business and the need of looking after the resource are things to be considered by feds and locals alike when power plants are planned within sight of the Bryce rim, or when the Sagebrush Rebels propose to take all the surrounding BLM lands out of federal hands and put them into hands that will know what to do with them. There would be fewer rolls of film sold at the park store if the air, now dry and brilliant, were clouded with particulates. Even so well-placed a conglomerate as TWA wouldn't sell many package tours to watch evening cast the shadow of a smoke plume on Table Cliff. If even a part of the proposed energy installations goes in, southern Utah will be a sacrifice area, and its national parks casualties. But even if those threats are stalled off, there will be change.

From the beginning, this trip has had the feel of a last visit. We are getting beyond the age when we can unroll our sleeping bags under any pine or in any wash; and the gasoline situation throws the future of automobile touring into doubt. I would hate to have missed the extravagant personal liberty that wheels and cheap gasoline gave us, but I will not mourn its passing. It was part of our time of wastefulness and excess. Increasingly, we will have to earn our admission to this spectacular country. We will have to come by bus, as foreign tourists do, and at the end of the bus line use our legs. And if that reduces the number of people who benefit every year, the benefit will be qualitatively greater, for what most recommends the plateaus and their intervening deserts is not people, but space, emptiness, silence, awe.

I could make a suggestion to the road builders, too. The experience of driving the Aquarius on pavement is nothing like so satisfying as the old experience of driving it on rocky, rutted, chuckholed, ten-mile-an-hour dirt. The road will be a lesser thing when it is paved all the way, and so will the road over the Fish Lake Hightop, and the one over the Wasatch Plateau, and the steep road over the Tushar, the highest of the plateaus, that we will travel tomorrow. To substitute comfort and ease for real experience is too American a habit to last. It is when we feel the earth rough to all our length, as in Robert Frost's poem, that we know it as its creatures ought to know it. □

Wallace Stegner, a Pulitzer Prize-winning author, has written for many years on issues related to the nation's public lands.

Mining on the Border of Bryce

Has the Allen-Warner Energy System Been Stopped?

TERRI MARTIN

FOR A WHILE it seemed as though one environmental battle ended the way fairy tales do—with the dragon slain and everyone living happily ever after. But in the saga of the Allen-Warner Valley Energy System, the dragon shows signs of coming back to life.

The whole project would have included a coal stripmine in the Alton Hills adjacent to Bryce Canyon National Park, the 500-megawatt Warner Valley power plant 17 miles upwind of Zion National Park, the 2000-megawatt Harry Allen power plant near Las Vegas and two coal slurry pipelines to carry the coal from Alton to the plants. At this moment the coal mine seems unlikely, the Warner Valley plant's request for an air permit has been turned down and the Harry Allen plant has its air permit but no coal to burn and, most important, not enough buyers for the power. But the Department of the Interior is rethinking its decision about disallowing the mine; the next development will occur by September 20.

This time it will not have been so much the red light of environmental regulation that stopped the project—if it is stopped—but more the two California utilities that were to receive 80% of the power produced. In a dramatic shift in energy policy, both Southern California Edison and Pacific Gas and Electric Company announced in February 1981 that they were withdrawing from the plan. Their reason sounded like the argument environmentalists had been making: "We're not going to see any need for the energy from the project," said Glen J. Bjorklund, vice-president of Southern California Edison.

That simple revelation was rooted in more than two years of intensive work by environmentalists and utility reformers who opposed the Allen-Warner Valley Energy System (AWVES) not only because it was environmentally destructive, but also because it was unnecessary.

While it was still on the drawing board, the AWVES became the focus of a national debate about our national priorities and our future energy policy. The questions were whether the drive toward energy independence means we must sacrifice our national parklands for the sake of megawatts, or whether using renewable resources and conservation can render big oil, coal and nuclear projects unnecessary.

Although President Carter called the AWVES critical to the increased development of domestic coal production, Brian Beard from the Utah chapter of the Sierra Club said, "The Allen-Warner Valley Energy System signifies the sacrifice of our national heritage for another mess of unneeded megawattage."

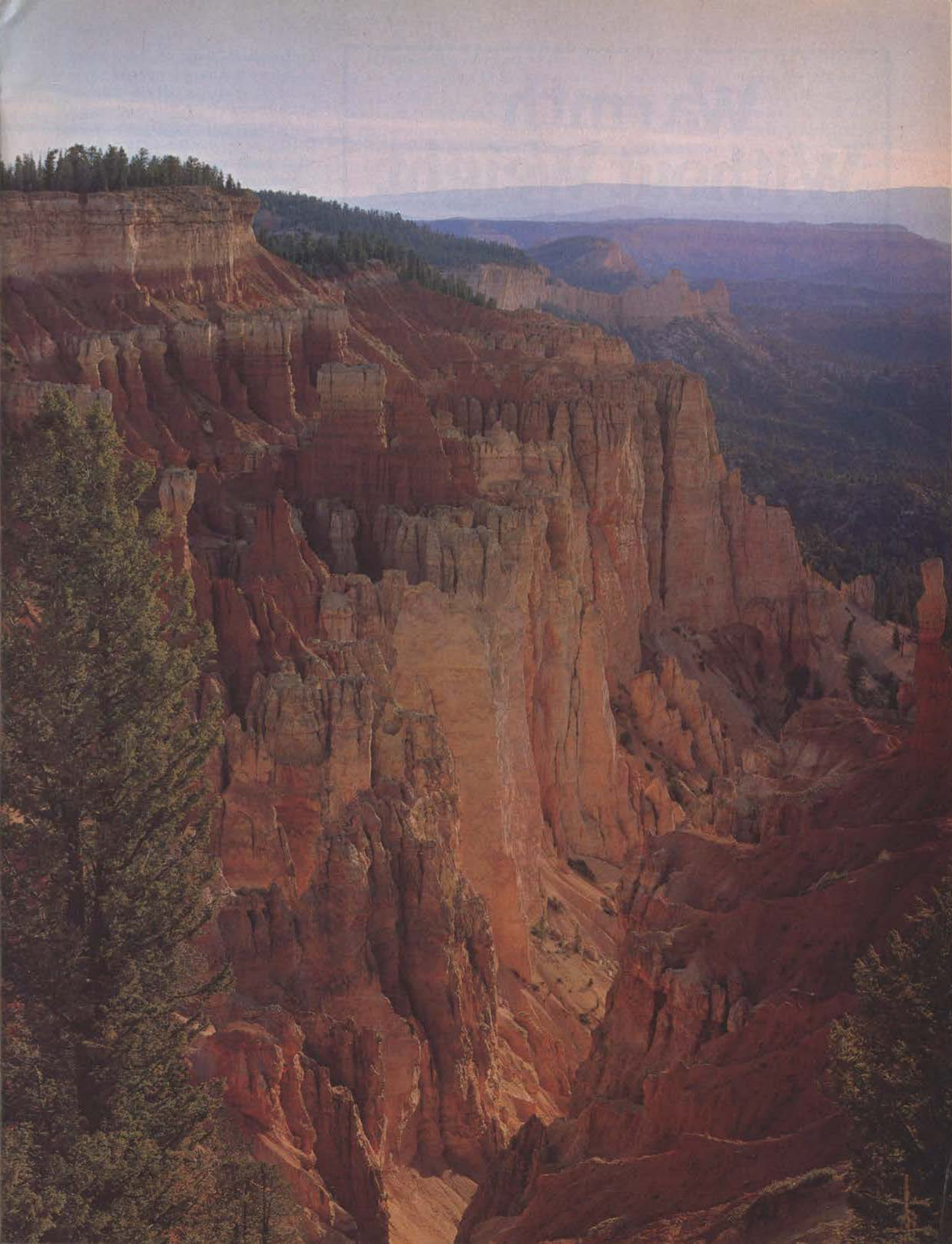
From the start, the AWVES seemed to be a dragon destined to die by the sheer ill conception of its design. To begin with, extracting coal for the AWVES would have meant carving out one of the world's largest stripmines directly below Bryce Canyon's popular overlook, Yovimpa Point. Although it is not inside the park, the overlook is visited by more than 300,000 people every year because it provides a sweeping panorama of the Colorado Plateau—an unmarred vista of canyons, mesas, cliffs and hills that stretch the eye to the horizon. Here, only four miles from Bryce Canyon National Park, Utah International (the mining subsidiary of General Electric) and Nevada Electric Investment Company (a subsidiary of Nevada Power Company, the Nevada-based utility serving Las Vegas) want to mine approximately 10 million tons of coal a year over a 35-year period. "Visitors to Yovimpa Point would be introduced to the sights, sounds and smells of a coal strip mine," said Ron Rudolph of Friends of the Earth.

Furthermore, the enormous cost of transporting the coal by truck or rail would mean that the coal would be moved away from the Alton hills by coal slurry pipeline. Deep wells drilled into the underlying Navajo formation, a water-bearing layer of sandstone, would withdraw more than 10,000 acre-feet of water a year. Mixed with crushed coal, the water would have been slurried away to the Harry Allen and the Warner Valley power plants.

In a state where water is the lifeblood, such a proposal was bound to raise the ire of

Bryce Canyon was named for Ebenezer Bryce, a Mormon who founded nearby Tropic.

Photograph by Harry A. Jarvis



local residents—and it did. Resident ranchers insisted that massive water withdrawals would dry up wells, springs and streams on which the area's livelihood has depended for four generations. Caroline Lippincott, a cattle rancher in Johnson Canyon (part of which would have been mined) explained, "The pumping would take the recharge water that has built up in the Navajo sandstone over the centuries. To draw that water from the aquifer is as if you've been living on interest and all of a sudden somebody takes all your money out of the bank. There's not going to be any interest any more!"

In an alliance that would have seemed unthinkable a few years earlier (county residents publicly burned effigies of Kaiparowits project foes when the project collapsed in April 1976), seven ranchers from Kane County joined the Environmental Defense Fund, Friends of the Earth and the Sierra Club Legal Defense Fund in petitioning the federal government to declare the Alton coal fields "unsuitable for surface mining."

This was the first test of Section 522 of the 1977 Surface Mining Control and Reclamation Act. Section 522, which authorizes citizens to petition the Interior Department to designate environmentally fragile coal-bearing lands as unsuitable for mining, is based on the idea that the United States has enough coal to provide discretion over where coal is most appropriately mined. Areas can be declared unsuitable if coal mining would "adversely affect any publicly owned park" or "result in the long-range reduction of water supply or of food and fiber products" of lands with renewable resources.

The Alton petition not only alleged that mining operations would adversely affect water quality and quantity, but also stressed damage the mine could cause to Bryce Canyon National Park. Dust from mining could ruin matchless visibility. Daily blasting would shatter the area's silence and sense of solitude. If reclamation proved unsuccessful, the mine would leave a sprawling scar on thousands of acres of land below Yovimpa Point. In public testimony before Department of Interior officials, the National Park Service noted that even with mitigating efforts, the strip mine would be unavoidably obvious for a "30-year period, during which 10½ million visitors to Bryce Canyon would be subjected to impairment of the natural scene."

Studies by the Office of Surface Mining, (OSM), the Bureau of Land Management and the National Park Service confirmed that many of the environmental impacts alleged in the petition would occur, particularly park visitors' diminished enjoyment.

The evaluation document prepared by the

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OSM verified the Park Service's claim that mining operations would not only be partly visible from Yovimpa Point but would also reduce visibility because of dust from the blasting. Furthermore, OSM studies compared the silence at Bryce Canyon National Park to that of a "high-quality sound studio" and reported that "surface mine blasting would be distinctly perceptible and probably annoying to visitors through the park at all times of the year."

The OSM analysis also showed that the would be unconscionable to allow strip mining, blasting, heavy truck traffic and air quality degradation in that portion of the field closest to the national park."

The Secretary's ruling crippled but did not kill potential coal development in the Alton area. While the decision affirms our national commitment to protecting the parks, it also leaves the western portion of the coal field open to development, even though the OSM studies indicated that blasting in these areas would also be heard in Bryce Canyon. Furly a boondoggle. The BLM's environmental impact statement on the AWVES made it clear that the St. George area needed no additional water supplies, including the Warner Valley reservoir, before the year 2020; also, the city of St. George needed only 10 megawatts of electrical power, although the Warner Valley power plant would supply 500! (The city had asked for 125 MW.)

Plans for the Harry Allen and Warner Valley power plants were also poorly con-

DeWitt Jones

The view from Yovimpa Point in Bryce National Park, looking at the coal-rich Alton Hills. Proposed stripmines would recover only 10% of the hills' coal but would spoil park visitors' experience for 30 years by being visible and audible from here. The Office of Surface Mining found the silence in Bryce equal to that in a sound studio and also said the coal is unnecessary. Secretary Watt will decide in September whether to change the decision banning mining.

Alton coal is not really needed at this time, even though the mining company tended sometimes to justify the mine, as well as the entire Allen-Warner Valley Energy System, with energy crisis rhetoric. The OSM evaluation document noted that even if the entire petition area were closed to mining, "it would impose no limitations on national consumption (of coal) over the foreseeable future."

Secretary of the Interior Cecil Andrus announced a decision on the petition in December 1980. He declared lands within view of Bryce Canyon National Park as "unsuitable for mining." The action effectively banned strip mining on about half the surface area proposed for coal development. Although that area contains only about 10% of the total coal the industry wanted, it is the part of the coal field that would have been easiest to develop. The secretary said, "It thermore, the Secretary did not rule on whether the massive amounts of groundwater could be withdrawn for slurrying the coal.

At the other end of the slurry line, design problems for the AWVES were just as plentiful. Traditionally provincial about water supplies, Utah law requires that water can only be transported across state lines if there is a "clear reciprocal benefit" to Utah. Since the slurry lines would carry water and coal out of the state to Nevada, there had to be a payoff. The solution was a 55-acre-foot reservoir in Warner Valley, which would capture and store the silt-laden water of the free-flowing Virgin River. The reservoir would ostensibly serve as a source of water for the St. George area and would also provide cooling water for the Warner Valley power plant—component of the AWVES.

But rather than a clear reciprocal benefit, the Warner Valley reservoir was unabashedceived. Air quality tests by the Environmental Protection Agency and by Nevada Power Company itself proved that the prevailing winds would carry pollution from the proposed 500-MW Warner Valley power plant the short 17 miles into Zion National Park, shrouding the canyon's sharp horizons and violating federal Class I standards.

Even the 2000-MW Harry Allen plant, considered the least objectionable portion of the system, has had its problems. Proposed for a site only 25 miles from Las Vegas, the Allen plant has managed to scrape by under the federal air-quality standards only by promising to install a substantial pollution-control technology to remove sulfur dioxide. The plant will still undoubtedly contribute to overall regional haze; present air quality laws fail to consider this problem.

But it was not this confusion of badly laid plans that ultimately defeated the Allen-

Warner Valley Energy System. The fatal flaw of the AWVES lay in the project's connection to California. The 2500-MW system was designed to supply 80% of its electrical power to the coastal state, which not only did not need the power, but whose state energy policy clearly gave priority to the use of renewable energy sources.

California's colonial connection to canyon country coal has a long history. For almost two decades, building polluting coal-fired power plants in the Southwest's "Golden Circle" of parklands has proved a politically expedient way for California utilities to generate additional electricity. California now receives substantial amounts of power from the Glen Canyon dam, the Four Corners power plant and the Navajo Generating Station. If the mammoth 3000-MW Intermountain Power Project (IPP) is completed in central Utah, California will take about 50% of the power produced. While power and profit are wired directly to California, air pollution is left behind.

But plans for the Allen-Warner Valley Energy System proceeded without reference to California transforming its policies regarding energy supply. Over the past five years, California has made a fundamental decision regarding its energy resources. Rather than relying on conventional "hard path" resources of oil, gas, coal and nuclear power, the state has given top priority to the use of conservation and renewable resources and has considered the development of conventional sources of energy only as a last resort.

"Geothermal, cogeneration, and renewable energy sources including solar are available now," says the California Energy Commission's *Second Biennial Report*. "They should be expanded because of their favorable characteristics, efficiency, more stable costs and the fact that they are indigenous to California."

Environmentalists and the electrical utilities squared off over the AWVES. To participate in the project, the California utilities were required to receive a "certificate of public convenience and necessity" from the PUC. But if the PUC found that the utilities didn't really need the project, or if they were convinced that there was a better way to supply California's energy needs, the permit would be denied.

The central question was, is the AWVES really needed? The utilities insisted that it was, that they needed the electricity to satisfy inevitable growth in demand. Environmentalists argued that the utility's energy demand predictions were much too high and that a combination of conservation and alternative energy sources could render the project unnecessary.

"The energy problem is a lot more malleable than the utilities have been telling us," said the Environmental Defense Fund. "There is remarkable evidence of how much flexibility there is, once somebody looks at the numbers. The utilities may still think they need to build more dinosaurs like the AWVES, but the point is that they don't, if they'd look elsewhere."

"Elsewhere" might have been the BLM's environmental impact statement on the proposed AWVES. The question "Is the power really needed?" was asked so many times that the agency decided to prepare its own forecast of energy demand independent of the utilities' projections. The analysis slashed the estimate of California's requirement by 547 megawatts (it was 2050) and cut Utah's 125-megawatt share to 10 megawatts (all for the city of St. George). The report also showed that a strong conservation program, coupled with energy from cogeneration, biomass, wind, geothermal plants and coal could produce more than twice as much energy as the proposed AWVES.

"Elsewhere" might also have been the

Coming Up in the Allen-Warner Story

Air permits

The 500-MW Warner Valley power plant was denied an air permit when it requested one from the regional office of the Environmental Protection Agency in Denver on the grounds that it would violate federal regulations regarding prevention of significant deterioration in air quality. But the sponsors have indicated they will appeal the decision, and the next person to rule on the question will be Anne Gorsuch, Administrator of the EPA in Washington.

Coal Mining

In December 1980, speaking of the Alton coal fields, former Secretary of the Interior Cecil Andrus said, "The lands I have declared unsuitable for mining contain less than 10% of the coal in those federal leases proposed for development near Bryce Canyon. My decision leaves the mining industry free to develop more than 90% of the coal it originally intended to recover."

But four lawsuits have been filed against the decision, all charging procedural error, and Interior must respond to the charges by September 20. What option Secretary Watt will take had not been decided at press time, but an internal memo from July 7 that was signed by Daniel N. Miller, Jr., assistant Secretary for Energy and Minerals, outlined the alternatives:

"It is clear from the breadth of the litigation and from new information which has been placed before the court, as well as the serious allegations of insufficient opportunity for public comment, that a reexamination of the Alton decision be undertaken. It is critical in a matter of this importance, particularly in the first application of the Section 522 unsuitability petition process, that any administrative defects be cured.

"There are a number of options available to cure administrative defects by reconsidering that decision: reconsideration *without* reopening of the administrative record; [and] reconsideration *after* receipt of additional public comment.

"Such reconsideration may be accomplished either: independently and without regard to the existence or status of ongoing litigation; or as a result of a court order or court-approved stipulation, directing a reopening of the administrative record.

"Each of these issues has a suboption regarding the *scope* of the reevaluation. Reconsideration can be: limited to a few factual issues which have been the most questioned; [or] applied to all factual considerations raised by the designation process.

"It is recommended that the second of each of the above options and suboptions be adopted; that is, reconsideration *after* receipt of additional public comment as a result of a court order or court-approved stipulation directing such a reopening applied to all factual considerations raised by the Alton case."

By September 20, readers will be able to determine by keeping track of newspaper headlines which option Secretary of the Interior Watt chose.

If the worst were to happen, and the Alton coal field were declared suitable for mining, then the mining companies would have to apply for a mining permit; the application would be challenged by environmental groups.

If the application were granted, however, and if Anne Gorsuch were to grant the Warner Valley plant permission to burn coal, then the way would be cleared for all three parts of the Allen-Warner Valley Energy System.

Environmental Defense Fund's (EDF) computer-based "Alternative to the AWVES: A Technical and Economic Analysis." Using the utilities' assumptions, the EDF report shows that a variety of measures using conservation and alternative technologies could not only "fully match the AWVES and other projected power plants in terms of energy, capacity, reliability and timeliness," but that they could cost consumers some $500 million less in the next decade than using coal.

A *New York Times* editorial said EDF's analysis could mean "that the changing economics of electricity generation has rendered the large-scale power plant obsolete, and that it is inertia and lack of imagination, not cost advantage, which now drives utilities toward conventional solutions to energy needs."

But the California utilities maintained that they needed the AWVES. "We find no bases in fact whatsoever for these exaggerated estimates," said Southern California Edison's vice-president Glen J. Bjorklund, in response to the BLM's figures. "We've cranked in what we think is a prudent amount of cogeneration, geothermal and wind based on estimates of what firm capacity would be. I can say categorically that it would be technically impossible for solar to be developed in that quantity in that time frame. There's no question about that."

Yet neither PG&E nor SCE ever submitted a serious analysis supporting the contention of need. In fact, the utilities' testimony before the PUC often raised questions about the reliability of their energy planning.

To begin with, the utilities used outdated forecasts of energy growth rates of more than 3% a year. By comparison the Energy Commission's forecasts were less than 1.6%, the lowest rates yet for California. Moreover, CEC noted that "the downward trend [in the growth of energy demand] is not slowing, and the 1.6% does not take into account the effects of many conservation programs only now beginning to take effect. Even a cautious estimate, admittedly preliminary, of the potential savings from these existing or likely programs suggests [growth in] electrical demand is approaching zero."

Even using the utilities' outdated demand figures, however, statements by SCE and PG&E revealed that their need for AWVES was marginal. Most significant was the admission by SCE's Glen Bjorklund that SCE simply does not know whether AWVES is going to be needed or not. Bjorklund's statement followed SCE's announcement of a major shift in policy that seems to render AWVES unnecessary by itself.

After repeatedly insisting that it didn't expect more than 10% of its supplies to come from alternative energy within this century, the utility suddenly announced that company policy is "to make renewables our preferred technology—to make it happen." The giant California utility's new plan is to satisfy up to 30% of its extra power needs by investing in renewable and alternative sources of energy. That means SCE is more than doubling its commitment to wind, geothermal power, solar power, fuel cells, hydropower, industrial cogeneration and load management.

SCE attributed its change of mind to "some significant successes in a number of research and development areas." But as the *Washington Post* suggested, "It seems equally likely that the utility took a second look at such things as skyrocketing costs of capital financing, the decreased demand for electricity and the realistic technical potential of new energy sources."

In a less dramatic style, PG&E was also showing signs of moving away from the AWVES. In testimony before the PUC, PG&E vice-president Nolan Daines said the utility no longer needed its share of the AWVES in the time originally scheduled. In a quiet announcement, PG&E expressed its intention to sell 50% of its share of the energy system, apparently because of financial difficulties.

When the staff of the California Energy Commission completed their analysis last winter of whether PG&E and SCE needed to participate in the AWVES, their conclusion was predictable: "Feasible preferred alternatives to AWVES exist, and the strategy of not proceeding with AWVES shows clear advantages compared to the disadvantages of doing otherwise." What is startling is the figures supporting that conclusion.

For PG&E, the CEC analysis showed that the utility not only needed less than half of the energy that the AWVES would have supplied the company, but also, that "there are at least six *separate* ways for the PG&E area to meet this . . . need." These ways include: "conservation, geothermal, cogeneration, purchases already in PG&E and SMUD resource plans, two-year deferrals of 1991–92 retirements, and purchases from SCE."

For SCE, the CEC's staff report showed that either the utility, or other entities within its planning area were already planning or building additions to capacity that added up to "more than 2300 MW above the new capacity needed." Moreover, stressed the report, "that doesn't take into account the more than 1000 MW of hydro fuel cells, Pacific Northwest purchases, cogeneration and solar in SCE's own resource plan. Nor does it count another 7000-plus megawatts of potential capacity from conservation which would be available."

When the official Board of California Public Utilities Commissioners convened on February 11, 1981, the purpose of the meeting was to cast a vote on whether the California utilities should be allowed to participate in the AWVES. Environmentalists in the audience waited for the first axe to fall on the plans. What they saw was the entire project collapse. When the meeting opened, spokespeople for SCE and PG&E made everyone's jaws drop by announcing that the two companies were scrapping the project. They said they didn't need it.

David Roe of EDF commented, "The utilities are voluntarily pulling out of this project because they know the decision would have gone against them. After the most exhaustive analysis ever of a proposed power plant, the record shows that utilities could not make their case. They deserve credit for recognizing things have changed."

Unfortunately, however, the project is still not dead. Utah International still wants to dig up the Alton coal, and the city of St. George, with its 10-MW need, still says it needs a 250-MW or 500-MW power plant (so it can build a reservoir). Nevada Power Company still wants a power source so it can provide its customers with as much electricity as they want, including enough to light the neon of Las Vegas.

The Warner Valley plant's petition for an air permit has been turned down, but the principals intend to appeal the decision; Anne Gorsuch, Administrator of the Environmental Protection Agency, will rule on the appeal. The Harry Allen plant has received its permit. Its power buyers have backed out, and it has no coal to burn, but the Interior Department is thinking over that last problem.

When Cecil Andrus declared the most accessible part of the Alton coal field unsuitable for mining, four lawsuits were filed over the action by Utah International and Nevada Electric Investment Company, the state of Utah, the Environmental Defense Fund and Sierra Club. The department's available options are outlined in a box accompanying this article; it must respond to the charges by September 20.

What combination of events will occur is difficult to predict, but the story is definitely not over, as it had once appeared to be. Readers can watch headlines that will soon reveal the next development in the saga to see if the dragon will rise again. □

Terri Martin is an environmental writer who has worked with, written about and walked through the red rock canyon country of Utah since 1973.

Wilson Goodrich

The Drowning of Coyote Gulch

JAMES COGAN

IN THE SPRING OF 1980, the waters of Lake Powell crept up the Escalante River in southern Utah to drown lovely Coyote Gulch. The reservoir has receded a bit this year, exposing the remains of the historic junction of the gulch with the Escalante

River. The damage is indelible: the lake water has bleached the once-intense color out of the lower twelve feet of the sheer canyon walls. Floods have washed much of the mud away, but many areas have still not recovered from their burial. And though the waters have slipped down-canyon because of an arid winter, they will return with the next rains.

Because the reservoir's designers used faulty maps, this inspirational spot, a principal route to the Escalante wilderness, is already disfigured and may be doomed. Other treasured places, including Stevens Canyon, may soon choke on Lake Powell's fluctuating backwaters. Unless such floodings are prevented, the last of the wild canyons that once filled the entire Glen Canyon region will be lost.

Coyote Gulch is vulnerable because it is not part of a designated wilderness area, nor is it included in the national park system. This spectacular 1000-foot-deep slit in the sandstone plateaus lies within the administrative boundaries of Glen Canyon National Recreation Area.

Through the 1930s and 1940s, only a handful of people plunged into the depths of Glen Canyon to explore its secrets and admire the intense but gentle beauty of its colorful rocks and sands.

In the 1950s, as interest in preserving wilderness and wild rivers began to increase across the nation, the Bureau of Reclamation stepped into the area with a plan to impound the Colorado River in a long series of lakes. Riding a tradition of pork-barrel politics and popular acceptance of water-development projects, the bureau quickly gained the Eisenhower administration's support and the backing of many congressmen. Pledging to provide jobs, control floods, generate hydroelectric power and back up huge reservoirs for recreation, the bureau neglected to mention that the reservoirs would drown some of the most beautiful canyons on earth.

In a show of solidarity, conservation organizations brought this fact to public attention. Winning tremendous grassroots support, they managed to preserve the wild canyons of Dinosaur National Monument against several proposed dams. But because of political compromises and tradeoffs, they failed to save the still-remote hidden gorges and grottos of Glen Canyon.

Congress passed the Colorado River Storage Act in 1956, and President Eisenhower immediately signed the bill into law. In part, it authorized the Bureau of Reclamation to build a 710-foot-high dam at the mouth of Glen Canyon and to flood more than 180 miles of the Colorado River. Thanks to preservationists, the law also stipulated that the lake not encroach upon any established national monuments in the area, such as Rainbow Bridge.

Beautiful in its own right, Coyote Gulch is also a portal to the mesas and arches of the lower Escalante wilderness.

Gordon Anderson

Though Coyote Gulch is administered by the National Park Service, Glen Canyon Dam and Lake Powell (above) are under the sole authority of the Bureau of Reclamation. When Lake Powell was filled to its legally mandated level, the floodwaters crept through the gulch to wash against the foot of famous Rainbow Bridge, a national monument.

In 1968, the floodgates of the newly completed Glen Canyon Dam closed. As the waters backed up into Navajo Canyon, the physical remains of the region's heritage began to vanish. Hole-in-the-Rock crossing was drowned. Then the Crossing of the Fathers slipped beneath the rising waters. The Music Temple was stilled. Hite, the Dirty Devil and Gypsum Canyon went under. Finally even the rapids of Cataract Canyon ceased to roar. Thousands of petroglyphs, ancient ruins, moki steps, old mines, cabins and springs quietly disappeared.

The reservoir also flooded the lower reaches of the famed Escalante River canyon, a candidate for national park status in the 1930s. The Escalante River watershed contained some of the most varied and fascinating canyon country on the planet. An especially wild landscape characterized the region of a main tributary of the Escalante—Coyote Gulch.

Reclamation engineers surveyed and mapped most of this area. The dam's spillway lay at 3711 feet, but planners set the reservoir's normal operating level at 3700 feet, allowing 11 extra feet of storage in the event that some overriding need for it should arise. Maps by the Bureau of Reclamation and U.S. Geological Survey issued after the survey showed that natural wonders such as Rainbow Bridge and Coyote Gulch lay above the highest possible water level at 3711 feet, safe from future encroachment.

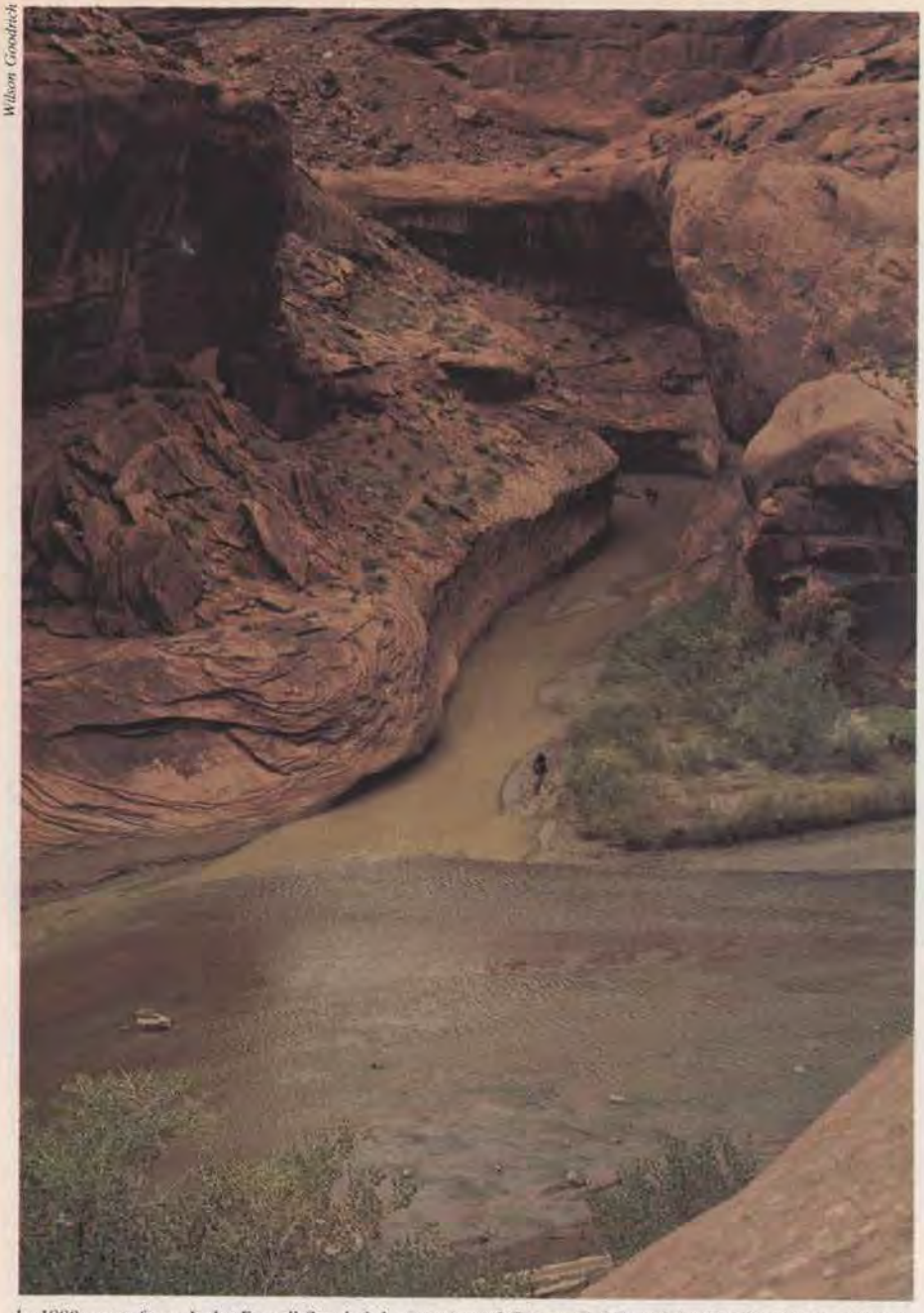
But the maps were wrong. Several years ago, the base of Rainbow Bridge, the most outstanding natural arch in the world, was awash in the dissolving waters of Lake Powell. The swelling reservoir was back there again last summer. Now Coyote Gulch is being invaded, too.

Millions of people are affected. Since the mid-1950s, a growing number of mathematicians, judges, college students, factory workers and desert rats, among others, have bounced their vehicles over the potholes, washes, rocks and ruts of the Hole-in-the-Rock road to get to the isolated water tank marking the head of Hurricane Wash. Leaving their machines, they headed down the hot sands of the Hurricane on foot.

Many people have realized that true progress comes only with the development of the human spirit; many Americans see their wilderness as one of the nation's most valuable resources, ideally suited to provide enrichment. As a result, they head there in droves searching for solitude, personal challenge, inspiration, recreation, a kinship with the natural world and other qualities and opportunities rapidly disappearing from our modern technological world.

One after another, people trekked down

Wilson Goodrich



In 1980 water from Lake Powell flooded the junction of Coyote Gulch and the Escalante River (above, before the flood), incorrectly mapped as safe from the reservoir's fluctuations. Lowering the lake's maximum operating level just two feet—from 3700 to 3698 feet—would prevent further harm.

the Hurricane because it led to Coyote. Once in the gulch, they let the waterfalls, seeps, springs, tanks, arches, dives, rincons and alcoves work their magic and became eternally captivated.

Coyote Gulch has become a particular attraction for canyon enthusiasts in recent years, not only for its own beauty, but also because it is one of the last open portals to the lower Escalante wilderness. From the Coyote-Escalante junction, they may ascend the main Escalante Gorge to Stevens, Scorpion or Moody Canyon. Or they can head up into the distant world of the Waterpocket Fold, or higher to legendary Wild Horse Mesa. But if they venture even a short distance downstream they will find only the silt, the flotsam and the unsightly mess of a fluctuating reservoir.

In the spring of 1980, the Federal Water Power Resource Service (as the Bureau of Reclamation was briefly designated) allowed the water to rise above 3700 feet. In early June, several groups of hikers from the Salt Lake City area were shocked to find a reservoir flooding the lower portion of Coyote Gulch.

A flurry of protests were immediately hurled at the National Park Service. Since it had been given administrative authority over the vast desert lands of the Glen Canyon region and over surface use of Lake Powell in 1972 by the law establishing Glen Canyon National Recreation Area, the agency was responsible "to preserve scenic, scientific and historic features, contributing to the public enjoyment of the area."

But the National Park Service was surprised to learn of the flooding. Glen Canyon's former resource-management specialist, Bill Supernaugh, explained that before 1972, almost everyone believed that the mouth of Coyote Gulch lay above the lake's high-pool level. In that year, however, surveys by the Utah Department of Transportation and the Bureau of Reclamation placed the 3700-foot elevation far upstream of the mouth. Only then did the Park Service become fully aware of the fate in store for Coyote Gulch.

"It didn't matter," Supernaugh said. The 1972 law establishing the recreation area prohibited the National Park Service from interfering with the operation of the dam and reservoir. "That responsibility rested solely in the hands of the Bureau of Reclamation," which, Supernaugh explained, was directed by law to use the storage for hydropower generation and flood control.

"Besides," he continued, "no one ever really believed the lake would rise to its operating level. The dry conditions of the region did not produce much water." The news of the flooding, Supernaugh admitted, "was quite unexpected."

Jay Wells, Escalante's subdistrict ranger for the Glen Canyon National Recreation Area, described subsequent efforts to cope with the problem. "Engineers of the Federal Water Power Resource Service suggested that we build a floating walkway around the junction, or that we place a ranger with a boat in the locale to transport people into the main Escalante Canyon and back. Instead, we decided to improve a rough trail up the ridge between the main canyon [Escalante] and Coyote Gulch, allowing hikers to bypass the junction on foot."

To be optimistic, Supernaugh pointed out that "in some respects the flooding . . . can be looked upon as a good thing. This will force people to use other canyons such as Harris Wash and Twenty-Five-Mile Wash [both of which are accessible to trail bikes] to get to the Escalante. Coyote Creek is heavily overused. This will give it a chance to recover and give the Park Service some time to implement a management plan for the area."

The "general management plan" he referred to calls for administering most of the Escalante-Coyote Gulch area as wilderness. Jay Wells mentioned that "together with the Bureau of Land Management, the National Park Service hopes to determine the carrying capacity of the different canyon areas, institute a permit system to control use, and

issue various regulations to protect the remaining wilderness quality of Coyote Gulch and other specified natural areas from further degradation and overuse."

But the wilderness qualities of Coyote, Escalante and Stevens canyons are facing a far more deadly menace than vibram-soled boots and too many tennis shoes. A reservoir can deface a canyon for centuries.

Some people may claim that a reservoir is the highest and best use of the canyon area. Others may cite the need for energy as justification for this flooding. To put all these concerns into proper perspective, one should examine the potential answers to the question: who will benefit from raising Lake Powell a few feet each spring, then lowering it back each fall?

It certainly won't be the hikers and wilderness enthusiasts. They lose a natural trail, access to the lower Escalante, the wonder of the Coyote-Escalante junction, and considerable sympathy for the managers of Glen Canyon National Recreation Area.

It can't be the fishermen. The end of the Escalante arm of Lake Powell is often jammed with hazardous flotsam, and it is the natural dumping ground for tons of Escalante silt. Fishing will not show much improvement.

Ranchers lose a few more miles of canyon bottom land. Their cattle, a familiar sight in the canyon country for nearly a century, will not be able to get through deep water and quicksand. They will lose access to some valuable feeding grounds.

That leaves the urban residents of the Southwest. Many of these people already benefit, to some degree, from the dam's generation of hydroelectric power. More water will produce more power, it can be argued. But Glen Canyon Dam is built too high. There is not enough water in the Upper Colorado River Basin to fill this huge impoundment and still maintain high levels in all the other reservoirs along the river. When the next dry spell comes to the region, every dam along the river will have to lower its pool to provide an equitable distribution of water to all the states in the Colorado River Basin. The gains in power generation from a brief rise in the lake's water level each spring will be minuscule and short lived.

In the past, upper-basin states promised to pay the lower-basin states an annual fee for holding back water needed to fill Lake Powell. But last summer the lake reached its operating level of 3700 feet and became legally filled, releasing the upper-basin states from their financial obligation to the lower basin and removing perhaps the greatest pressure to raise the lake to its highest level.

The major reason to back water up into Coyote Gulch lies in the mandate Congress gave to the Bureau of Reclamation in 1956 to store water behind Glen Canyon Dam. The present managers of the dam interpret that mandate as calling for as much stored water as the dam will hold, regardless of the impact on Coyote Gulch, the Lower Escalante River or Rainbow Bridge.

A more rational action would be to ask Congress to lower the maximum allowable lake level to 3698 feet. This would preserve Coyote Gulch from further abuse, limit the potential deterioration of Rainbow Bridge, correct a rather costly mistake made by Reclamation's surveyors and balance utilitarian development of the region with some farsighted conservation.

Unfortunately, the kind of conservation the present administration and the officials of the Bureau of Reclamation prefer brings development. It's the same attitude that built Glen Canyon Dam, whose construction ushered a development boom into the Southwest and stimulated a growth in consumption that threatens the very special beauty of this corner of the West.

Unless some kind of restraint begins at Coyote Gulch, the path may soon be cleared to industrialize the area around Escalante. The plans have been underway to do it for a long time.

For example, the state of Utah proposed a modern highway linking the marinas along the west border of Lake Powell; the idea was approved by Congress in 1972. The Park Service did not object. One proposed route would bridge Escalante Canyon near the junction of Coyote Gulch. All that remains to be done is for Congress to provide funds.

Another plan is to mine the abundant coal in the region. The huge deposits in the Alton Hills below Bryce Canyon National Park have stimulated miners' appetites. Massive coal-fired power plants have also been proposed for the Kaiparowits Plateau above Coyote Gulch.

These projects would add their impacts to those of other proposed developments, such as synfuels plants and the MX missile system. They would also add to the air pollution that could spread over the region if clean air standards are relaxed over the parks. The impacts on the region from this complex combination would destroy many of the values of the wilderness.

Coyote Gulch would be a good place to begin protecting this area. It would stimulate valuable discussions bearing on the future of the region. Americans must decide what kind of "progress" they want and what heritage they will leave for their children. □

James M. Cogan is a free-lance writer and environmental historian who lives in Hailey, Idaho.

Photographers for the Parks

ROBERT CAHN

Sierra is proud to present these examples from American Photographers and The National Parks, *both a book and a museum exhibit assembled and written by Pulitzer Prize-winning journalist Robert Cahn. The exhibit consists of 204 photographs taken in national parks, or areas that later became parks, and is a partial history of landscape photography over the last hundred years. The following textual excerpt is from Mr. Cahn's curatorial notes in the book, to be published by Viking Press in September.*

Brett Weston (1911–) Untitled, 1978. *Hawaii Volcanoes National Park, Hawaii.*

FROM THE VERY BEGINNING, photographers have had a more special relationship with the parks than have any other artists, because their work so directly resulted in not only the development of the park concept but also the way the public has continued to view the parks and interpret them. Before the idea of a park system was even established, it was the work of photographers that brought public attention to these areas of natural wonder and ultimately aided the political legislation that was to preserve them in their undeveloped state for future generations to enjoy. As time brought the development and overdevelopment of nearly everything else, it was to these very parks, still in their "natural" state, that the people and the artists returned, hoping to remind themselves of a world that was possible without domination and disruption at the hands of mankind.

Photography has been recognized as one of the principal tools of communication in the twentieth century. A universal language, it transcends both the spoken and the written word. Accordingly, its allusion to reality has made it a resource of "believable" information to all who have looked at pictures. Although reality as represented by a photograph is arguable, it was its believability that gave photography such an important role during the formative years of the park concept. During surveys of the West, photographers were invaluable. Even in the company of painters, writers and geologists, it was their pictures that brought "proof" to the public and the legislators that such extraordinary places did exist. Their images did more than just scientifically document new frontiers; as prints and reproductions appeared in newspapers, the visions provided by such artists were also the first contact that most people had with these distant wonders. It left them curious, awed . . . and wanting to see for themselves.

To this day, photographers have continued to keep the public's attention focused on these areas. As with all great themes, the landscape in the photograph has continued to serve as an educational tool, an aesthetic pleasure, a reminder of the grandeur and complexity of nature and a foundation upon which artists have chosen to build their own styles of "seeing." □

William Henry Jackson (1843–1942) Yellowstone Lake, 1872, *Yellowstone National Park, Wyoming*. From the Museum of New Mexico Collection, Santa Fe.

Timothy O'Sullivan (1840–1882) Ancient Ruins in the Cañon de Chelle, New Mexico, 1873, *Canyon de Chelly National Monument, Arizona*. From the Library of Congress, Washington, D.C.

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As the only continuous filament polyester fiberfill, it simply can't separate or shift around. Forget the aggravations and discomfort caused by fillers that clump up or mat. No more cold spots to let the biting wind through — even if your gear gets wet.

PolarGuard is super fast-drying, with no moisture retention. And it's percolation-resistant as well. Real advantages over down and other fiberfills:

COMPRESSION	LOFT (Inches)		
DRY	PolarGuard	Down (550 Fill)	Premium Staple
Initial (no load)	3.99	4.17	3.28
0.1 PSI	2.33	1.26	1.46
0.2 PSI	1.67	0.82	0.96
0.3 PSI	1.47	0.69	0.73
0.4 PSI	1.33	0.51	0.59
SATURATED WET			
Initial (no load)	3.94	0.74	2.07
0.1 PSI	2.27	0.40	1.17
0.2 PSI	1.58	0.32	0.65
0.3 PSI	1.34	0.28	0.57
0.4 PSI	1.27	0.21	0.44
RATE OF TEMPERATURE DROP (°F/Hr)			
Dry	7.2	7.2	10.8
Damp	10.8	12.6	21.6

These comparisons, produced in controlled laboratory tests, prove **PolarGuard** insulation is equal to down, and superior to premium staple fiberfill, when dry. And **superior to both when damp** – a common occurrence when you're out in the field.

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For a current list of manufacturers who use PolarGuard and a free reprint of Don Roberts' personal account of his wilderness adventure, write to: **Reliance Products**, 1614 Campbell, Oakland, CA 94607.

Photographs by David Halsey

Peatlands such as these near Aitkin, Minnesota, perform crucial biological and hydrological roles. Peat accumulates at about three inches a century as layers of plant remains partially decompose. Water percolates slowly through these layers on its way to lakes or estuaries. Peat has a high energy potential and can be mined for fuel; with effort, it can be harvested or farmed. But peatlands are also habitats for animals and plants, some rare, and are vital components of an area's climate and water flow.

PEATLANDS: More Valuable Left Alone

MICHAEL J. PHILIPP

THE VAST PEATLANDS of the United States are among the least appreciated of all wild areas. Though not as spectacular as lofty mountains or lush forests, they are nonetheless aesthetically and biologically varied. A peatland is a contained ecosystem, with its own patterns of water flow and plant and animal interrelationships.

But peat also has a high potential for energy production. As a result, energy companies (including a major utility in Minnesota) and the federal government are examining the peatlands of Minnesota and other states with an eye toward mining and gasifying this fossil fuel.

What is peat? One can think of it as an early stage in the formation of lignite or coal. It is an accumulation of the undecomposed or partially decomposed remains of grasses, trees, mosses and other marsh and swamp plants in a wet and—in Minnesota—a cold environment. Anaerobic conditions prevent fungi and bacteria from decaying the organic material as they ordinarily would. Peat accumulates at a rate of about three inches a century, although part of the material's definition is that it be at least an eight-inch layer. In most places in the Upper Red Lake peatland of Minnesota, the layer is eight to fifteen feet thick.

Although the formation and structure of peatlands are still poorly understood, slope may be an important factor. In the Upper Red Lake peatland, there is a gradient of from one to five feet per mile; that may not seem much of a slope, but water will run down it. The current explanation of the Red Lake peatland's origin is that, after the warm climatic period of mid-postglacial times, organic material dammed up the water flow and peat built up on the slightly sloping surface. The Red Lake peatland is gradually expanding westward and, if left undisturbed, probably will continue into the Red River valley during the next several thousand years.

Like all other fossil fuels, peat is distributed unevenly throughout the world. A little more than half of the earth's 1.6 billion acres of peat lie in the Soviet Union. The United States has about a sixteenth of the total, much of it concentrated in Alaska. In the contiguous 48 states, Minnesota has about a quarter of the peat, including the largest single peatland—the Upper Red Lake or glacial Lake Agassiz land, which crosses the border from northern Minnesota to southern Manitoba.

Peat has an energy content of about 8000-9000 BTUs per pound (dry weight), or about half that of coal. Like coal, it can be burned directly or turned into gas and used as fuel. The total energy content of all the peat in the United States is about 1400 quads (1 quad equals 10^{15} BTUs). For reference, the United States consumes about 73 quads of energy per year.

Minnesota alone has 190 quads' worth of peat; because the state consumes only about 1 quad per year in total energy, it could use its own fossil fuel to supply its energy for 200 to 300 years, depending on the exact rate of mining and consumption, instead of importing fuels or energy from Canada or other states. A major natural gas company, Minnegasco, is already making plans to mine and gasify peat on a large scale at the still-

wild Upper Red Lake peatland.

The lands have several uses. Some that require extraction of the peat include: manufacture of coke, resins, waxes and absorptive materials; production of potting soil and soil conditioners; and production of energy by burning or gasifying. Uses that do not require extraction include: farming, forestry, production of biomass, provision of habitat for wildlife and provision of subject matter for scientific investigation. Whatever use is in mind, officials and the public should be cautious when contemplating schemes for massive development.

Developed Peatlands: The Case of the Sacramento Delta

IN THE SECOND HALF of the nineteenth century, when Chinese laborers went to the northern end of the San Francisco Bay, to the delta where the Sacramento and San Joaquin rivers join, they found an enormous marsh 25 miles wide and 50 miles long. In one of the greatest engineering projects of its time—the construction of more than 1100 miles of levees—the laborers uncovered more than half a million acres of what was unquestionably some of the finest farmland in the world. The land was solid peat, the remains of what had once been a tule marsh. The resulting tracts became productive farms, major contributors to California's agriculture.

But peat has a tendency toward what geologists call "consolidation"—that is, it settles in much the same way that a new building will settle for the first few years until it finds a solid foundation. Once the water was drained from the peat, the force of gravity and oxidation began to lower the soil level at the rate of about three inches a year, a rate that continues today. This means the farmland that was at sea level in 1900 is now from 15 to 20 feet below sea level. The levees that were originally intended to keep out the spring floods are now forced to hold back thousands of tons of water all year long.

The eroding levees are in bad shape, and the farmers feel their lands continuously threatened by water, the level of which is fifteen feet above the crops. In 1980 a study done by the state Department of Water Resources rated the condition of the levees. A total of 52 tracts were inspected. Of them, only 20 came away with a rating of "fair"; 28 were "poor"; and 4 were "very poor."

Maintaining the levees is a cost of farming in the delta, and in recent years it's become expensive. Most delta farmers have formed special reclamation districts and have assessed themselves an average of $25 an acre a year to pay for maintaining and rebuilding the levees; but they're fighting a losing battle because they can't afford the clay and sand that would make the levees hold for long periods of time.

In 1980 alone, there were six major breaks in levees, which destroyed thousands of acres of farmland and threatened to ruin the farmers who worked them. Repairing a broken levee is neither easy nor cheap; in the case of Lower Jones Tract, the cost of repairing the break and operating pumps capable of draining 400,000 gallons of water a minute from the inundated island ran to more than $4 million. Federal disaster relief paid only three-fourths the cost of the pumps, leaving the fifteen farmers in the Lower Jones Reclamation District to raise almost half a million dollars.

The delta's future is cloudy. The federal government has shown little inclination to help the farmers. California passed a bill several years ago that created a special fund to contribute a small annual percentage to repairing and maintaining the levees, but the fund has yet to receive money. Cynical farmers say the delta is a political pawn in the years-long struggle over the Peripheral Canal, a proposed 50-odd-mile canal that would divert water from the delta's supply rivers to southern California.

If the levees are allowed to continue breaking, it may happen that the delta farmers will have to leave and let the water reclaim the area, creating a lake that could cover more than 500,000 acres that were formerly wild lands. But if the levees are shored up continually, they will still keep breaking, because their task is so much greater than they were designed for.

The problems are serious and cannot be solved to everyone's satisfaction. It is difficult to find fault with the nineteenth-century people who caused them by reclaiming the peatlands. In those days, they didn't know any better.

This article was developed from a feature by W. A. Van Winkle that appeared in the East Bay Express; *used with permission.*

The first reason is that peatland hydrology and ecology are in their infancy. Scientists have barely begun to understand the complicated interactions among the water flows and vegetation patterns. Dr. Eville Gorham, a wetlands specialist at the University of Minnesota, has called peatland "the most delicate adjustment of vegetation to hydrology and water flow known to man."

In the Upper Red Lake area, satellite photographs (the most effective method of studying bogs' patterns) show a large band of water called a "water track" that moves east, then north. East of the track is a fen consisting mostly of sedges (closely related to, and resembling, grasses) and dwarf birch shrubs. For as-yet-unknown reasons, the shrubs are sensitive to the water flows in some way that often prompts them to grow in lines perpendicular to the flow. Some sources of water for the fen's tracks are also unknown. Mining an area whose dynamics are so unexplored seems risky.

The second reason to be cautious is that the effects of large-scale mining on regional hydrology are completely unpredictable but could be serious. Mining may exacerbate problems caused by spring run-off and may create acidic pools. If mined peatlands erode, nearby spawning beds in rivers' tributaries could be damaged by peat buildup. Mining in one area could affect areas far from the mine site and could alter the whole region's hydrology. This potential suggests that development should take place first on small, isolated bogs to gauge the effects.

Another reason for concern is that past efforts to alter the peatlands have been ill-fated. Early this century, developers undertook a vast project to dig a system of ditches that would drain the water and create lands suitable for agriculture. But the grid of ditches succeeded only in altering the vegetation by making some areas drier than others; the land did not drain. Such mistakes are visible for years; scars of large-track vehicles might well last for centuries, and marks made by small-track vehicles in 1966 are still visible.

In addition, peatlands are both habitat for some birds and stopping-places for others that are migrating, as well as habitat for large mammals such as timberwolves and white-tailed deer. The several varieties of rare plants carry significant genetic information that should be preserved.

Finally, peatlands are among the United States' last great wild areas. But the character of the lands, which depends on the delicate balance of water and plants, can be preserved only by setting aside a large portion of them. □

Michael J. Philipp, an attorney practicing in Minnesota, is a member of the North Star Chapter Legal Committee.

Pocosins of the Southeast

BILL THOMAS

POCOSIN—a strange-sounding word, used mostly in academia. Most people living near one would just call it a swamp; an Algonquin Indian word, "pocosin" literally means "swamp on a hill." But pocosins are distinctly different from most swamps. They are evergreen peat bogs, occurring only from southern Virginia down to Georgia along America's southeastern tidewaters. Usually higher than surrounding terrain, they tilt by as little as 18 inches to as much as 3 feet in a single mile, draining into the sea.

As landscapes go, the pocosin is not attractive. None has ever been nominated to become a national park. But climatically and biologically pocosins are important because they store heat and protect salinity balances; and since the energy-hungry 1970s, they have become threatened.

Although some pocosins are timber producers, in general they have been considered commercially worthless. Their spongy, acidic peat soil, wet most of the year, makes it difficult to build roads or transport equipment into them to clear their awesome undergrowth. In 1764 George Washington and a group of Virginia planters tried to clear 40,000 acres of Virginia's Great Dismal Swamp, some of it pocosin, for farming. The canal they built for drainage is still there, but the farming attempt failed because the would-be developers lacked the technology that would make it possible to farm such areas. Today the technology exists.

First Colony Farms, which owns 372,000 acres of a pocosin on a peninsula just west of North Carolina's Outer Banks, has begun a $1.5-million peat-mining operation that will strip up to 15 feet of the surface layers of organic peat and permit successful farming on the mineral-laden soils beneath. The peat removed is being touted as a major source of energy.

Machines designed in Finland (where peat has been mined extensively for many years) cut the peat from the ground in large sausagelike rolls that are then laid in fields to be sun-dried. Drying takes up to several weeks this way, but other methods proved prohibitively expensive for the firm. Once dried, the rolls can be loaded and shipped to nearby power plants for burning.

A study by the Research Triangle Institute puts the farm's recoverable peat reserve at more than 400 million tons on some 200,000 acres, enough to fuel four 400-megawatt power plants for 40 years, or one 80-million-cubic-feet-per-day peat gasification plant for 50 years. Another 2.2 million acres in 41 North Carolina counties may succumb to peat mining by the end of the century.

Virtually no opposition has been mounted by environmental groups against the peat mining. The local scientific community is less sanguine. Duke University's School of Forestry and Environmental Studies and the North Carolina Department of Natural Resources and Conservation Development cosponsored a symposium on the need for a pocosin land-management program.

Pocosins, according to the symposium report, are critical to a healthy natural environment. Besides providing habitat for flora and fauna, such as the carnivorous pitcher plant and the pond pine, the black bear and the rare *Hyla andersoni* tree frog, pocosins serve as giant sponges for an area's rainwater, storing it for gradual release into streams flowing to estuaries and, ultimately, the ocean. Pocosins may play a critical role in preserving the fresh- to salt-water balance in estuaries, though few studies have been done on the subject.

Finally, pocosins may have a far greater effect on the climate of the southeastern United States than is currently realized. "There's absolutely no question that wetlands have considerable direct impact upon climate," said Pat Gannon, Sr., meteorologist with the Environmental Research Laboratories of the National Oceanic and Atmospheric Administration.

Gannon has closely studied the muck lands of the northern Everglades in Florida, which he suspects bear great similarities to the pocosins. The Everglade muck lands are being used to raise sugar cane and cattle. Gannon believes that the continuing loss of the muck (five feet in 30 years because of drainage and agriculture) may change local climate drastically, with southern Florida perhaps ultimately becoming a desert. □

Bill Thomas has written several books on environmental topics, including The Swamp, *a study of America's great swamps.*

Environment in the '80s– The Carter CEQ Says Farewell

One of the more significant changes the Reagan administration has made in the structure of the executive branch has been to trim the staff of the Council on Environmental Quality from about 60 to 6. Most staff left on the same day, but before they went, they prepared a thoughtful statement outlining the environmental issues they believe will need particular attention in the coming decade. These are their farewell recommendations.

ENVIRONMENTAL PROTECTION in the United States is past its infancy. There is no question that our national commitment to improving the quality of our environment has accomplished a great deal, especially during the past ten years.

But the job is far from finished. Serious air pollution problems remain in many areas. Overall, the quality of our surface water is not getting any better. Cases of contaminated groundwater are being discovered with increasing frequency.

Clean air, clean water and clean energy are now at the center of public attention, as laws on these issues come up for review by Congress. But several other issues are just as important. Looking into the 1980s, the departing staff of the Council on Environmental Quality, which for the past eleven years has diagnosed the nation's environmental ills and proposed remedies, has identified seven additional major items of unfinished and inescapable environmental business:

1. Handling and disposing of toxic substances and radioactive wastes. Love Canal *was* something new under the sun. The postwar chemical revolution, in creating compounds unknown to nature, has also produced long-lasting substances with unknown new, sometimes dangerous and often delayed effects on human beings and the natural environment. Chemicals are everywhere in our society—in cleansing agents, pesticides, plastics and thousands of other common products. Production of chemicals rose sixfold from 1950 to 1980, and the nation now generates 60 million metric tons of hazardous wastes each year. At the same time, nuclear weapons production and the use of nuclear energy are creating increasingly large amounts of toxic radioactive wastes that must be isolated from the biosphere for hundreds of thousands of years. Finding suitable sites to store and dispose of these wastes will be a major undertaking over the next decade, requiring full participation by the public and by state and local governments. For both commercial nuclear wastes and those generated by defense-related activities, we must have laws to assure that technically adequate and publicly acceptable methods of disposal are chosen and implemented.

America's laws for dealing with toxic chemicals and wastes are potentially powerful. But knowledge of the risks these substances entail and how best to control them is still primitive. Meanwhile, toxic contamination of groundwater is turning up in scores of places, and serious diseases from exposure to toxic chemicals in the workplace and the environment continue to appear.

2. Protecting groundwater. Toxic pollution poses a special threat to groundwater; it literally poisons the wells. We do not yet know just how much of the nation's groundwater is contaminated or how many people may be affected, because we have no national monitoring system for underground water. But evidence of toxic pollution is increasing. For example, 36 community wells in Long Island's Nassau and Suffolk counties had to be closed in 1978 because of contamination by toxic organic chemicals. Those closures alone affected the water supply of more than 2 million people.

There are many causes of groundwater contamination. A history of 30 years of dumping chemical wastes is one. Another is decades of heavy use of synthetic organic pesticides nationwide. Once an underground aquifer is contaminated, the water in that cold, dark, lifeless environment can remain polluted for centuries or millennia.

Groundwater provides 25% of the fresh water used for all purposes in the United States, and the percentage is growing. Half the U.S. population relies on groundwater as its main source of drinking water, so

quantity as well as quality is a concern. In 1975, 25% of all groundwater withdrawals were overdrafts—removals of more than can be replenished—principally in the arid West. If these overdrafts continue at current rates, the cost of pumping groundwater could become prohibitive for many communities and irrigated farms in the Southwest within 20 years.

3. Preserving parks and scenic beauty. Some of our best-loved and most-visited national parks are suffering from overuse. Although the Reagan administration has wisely promised to increase funding for park maintenance, its proposals to enlarge the role of private entrepreneurs in park management may lead to conflicts with significant public park values. Moreover, in the face of continued rural growth and development, there is still a need to acquire and protect new parks and to purchase additional lands within the boundaries of parks already established by Congress. The administration's proposal to cut off funding for the Land and Water Conservation Fund, then, is a step in the wrong direction. If the proposed $66-million reduction in funds already authorized by Congress for the acquisition of parkland is continued through Fiscal Year 1986, the cost of acquiring this land, if it remains available, will rise by at least 15%—or about $10 million in 1981 dollars—each year that purchase is delayed.

4. Conserving agricultural lands and soils. Every year nearly 1 million acres of good U.S. cropland are paved over, built on or permanently flooded. The equivalent of an additional million acres is lost each year through soil erosion and salinization of irrigated land. At the same time, U.S. agriculture is undergoing a major transition to a more intensive use of land. In the 1970s foreign demand for U.S. farm products shot upward, while increases in yield (output per acre) leveled off. As a result, farmers plowed more land—"from fence row to fence row"—to meet the export demand.

No longer are there large U.S. agricultural surpluses. Of the nation's 540-million-acre cropland base, about 415 million acres are in use today; 60 million were brought into production in the 1970s. By the year 2000, virtually all of our high- and medium-quality cropland is likely to be under intensive cultivation. Most of the 125 million acres of potential cropland now used as range, pasture or forest land will have to be cultivated, even though much of it is more susceptible to erosion and would be naturally less productive than land that is now farmed. From this perspective, the irreversible conversion of the nation's best farmland to housing tracts and shopping centers and the continuing erosion of productive soil are serious problems indeed. The result could be substantial increases in the prices of U.S. agricultural products, with serious economic and social implications here and abroad.

5. Managing arid lands. Threats to croplands and grazing lands are especially severe in arid and semi-arid regions throughout the world. Every year productive lands equal in size to the state of Maine turn into desert-like wastelands. Desertification strikes rich countries as well as poor, but the impacts on human life are far more immediate and tragic in such nations as Somalia or Ethiopia, where there are no resources to spare. In America's arid West, 225 million acres—an area roughly the size of the 13 original states—have undergone severe desertification since Europeans came to the West. Yet it is here that rapid population growth, energy development and a growing demand for food are combining to put greater pressures on already scarce water and land.

6. Conserving plant, animal and marine ecosystems. Of the 5 million to 10 million species of plants and animals now living on our planet, more than 1 million may be extinct within our lifetimes, a loss without precedent in the last 65 million years. In most cases, the extinctions will result from physical or chemical degradation of habitats. At least half will be caused by extensive clearing of tropical forests. Of particular importance is the rapid disappearance of the wild relatives and locally cultivated varieties of the world's major food crops, such as corn, wheat, rice and barley. These strains are the source of genetic traits essential to improving crop yields and resistance to pests and diseases. By reducing biological diversity, humanity is squandering its greatest natural resource—a genetic storehouse for development of the new foods, fuels, medicines, fibers and building and industrial materials urgently needed by a growing world population.

Recognition of the need to preserve valuable marine resources by creating national marine sanctuaries has already lagged a century behind comparable efforts on land. The marine equivalents of the redwoods and the Everglades require similar protection. Large-scale international cooperation in setting aside biosphere reserves—particularly in the lands and waters of tropical nations—can provide a hope of preventing massive loss of our diverse living resources.

7. Controlling global pollution. Some polluting activities are a proper concern of everyone on earth, because they threaten resources that belong to all of the earth's inhabitants. The global climate system, for example, is in jeopardy from increasing levels of carbon dioxide in the atmosphere, the major source of which is fossil-fuel com-

bustion. Rising CO_2 concentrations trap the earth's outgoing radiation and thus warm the planet's atmosphere, posing the threat of changes in temperature and rainfall patterns that could seriously disrupt world agriculture within our children's lifetimes.

In addition, the protective blanket of ozone in the stratosphere is being depleted by chlorofluorocarbons and other chemicals used as refrigerants and as propellents in some aerosol spray cans. Besides increasing the incidence of skin cancer, this phenomenon could result in the disturbance of productive ecosystems and in harmful changes in climate. Still another international pollution problem is acid rain, currently a disturbing factor in U.S.-Canadian relations. The pollution travels in both directions, but Canada gets far more acid deposition from the United States than vice-versa. Dumping persistent organic chemicals and radioactive substances in the oceans may have profound, long-term effects over wide areas of the marine environment. International cooperation is essential to solve these problems.

A Nonpartisan Approach

These problems concern all of us, regardless of our position on the conservative-to-liberal political spectrum. While detailed prescriptions for dealing with them will vary, it is possible to reach broad agreement on the kinds of actions suitable for government. We suggest seven actions comprising an "ecumenical" national policy for the environment. It is interesting to find that the actions most protective of resources and the environment are often the same ones that would discourage raids on the federal treasury.

1. Protecting the commons. Air and water belong to everyone and to no one. Unless governments make rules to protect these common resources, individuals and corporations are free to use them as dumps for harmful wastes—and they have. Those who pay most directly for the damage may then be the public at large (as in the case of smog), one unfortunate segment of the public (those living near Love Canal, for instance), or citizens of a foreign country (Canadians affected by acid rain), rather than the producers and users of the substance causing the damage. Thus one aspect of the government's responsibility to protect the commons is to ensure that the costs of production are *internalized*—to insist, for example, that utilities and consumers of electricity pay for cleaner burning of coal, rather than forcing the public (especially children and old people) to pay by suffering respiratory illness.

2. Making the marketplace work. Market forces can be an important element in protecting natural resources. Removal of price controls on oil and gas, begun by President Carter and hastened by President Reagan, has already stimulated energy conservation. Conservation is clearly the cheapest and safest of the ways we now have to satisfy our energy needs. Americans used about 3.5% less energy in 1980 than in 1979 with no decline in gross national product. Setting prices for conventional sources of energy according to cost of replacement—what it costs today to produce that energy from scratch, *including* the costs of environmental protection—will also stimulate the development of solar and other renewable sources of energy. Price incentives can also be built into pollution control.

3. Eliminating government subsidies for resource use. As economists often point out, federal subsidies can lead to waste of resources, misguided land-use decisions and degradation of the natural and human environment. For example:

- Grazing fees on federal lands are about 30% to 50% lower than the fees charged by owners of private land; this encourages overgrazing, which leads to desertification—desolation of native vegetation, erosion and gullying.
- The federal government spends about $3 billion a year on flood control and disaster assistance, much of which encourages and rewards unwise development in floodplains, including environmentally damaging construction on barrier islands.
- The government has subsidized development of the nuclear breeder reactor to the tune of billions of dollars despite increasing evidence that the use of the breeder and the plutonium it would produce will be uneconomical for at least 40 to 50 years, and in fact may never be needed. Reactor research and development continue to focus almost exclusively on technologies involving plutonium in the face of growing concerns that the breeder reactor would substantially increase the risk of nuclear-weapons proliferation by introducing into the world large quantities of plutonium that could be used in nuclear weapons.
- The federal government fails to charge users the full costs of federally supplied water; in the arid West, the subsidized cost is about 10% of the real cost, which encourages waste of precious water and serious environmental damage.

4. Enforcing the laws. Congress and the administration have developed sound environmental protection laws designed to improve the quality of the air and water, to protect endangered species, to prevent toxic wastes from escaping into the environment. These laws should be enforced. Without enforcement they are virtually worthless. Effective enforcement requires adequate resources and vigilant action.

5. Analyzing the effects of government actions. It almost goes without saying that the government should not, through its *own* actions, heedlessly damage the environment. Advance analysis of the environmental effects of government actions is exactly what the National Environmental Policy Act (NEPA) requires. For more than a decade, federal agencies have prepared environmental impact statements (EISs) on their proposed actions, analyzed alternatives and given private citizens a chance to have their say. Through such analyses, agencies have learned how to design highways and major sewer lines so as to prevent urban sprawl and the needless destruction of good farmland. The EIS process has also proved valuable in developing ecologically sound management of national forests and parks.

Unfortunately, there have been many cases of superficial *pro forma* environmental analyses, especially of large public works projects that evolve more from a pork-barrel mentality than from close attention to real needs. The need remains for continued commitment to the effective implementation of the NEPA process and to help agencies and the public use it properly.

6. Providing information and technical assistance. The federal government can help protect the nation's environment and natural resources by providing information and technical guidance to state and local governments, to private parties and to appropriate federal agencies. The recent *National Agricultural Lands Study*, produced by the Department of Agriculture and CEQ, concluded that state and local governments are best able to preserve farmland and *can* do so if the federal government provides technical aid—and if its own public works do not encourage any unnecessary conversion of farmland.

One especially promising way to provide federal technical assistance would be to have the federal government offer state and local governments help, such as legal and scientific advice, in creating greenline parks. Under this concept, a boundary would be drawn around outstanding landscapes, including homes, towns, recreation areas and working farms. Areas within the greenline would be protected principally by state and local actions such as zoning, purchase of easement and development rights, and restrictions on use of such critical areas as wetlands.

7. Cooperating with other nations on global problems. Nearly all the major environmental problems of the 1980s are global as well as national in scope. Some are much

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photo: Bentley Kassal

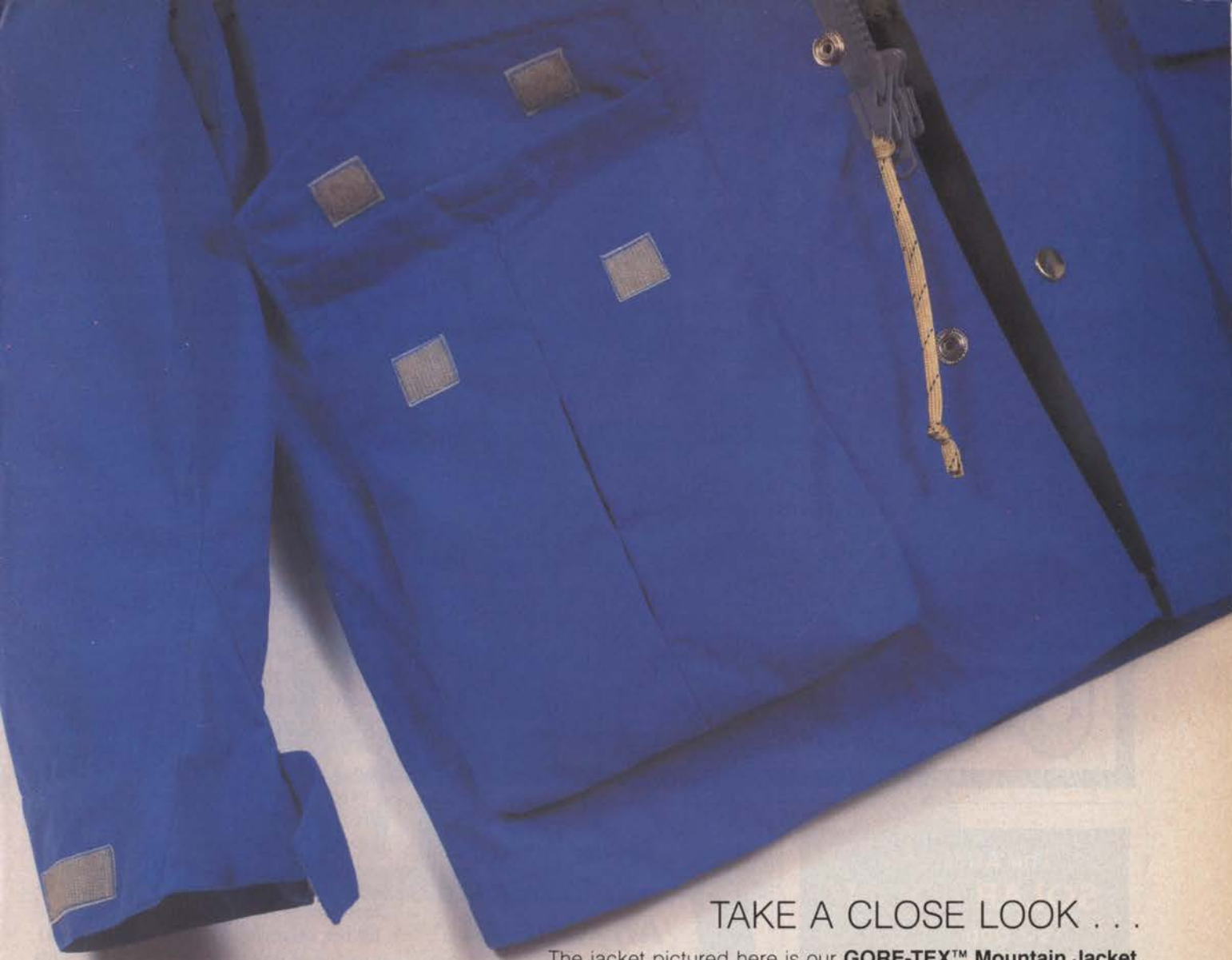
more urgent in other countries than here. For example, the biggest single foreseeable cause of species' extinction is the loss of tropical forests. The United States has only a fraction of the world's tropical forests, but Americans, like the rest of humanity, will be much the poorer for the loss of species that will result from extensive deforestation.

Besides the ethical and economic reasons for the United States to be concerned about the loss of basic resources in other countries, compelling and hardheaded concerns for national security are also involved. Resource depletion, soaring population and the widening disparity between rich and poor in strategically important developing nations could spark instability that would threaten vital U.S. interests. Moreover, if the loss of farmlands and forests restricts world production of food, fuelwood, building materials and so on, the United States and the rest of the world will have to pay escalating prices for the necessities of life. If food and forest production decline elsewhere, the pressures will be great to overexploit or abuse America's resources.

The government's *Global 2000 Report*, issued last year, called attention to mounting world problems of resources, environment and population, and warned that they could get much worse by 2000 unless nations of the world act promptly to change the trends. The *Global Future: Time to Act* report issued six months later discussed what the United States can do, in concert with others, to respond to this challenge. Private citizens can contribute, but the international cooperation needed to deal adequately with global problems must come mostly from governments. One of the best ways the United States can help tackle these problems is through technical assistance—tapping the wealth of our scientific and technical know-how and sharing our experience in taking inventory of and assessing natural resources, managing resources, building institutions and training people.

Beyond the Economic Calculus

All the elements of a national environmental policy discussed so far can be justified by economic calculation. Cost-conscious environmental policy will not only look for effective, money-saving ways to control pollution but will also keep in mind that the costs of doing nothing can be far higher than the costs of cleanup and good management. That's because *all* costs count: the costs of illness or premature death of unknown victims of toxic chemicals; the cost of shellfish beds closed by pollution; the depressed real-estate values in areas subjected to smog; the cost of illness untreated by drugs that will



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never be developed because of extinctions of medically valuable species; the higher food prices that will result if farmland conversion and soil erosion are not arrested. Of course, some of the costs and most of the benefits of environmental protection are extremely hard to translate into dollars. They involve complex economic calculations, the detection of low-level effects of pollution within large populations, and putting a price on human and other life.

Beyond these strictly economic considerations are the intangible values associated with conservation and environmental protection—values arising from bedrock feelings about the relation between humans and nature. Many people—irrespective of their place on the political spectrum—feel that human beings are part of the natural world and should live in harmony with it, rather than seek to be masters of nature, attempting to dominate it entirely for their own purposes.

This feeling is expressed in many ways: in a capacity for awe; in a respect for our fellow creatures and their right to exist on earth; in a resolve to maintain the earth as a beautiful, habitable and productive place for our children and all future generations; in an understanding that, clever as we humans like to think we are, we have not nearly penetrated the mysteries of nature, nor can we anticipate all the effects of our cleverness.

Protecting intangible values requires a genuine conservatism. It means that we must strive to avoid irrevocable losses—extinction of species, paving over of farmland, sacrifice of unique wilderness, irreversible modification of climate—to satisfy short-term goals. It does not mean running the parks for profit by private concessionaires, the way restaurants and gift shops on superhighways are run. It means managing our publicly owned resources with the broadest and most farsighted vision of the common good, not merely for the short-term profit of a few special interests. In our national forests, it means management not only for such easily measured benefits as sustained timber production and flood control, but also to preserve wildlife that may never be hunted or eaten, ecosystems whose workings we do not fully understand, and the beauty of nature.

Clearly, our concern for the human environment must recognize economic realities. But it would be false economy indeed to limit our economic vision to the needs of the present. We recommend instead the long view—the view that looks toward the world of our children and our children's children, linking their destiny to the values of our past that have always depended on a healthy, rich and beautiful earth. □

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The Grinch That Stole The Wilderness

There was a Grinch in the West who hated wilderness. He couldn't stand clean air or clean water, and found the Grand Canyon boring.

Most folks didn't agree with the Grinch. But, they knew that every world has a Grinch or two ...and thought of more important things.

Then one day, the Grinch was called to Washington and put in charge of much of our land, and air, and water.

"Should we worry?" asked the Senator. "About me?" asked the Grinch, with a Grinchy smile. "Just give me a chance, and I'll show you." So they did. And he did!

Behind his Grinchy desk, the Grinch is now at work. No more wilderness! Dirty air! No more parks! Drill for oil!

So the voice of Sierra Club is raised across the land. THIS GRINCH MUST GO!

And he will...with your help.

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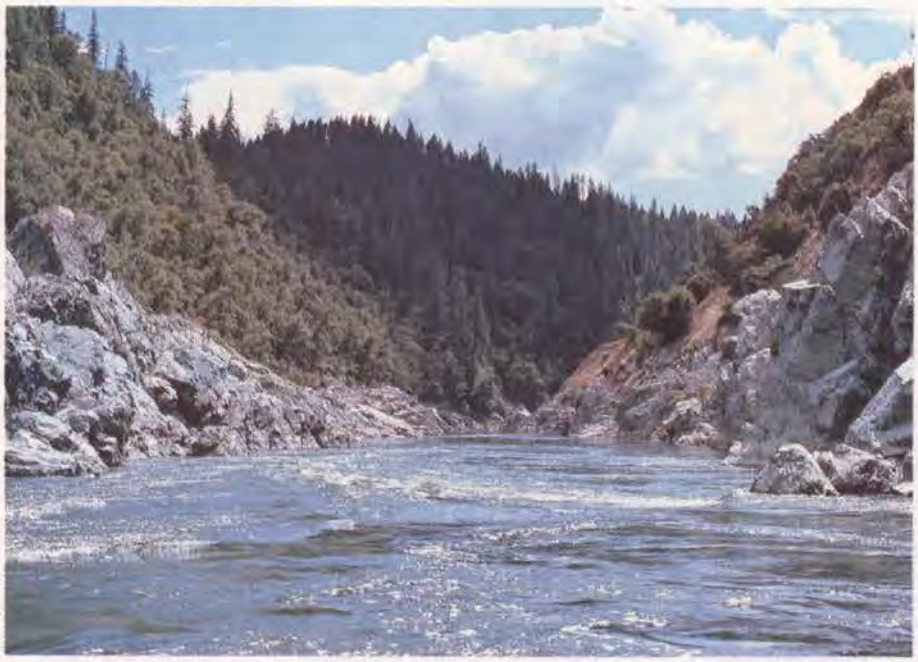
Building the Wild and Scenic System



Liz Hymans

DAVID SUMNER

Past these towering monuments, past these mounded billows of orange sandstone, past these oak-set glens, past these fern-decked alcoves, past these mural curves, we glide, hour after hour . . .

Major John Wesley Powell (1869)

THE ACCOUNT is of a magical day adrift on the Colorado River in Utah's Glen Canyon. Its alcoves are now flooded and its walls awash, but once it was among the most sublime landscapes on the continent.

Along with the loss of Hetch Hetchy Valley on the Tuolumne River next to Yosemite, Glen Canyon's flooding is widely regarded as one of the nation's most poignant environmental tragedies. As a symbol of terminal ruin, nothing quite matches what a dam does to a river and its canyons.

Isn't it ironic, then, that conservation of our nation's rivers lags? We mourn the loss of Glen Canyon, of Hetch Hetchy, of upper Hells Canyon on the Snake and of Flaming Gorge on the Green. We speak eloquently of rivers as ribbons of life, and in growing numbers we raft, canoe and kayak them. So how is it we've managed to protect only .3% of all our free-flowing waters? Why has this happened when we've a base of approximately 3.5 million miles of river and stream, creek and brook to work with?

That the National Wild and Scenic Rivers System to date consists of token remnants rather than a true system is evident using any of several ways to measure. One way is to read a list of the rivers not protected, headed by the Colorado in the Grand Canyon, the dying Stanislaus in California and Colorado's Dolores, whose Slick Rock Canyon is the closest thing left to what Glen Canyon used to be before the dam was built.

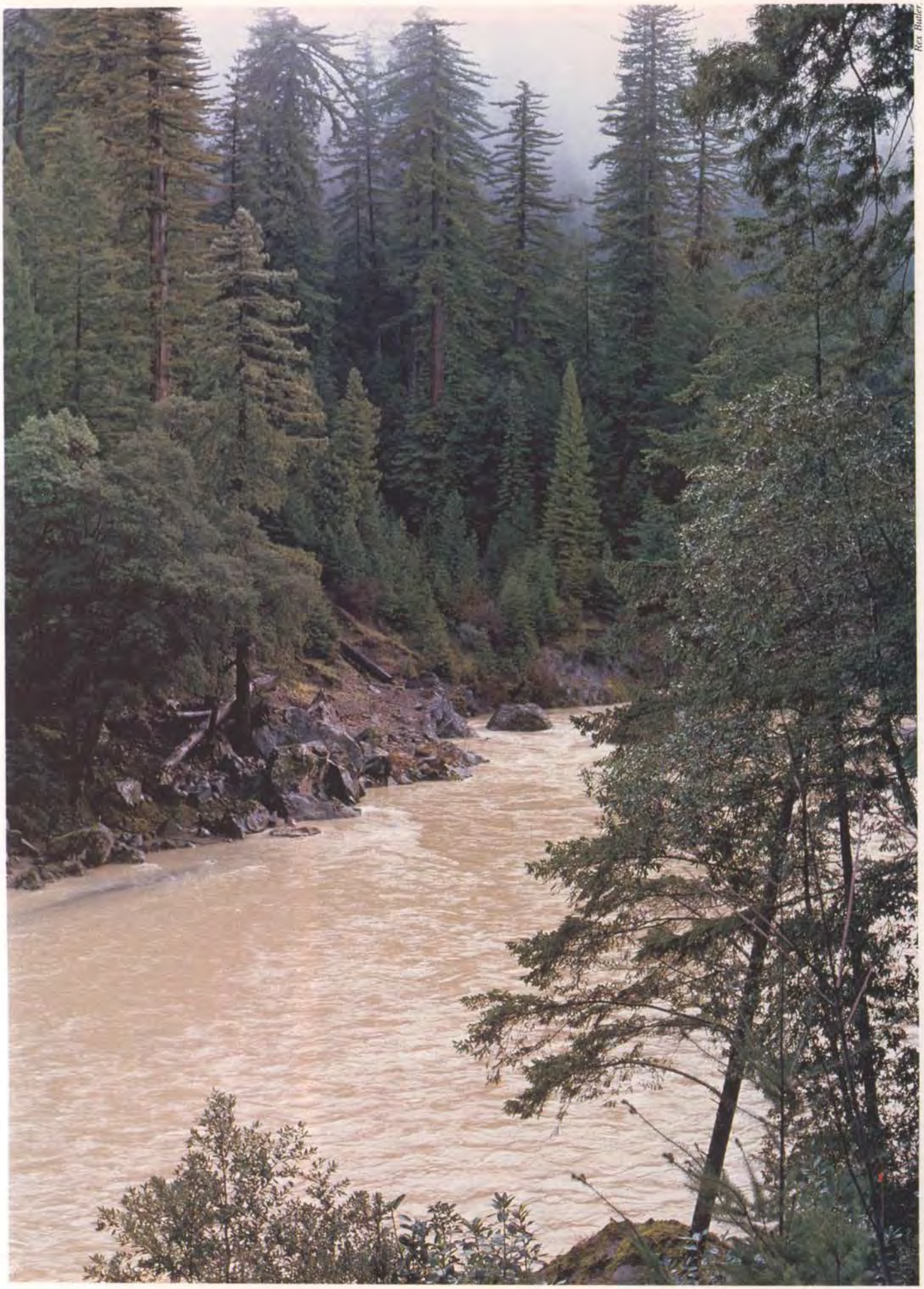
A second measure is the goal envisioned by Congress when it passed the Wild and Scenic Rivers Act in 1968. The short-term target was 100 protected rivers in a decade; through 1978 the system included 28. The old long-term conservationists' goal of 550 to 600 protected rivers has given way to a more realistic figure of 200 by 1990—and probably few thereafter as the nation's unexploited land and water base continues to shrink. Currently 61 rivers are in the national system; 26 came in a block as part of the 1980 Alaska National Interest Lands Conservation Act. From 1968 to 1980, the United States protected just under 7000 miles of its rivers; in the same period, close to 9000 miles were channelized.

State river preservation systems do brighten the picture; there are 26 of them. But comparatively few—notably Minnesota, Oregon and California—have comprehensive strength. The weakest do more harm than good, intensifying the pressures of recreational use but offering no controls. Some prohibit dams in the rivers but do not address the issue of preserving shorelines. Problems of understaffing and underfunding are common in many state programs. Four state river systems exist only on paper and include no rivers at all!

The idea of a national system of protected rivers—a parallel to the parks, wildlife refuge and wilderness systems—surfaced in 1961, when Glen Canyon was still alive but condemned. At that time the Senate Select Committee on National Water Resources suggested protecting rivers that had special scenic, scientific and recreational value. Next, the Interior and Agriculture departments screened 650 rivers and selected a starter system of 22. In 1965 the Johnson administration submitted the first wild rivers bill to Congress. It passed the Senate but not the House in 1966; it was reintroduced in 1967, along with several competing bills. Finally, in 1968, Congress voted a compromise bill that became law on October 2.

The Wild and Scenic Rivers Act is modest, accommodating and flexible—providing for basic river protection with minimal federal involvement. Most specifically, it launched the national system with eight rivers—or river segments—flowing a total of 803 miles in seven states. That it dealt in segments was a concession to historic fact. Among land types in the United States, riverine areas have drawn the heaviest settlement, development and, often, abuse. Protecting entire rivers from headwaters to

During the final days of the Carter administration five northern California rivers were made part of the federal Wild and Scenic River System: the Klamath (above, left), the Eel (opposite), the Trinity, the Smith and the lower American.

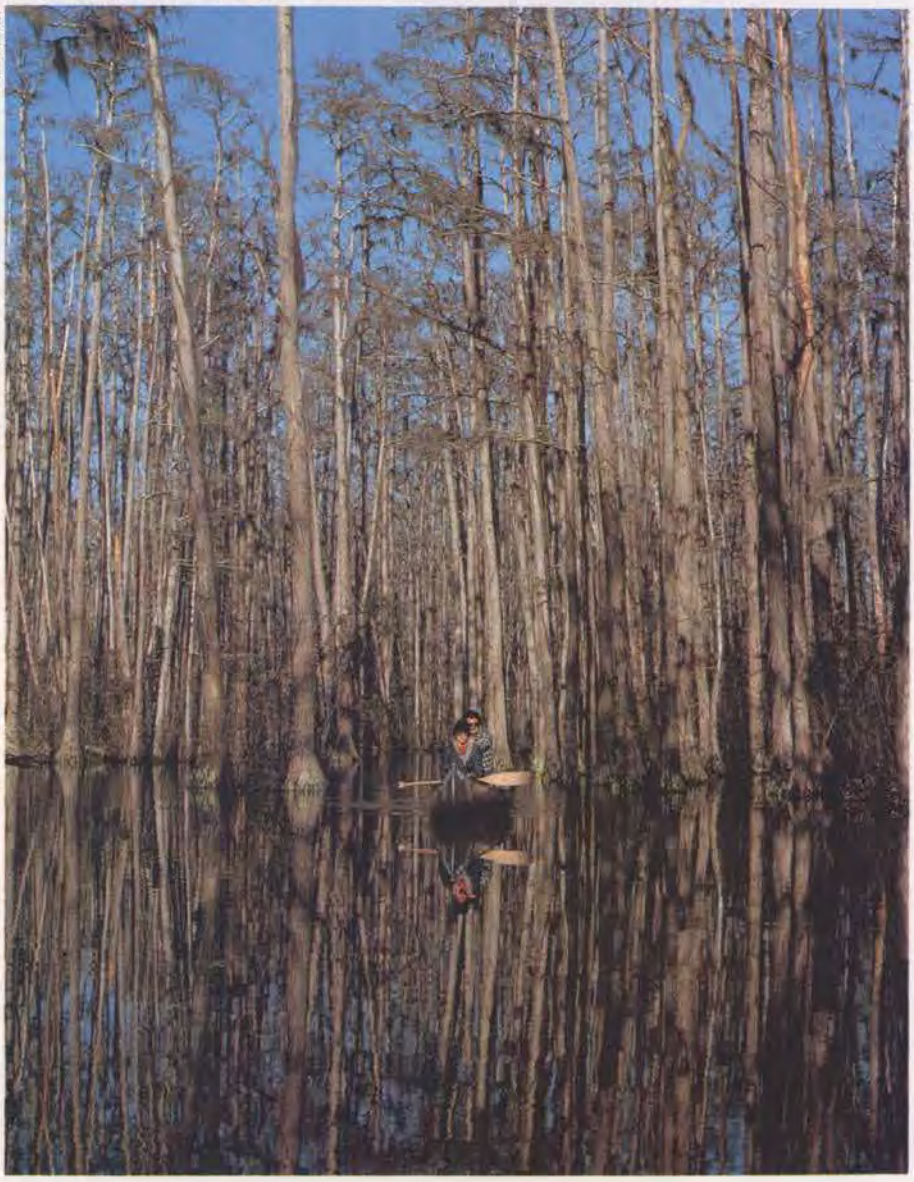


Rex Butler

Tim Palmer

Montana activists have organized to save the Kootenai River (above); the states of Florida and Georgia have stalled protection of the Suwanee River (below).

Tim Palmer



mouth is ecologically appealing, but at this late date it is also politically unlikely. So the notion of protecting segments of flow, contrary as it may seem, became law.

The act protects free-flowing rivers by prohibiting dams and other instream developments such as channelization and dredging. It protects adjoining shorelines, valleys and canyons—both public and private—by restricting land use to its present character. These protected corridors are narrow; no cleanup of polluted or damaged areas is involved. Rivers are taken "as is," but no further degradation is permitted. The law limits further federal acquisition of land and the condemnation of private land.

The prominence of the term "wild" in the law's title is misleading; few truly wild rivers remain in the United States, especially in the East. Wild rivers are, in the law's language, "vestiges of primitive America." There are, however, plenty of rivers only modestly developed that are worth protecting.

The law classifies rivers—or segments of rivers—as wild, scenic or recreational. Some designated rivers fall entirely into one classification. Missouri's Eleven-Point River, for example, is all classified as scenic. Other rivers have multiple classifications; California's Feather River has all three. Thirty-three miles are wild, 10 miles are scenic and 50 miles are recreational.

The classifications refer basically to the amount of development permitted along the river's shore. For wild rivers, no motorized recreation is permitted nor heavy public use along the shores. Scenic classification permits a greater degree of development and outdoor recreation; compatible land uses along the shoreline, such as agriculture or forestry, are also permitted. Recreational rivers permit motorized recreation and place no restrictions on the type or amount of shoreline development.

As theory, as policy, the Wild and Scenic Rivers Act is attractive. But when the practical questions arise of expanding the system beyond its original eight rivers, a number of special problems become apparent. Of these, ten are of primary importance.

1) No provision for a true system. A land area can qualify for the National Wilderness Preservation System if it is "wild"—period. But the criteria for the National Wild and Scenic Rivers System are more varied and confusing. To qualify, a river must be free-flowing (i.e., undammed) and have one or more "outstandingly remarkable" values. Those cited in the law are "scenic, recreational, geologic, fish and wildlife, historic (and) cultural," but the list is open-ended and could include, for example, unusual flora, fossil remains or hydrology.

The result, to date, is an *ad hoc* museum

Tim Palmer

The opposition of some local landowners has kept Idaho's St. Joe River (above) from being protected; many Colorado activists have worked for the protection of the Dolores River (below).

David Sumner

system. The pieces have been selected according to unduly strict perception of "outstandingly remarkable" and added to the system according to the varying forces of popular politics.

In 1975 government officials grew uneasy about this situation, so the Interior Department's old Bureau of Outdoor Recreation (BOR) was assigned to conduct a methodical Nationwide Rivers Inventory. When BOR became part of the Heritage Conservation and Recreation Service (HCRS), the latter took over the job. The inventory, now almost complete, is a major, positive step for preserving rivers. The prime goal was to "provide baseline data on the condition and extent of our free-flowing river resource." In addition, the inventory also estimated, in an orderly if approximate way, the maximum possible extent of the National Wild and Scenic Rivers System. The inventory includes 1524 river segments covering a total of 61,700 miles, and remains open to additions or deletions. A broad spectrum of river types is listed as well as representative rivers from all the major physiographic provinces in the United States.

Reports listing the inventory rivers are available at HCRS regional offices (now merged with those of the National Park Service). Detailed descriptions of individual rivers are also available, as are videotapes of aerial views of all the segments. This is a fascinating inventory "bank"—especially useful for citizens' groups interested in river resources.

All inventory rivers now also have a modest level of protection. In August 1979 President Carter, acknowledging that federal projects inflict the most damage on rivers, instructed all federal agencies to consult with HCRS on any project planned on an inventory river that might preclude its future inclusion in the national system. Furthermore, adverse effects on those rivers were, wherever possible, to be avoided or mitigated. A year later, the Council on Environmental Quality (CEQ) formalized this policy in a specific directive.

The CEQ directive has already taken effect, especially in the Northeast, primarily by establishing communication and cooperation among agencies and groups with different ideas of how rivers should be used. For example, when the New England River Basin Commission conducted its regional hydropower expansion study, it consulted the HCRS rivers inventory to identify sites where conflicts might arise between Wild and Scenic River values and energy production. Knowing that such conflicts are costly, developers can be forewarned and possibly

redirect their plans to non-inventory rivers. The Virginia State Highway Department has adopted a similar approach.

With the Reagan administration in office and with HCRS merged with the National Park Service, the fate of the inventory and the CEA directive is uncertain. An Interior Department task force associated with the Solicitor's Office is reviewing all such directives and regulations.

2) River study delays. In addition to naming eight "instant" rivers to the national system, the Wild and Scenic Rivers Act listed another 27 to be studied, specified study procedures and charged Congress with designating more "study rivers" as it saw fit. The Forest Service and the Bureau of Outdoor Recreation were the lead agencies for these studies; in 1978 the Park Service took over BOR's job.

The histories of many of these studies are nightmarish. The agencies were not aggressive in pursuing the program. Many studies dragged on five years, and some even took ten years to complete. Study reports and environmental impact statements duplicated one another. In at least one case, a river segment was reported on (and declared "ineligible" for the national system) without ever having been studied first-hand. On the positive side, the study process did awaken many river-valley communities to new perceptions; for the first time they saw their rivers as wholes and saw the effects various uses would have on the rivers and on themselves.

Once complete, the studies faced other administrative hurdles, most notably the Office of Management and Budget (OMB). During the Nixon and Ford administrations, the Wild and Scenic Rivers program piled up here until, at the end of the latter's term, nine studies were stalled in the OMB. The Carter administration moved both to accelerate the studies and to expedite OMB review.

3) Two trips through Congress. Unlike wilderness areas, wildlife refuges and even national parks, a potential wild and scenic river usually must pass Congress twice. First the lawmakers must approve study; then, years later, after the study is done, they must admit the river to the national system. This double process involves a long time and subjects each river to congressional exami-

Big Wave in the Grand Canyon

THE COLORADO RIVER flowing through the Grand Canyon is not part of the National Wild and Scenic Rivers System. The reason usually given is that Grand Canyon is a National Park and the river already thereby protected. But this is not true. The Colorado River in Grand Canyon is now more threatened than it has been since the 1960s when the old Bureau of Reclamation (BuRec) proposed to dam it.

The threat originated with BuRec while it was known as the Water and Power Resources Service, a brief but significant change in name that reflected the agency's increasing orientation toward hydropower and away from irrigation. The new proposal is a power-plant expansion at Glen Canyon Dam upstream of Grand Canyon, which at first glance seems modest enough.

However the additional 250 megawatts from Glen Canyon during peak demand periods will require releases of 40,000 cubic feet per second (cfs) or more to turn Glen Canyon's turbines. This flood will then rush down the Grand Canyon. In contrast, during the long low-demand hours, the flow from the dam will drop to 1000 cfs. This fluctuation will create "the wave" through Grand Canyon as the Colorado rises and falls daily, from flood to drought levels.

What will "the wave" do? The Park Service's Marvin Jensen lists the following "very obvious effects and impacts":

- accelerated erosion of beaches and, thus, loss of camp areas.
- long periods of extreme low flow, making some rapids impassible for hours on end,
- probable exclusion of large motorized rafts and wooden dories from the Grand Canyon, putting some river companies out of business.
- destruction of riparian ecosystems in some areas; intensified environmental impact in others; severely impacted fish habitat.

Is there local support for this project? "Understandably," editorialized the prestigious Arizona *Republic* on March 18, "river-runners want the *status quo*. When it boils down to them vs. energy-hungry cities, it's obvious who must yield."

To express concern and receive information on the Glen Canyon power plant expansion, contact the Bureau of Reclamation, Durango Projects Office, P.O. Box 640, Durango, CO 81301, the American Wilderness Alliance, 4260 East Evans Ave., Denver, CO 80222, and Brant Calkin, Southwest Representative of the Sierra Club, 338 E. DeVargas, Santa Fe, NM 87501.

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nation twice—and, incidentally, to the scrutiny of industrial, agricultural or development interests with different uses in mind for the water.

The Carter administration recognized the difficulty of this double trip through Congress and sought to ease it for rivers that flow through public lands. In August 1979 land management agencies (mainly the Forest Service, BLM and the Fish and Wildlife Service) were ordered "to take prompt action" to protect inventory rivers under their jurisdictions—preferably by proposing them for the national system. No agency chose to do so.

During the almost 13 years the Wild and Scenic Rivers Act has been on the books, Congress has approved 88 river studies (including the original 27), but it has added only 11 rivers to the system as a result of those studies.

4) Private Lands. Especially in the East, much river frontage is private and has been since the 1700s. The Wild and Scenic Rivers Act accordingly goes to great lengths to accommodate riparian landowners and to infringe on them as little as possible. The act does, however, affirm the need for land-use controls within the river corridor and the need for access to, from and along the river.

Scenic easements—purchasing certain development rights—are the act's preferred means of land-use control when state and local zoning do not suffice. Easements may be condemned as a last resort and only to a limited extent. The same is true of outright purchase, usually of access rights only. In either case, just compensation at fair market value is required.

Despite the cautious approach of the Wild and Scenic Rivers Act, fears of federal "land grabs" and meddling have been intense along many rivers, sometimes blocking protection. A long reach of the Obed River in Tennessee, almost half the length proposed for the system, was not included because of entrenched landowner opposition.

Recently the Forest Service has been leery of even attempting to manage private land. When one of its study rivers involves a great deal of private land, and when local discomfort surfaces, the river becomes "not eligible" for the national system. Examples of this include the Cahaba in Alabama, the upper North Branch of the Au Sable in Michigan, part of the St. Joe in Idaho and the Snake below Jackson Hole in Wyoming. This policy, while politically expedient, is blatant disregard of the act's intent to protect private riverine lands.

5) Cost. The Wild and Scenic Rivers System was not intended to be a high-cost program. It was expected that monies would be spent in moderation on easements, on land

A PRESENT OF THE PAST

Wes Walker

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purchased and on low-level developments such as campgrounds and launch and take-out areas.

However, when the price tags started to show, it became clear that costs could be more than modest and that the acquisition option was being abused. In 1975, the cost of easements and fee purchase along 118 miles of the Gasconade and Big Piney Rivers in Missouri amounted to $7.1 million; along 33 miles of the Little Beaver in Ohio it was $5.23 million. Development programs also overreached. In 1974 the Forest Service proposed spending $3.8 million on Idaho's Salmon River for development and administration alone.

High costs tend to stop government preservation programs more quickly than they do other kinds of projects. A dam may cost $150 million, but porkbarrel politics will slip it through; a protected river might cost $1.5 million—and be stalled.

In some cases, agencies appear deliberately to have exaggerated costs in order to discourage protecting "difficult" rivers. The Forest Service took this process a step further with the West Dolores River in Colorado, dreaming up $430,000 in easements and recreational development where virtually none was needed, and then declaring the river ineligible for the national system in part because of its cost!

Now that Interior Secretary Watt has frozen land acquisitions by his agencies, spending on river protection will certainly drop. Some government officials still hope to move ahead on the purchase of critical lands, gaining the authority to do so now, but with funding postponed until later. Even stronger efforts will go into protecting riverine lands without buying them.

6) State involvement. When the Wild and Scenic Rivers Act was drafted in the mid-1960s, Congress and conservationists envisioned an active state role in the national system. A provision of the act enables a governor to request the Interior Secretary to add state-designated rivers to the system; these rivers would remain under state administration but would gain federal protection, especially from federal water projects which states by law cannot prevent. The 1960s were a time of increasing state interest in river conservation, and this seemed an excellent means of expanding the national system.

The promise did not materialize. Only eleven state rivers have been added to the national system, the most recent being five in California, four of them along the North Coast that former Interior Secretary Andrus approved only hours before leaving office in January.

In addition, the state rivers provision has turned out to be a convenient ruse by which federal agencies can dump controversial rivers into limbo. This evasion is simple. The agency studying a river—in most cases it has been the Park Service or the old BOR—encounters controversy. Since there's no reason for excluding the river from the national system, the agency solves its political problem by bouncing it back to the state, recommending that it preserve and manage the river and request federal designation at a later date. This has been done repeatedly in cases where there has been no reasonable prospect of state action and where none has occurred. Many of the rivers thus shunted have also carried outrageous price tags for protection. No wonder the states have balked.

Among the rivers that have lost protection in this way are the Buffalo in Tennessee, the Suwanee in Georgia and Florida (where the states promised to act but have not), and the Penobscot in Maine (where the state has now given a paper company the rights to build a hydropower dam in the wild Ripogenus Gorge, the best whitewater run on the river).

7) Overemphasis on wild rivers. From its beginnings, the national system has demonstrated an unspoken inclination toward wild rivers. Conservationists, strongly drawn to things wild, have made their strongest efforts on behalf of the classic remaining wild rivers. Recreational rivers do not seem to have the same compelling allure. For federal agencies, wild rivers present clearer decisions than the other classes and fewer troublesome management situations. In Congress, too, wildness has been a more attractive concept; in some cases, recreational rivers have been perceived as social programs.

At present, with more than 3000 miles of new Alaskan additions fresh to the system, more than 65% of all federally protected rivers are wild.

8) Limited support from conservationists. None of the major national conservation groups has made the National Wild and Scenic Rivers System a steady, high priority. National leadership has instead come first from the Washington-based American Rivers Conservation Council (ARCC), and more recently, from the Denver-based American Wilderness Alliance.

A third force in river conservation is state and local groups; most notable of these is California's Friends of the River, which has repeatedly gone to the wall to prevent the New Melones Dam from flooding the Stanislaus. Other examples are the Kentucky Rivers Coalition, the River of No Return Wilderness Council (for the Salmon in Idaho), Save the Kootenai (Montana), the Save the Niobrara Association (Nebraska) and Friends of the Dolores River (Colorado).

9) Limited support from users. The greatest untapped source of support for river conservation is river users—often formed into canoe clubs, outfitters' associations and fishing clubs—as well as manufacturers and distributors of river gear. But user groups of whatever kind have most often been erratic political forces. In the West, for example, commercial guides and outfitters generally have been more interested in establishing their permit rights and—more recently—the right to sell those permits.

Some signs of change have appeared. The Western River Guides Association (WRGA) has recently hired its first paid executive director and is taking a broader view of river conservation. The Eastern Professional River Outfitters is moving in a similar direction. Trout Unlimited, the American League of Anglers and other fishing groups are doing likewise. Such groups have tremendous political potential, beginning with their client lists, which number in the hundreds of thousands.

10) Massive opposition. A great misconception is that river conservation battles are variations of the more familiar wilderness campaigns and can be approached in about the same way. This is true only for a few remote wild rivers. For the rest, the opposition is stronger and more diverse because the resource is more central and in demand.

Coalitions against river protection may include groups interested in growth: towns, cities, chambers of commerce, subdividers, large industry, builders, labor groups, shippers, flood-control agencies, farmers, miners, timber companies and energy developers.

The point is important. New demands for water are increasing rapidly. Hydropower is one such case; interest in new (often smaller) hydro plants has grown so intense that the Federal Energy Regulatory Commission (FERC) is reeling—and river people are scared. It is FERC's job to represent the public interest by reviewing, among others, permit applications for hydro projects. From fiscal years 1978 to 1980, the number of these applications rose from 35 to 71, to more than 500. In the first four months of FY 1981, a total of 572 applications came in, and the backlog is more than 700.

FERC's response to this flood of applications has been to get rid of it by seeking deregulation. The Reagan administration fought unsuccessfully to pass legislation that would have exempted all hydro projects smaller than 15 megawatts from FERC review. That would have, in effect, deregulated 85% of the remaining hydro sites in the nation. Of course 15 megawatts sounds

small, but to generate this amount of power on a headwaters river, such as the upper Rapidan in Virginia or the Elk in Colorado, means building a dam 200 feet tall. On a large river such as the Green in Utah, a dam 30 to 40 feet high would be required. Hydro deregulation, by no means a dead issue, would mean that there would be little or no constraint on where these dams would go.

So in the end, it is no surprise that after more than twelve years, the Wild and Scenic Rivers System is no further along. The real question is whether it can ever grow to become an actual national system. If it is to do so, two minimal steps appear necessary.

The first is a major national rivers organization. The Alaska Coalition could be a model for this, but the constituency must be broadened well beyond traditional conservationists. Because of its national scope, its Washington location and its extensive experience, the American Rivers Conservation Council seems a sensible organization to lead such an effort.

The second step is to draft and enact a diverse, imaginative array of river conservation measures on all levels. The Wild and Scenic Rivers Act is not achieving all its goals; some provisions have failed and new ones are needed, along with some entirely new programs. An encouraging series of measures appeared last August in Pennsylvania Representative Peter Kostmayer's State River Planning and Preservation Act. Introduced too late in the session to pass, the bill included incentives to stimulate state river conservation systems and to promote local river-corridor zoning as an alternative to costly federal purchase. Alternative means for purchase were also spelled out: for example, buy and lease-back, buy and resale with protective covenants, and land exchange. Another approach, one now being pursued in Oregon, is a property tax exemption to land owners who protect riparian land. These are just beginnings.

The opening declaration of the Wild and Scenic Rivers Act states that the established national policy of damming and developing some rivers "be complemented by" one that preserves others. The intent is to strike a balance, not a particularly even one—30,000 miles of the nation's rivers have already flooded out behind dams. Some argue there is no way to balance a loss like that of Glen Canyon short of dismantling the dam. Perhaps so. In the meanwhile, river conservation in the United States is near a crisis, and only a consistent, major effort will keep more tragedies from occurring. □

David Sumner is a writer and photographer who has studied the Wild and Scenic River System intensively and is an avid river-runner and raftrower.

Frozen Fun

ROGER COHN

CROSSING the pond was the worst part.

The bitter north wind whipped across the snow-covered ice, swirling about wisps of white that looked almost like clouds of steam rising off the frozen surface. Even layers of the best winter clothing could not fully protect against this weather, and we skiied heads down, our wool-masked faces tucked against our chests, hoping that each glance upward would show some sign of our destination—a cluster of log cabins nestled amid the evergreen trees along the shore.

Finally, after six miles of skiing in conditions as Arcticlike as can be found in the northeastern United States, we arrived, shed the 30-pound-plus packs from our backs, and set up camp in the cabins that would be our home for the next week. And that evening, as we huddled about the wood stove trying to shake the chill from our bones, most of us had almost stopped wondering why we had been crazy enough to come on this trip.

We had come to experience the eerie calm of the remote Maine woods in the dead of winter and to see the white peaks of northern mountains illuminated by pink dawns and golden sunsets. And we had come to ski on virgin snow where the only tracks we would see would be our own or those of a moose or a coyote.

The trip had been billed in *Sierra* as a seven-day cross-country ski trek across the backcountry east of Maine's Moosehead Lake. It was one of more than 200 outdoor trips offered by the Club in 1981.

We had been told that the trip would be rugged and the weather frigid, and we had been quizzed about our skiing ability and our physical condition. We had been told of the equipment we should bring and of the provisions we should make to cope with the extreme cold, but nothing could really prepare us for what we encountered when we gathered in Bangor one morning in January for the trip's departure.

The night before, the temperature in Bangor had plummeted to 25° below zero, somewhat chilly even by the standards of Maine's hardy inhabitants. As the 17 of us and the two trip leaders congregated in the lobby of the Ramada Inn, adjusting our packs and skis, some of the natives passing by stared at us with bewildered looks and remarked that this was surely no day to spend outside.

We were definitely a motley crew—clad in caps, sweaters and pants of wool, plus ski boots and nylon leggings called gaiters. Yet this was no collection of he-men or Amazon

Illustrations by Will Noble

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women. Most of us were in our late 20s and 30s, but there was also a gentleman in his 50s and a wonderful ma-and-pa couple whose youthful enthusiasm belied the fact that they were both nearly 60. While we were all in good physical shape, most in the group had limited cross-country skiing experience.

From Bangor, we set out in a caravan of cars to a place where the lumber company's dirt road ended and the trail began. Then we faced the biting cold for the first time—shouldering our backpacks, stepping onto our skis and taking off through the woods for the six-mile journey to the waiting cabins on Long Pond.

The first few miles went well—trundling up snow-covered hills and skiing smoothly through white woods of spruce and balsam fir. But we had gotten a late start, hitting the trail about 2 p.m., and, by the time we reached the pond, the sun was beginning to set, the temperature was dropping, and the wind was roaring.

With three miles still to go, we headed out onto the frozen surface, moving along the length of the pond only a short distance from shore. We skiied one behind the other, saying little, though I recall mumbling through my facemask that I had never experienced weather so bitter. Our pace slackened, not only because of the cold and our fatigue, but also because we were taking turns hauling a toboggan laden with supplies too bulky to fit in backpacks.

We reached the cabins just as darkness was falling. Fred Anders, the trip leader, who is a research geologist, checked the tiny thermometer he had attached to the zipper of his jacket; it had stopped at 30° below zero. With the wind-chill factor—well, you can use your imagination.

Inside the main cabin, frozen fingers fumbled with matches and soon the warmth of a fire radiated from the potbellied stove. The old hunting and fishing camp where we would be staying actually consisted of four cabins, but Fred decided that only the main cabin and one on the shore of the pond were constructed well enough to be used at these temperatures.

Feeling somewhat revived after thawing out by the fire, I volunteered to stay in the smaller cabin. That night, though I had come prepared with a down-filled sleeping bag that was supposedly suitable in sub-zero temperatures, I shivered with my head buried in the bag. And when I awoke in the morning, the top of the bag was coated with ice—the frozen remnants of my own breath. At this point, I questioned whether I would last the week unless the weather changed.

After a hearty breakfast of scrambled eggs (powdered, but tasty), our spirits began to pick up. The only real casualty was a fellow who had frostbitten feet and who would spend the rest of the trip curled up in front of the stove with a good book. The rest of us were starting to feel rather chipper, so when someone came in and announced that the temperature had soared to 2° above zero, the group broke into applause.

That afternoon, we set out on skis for Trout Pond, about two miles away under the white-faced hump of Elephant Mountain. We carried only daypacks that held our lunches and drinking water and, without the heavy backpacks we had used to haul our week's supplies to the cabins the previous day, we found the skiing much easier.

The untracked trail wended its way between snow-laden evergreen trees, and we experienced the thrill of knowing we were the first creatures through these woods since the last snow fell. Certainly, the going was tougher and more cumbersome than the prepared trails of a cross-country ski center, and we had none of the excitement of speeding down a groomed slope at a downhill ski area. But we were experiencing the solitude of the winter woods and the sense of pioneering a small piece of wilderness.

Back at the cabins that night, there were chores to be done. One of us had to stoke up the fire, another cook the tuna stroganoff dinner, and others had to haul the toboggan a quarter mile to fetch water from a nearby stream where the ice had been broken through. Even normally simple operations became major projects because of the extreme cold. For instance, heading for the outhouse after dark in below-zero temperatures required a true measure of fortitude.

After dinner each night, we would sit around the stove, swapping stories and jokes or reading under the light of gas-fueled lanterns. One of my bunkmates in the smaller cabin had shown enough foresight to bring along a flask of bourbon, which we carefully nursed each evening and which somehow tasted far better because we knew how bitter it was outside.

The trip brought together an odd cast of characters—a group of people who otherwise probably never would have spent so much time so close together. There were 13 men and six women, including a corporate lawyer from New York City, a bartender from Milwaukee, a physical therapist from Bucks County, a college teacher from New Hampshire and a chemical engineer from Massachusetts.

In many ways, it all resembled summer camp or a group encounter session. We were forced together at random, and yet some-

how, perhaps because of a sense that we needed each other to brave the elements, we got along remarkably well.

It was a good thing that we did. We saw no other people for the entire week, only the snowmobile tracks of a fur-trapper who had apparently been out checking his traps. Except for an occasional woodpecker and field mouse, the only other signs of life we encountered were the tracks of the moose, deer, snowshoe rabbits and weasels that manage to survive winter in these woods.

We survived, too, and even found we could be quite comfortable. A warm front moved in and, after the first day, the afternoon highs climbed to between zero and 10° above and the nighttime lows ranged between 10° and 20° below. One especially brilliant, sunny day, the temperature skyrocketed to about 20° above, downright balmy compared to what we had become accustomed to.

We discovered that we could stay warm while skiing, even when the thermometer hovered in the single-digit range. The key was to keep moving, never to stand still for more than a few moments. Cross-country skiing is a vigorous activity, requiring constant movement of the legs and arms and producing a great amount of body heat. I found myself working up a sweat even on the coldest days, and I would put my down jacket in my daypack and ski dressed in a sweater, flannel shirt and long underwear.

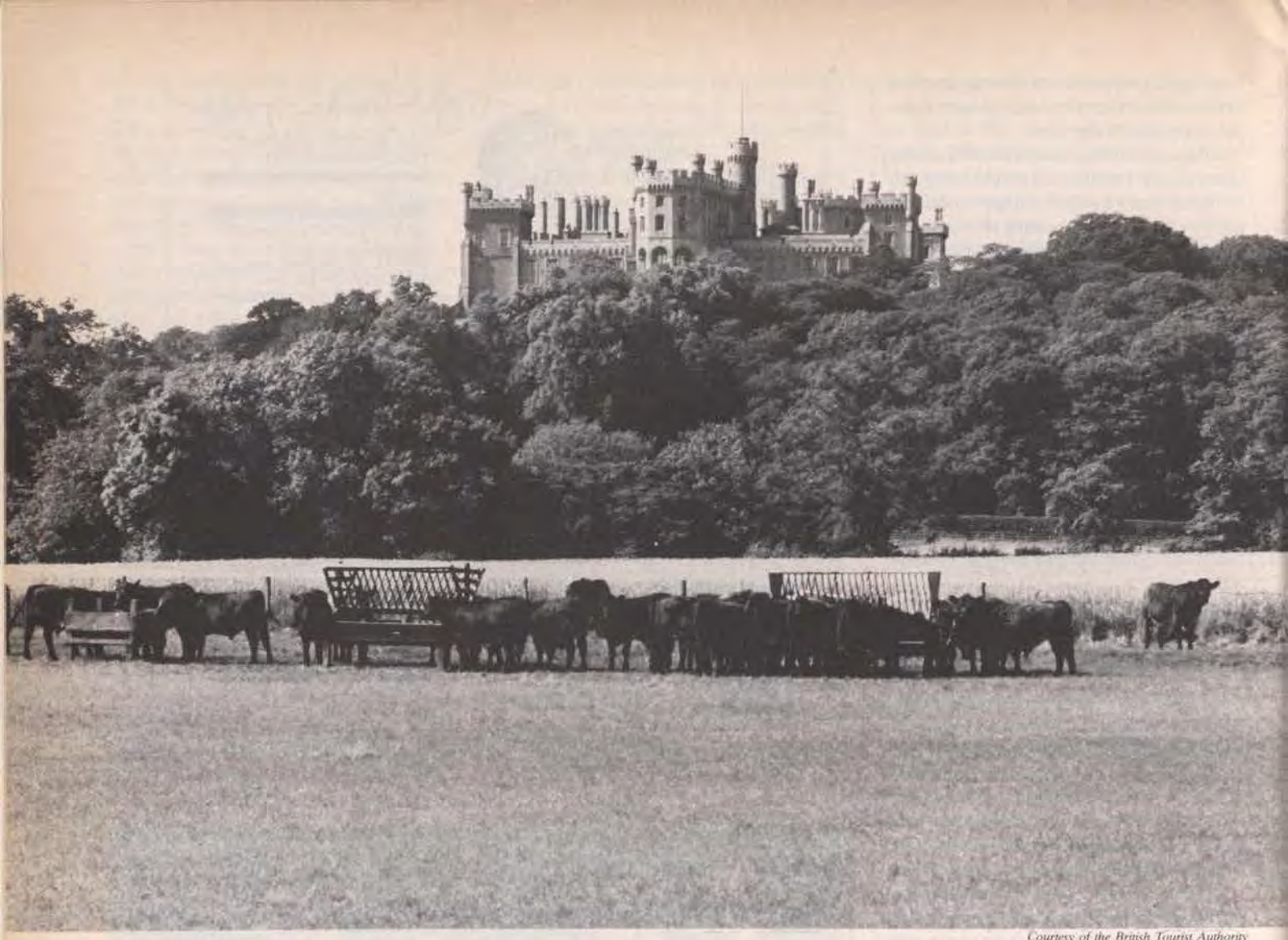
We also learned some of the tricks for staying warm, such as shedding layers of clothing when our bodies heated up and putting them back on as soon as we started to cool off. And we learned to remove all wet clothing immediately upon returning to the cabins, before a chill set in.

Each day, we would take off on skis along the trails that branched out from Long Pond. Depending on the weather and how we felt, we would ski anywhere from 4 to 14 miles. One day we descended into a deep gorge where chunks of ice coated cliffs from which waterfalls once had gushed. Another day, we trekked up a ridge to a hillside where the skiing rivaled beginners' slopes at most downhill ski areas.

On the morning of the last day, we awakened to find snowflakes streaming down steadily from a steel-gray sky. By that time we felt like veterans, and the return trip along the pond was much easier than it had been a week earlier.

When we reached the woods at the far end of the pond, I looked back and, through the screen of snow, could barely make out the ridge we had climbed the previous day. □

Roger Cohn is a staff writer for the Philadelphia Inquirer.



Courtesy of the British Tourist Authority

Battle of the Belvoir

PETER STOLER

England's Vale of Belvoir is the scene of a familiar conflict: a rural way of life or coal development? Above, Belvoir Castle, set amid farms and fields.

OF ALL THE PLACES in England's scepter'd isle, few are as typical of the quiet, comfortable and enclosed landscape as the Vale of Belvoir. Wales may have Snowdon, England's highest mountain. Yorkshire may have its expanses of moors. But Belvoir (which the English pronounce "beaver") has a quieter kind of beauty. A broad valley in England's heartland in the northeast corner of Leicestershire, the Vale is a land of lush, green farms and picture-postcard hamlets, of winding lanes and gracious manor houses. Foxes make their homes in the Vale's hedgerows, providing sport for the red-coated crowd that Oscar Wilde once called "the unspeakable in full pursuit of the uneatable." Trout thrive in the Trent River and the clear chalk streams that feed into it, delighting those fortunate enough to get a day's fishing on one of the local "beats." Quiet, traffic-free roads lure walkers and cyclists eager to escape from the tumult of such nearby cities as Nottingham and Derby.

But despite its beauty, or rather because of it, this idyllic valley has become a battlefield in a developing clash between energy and environmentalism. The cause of the combat is simple. The National Coal Board, which operates Britain's government-owned mines, has discovered a 90-square-mile coal field beneath the Vale's rich soil. It has estimated that this field, the largest unexploited coal deposit in Europe, holds more than 500 million tons of coal—worth some $20 billion at current prices.

It wants to mine this coal. The Coal Board has proposed to sink three shafts, two of them on the edge of the Vale, the third right through its heart. The idea has touched off a battle that pits Britain's troubled coal industry against just about everyone in the Vale. "There is absolutely no way we can mine the coal and still preserve the placid, agricultural nature of the Vale," said one of the combatants recently. "We have to chose one or the other."

To help Britain make this choice, the

national Department of the Environment appointed an inquiry inspector and two assessors, who held a series of hearings in the Vale and in London and took testimony from more than 150 witnesses, some speaking as individuals, others representing a total of 50 organizations. The hearings, which ended in April 1980, were acrimonious at times; each side felt it was fighting for its very survival.

For the Coal Board, which was established in 1946 to manage Britain's coal industry, the choice is clear. Britain, which gets about 65% of its electric power and nearly 10% of its home heat from coal, wants the fossil fuel that nature has buried under Belvoir. The country's miners, hard-hit by unemployment and automation, want jobs.

As the Coal Board has argued, the deposit under the Vale of Belvoir could provide both. Once they became fully operational, the three proposed mines could produce 7 million tons of coal a year, increasing Britain's coal production (which reached 119 million tons in 1977–78) by more than 5%. The mines would also provide jobs for some 3500 miners and almost as many related workers. Small wonder, then, that the board considers exploitation essential. "Oil is going to get scarcer and more expensive in the coming years," Robert Alexander, a lawyer for the Coal Board, told the panel of inquiry. "North Sea oil gives us some breathing space but nothing more; it provides no long-term security. We need greater contributions from energy conservation, nuclear power and coal. These are not alternatives; they are all necessary."

The board has conceded that the nation's good fortune in having the coal may be regarded as something of a misfortune by those whose homes and farms sit atop the coal field, but it contends that this resource can be exploited without destroying the Vale. It has promised to keep environmental damage to a minimum and to restore the land it digs. But it also contends that national energy needs must be satisfied. The coal, it maintains, is "a national asset."

Few in the Vale disagree. But a growing number argue that agriculture and rural calm and beauty are equally valuable assets that should be preserved. Led by the Duke of Rutland, a 58-year old Tory whose crenellated 70-room castle stands on a hilltop overlooking the Vale, they are digging in to defend their land—and their way of life—from the Coal Board.

The Duke's forces are a motley lot and include farmers, sportsmen and environmentalists. For the latter, in particular, the fight poses a tactical problem. In their struggle against nuclear power, British environmentalists have long advocated coal as an

alternative, a fact that the Coal Board itself has called to the attention of both its opponents and the panel of inquiry. The environmentalists, however, have pointed out that by the 1990s, when the proposed mines would begin operating, and for the seven decades that it would take to exhaust the coal field, a combination of solar and tidal power and energy conservation measures could make exploitation of the Belvoir bonanza unnecessary. In any case, independent experts familiar with low-energy-use scenarios consider the Department of Energy's forecasts inflated.

Farmers, of course, have an easier explanation for their oppostion. They are worried about the impact of mining, with its problems of subsidence, drainage, noise, dust and potential for stream pollution in a valley that is usually so quiet that, in the words of one resident, "the loudest sound you hear is the rumbling of a cow's stomach as she digests her grass." About 2000 acres would be lost, and there are doubts about how well the land can be restored. The National Farmer's Union told the panel that it foresaw a blighted valley, too similar for anyone's comfort to valleys in Wales, if mining were allowed. The Melton Borough Council, worried about what would happen if 3500 miners and their families were to descend upon the Vale, predicted that "a heavy industrial revolution would convulse the Vale and sweep into history all that is best in the English shire—good earth, good husbandry, hamlets and villages, lanes and byways, copse and hedgerows, field and farm and market town alike." An anti-mining group in Harby quoted William Blake in defense of "England's green and pleasant land." Producers of the Vale's world-famous Stilton cheese, a heady concoction that connoisseurs rank with Roquefort, worry that mine dust might upset their cows and change the makeup of their milk.

Fishermen's associations have joined the fight, warning that mine waste would produce stream pollution that could endanger already-fragile trout habitat. Cyclists have also enlisted in the battle. The Cyclists' Touring Club has argued that mining and the traffic that it would inevitably engender would destroy the Vale's "pleasant, little-trafficked lanes." The organization has insisted that recreation is just as important as energy. "The nation's need of happy, healthy people is beyond dispute," a spokeman for the Cyclists' Club told the panel. "The nation's need of coal is not."

The most vocal member of the opposition, however, may well be the Duke of Rutland himself. The tenth of his line to hold the title, an ardent trout fisherman and grouse shooter and a staunch supporter of

the *status quo*, Rutland maintains that mining the Vale would be "a needless outrage against the environment" and has vowed to do whatever he can to prevent it.

So far, he has done plenty, giving his money and lending his name and his prestige to the cause. The Duke, who heats most of his own hot water with solar power, has pledged to lie down in front of the first Coal Board bulldozer to invade the Vale, a promise that prompted one member of the promining forces to volunteer to drive the machine.

On the more practical side, however, the Duke, who landed with the Grenadier Guards at Normandy, plans to enlist broad public support and use delaying tactics. He hopes to prevent mining of the Belvoir field until such alternative energy sources as solar and nuclear power are developed enough to make the coal unnecessary. Rutland, whose family motto is "Obtain Your Object," says that he has no intention of not living up to this tradition in the battle for Belvoir.

So far, the Duke seems to have united most of the people of Belvoir behind him and against the Coal Board. Whether this opposition will prove adequate, though, remains to be seen. The anti-mining forces have managed to make their voices heard before the panel of inquiry and have picked up substantial support from other parts of the country where the environmental movement is strong. But Britain's Coal Board is every bit as used to having its way as the Duke is to having his, and its arguments have made an impression, particularly among Britons worried about their nation's dangerous dependence on unstable energy-exporting countries. Just as important, the Coal Board has been picking up support from Britain's labor unions, which feel that saving the environment must take second place to stabilizing the country's economy and providing its workers with jobs.

Pressured by both sides, the inspector is expected to make his report and release his recommendations shortly. Whichever way he finds, the impact of his decision will be enormous. A decision in favor of leaving the Vale to Belvoir would come as a tremendous boost to British environmentalists, who feel that their country will have few chances to preserve those sections that industrialization has not already destroyed. A decision in favor of the Coal Board could be a serious setback to the nation's environmental protection movement, and worse, say critics, establish in the public mind the idea that developing new power sources is more important than conservation. □

Peter Stoler is chief of the New York bureau of the Time-Life News Service.

Farewell to Summer– The Season's Last Climb

DAVID MAZEL

IT'S ALREADY MIDAFTERNOON when Dave Ingersoll and I complete the laborious, 4000-foot climb out of Mineral King Valley and set up camp at Columbine Lake, high in the alpine heart of Sequoia National Park. A cold wind blows down in furious, unpredictable gusts from the ramparts, chopping the lake's surface and splintering the reflected images of the peaks all around us. The sun sets early behind a high cliff to the west; we make a cursory reconnaissance of our planned route on Needham Mountain's nearby north face, then retreat into the tent. The remainder of the long afternoon we spend listening to the flapping of the nylon sidewalls, and occasionally peeking outside to gauge the progress of the sunlight as it creeps steadily up the distant ridges.

It's been a long, busy summer. Since last June Dave and I have made some 20 climbs, most of them technical endeavors on Needham and other backcountry peaks like Needham. Now it's late September. All the past week the mountains have been lashed by electrical storms and dusted with snow flurries—not-so-subtle harbingers of the rapidly deteriorating season. Later in the evening, as I turn stiffly in my sleeping bag, I find myself wondering if we aren't pushing our luck, climbing so close to the edge of winter. But Dave has had his eye on this route for almost three years now; twice already he's failed to complete his envisioned line, and he's not about to give up this time—certainly not without giving it a good shot.

At first I found it hard to share Dave's enthusiasm. But that was before arriving here, before seeing the mountain for myself. It really *is* a fine peak, at 12,467 feet the highest prominence in this stretch of the Great Western Divide, with a steep, 900-foot granite wall dropping away on its north flank. Dave's chosen line is bold and direct—or *esthetic*, as climbers are wont to say—and it seems well worth any risk posed by the weather. I'm sold, and it's agreed: tomorrow we will go for it. All that night the cold, wet wind moans and sighs, but I shut the sound out of my mind.

The next morning dawns clear. We leave early and are well on the face by sunrise. Several pitches up, it's Dave's lead. I feed the rope out to him slowly, estimating his progress solely by the changing tension in the line, for he has long ago passed from sight above me. The climbing must have suddenly become quite touchy; he's gained scarcely twenty feet in the last ten minutes, and I'm losing patience, tied in as I am to a narrow, uncomfortable ledge. But finally the rope pays out steadily again, and I hear the reassuring click of a carabiner. I look closely at the pile of loose rope coiled at my feet.

"Fifty feet!" I yell, letting Dave know how much farther he can go. There's no reply, and I call out again, louder, "Fifty feet. Five-oh!"

"Okay. Five-oh," Dave's voice comes back faintly, almost lost behind a bulge in the cliff. Presently he stops moving again, then resumes at a snail's pace. A cold breeze has sprung up; I'm shivering and in no mood to wait.

"Four-oh!"

"Okay—just hang on. It's a little thin up here, really blank. Be ready for a fall, okay? I'll be able to bring you up in a few . . ." His worried, distracted voice suddenly trails off, and I half suspect what comes next—

"Falling!"

Reflexively I yank the rope in around my waist and crouch against the wall. In a split second the line snaps taut and jerks me a few inches into the air. A shower of small rocks flies past and smashes onto my ledge, missing me by inches and raising a smell of ozone. I struggle against the pull of the rope to regain my original stance, then call out.

"You okay up there?"

"Still in one piece. . . . Listen—there's a platform below me, about ten feet. Can you lower me?"

I let the line slip through my hands until it goes slack. When Dave gives the off-belay signal I gather up the rucksack and the gear that has held me fast to the rock. From above comes the call, "Climb when ready!" and I start upward. The pitch is steep and difficult, and I'm forced to admire the way Dave led it, fall or no. At several points the climbing threatens to exceed the limits of my ability, but with the assurance of a top-rope I eventually manage to reach the platform.

There I find Dave handling the rope gingerly—almost with his fingertips. His hands are bloody all over. "A hell of a belay I had," I think to myself. Fortunately the gruesome appearance of Dave's hands is deceptive; we wash them down with a little of our drinking water and expose only two minor lacerations, which have already stopped bleeding and are quickly dressed. We chalk this one up as just another minor mishap, though Dave still looks a little shaken to me.

The wind has picked up considerably by now. Only a few clouds have sailed by, and we've heard no thunder as yet, but we don't doubt that storms will be breaking in our area by the afternoon. We force ourselves to hurry. Dave passes the rope around his waist with his bandaged hand. I sort the hardware dangling from my shoulder sling and lead off horizontally across a seam at the base of the blank section, then up its right-hand edge for 30 painstaking feet and finally up onto easier terrain. An hour later we stand on the summit ridge, a few hundred feet from the top.

Before continuing, Dave suggests we stop for a snack. We settle into a sheltered hollow a dozen yards or so away from the exposed ridgetop and break into our supply of cheese and tinned herring, all the while keeping a weather eye to windward.

Illustration by Don Evenson

But lunch is to be short-lived. As we eat and watch, a single white cloud—dazzling in a shaft of sunlight—boils over a ridge and begins spreading our way, slowly inundating the sea of lesser peaks below us.

"Looks like we're in for company." Dave nods in agreement, swallowing a chunk of fish. "Think it's a live one?"

"I don't want to find out. If we leave now we can probably beat it to the top."

"Then let's go."

Reluctantly we stow our half-eaten lunch and start upward. Now that we're on the peak's southern slope the way is easier—a walk-up, in fact. But we scarcely cover half the distance to the summit before the cloud overtakes us and wraps us in a swirling void of mist and wet snow.

"What do you think?" Dave is only ten feet above me, yet in the mist his voice seems to come from nowhere.

"We're almost there. Let's keep going. A minute more."

Seconds later I catch up with Dave. As his dim figure looms into view I'm startled and horrified at what I see: his long hair stands on end around the edges of his balaclava, and blue sparks leap like Saint Elmo's fire from his shoulders.

"Uh, Dave . . ."

He turns, and suddenly gives me the same look I must be giving him. A short, speechless interval ensues; then we simultaneously shout "*Run!*" and plunge in a barely controlled panic down the slope.

Just as the thunder begins we stop and crouch in a shallow depression in the mountainside, bending sharply forward, desperately trying to keep our heads below the surrounding ground level. At the last second Dave remembers to heave the metal climbing gear as far as he can down the slope. Then the lightning comes on in earnest, leaving us temporarily blind and deaf. Each strike sends avalanches of electric current down the incline and strange, not altogether unpleasant tingling sensations pulse through our limbs. Shock waves resound through the thick air, shaking masses of snow crystals from the cloud. Graupel (granular snow, like soft hail) rains down noisily on the upturned backs of our parkas.

After what seems an eternity the storm lets up—slightly. The bolts come less frequently now, and more of them can be heard in the distance to the east, raising the hope that the disturbance is passing. Dave and I discuss our options. Camp lies just northwest of the peak, and there are two ways to reach it. We can descend the gentle southern slope, on which we're presently pinned, and then follow a long network of canyon bottoms down and back up to Columbine Lake. Or we can recross the summit ridge and

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make a few rappels, dropping almost directly into camp—less than an hour's jaunt. But to cross that ridge now would be suicidal. In fact, neither prospect is particularly enticing. The very thought of moving back toward the ridge, with the lightning still dancing all over it, appalls us, but slightly less than does the idea of a ten-mile forced march through the snow and freezing sleet. We estimate the time at about noon—or is it later?—and after a short, spiritless debate we elect to postpone our decision. After all, if we just wait a while, the storm may yet clear up. But almost immediately, as if to warn us otherwise, the lightning resumes all around us.

The strikes continue. Always, when we think we hear them drifting off to the east, a random bolt lands nearby and destroys that hope. Now tiny sparks fly from my metal-cased pen as I scribble, and it hastily joins the jettisoned equipment far down the slope. I search my pockets for a safe, wooden pencil stub.

Hours later the storm has still let up only a trifle, if at all. We've scarcely moved a muscle the entire time, except to occasionally shake our backs clear of snow, which lies all around in thick piles. We begin to realize that the lightning isn't going to let us cross that ridge for some time, and we sense further that impending darkness will soon foreclose our only other alternative. To travel at night is difficult enough when the trails aren't buried in snow, when the moon and stars aren't veiled by clouds. Even now we seem to sense the darkness falling. It may be just an illusion, a thickening of the mist, perhaps, or some conjuring of our own tired minds. But we're not sure, and we decide to leave immediately, come what may.

The next bolt sounds. We leap out of our shallow hole and bound down the sandy slope, praying we won't be electrocuted in midflight. We astound ourselves with our speed and agility on the adrenalin-powered descent, scarcely touching the ground yet half striding, half falling eight feet and more at a touch. The time flies with us, and before we quite realize it the immediate danger has been left behind, nearly half a vertical mile above us.

We continue downhill at a more sustainable pace until bottoming out at a canyon, where we stop for a brief consultation with our topo map. A little farther down the snow changes into a cold, driving rain, and we resign ourselves to what promises to be a long, comfortless evening.

Darkness overtakes us some six or seven miles from camp. We've already been slogging along for hours. The rain lasted just long enough to soak us to the gills, then metamorphosed back into a light, invisible snowfall. At times we both find ourselves shivering uncontrollably. We walk faster to keep warm.

Lightning still plays on the high ridges, and every once in a while a stray bolt lands nearby, blinding us with a glut of useless light. Each such strike illuminates and preserves an image of whatever is momentarily in our sight, and for hours at a time, no matter where we look in the darkness, we see nothing but the same pale mirages. For the longest time I'm unable to shake the image of some twisted ghosts of timberline trees we must have passed hours ago; later I'm plagued by a disorienting kaleidoscope of swirling, windblown snow. Another bolt strikes, and drunkenly wandering lines of snow-pressed footprints—our own—float endlessly before my eyes. In my exhausted, confused state I'm tempted to follow them. Dave sees my folly, correctly, as a symptom of hypothermia and decides I must go first so he can keep an eye on me. But I can no longer judge precisely which direction is uphill; Dave resumes the lead, keeping up a steady stream of talk so I can follow his voice in the blackness. Later, even this isn't enough; to find my way, I'm reduced to clutching a loop of cord tied to his rucksack. Over and over I say to myself, "Keep walking. Keep the core temperature up. Keep walking."

Thus we make our way, entirely without benefit of sight. For direction we rely solely on the sound of Lost Creek—is there some significance to that name?—which we keep always just to our left, and on occasional match-lit glimpses of the compass, whenever its needle isn't swinging wildly in sympathy with the storm. At length we're able to locate Columbine Lake; we follow the sound of lapping water around its shore and finally stumble into our camp around midnight. Neither of us bothers to eat. Sleep is all we seek, and we aren't long in finding it.

The next morning the sky is still somber, a low, grey ceiling. What is visible of the world beneath it is white with snow, bright even in the dull light but devoid of cheer. We strike camp in silence, then search for the trail beneath the soft powder. A keen wind greets us at Sawtooth Pass, knifing through our still-damp clothing and harassing us as we begin the long descent into Mineral King. Four thousand feet lower down the wind is still with us, not noticeably warmer. A light rain falls as we start down the road to Three Rivers, and we keep the jeep's windows rolled up tight. For us, at least, the season is definitely over. □

David Mazel is a counselor for developmentally disabled adults in Colorado. He recently wrote Arizona Trails, *a guide to the wilderness areas of Arizona.*

Next to this El Salvadoran store, the motto on the De-Pester drum reads, "the mark of confidence." Bayer and Shell export pesticides from the U.S. that are banned here.

THE POISONING OF CENTRAL AMERICA

Text and Photographs by
MARTIN WOLTERDING

THE USE OF PESTICIDES such as DDT, eldrin and parathion is severely restricted here in the United States, but their manufacture is permitted. These and other poisons are now being used in enormous quantities in many parts of the Third World, and the impacts are as heavy as the use.

Forty percent of the United States' $7-billion-a-year's worth of pesticide production is exported. In 1979, 25% of the exports were chemicals that were unregistered or banned from domestic use. In addition, Western European manufacturers export five times the amount this country does. The World Health Organization estimates that the exports poison a half million people each year, most of whom live in underdeveloped countries.

The six Central American countries—Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama—are especially hard-hit, because they are the world's heaviest per-capita users of pesticides. Their economies depend on agriculture; coffee, sugar cane, bananas and cotton are their principal cash crops. For the past 20 years, enormous quantities of deadly pesticides have been dumped into their water and onto their soil, and a large quantity has ended up in their people—and in people who imported their products. It is ironic that the same nations that prohibit the use of dangerous pesticides are nevertheless poisoned by them. For though the United States exports the pesticides, we import the crops to which they are applied—including such major trade items as bananas and coffee.

Cotton was first grown on a commercial scale in Central America at the beginning of the century. It was native to the region, so it was a natural component of the tropical ecosystem. Before pesticides were developed, the boll weevil, *Anothomus grandis*, was the only important pest affecting the

crop, and it was kept in check by natural parasites and predators.

But in the 1950s, the acreage planted with cotton increased tremendously, and growers introduced farm machinery and agricultural chemicals. Most commonly they used toxophene, DDT and BHC, applying them alone, in combination or mixed with water. Pesticides were applied aerially an average of eight times per growing season. Eventually, heavy pesticide use and extensive single-crop planting upset the ecological balance, and the number of cotton pests increased. By 1955 the leafworm, bollworm, aphid and false pink boll worm were all serious pests.

To combat the new pests, every conceivable pesticide was used in the 1960s. Because the Central American governments did not restrict pesticides' use, the area became an enormous testing laboratory for every new bug-eradicating product the chemical industry developed. Aerial applications increased to 28 per season, with growers choosing from more than 50 products and mixes formulated to control a single cotton pest. By 1970, the number of serious cotton pests had increased to eight.

This empty pesticide barrel at the corner of a school collects rainwater for the children to drink.

As new and resistant pests appeared, cotton growers turned to larger quantities and more frequent applications of pesticides. By 1974, growers sprayed aerially up to 40 times in a growing season. An average of 3380 pounds of pesticide was applied every year to every square mile of land—4.4 pounds for every man, woman and child in Central America. When the United Nations Environment Programme funded a two-year study by the Central American Institute for Industry, the Institute found that "organic synthetic pesticides [had] become part of the natural and human environment."

Cotton-field workers were among the first to suffer; cases of pesticide poisoning rose dramatically. More than 80% of these workers and their families live within 350 feet of the cotton fields. Not only do they receive a dose of poison every time the field is sprayed from the air, but often the only water available to them is from the drainage ditches along the sides of the cotton fields.

Chlorinated hydrocarbons such as DDT are cumulative; that is, they are stored in the body, usually in fat, for years, where they accumulate. Long-term exposure leads to damaged brain and liver tissue. High levels in a woman's body pass to her children through her milk. The Central American Nutrition Institute found in 1977 that the DDT concentration in the milk of women living in Guatemala's cotton-growing areas was the highest ever recorded in the western world. Harmful effects on the developing child are unknown.

As insects developed resistance to the chlorinated hydrocarbons, growers switched to such organophosphates as parathion. This group of pesticides is 60 times more lethal to humans than DDT. Parathion attacks the nervous system. Symptoms of low-level toxic quantities in the body are vomiting, dizziness, tremors, blurred vision, diarrhea and cramps. Higher levels produce paralysis, convulsions, coma and death.

In 1975, 2284 poisonings were reported in the cotton-growing areas of Central America. But this figure is probably only a small fraction of the real number, because many cotton workers have no easy access to free governmental clinics, or else they are unwilling to endure the long waits and indignities that visiting the clinics often involves. Also, since children cannot use the free clinics, any poisoning they have suffered does not appear in the statistics.

El Salvador has by far the highest rate of pesticide poisonings of all the Central American nations because of its heavy use of organophosphate pesticides. In 1975, 20% of the world's production of parathion was applied to the crops grown in this tiny country of 4.5 million people—an average of 2940 pounds of parathion per square mile.

Supporters of pesticides' use often deplore these conditions but make the persuasive argument that the chemicals are required in the battle against malaria. During the 1950s, malaria was almost eliminated from Central America by DDT and dieldrin, which controlled the vector, the *Anopheles* mosquito. But massive use of these same pesticides for agricultural purposes let the insects rapidly develop a resistance to them. The agents of control were changed to malathion and proxopur, and as these chemicals also began to be used for agriculture, mosquitoes resistant to the organophosphates and carbamates evolved. Today there are more cases of malaria than there have been in the last 25 years.

Like much of the rest of the Third World, Central America finds it particularly difficult to deal with the complex problems caused by large-scale use of pesticides because of widespread poverty and illiteracy. Environmental contamination and human toxication result from a combination of hazardous working conditions, improper use of pesticides and unsafe acts by uneducated people who are ignorant of, or ignore, pesticides' nature and properties. Sound environmental laws, even when present, often fail because the government cannot or will not enforce them.

One of the biggest contributors to the enforcement problems is the factor of unsafe acts, largely caused by years of common agricultural practices that completely ignore pesticides' toxic properties. Spray planes have been seen emptying their tanks at the end of the day by dumping the "excess" pesticides in lakes and bays. To obtain maximum yields, growers often plant cotton right up to the houses on the outskirts of a town. Corn is often grown alongside and inside cotton fields; the contaminated grain is consumed by people. After the harvest, cattle are commonly grazed in the cotton

fields. DDT levels of up to 106.3 parts per million (ppm) were found in the fat of Central American beef, much of which is exported to the United States. The Environmental Protection Agency considers 5 ppm in the beef a reason to stop the shipment—if the agency catches it.

In 1979, the U.S. General Accounting Office admitted that "a large portion of the food imported into the United States may in fact contain unsafe pesticide residues. In some foreign countries, pesticides known or suspected of causing cancer, birth defects or gene mutations are carelessly or excessively used."

The excessive use has had enormous impacts on the environment. In many of El Salvador's coastal bays and estuaries, massive fish kills occur twice a year. The first, in April, comes with the heavy rains that wash the pesticides from the soil into streams and rivers. The second, less severe, occurs in late September when growers begin aerial spraying of the cotton. A Peace Corps volunteer who took samples in El Salvador's Jiquilisco Bay during the 1976 spring fish kill reported, "My nets came up filled with dead, decaying fish, crustaceans and echinoderms. I didn't collect a single living fish that day. Bloated fish washed up on shore in large numbers."

Although the people do not eat the dead fish, they do eat other fish that are easy to catch because they are seriously affected by the pesticides. Also, pigs forage around the edge of the water and eat the dead fish. Therefore, the pesticide passes up the food chain, not only to whatever human eats the pig, but also to whatever shark, shrimp or lobster feeds on the dead fish that wash out to sea. DDT levels of up to 1000 ppm have been recorded in shark liver oil; since sharks are at the top of the food chain (they eat everything else, but almost nothing except humans eat them), the pesticide from everything they eat accumulates in their bodies. Shrimp, lobsters and shark meat and oil are both exported and consumed locally.

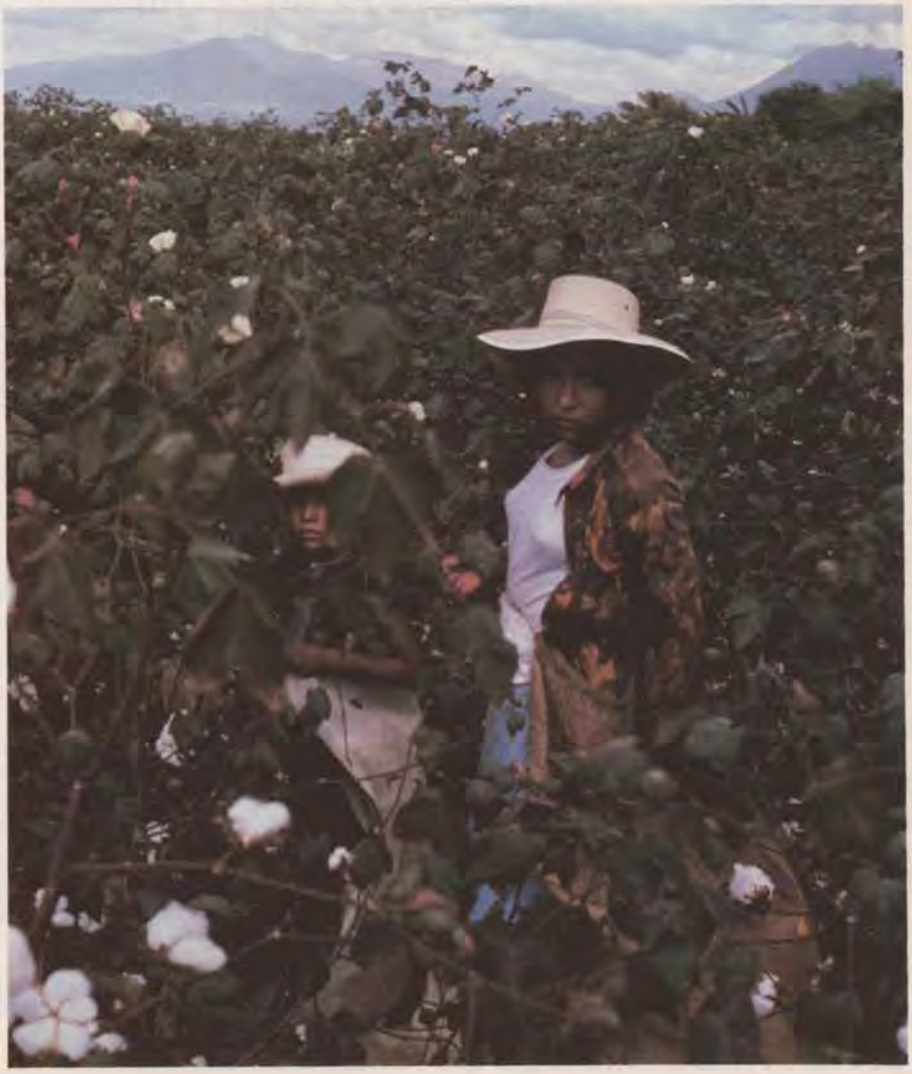
As a result, the average Central American peasant's body contains eleven times more DDT than the average American's. The harmful effects of sublethal levels of DDT on a malnourished, heavily parasitized population are unknown. But pesticide use is expected to double in the next ten years.

The attempts the United States has made to control this use have been minimal. In 1976, after several environmental groups (including the Sierra Club) filed suit, the U.S. Agency for International Development was forced to prepare environmental impact statements on its pest control programs abroad and to refrain from financing the purchase of pesticides that are unregistered in this country, except in health-related emergencies. Still, other countries can buy unregistered pesticides if they don't use AID money. Five days before he left office, President Carter signed an executive order that would, in some instances, require the written approval of foreign governments before an unregistered pesticide is shipped. But President Reagan revoked the order in February. Aside from those actions, U.S. manufacturers have been exporting whatever pesticides are ordered.

Cotton growers in the affected Central American countries, in their attempt to reduce costs and overcome insects' growing resistance to poisons, have reduced their use of pesticides a little with a new technique called ultra-low-volume spraying (ULV). Whether it is an advance remains to be seen. Using ULV, cotton fields are sprayed with pure pesticide rather than diluting the chemical 1:4 with water. When applied aerially in ultra-low-volumes, 25% of the pesticide settles on the 46-foot-wide target strip of ground below the plane, and less than half even lands on the field. Of the total, only 60% sinks to earth within a mile; the rest is dispersed by the wind.

There is, however, an alternative to saturating the land with poisons, and it is being promoted by many public and private agencies, including the United Nations. Integrated pest management (IPM) can dramat-

In 1975, 2284 poisonings (not counting children) were reported in cotton-growing areas of Central America. Workers live next to the fields and often drink water from drainage ditches. Cotton is sprayed as many as 40 times a season with an average of 3380 pounds of pesticide per square mile.



BOOMERANG: Exporting Poisons and Getting Them Back

IN THE UNITED STATES, a mere dozen multinational corporations dominate the $7-billion-a-year pesticide market. Many are conglomerates with major sales in oil, petrochemicals, plastics, drugs and mining. The list of companies selling hazardous pesticides to the Third World reads like a *Who's Who* of the $350-billion-a-year chemical industry: Dow, Shell, Stauffer, Chevron, Ciba-Geigy, Rohm & Haas, Hoechst, Bayer, Monsanto, ICI, Du Pont, Hercules, Hooker, Velsicol, Allied, Union Carbide and many others.

Tens of thousands of pounds of DBCP, heptachlor, chlordane, BHC, lindane, 2,4,5-T and DDT are allowed to be exported each year from the United States, even though they are considered too dangerous for unrestricted domestic use. . . .

Not only do the chemical corporations manufacture hazardous pesticides, but their subsidiaries in the Third World import and distribute them.

- Ortho: In Costa Rica, Ortho is the main importer of seven banned or heavily restricted U.S. pesticides—DDT, aldrin, dieldrin, heptachlor, chlordane, endrin and BHC. Ortho is a division of Chevron Chemical Company, an arm of Standard Oil of California.
- Shell, Velsicol, Bayer, American Cyanamid, Hercules and Monsanto: In Ecuador these corporations are the main importers of pesticides banned or restricted in the United States—aldrin, dieldrin, endrin, heptachlor, kepone and mirex.

The Ministry of Agriculture of Colombia registers 14 multinationals that import practically all the pesticides banned by the United States since 1970. . . .

Pesticide pollution does not respect national borders. As one of the world's largest food importers, we in the United States are not escaping hazardous chemicals simply by banning their use at home.

Approximately 10% of our imported food contains illegal levels of pesticides, according to the U.S. Food and Drug Administration (FDA). But that 10% is deceptive. The FDA's most commonly used analytical method does not even check for 70% of the almost 900 food tolerances for cancer-causing pesticides. (A tolerance is the amount of a pesticide allowed in any particular food product.)

In addition, the FDA frequently finds mysterious, unknown chemicals in imported foods. Government investigators believe that some of these fugitive chemicals come from the millions of pounds of "unregistered" pesticides the EPA allows U.S. manufacturers to export without divulging any information about their chemical makeup or their effects.

Knowing how little we know, we suspect these statistics from the General Accounting Office (GAO) represent only the tip of the iceberg:

- More than 15% of the beans and 13% of the peppers imported from Mexico during one recent period were found to violate FDA pesticide-residue standards.
- Nearly half the imported green coffee beans contain levels (from traces to illegal residues) of pesticides that are banned in the United States.
- Freshly cut flowers flown in from Colombia caused a rash of organophosphate poisonings among American florists.
- Imported beef from Central America often contains pesticide contamination. The GAO has estimated that 14% of all U.S. meat is now contaminated with illegal residues, and imports make a significant contribution to that total.

Meat-packing plants from several South American countries, including El Salvador, Guatemala and Nicaragua, have been repeatedly "de-listed" (removed from the list of packers certified to export meat to the United States) by the U.S. Department of Agriculture because of excessive pesticide residues. Mexico voluntarily halted all beef exports to the United States in 1979 after seven packing plants were de-listed and has only recently taken steps to resume exporting. Agricultural practices in those countries, including heavy pesticide use on crops next to cattle-grazing land, have backfired on ranchers raising beef for the U.S. market.

Despite the widespread contamination of imported food, FDA inspectors rarely seize shipments or refuse them entry. Instead, a small sample is removed for analysis while the rest of the shipment proceeds to the marketplace—and the consumer. The rationale is that perishable food would spoil if held until the test results were known. But by the time the test results *are* available—showing dieldrin or parathion or DDT residues—the food has already found its way into our stomachs. Recalls are difficult.

During one recent 15-month period, government investigators found that *half* of all the imported food identified by the FDA as pesticide-contaminated was marketed without any penalty to the importers or warnings to consumers! Even products from importers with repeated violations were routinely allowed to pass. Some examples:

- USDA officials in Dallas noticed a strong "insecticide-like smell" in a batch of cabbage from an importer with a record of shipping contaminated products. Despite USDA's complaint, the FDA allowed the cabbage to go to market. A sample that had been removed for testing later revealed illegal levels of BHC, the dangerously carcinogenic pesticide whose registration was cancelled in 1976 at Hooker Chemical's request. But it was too late to recall the cabbage.
- Peppers from a shipment that was sent on to supermarkets turned out to have 29 times more pesticide residue than allowed by U.S. law.

In a world of growing food interdependence, we cannot export our hazards and then forget them. There is no refuge. The mushrooming use of pesticides in the Third World is a daily threat to millions there—and a growing threat to all consumers here. Therefore we and Third World people are allies in a common effort to halt the production of hazardous pesticides and contain *all* pesticide use to safe levels.

Excerpted from Circle of Poison: Pesticides and People in a Hungry World, *by David Weir and Mark Schapiro. Institute for Food and Development Policy, 1981. $3.95.*

ically reduce the use of pesticides while increasing crop yields. Using IPM requires a day-to-day understanding of and attention to the conditions in the fields. The system uses natural controls as much as possible—natural parasites, predators and organisms that are pathogenic to the pests. These methods can keep pests' numbers low. In addition, IPM can take into account the local mechanical, climatic and cultural conditions to achieve maximum harvests while keeping environmental effects low. When artificial control (pesticide) is necessary, it is done carefully and selectively and only when economically and ecologically justified. Several test programs have been run in Central America, and harvests increased by 8% while pesticide use decreased by 32%.

As part of a worldwide program, two agencies of the United Nations, the Food and Agriculture Organization and the Environment Programme, plan a project to promote IPM in Latin America. In 1977, the Environment Programme passed a resolution urging governments to prohibit the export of potentially harmful chemicals "except with the knowledge and consent of appropriate authorities in the importing countries." (This would have been the result of President Carter's executive order.) In addition, the FAO and the World Health Organization, which advise agricultural and health authorities in Third-World countries, have suggested safety limits for various pesticides. But the governments must put the limits into their laws and enforce them.

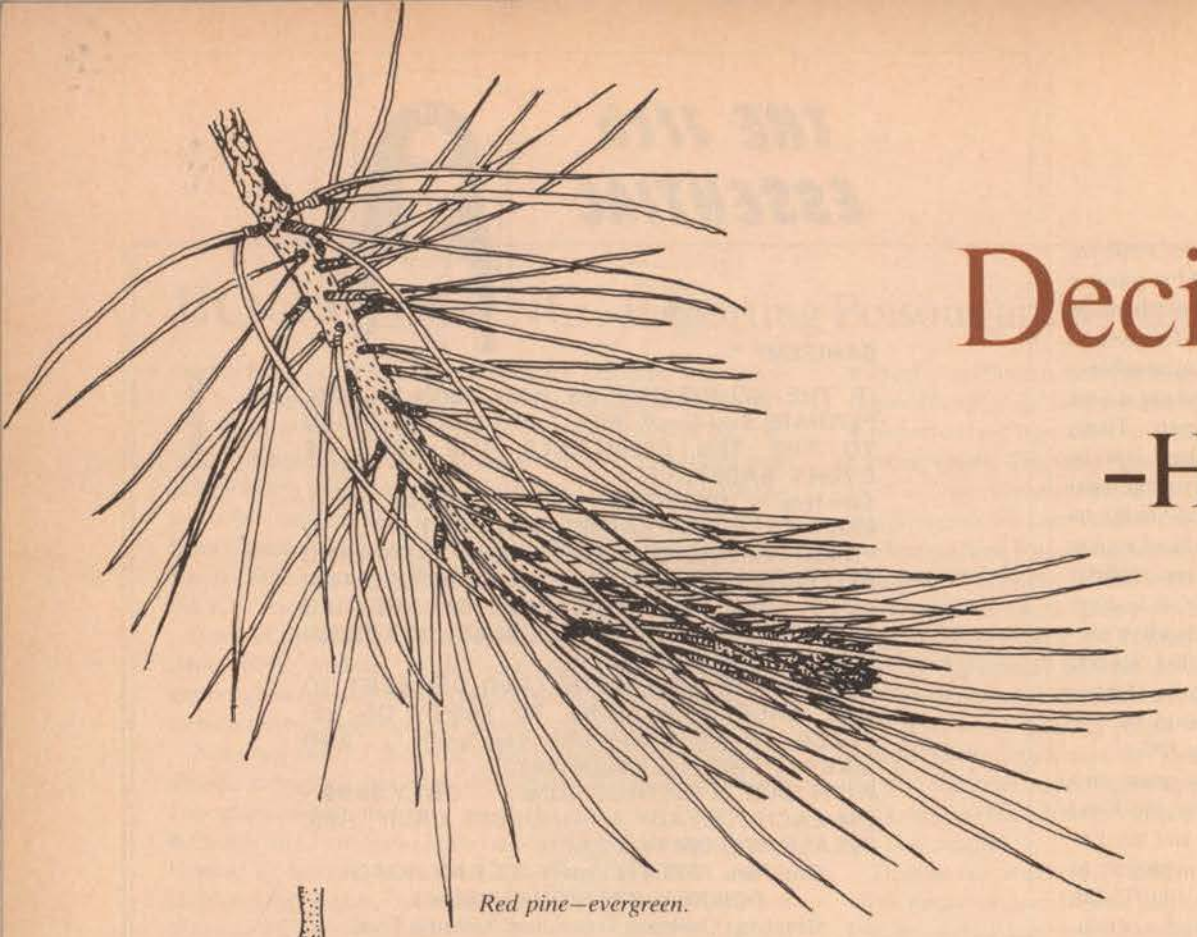
At the moment, the major obstacles to widespread use of IPM are landowners' resistance to change, pressure in all directions from pesticide manufacturers, and a lack of people trained to evaluate conditions in the fields. The FAO has shown a decreasing concern for the environment with mounting pressure on the agency to stimulate the world's food production.

How the problem of pesticide abuse will be resolved is yet to be determined. Perhaps IPM can eventually be implemented effectively for most crops in most areas of the world. In the meantime, in Central America at least, fish die on schedule twice a year, and children drink poisoned water from the drainage ditches alongside cotton fields. And exporters send cotton, beef and fruit to the United States. □

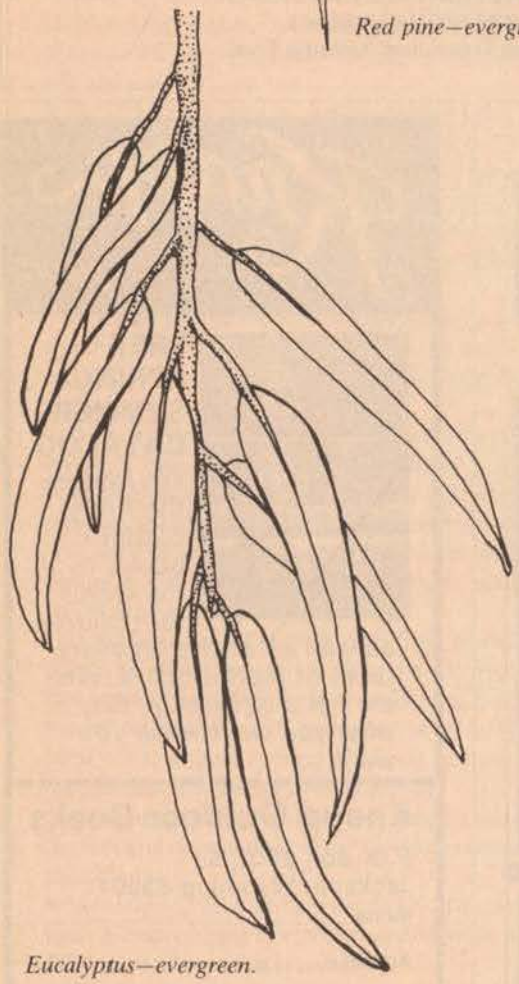
Martin Wolterding is now a professor of marine biology at the 'Atenesi Institute in the Kingdom of Tonga. He also has done research on ecology for El Salvador's Department of Agriculture.

Deciduous -How Can

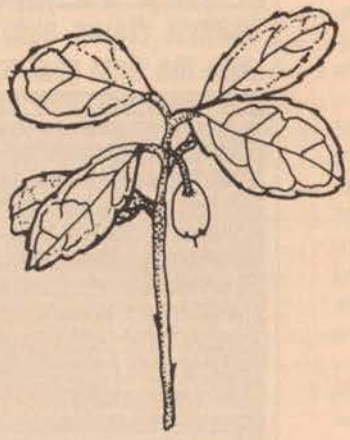
Text and Illustrations by
JUDITH GENDLIN



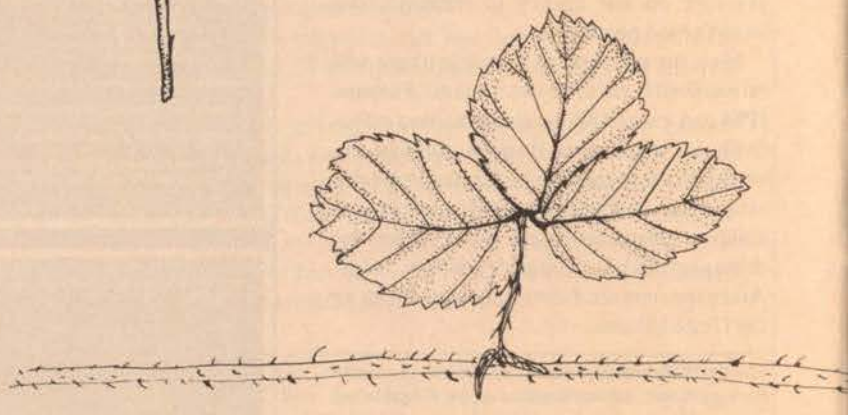
Red pine—evergreen.



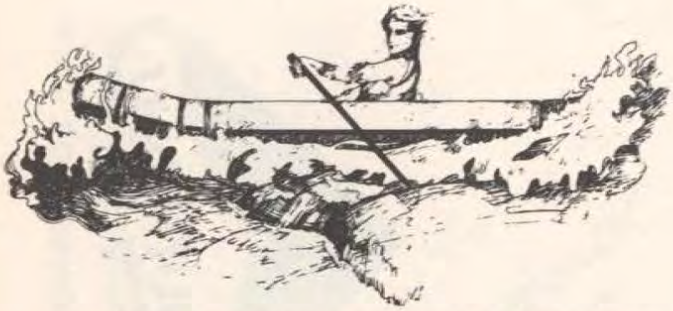
Eucalyptus—evergreen.



Wintergreen—evergreen.



TAKE US ALONG . . .



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FOR YOUNGER READERS

or Evergreen

You Tell?

Maple—deciduous.

Raspberry—the species pictured is evergreen; some are deciduous.

IT'S GOING TO BE FALL SOON, the season when the leaves change colors. Some trees, but not all, will lose their leaves. The ones that do are called "deciduous" (dē-cid′-ū-ous) trees, which simply means that they shed their leaves and then stand bare throughout the winter. Maples and most oaks are two kinds of deciduous trees.

Trees that keep their leaves all year long are called "evergreen," but don't be fooled—evergreen trees still shed leaves, it's just that they do it all year long instead of shedding them all at once in the fall. Each evergreen leaf lasts more than one growing season. No leaf lasts forever. Pines and spruces are two kinds of trees with evergreen leaves in the form of needles. But not all evergreens have needles. The eucalyptus and the magnolia are broad-leafed evergreen trees.

In the winter, when the temperature is below freezing, it is harder for trees to get water. Plants need water to live and make food, or photosynthesize. They can't use water that has turned to ice. So to last through the winter, deciduous trees shed their leaves and stand dormant (a word taken from Latin and French; it means "to sleep") until new leaves grow in the spring. Even in some parts of the tropics, there is a dry season of the year when there is no rain. The deciduous trees there lose their leaves and are dormant then.

But evergreen leaves are specially made so they can produce food during the dry times; their leaves are thicker and often have a shiny coating. Evergreens grow a little all year long instead of doing all their growing during the spring, summer and fall.

The words "deciduous" or "evergreen" can be used to describe any kind of plant, not only trees. There are evergreen shrubs and herbs, too. Wintergreen is a small plant with thick, shiny leaves; it stays green even under the snow. There are some kinds of raspberries that keep their leaves all winter long, and even some ferns are evergreen.

Our most familiar evergreen trees are "conifers," meaning that they grow cones instead of flowers and fruit to bear seeds and reproduce. Not all evergreen trees are cone-bearing. Holly is an evergreen that produces red berries. We use holly in wreaths at Christmastime because it is one of the few plants in colder climates that is still green at that time of year. The live-oak tree of California is an evergreen too, but, like all other oaks, its fruit is an acorn.

There are also cone-bearing trees that are not evergreen, such as the tamarack tree (one kind of larch), which turns golden in the fall before it loses its needles.

After the leaves fall this year, you will know which trees around you are deciduous and which are evergreen. But remember, even evergreens don't keep their leaves forever. If they did, there would be no pine needles carpeting the forest floor. □

Judith Gendlin is a freelance writer living in Chicago. She is interested in botany and botanical illustration.

The Nuclear Bond Between Power and War

ELLEN WINCHESTER

Energy/War, Breaking the Nuclear Link by Amory B. and L. Hunter Lovins, Friends of the Earth, San Francisco, 1980. $10.00.

At last the link between nuclear power and nuclear war has been clearly articulated. Amory and Hunter Lovins call nuclear power reactors "bomb larvae." With the technology to build and operate nuclear reactors comes the technology that can build reprocessing plants to extract plutonium and build bombs. This was the path followed by Britain, France and India. While the world watches, Pakistan builds a bomb with materials separated from spent fuels, using a centrifuge purchased by front organizations in West Germany and the Netherlands.

With even a small research reactor, enough plutonium can be slowly produced and extracted from spent fuel to produce a small bomb, as India demonstrated in 1974. Hundreds of kilograms of plutonium are produced every year in large power reactors, and the larger the plutonium production, the more difficult it is for the few inspectors of the International Atomic Energy Agency to keep track of it. In the United States, losses of plutonium already exceed several hundred kilograms. Yet bombs can be made from as little as five kilograms. A large reprocessing plant, the Lovinses say, can separate tens of thousands of kilograms a year.

With the already recognized quantities of plutonium potentially available on an international black market, it seems only a matter of time before a bomb unsponsored by any country is set off somewhere, possibly triggering nuclear exchanges between the Soviet Union and the United States. And plutonium can be used for sinister purposes other than to make bombs—to contaminate the atmosphere, for instance.

Because its radiation is not very hazardous until the element enters the body (and there it is more dangerous in the respiratory system than in the gastro-intestinal tract) plutonium lends itself easily to clandestine transportation. It is ironic and tragic that humanity has gone to such great expense and trouble to cancel the natural insurance against detonation of a critical atomic mass; plutonium occurs in nature only rarely, and naturally occurring uranium is not sufficiently enriched to make bombs.

Part of the thesis of Amory and Hunter Lovins is that the Atoms for Peace program begun under Eisenhower in the '50s was "one of the stupidest ideas of our time." The United States gave away research reactors throughout the world and followed them swiftly with the export of power reactors supplied with uranium enriched by our government-owned facilities. Under the terms of the Nuclear Nonproliferation Act passed during the Carter administration, reprocessing of the fuel was forbidden without express permission from the United States. As it turned out, however, any country wanting fuel reprocessed has been permitted to contract for it.

In the decades since Atoms for Peace was scattered to the four winds, our scientists have taught nuclear technology to eager swarms of foreign students, including Libyans and Palestinians. We not only let the genie out of the bottle, we insisted on training its technical servants and canvassing the globe to find the maximum amount of work for them.

Now, with the world fast approaching a situation of mutually assured terror that is only too likely to lead to mutually assured destruction, the Lovinses say it is our responsibility to put the genie back in the bottle. The means to accomplish this considerable stroke of magic is the same soft-energy path Amory Lovins has been persuasively championing for half a decade.

A major corollary of the Lovinses' argument that nuclear power is the main driving force behind nuclear-weapons proliferation is their contention that any diminution of mutual terror potentially contributes to a spiral of trust. Although desirable, it isn't necessary for Russia and the United States to reach an agreement on disarmament before a meaningful step toward peace can be taken unilaterally by signatories or nonsignatories of the Nuclear Nonproliferation Treaty. That step is the removal of the *cover* for creating a military nuclear infrastructure: the operation of central-station nuclear power plants.

The threat of clandestine plutonium traffic diminishes in direct proportion to the lessening number of operating reactors; the rate of spent-fuel accumulation is also reduced; the pressure for reprocessing eases; the expanding number of nations with nuclear weapons stops short of an "armed crowd," while at the same time benign-energy technologies are spurred by funding formerly absorbed by nuclear power; the tick of the world nuclear clock slows; and the whole apparently intractable problem may become susceptible to human resolution.

Right now—with the cost of nuclear reactors going out of sight and *de facto* moratoria on reactor orders in every country except the USSR and France; with excess electrical capacity in all industrial nations while stores of relatively cheap fossil energy remain—is the optimum time for urging the soft path worldwide. Its cheapness will appeal to leaders increasingly worried by the costs of both nuclear power and oil. Its immediacy of application will support the aspirations of their people. And refusing to accept it will expose nations with bomb-building intentions to international safeguards, or at least alarm. Niger's recent sale of 450 tons of unenriched uranium to Libya's Qaddafi, for example, has left the latter's neighbors with little doubt about his intentions.

The Lovinses' sovereign argument is that nuclear power is an inadequate, expensive replacement for oil. Nuclear power produces only electricity, inappropriate for the heating and transport needs of developing or developed nations; supplies only 7% to 8% of all demand for delivered energy; and is as dependent on high capital investment and outside supply as oil. The full range of the soft path, on the contrary, including conservation and ranging from biogas to the photovoltaic cell, can do a better job of replacing

oil overall (only a tenth of the world's oil is used for electricity), can do it more cheaply, and can do it independently of outside suppliers.

For those nations lured by the promise of energy independence through reprocessing and the breeder reactor, the Lovinses point to the fact that reprocessing of power reactors' spent fuel is yet to be accomplished anywhere on a commercial scale because of technical and safety problems. The French plant at La Hague, intended to reprocess foreign as well as French spent fuel, is reported as operating at only a tenth of planned capacity, with costs risen tenfold in six years. Furthermore, breeders take so long to achieve their theoretical uranium efficiency that in practice their dependence on plutonium from the spent fuel of light-water reactors (LWRs) requires a network of LWR suppliers for many decades. The Lovinses believe that once nations laboring to find capital for breeders sift through the hard sell of nuclear suppliers and discover the facts of the breeder case, they will voluntarily seek cheaper and safer alternatives.

The authors of *Energy/War* assume that, aside from prestige purposes, national leaders seek nuclear-weapons capability out of fear, either of the superpowers or of their neighbors. Here again the argument is that, as more nations take the soft path and it becomes easier to identify weapons aspirants, the latter, with fear reduced, will give up their nuclear aspirations. With increased security will come increased motivation to forego the expense of nuclear prestige and to choose the amount and type of energy that will satisfy national needs most cheaply.

As a kind of proof of their own ultimate intention to reduce the dangers of weapons proliferation, the states with nuclear weapons, in the view of the Lovinses, should provide special guarantees of financial cooperation or interim oil to countries displacing oil most effectively with inherently nonviolent technologies. Agencies such as the World Bank should make fair cost comparisons between nuclear technologies and energy technologies using local resources at low cost, with funding going to the best buy.

As another means of financing the infrastructure for low-cost energy systems, the Lovinses promote FREE, an international fund financed by a tax on fossil fuels, uranium mining, arms budgets or megatons of bomb inventories. It would complement existing institutions, as well as work with nongovernmental organizations to finance identification of opportunities, distribution, site testing, training and institution building.

Since there is not "world enough and time," as the authors acknowledge, to wait for all of the conditions for peace to mature, they recommend that the nuclear midgets start admonishing the nuclear giants, de-

"Well, now that we've discovered fire and invented the wheel—I guess we'll have to domesticate animals, cultivate plants, develop great urban centers, develop complex industries and eventually destroy the environment."

manding a no-first-use doctrine at the least. It will be a surprise to most American readers to learn that American presidents "brandished the nuclear threat" some 33 times between 1945 and 1975.

As part of an effort to create a realistic apprehension of the dangers of nuclear war, the Lovinses believe more use should be made of television documentaries. Another aid to improving the psychological climate would be for great powers' national leaders to express their regret about their nuclear arsenals rather than brandishing them. Finally, mutual strategic arms reduction should be accompanied by a delegitimization of international violence.

On the way toward these recommendations, the authors leave weakened a number of shibboleths used by proponents of nuclear energy. One is that any country wanting nuclear weapons would prefer to set up the facilities to manufacture weapons-grade plutonium directly, rather than to reprocess spent fuel from power reactors. Amory Lovins reports research of his own showing that any practical composition of plutonium can be made into bombs. However, if weapons-grade plutonium is desired, power reactors can produce it without increased costs. Therefore, say the authors, "Power reactors . . . can be considered large-scale military production reactors with an electricity byproduct rather than benign electricity producers with a militarily unattractive plutonium byproduct."

Another battered illusion is the concept of the timely warning, the basis for much of the United States' nuclear strategy. If a nation intends to manufacture bombs, the theory goes, the thinly spread inspectors of the International Atomic Energy Agency (itself mandated to promote nuclear energy) will discover the diversion of spent fuel quickly enough to warn the United Nations. But in fact, "In 1976 the IAEA was unable to verify spent-fuel inventories in 8 of 34 LWRs and in 5 of 11 on-load refuel reactors." In addition, new, unconventional medium- and small-scale methods of reprocessing provide the means for evading inspection.

Nor can spent fuel be intentionally processed in a way to make its use in bombs impossible, a conclusion arrived at by the two-year International Fuel Cycle Evaluation launched by President Carter. Even natural uranium can be enriched, using old centrifuge techniques, in sufficient quantities to make a bomb.

Adding to the impossibility of timely warning is the fact that new dangers are showing up at the front end of the fuel cycle. One stolen unirradiated LWR fuel bundle

could be made into one bomb's worth of separated plutonium. And even if the IAEA does discover enough separated plutonium for bomb manufacture, as it did at research reactors in 7 of 41 countries in 1976, present treaties governing the peaceful use of nuclear energy have so many loopholes or are unsigned by so many nations that the plutonium producer does not risk even a slap on the wrist.

In the context of events since *Energy/War* was written, some of its recommendations seem unrealistically sunny. A budget providing for three times the military spending of the Vietnam War is being pushed through Congress; the growth of energy efficiency and solar energy is being left to the marketplace, while the historically heavier subsidy to nuclear energy is greatly increased; Congress is considering a new 1000-MW breeder reactor as an unlicensed research and development facility; nuclear war is discussed as a strategic option; the possibility of an arms sale to China has been aired; oil companies, occupying six of the top ten manufacturing positions in the United States and making 40% of all manufacturing profits, are buying up coal, uranium and mineral resources; Pakistan is expected to share its bomb with Libya; Defense Secretary Weinberger says the Reagan administration is shaping a new military strategy designed to counter Soviet threats anywhere on the globe with extended conventional war, with no indication of how the extension would be kept conventional; within the United States, every BTU of fossil energy is being pursued, no matter how grave the environmental costs.

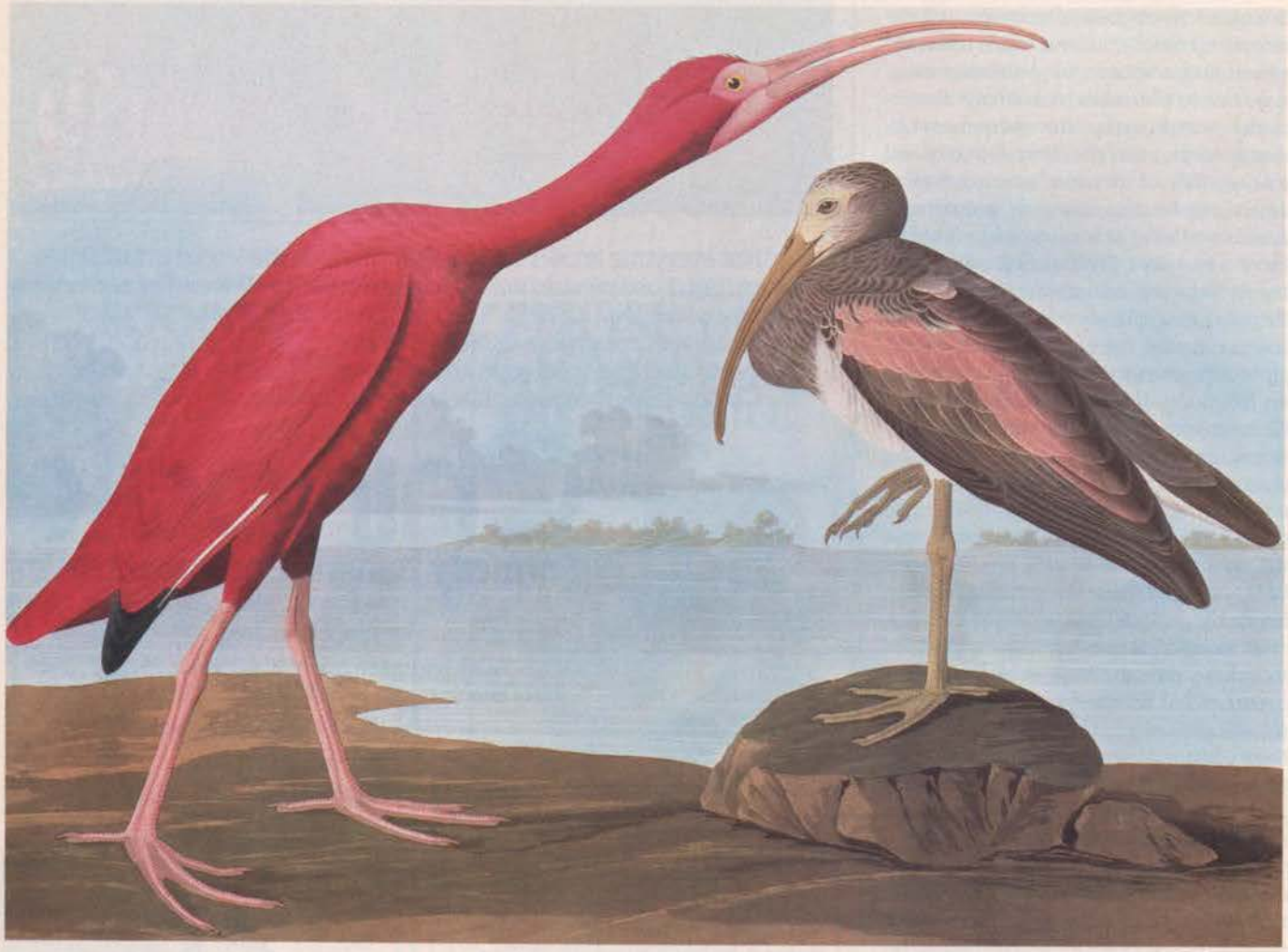
It is hard to believe that the superpowers will ever cooperate to give production of benign energy even encouraging lip service, let alone unilaterally close down their nuclear arsenals and power reactors. It is hard to believe that the leaders of developing countries will have an opportunity to learn the real costs of nuclear power and compare them with the costs of renewables sources or that, if they do, in a world insanely bent on proliferation, they will arrive at the same conclusions as the Lovinses.

But in fact, Amory and Hunter Lovins never promise us a rose garden. They merely outline an opportunity, now when market forces themselves are allied with opponents of nuclear energy, then fill it in with hard facts and leave it to us to go forth and organize, form networks, educate and *lead* from whatever podium we can find. They have done us the good service of abundantly documenting the potential for avoiding our nuclear demise. □

Audubon's Birds Revised

Sierra is pleased to present three paintings by John James Audubon which are included in a new edition of his monumental *Birds of America*, revised and updated by Roger Tory and Virginia Marie Peterson. The first edition was printed in parts from 1826 through 1838 on "double elephant" sized paper; when it was folded and trimmed, it measured 29½ by 39½ inches. All 435 illustrations were hand-tinted engravings. A later, smaller edition included 500 lithographs. The extra 65 were not new birds, however; Audubon had simply separated birds previously shown together, in some cases clipping apart trees with several birds on them to show the birds on branches individually.

The updated book uses the original hand-tinted engravings, as well as distinguished illustrations that have been done since Audubon's time. Dr. Peterson has updated the nomenclature—nearly half the scientific and common names were out of date—as well as the information on the birds. He has also written a long essay on Audubon and his place in ornithological history. *Audubon's Birds of America* will be published by Abbeville Press in September.

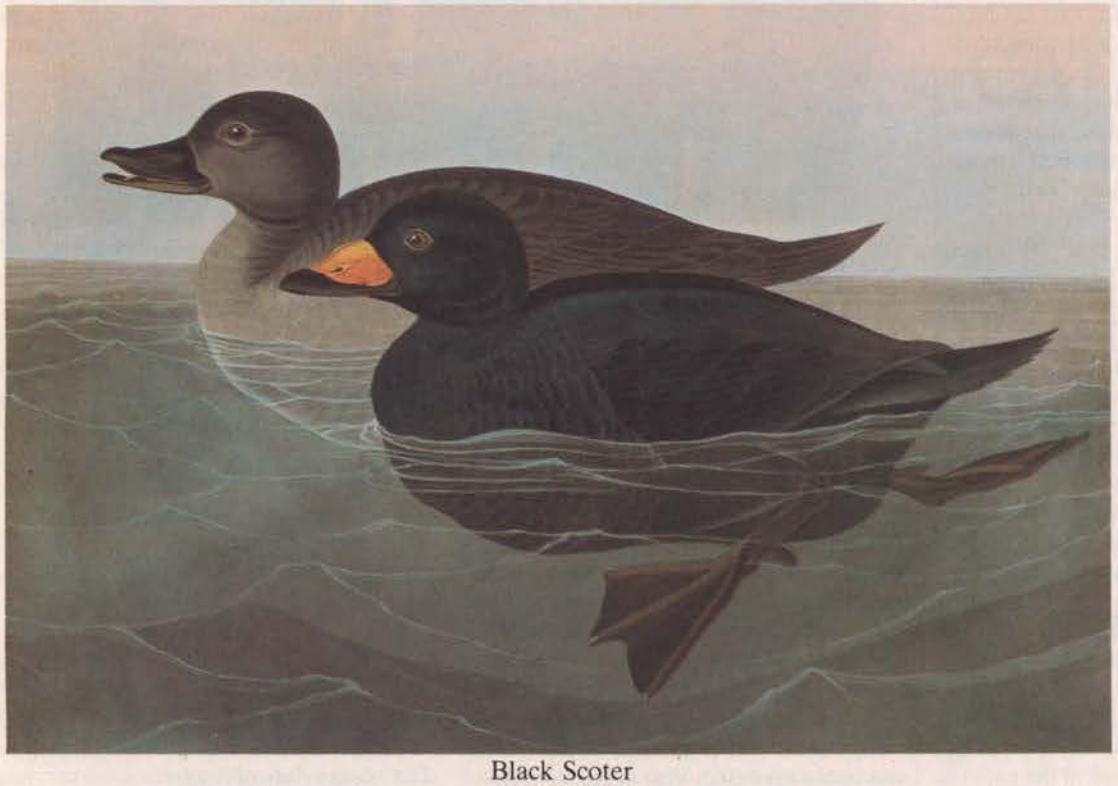


Scarlet Ibis
Eudocimus ruber

"The scarlet ibis, a South American species closely allied to the white ibis, was supposed by Alexander Wilson to be not uncommon in the southern parts of the United States. Audubon took issue with this, stating that he had seen the species only once, three birds at Bayou Sara in Louisiana on the 3rd of July, 1821: 'They were traveling in a line, in the manner of the white ibis, above the tops of the trees.' In his journal he wrote, 'My drawing of the adult male, and that of the immature bird, were made from specimens procured beyond our limits.' He added, 'As I have not had opportunity of observing them I judge it better to abstain from offering any remarks on the subject.'"

Common Goldeneye
Bucephala clangula

"The large, round, white spot between the eye and the bill of the male goldeneye is its most distinctive field mark. The female is more modest in appearance: gray with a chocolate-brown head, separated from the gray chest by a broad white collar. This cold-weather duck whistles or 'sings' with its wings as it flies swiftly over the lakes, ponds and streams. In such places the 'whistler' is often the only duck to be found during the winter months, except for the common merganser."



Black Scoter
Oidemia nigra

"Hunters once knew all three scoters as 'coots,' and this species, solid black with a bright yellow or orange swelling on its bill, was known as the 'butternose coot.' At times it mingles in flocks beyond the breakers with its relatives, the surf and white-winged scoters, but more often than not it is found in pure flocks of its own kind. It has a curiously disjunct breeding range in North America, nesting in Alaska and locally in northeastern Canada, but seemingly not in between. The black scoter is better known in winter when it resorts to the coasts—on the Pacific side from Alaska to Oregon and on the Atlantic coast from the Gulf of St. Lawrence to the Carolinas and, rarely, to the Gulf states."

Sierra Club Books—How a Small Publisher Prints a Big Book

ROBERT IRWIN

Perhaps you've already received it. If not, you soon will. The Sierra Club Books catalog for Christmas 1981 is in the mail to all of the Club's more than 220,000 members. The handsome 8½ by 11 brochure is impressive, as is its list of thirteen new books. They include a large-format, richly illustrated volume on Alaska by Galen Rowell and John McPhee; a book on chemical pollution edited by Ralph Nader; a comprehensive look at the public's exposure to radiation by Dr. John W. Gofman; John Hart's Totebook on the Great Basin; and Wesley Marx's examination of the planet's water resources.

Along with eight others, these new titles are expected to push sales for the coming year significantly above the record level of fiscal 1981. Total receipts for the year ending September 30, 1981, were projected at more than $2 million and net sales at more than $1.5 million.

There can be no doubt that the books program has expanded far beyond its modest beginnings in 1900. Although it is still a small publisher by New York's standards, the sales figures—along with the high quality and comprehensive scope of its books—have won the Sierra Club recognition as a full-fledged and respected member of the book publishing community.

The Sierra Club has been publishing continuously since its earliest years. "Publish[ing] authentic information concerning mountain regions of the Pacific Coast" was written into the Club's articles of incorporation in 1892 as one of the chief purposes of the Club. The first issue of the *Sierra Club Bulletin* appeared in 1893 and has come out regularly ever since—in the early decades only once or twice yearly and in the paperback format of a professional journal.

Then, in 1900, the first Sierra Club book was published, Joseph N. LeConte's *A Journal of Ramblings Through the High Sierra*. From that time until 1960, the Club published only about a half-dozen other books, for the most part trail and climbing guides to the Sierra.

Peter Booth Lee

Most of the Books staff. Front row, left to right: Cathy Kouts, Eileen Max, Susan Ristow, Joni Vieira, Peter Beren. Back row, left to right: James Cohee, Jon Beckmann, Diana Landau, Alan Weaver, Daniel Moses. Not pictured: Kate Gross, Rosa Li and Don Oppenheim.

But in the 1950s the Club's horizons began to broaden. Under the aegis of Executive Director David Brower, it launched a five-year nationwide environmental campaign to save Dinosaur National Monument from the dam builders. For the first time, a book played a prominent role in a Sierra Club conservation campaign. *This Is Dinosaur: Echo Park Country and Its Magic Rivers* was conceived by Brower, who also rounded up the illustrations, writers, an editor (Wallace Stegner) and publisher (Alfred A. Knopf).

In 1960 the first of the famed exhibit format books appeared, *This Is the American Earth* by Adams and Newhall, a transformation of the 1955 exhibit. The Club had leapt into trade books; book publishing became a separate department with a full-time editor and publications manager. Through the 1960s and into the 1970s, book after book in the exhibit format series came out. John McPhee, co-contributor with Galen Rowell to this year's *Alaska: Images of the Country* (the most recent and somewhat smaller descendant of the exhibit format books), describes the exhibit format books in *Encounters with the Archdruid:*

> "big, four-pound, creamily beautiful, living-room furniture books that argue the cause of conservation in terms, photographically, of exquisite details from the natural world and, textually, of essences of writers like Thoreau and Muir."

The Money Side of Books

The books of the exhibit format era, however, were successful editorially but not financially. Jon Beckmann, director of the books department, says that by the early 1970s inventories of unsold books were perilously large, and the program had incurred a mil-

lion-dollar deficit. The Club felt it could not afford such an expensive communications effort, and there was talk of abandoning the whole books program. In late 1973, however, the board of directors decided to hold on. The program moved from New York to San Francisco in 1974,and it crept into the black in 1975.

The board still thought the program might be a drain on Club resources, but a surplus of almost $110,000 in 1976 allayed their fears. Since that breakthrough year, the program has consistently operated in the black; its surplus has averaged more than $100,000 a year.

What Beckmann has been doing is keeping a watchful eye on costs in relation to income. That means careful control of the choice and number of titles to be published in a year. Still, while heeding financial reality, he continues to communicate environmental issues to the public and express the Club's concerns. As a result, the publishing program has achieved a remarkable financial success. For the last three years, it has had surpluses of 31.4%, 11.4% and 32.8% (compared to a range of averages from a loss of 5.2% to a profit of 5.2% for the other environmental publishers with less than $5 million in annual net sales).

Books' continuing close attention to the financial facts of life was obvious at the Publications Committee meeting last May. A visitor wandering in a few minutes late, as I did, would have thought a group of accountants, not book people, were deliberating. The conference table was laden with reports, charts and tables on sales, costs, ancillary income, cash flow and inventories. There were figures on past results and on projections from three months to three years in the future. All were reviewed and discussed in detail. Most of the department's staff of thirteen took part, along with the attending ten members of the thirteen-member committee.

The Publications Committee scrutinizes all aspects of the books program, their concerns delicately balanced between editorial content and financial solvency. Most committee members are present or past members of the board of directors, including Denny Shaffer, Helen Burke and Mark Hickok; six members are knowledgeable publishing professionals. The committee's chair, Marvin Baker, has served as the Southern Plains regional vice-president and as chair of the Oklahoma chapter.

Publishers must constantly plan ahead editorially and financially, and both aspects must advance synchronously. Survival depends on a steady flow of books onto the market every year. Sales of "old" books (the backlist) account for only 30% of the total annual volume. Therefore, for most of the meeting's afternoon session, the committee deliberated on editorial matters, reviewing status reports on some 50 titles for publication between the spring of 1981 and fall of 1983. It also considered about 40 other future book ideas or projects, some more advanced than others.

Two book ideas—one on wilderness running and the other on solar architecture—were presented as formal proposals for publication, both in the spring of 1983. Each was accompanied by a *precis* or outline of the proposed book, as well as by a worksheet covering the book's length, page size and other physical details; its probable twelve-month sales; net receipts projected and all costs broken down per copy, for total copies and as percentages of total net receipts; and, finally, how many copies would have to be sold to break even.

Members of the Publications Committee have ten days to refuse a proposal. If no one opposes the book, it gets the go-ahead, and contracts are signed. Once in a while, when a committee member or two raises serious objections, a proposed book has been dropped despite tacit or expressed approval by the rest of the committee. The books department makes the decision, since it has final approval of book projects. Usually, however, there is unanimity because by the time a book idea reaches the proposal stage, it has already been discussed extensively.

History of a Book

From idea to bound volume, the usual gestation period for a Sierra Club book is about two years. Ideas are sometimes generated in-house, but senior editor Diana Landau notes that as the Club's trade book reputation has grown, more new book proposals have been coming from authors or their agents. Every day the department receives about a half-dozen inquiries, proposals or manuscripts. Each one is read by at least one editor; better ideas are passed along, and before a decision is made to develop an idea, at least three editors have read it and discussed it thoroughly in the weekly editorial meetings. At some point during the evaluation, the manuscript or idea is sent for review either to someone inside the Club, or to an outside expert or both. If all opinions are favorable, at an editorial meeting someone is designated the sponsoring editor.

The sponsor compiles all the information the Publications Committee will need to make a sound evaluation, especially estimates from the production department.

Production estimates costs, finding the best formula after taking into consideration a number of factors including size, whether color printing will be required and what size print run will be best according to the marketing department's estimate of probable sales. Italian or Japanese printers usually turn in the lowest estimates for high-quality four-color work; the difference between their prices and those from American companies is often up to two dollars a book, which translates into ten or twelve dollars in the book's cover price.

When the estimates are done and put together with the editorial material, the entire proposal goes to the Publications Committee. If the committee doesn't disapprove, the book begins its way through the standard publishing process—writing, editing, typesetting, proofreading, printing and binding.

Some books are exceptions to this general rule, however; *Alaska: Images of the Country* is one of them. The idea of a book combining his own photographs with John McPhee's now-classic *Coming Into the Country* occurred to Galen Rowell in 1979. He had thought before of doing such a book by himself—similar to his two previously successful books done with the Club—until he read McPhee's eloquent book in 1978. He suggested the collaboration to McPhee, who agreed. Rowell took the idea to Jon Beckmann, who turned it over to Diana Landau for development. She mailed her formal proposal to members of the Publications Committee in July 1980, the contract was signed the next month and the authors began selecting photographs and excerpts from the original text. Soon Landau was editing, copy was being set, proofs were being checked, pages were being laid out and color transparencies were being separated.

In May 1981 the department launched the marketing effort for this book and the other fall titles at Charles Scribner's Sons' semi-annual sales conference and at the annual American Booksellers Association convention. By July the book was on press in Italy. During the summer, Landau took care of last-minute details such as arranging for McPhee to autograph 500 copies of a limited edition, which will sell for $100. The entire press run of 17,500 books left Italy for New Jersey in August.

"Over the years Julius has helped Save the Redwoods, Save the Children, save the mustangs, Save our POWs, save the Hudson, save old Charleston, save the wilderness and now he's saving up to help Save San Francisco Bay."

Books' Future

A financial master plan presented at last May's Publications Committee meeting has projected the books program's future into 1985. It grew out of guidelines developed by a Club task force, which assumed there would be no major recession, inflation would continue, and there would be a gradual decline in sales of calendars, whose royalties have been the chief factor in the program's profitability. The plan suggests a number of other avenues for increasing revenues:

- Finding new markets for the books;
- Publishing more titles, with a slight increase in staffing;
- Pursuing such sources of ancillary income as film rights, reprints and serialization, and exploring new directions, such as videotapes.

Assuming progress on its suggestions, the task force projected the following developments by fiscal 1985: a $100,000-per-year rise in net sales to $1.9 million; a staff of 16, up from the current 13; 26 new book titles a year, versus 17 in 1981 and 20 in 1982; and a surplus of $346,000 as opposed to $290,000 for fiscal 1981.

How You Can Help

Let's get back to that Sierra Club Books Catalog for Christmas 1981. It gives you as a member the chance to help one goal of the books program, namely to increase non-bookstore, direct-mail sales. The price is right—there's a 20% discount for members. It is even more right if you buy several titles, because a blanket $1.75 postage and handling charge applies to each order no matter what its size. This member sales program helps both you and the Club. Such sales in fiscal 1981 rose 21%, topping $271,000.

Buying books and calendars through your group or chapter has even more advantages. You get a discount and may not have to pay for postage; at the same time, your group or chapter can take advantage of its much larger discount. It has been a successful fundraiser for many chapters. Still, although last year's sales climbed 34%, the total of $135,200 was far below its potential. About half the Club's chapters and groups are overlooking this program.

If your chapter or group is not participating, maybe you can do something about it. Talk to your chairperson, treasurer or both. For full information, write to Alan Weaver, Chapter and Group Sales Coordinator, Sierra Club Books, 530 Bush Street, San Francisco, California 94108. □

(18" x 24" stamp embossed with gold foil)

S.O.S.
SAVE OPEN SPACES

(18" x 24" full color offset litho)

(18" x 24" stamp embossed with silver foil)

S. O. S.

POSTERS TODAY BECAUSE TOMORROW MAY BE TOO LATE!

Let the **"S.O.S."** theme symbolize and dramatize our commitment and unite us in this ecological crisis at these historical crossroads.

Please join us in popularizing this urgent **"S.O.S."** theme and help sound the alarm for reason. We can help to protect our natural heritage by blending our voices and being heard. If we are not heard, the blind forces of greed and ignorance could destroy our ecological balance forever! With your commitment we can make **"S.O.S."** a national watchword.

*A portion of the monies received will go to the John Muir Fund For Wilderness, of the Sierra Club Foundation

*MONEY-BACK GUARANTEE

THE POSTERS:
Let these fine art posters stand as living symbols to reflect your concern, as well as beautify and enrich your living space. Like many fine-art posters, especially those of historical significance, these will surely become collected and highly valued in years to come. These beautifully printed graphics on fine art paper may be proudly framed (or not) and enjoyed for years and years.

THE ARTIST:
Russell McDougal, the creator of these **S.O.S.** posters, is a San Francisco photographer, designer, poet.

A little more fresh air from OPEN WINDOW GRAPHICS—

"The S.O.S. posters are simple, direct, and important. Their messages are cogent, too...

All display the vital signal S.O.S., the call we cannot afford to ignore.

And the S.O.S. poster that hangs on my office door at Friends of the Earth says it well:

Solar: Our Solution."

—David Brower
(Founder of Friends of the Earth)

(18½" x 26" full color offset litho)

"The theme of these posters—S.O.S.—is appropriate to alert people to the Earth's mounting ecological crisis. Today more than ever we need to be reminded that saving our Earth means saving ourselves. These posters can serve as such a reminder."

—Barry Commoner
(Director of the Center for the Biology of Natural Systems, Queens College)

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Administration Declares Secret War on Clean Air Act

In a surprise move, Environmental Protection Agency Administrator Anne Gorsuch declared on August 5 that instead of submitting its own legislation to revise the Clean Air Act, the Reagan administration would be guided by a set of eleven principles in working on the issue with congressional leaders. The principles are bland on the surface—for example, number nine reads, "Deadlines for achieving primary air quality standards should be adjusted to reflect realities in particular areas." But advocates of a strong act believe there are clear indications the eleven points are simply a way to put a pleasing face on a vigorous behind-the-scenes effort to push the damaging bill recently introduced by Representative James Broyhill, or some equivalent. That bill would delay achievement of health standards and eliminate other important air standards (see "News," July/August *Sierra*).

Behind the rhetoric, the administration is expected to promote: eliminating protection for the clean air over the 90% of the nation's lands that now enjoy relatively clean air but are not national parks or wilderness areas; allowing cars built in the future to emit twice the amount of nitrogen oxides as this year's cars; rewriting emissions standards for power plants to let them emit three million more tons of sulfur oxides a year; eliminating some of the Clean Air Act's provisions that make the act enforceable by citizens' groups or the Environmental Protection Agency; and relaxing standards that protect against adverse health effects from pollution. Ruth Weiner, chair of the Sierra Club's national Clean Air Campaign Steering Committee, found the EPA's announcement "an example of dishonest backroom politics, unworthy of an issue of this importance." She called on all Americans to express to Congress their outrage over the proposals and over the administration's attempts to characterize them misleadingly as "continuing progress toward clean air."

Concerned readers should ask their representatives to support a strong Clean Air Act and oppose the Broyhill bill and the administration's stance. Addresses are: House Office Building, Washington, D.C. 20515, and Senate Office Building, Washington, D.C. 20510.

California Wilderness Bill Passes House Again

Representative Phillip Burton (D-CA) has successfully steered his compromise California Wilderness Bill (H.R. 4083) through the House. The bill, virtually identical to legislation passed by the House last year, passed on a voice vote. It would designate 2.1 million acres of roadless areas in national forests as wilderness and would protect some 1.5 million acres of national parks as wilderness, ratifying the parks' management plans. It would also permit other roadless lands to be developed.

But the bill and its companion in the Senate, S. 1584, by Senator Alan Cranston (D-CA), are both stuck in the Senate Energy and Natural Resources Committee, which still has on its agenda the so-called Anti-Wilderness Bill (S. 842). That bill, authored by California's other senator, S. I. Hayakawa, would essentially prevent additions from being made to the National Wilderness Preservation System by barring the Forest Service from considering wilderness as a management option in the future, and by setting hasty deadlines for congressional consideration of proposed wilderness areas.

Readers who have not yet asked their senators to oppose the Hayakawa bill, S. 842, and to support Cranston's California Wilderness Bill, S. 1584, can help a lot by doing so now. The bill needs to be moved through the committee, but it will be stymied by opposing political forces unless popular support forces its movement.

Watt Petition Campaign Rolls On

By the time members receive this issue, the Club will have on file about 850,000 signatures in its "Replace Watt" petition drive; 700,000 were in at press time, with about 45,000 coming in each week. Other organizations, including Friends of the Earth, Greenpeace and the Massachusetts Audubon Society, are collaborating on the drive and have also collected a substantial number of names. The Club hopes to put its petitions into the hands of Congress soon. People collecting signatures are urged to send in completed or nearly completed petitions as soon as possible, while continuing to collect new names. Please send petitions to "Replace Watt," Sierra Club, 530 Bush Street, San Francisco, California 94108.

While the Club has been busy with the campaign, the National Wildlife Federation and the Izaak Walton League have joined the Club, Friends of the Earth, the National Audubon Society and The Wilderness Society in calling for Watt's replacement. The National Wildlife Federation conducted a poll of its members and found that although they had voted for Reagan over Carter by a two-to-one margin, 80% of them thought Watt's policies were "extreme." Delegates to the national convention of the Izaak Walton League called for an Interior Secretary who is "sympathetic to the nation's conservation needs and who will restore the Department of the Interior to its proper role."

Minerals Bill Loses Support

Representative Jim Santini's (D-NV) National Minerals Security Act, H.R. 3364, is losing support in the House even before hearings have been scheduled on it. In a joint statement, three representatives announced they were withdrawing their cosponsorship. They said, "We are concerned that the public lands sections of the bill contained in Title III may result in doing more to damage non-mineral resources than they will to contribute to solving strategic minerals problems." The statement was signed by Representatives Tom Foglietta (D-PA), Harold Ford (D-TN) and Austin Murphy (D-PA). A fourth representative, Dick Cheney (R-WY), withdrew separately. At press time, rumors indicated that more of the 50 remaining cosponsors were considering withdrawing. Such withdrawals are unusual, indicating the bill is in trouble.

GUEST OPINION

The Importance of Barrier Beaches

SENATOR JOHN H. CHAFEE and REPRESENTATIVE THOMAS B. EVANS, JR.

Senator John H. Chafee (left), a Republican from Rhode Island, chairs the Senate Subcommittee on Environmental Pollution. Representative Thomas B. Evans, Jr. (right), a Republican from Delaware, is a member of the House Subcommittee on Fisheries and Wildlife Conservation and the Environment.

IMAGINE, in the year 2003, arriving at Horseneck Beach in Massachusetts, or Dog Island in Florida, and finding this sign: "This half-mile stretch of shoreline is a perfectly preserved example of what was once known as a 'beach' in its natural, undeveloped state. Today, all our shoreline areas are profitable sites for commercial developments, condominiums and hotels. Once upon a time, all our shoreline developments were 'beaches,' such as this small stretch of land now preserved as a landmark."

Before this country sadly retains only a half mile of natural beach, we must stop the reckless development of America's barrier beaches and islands.

Of the 1.5 million acres of barrier islands and beaches with an oceanfront shoreline of 2700 miles, somewhat more than one third are protected by state, federal and local governments or private interests; one third have been developed; and a little less than one third are undeveloped. We strongly believe this Congress should make every effort to conserve the portion that remains undeveloped.

Why? Because these barriers provide essential habitat where healthy fish and wildlife populations can find shelter, food and places to raise their young. Barrier beaches and their associated aquatic systems are places to nest, nurse, feed and rest for millions of migratory waterfowl, shorebirds, and other wildlife. As many as 90% of all commercially important fish and shellfish species on the Atlantic and Gulf of Mexico coasts spend some portion of their lives in estuaries created by barrier islands. It makes no economic sense for the federal government to subsidize development in these fragile areas, yet the Department of the Interior has estimated that nearly $500 million were spent to foster barrier island development between 1976 and 1978.

What are these funds used for? Projects include federal flood insurance, bridges, roads, sewers, loans for economic development and loans for home construction. One example of this wasteful federal spending is a $65-million plan to replenish sand on Miami Beach, despite the warnings of geologists that the sand will disappear again.

If the United States were enjoying better economic times, we would propose acquiring all undeveloped barrier areas as national wildlife refuges. But given the reality of fiscal austerity, environmentalists should look for other ways to preserve these lands from future degradation. It turns out there is a way not only to provide necessary protection, but to save federal dollars as well.

Because we care deeply about the protection of our natural resources, we introduced legislation last spring—John Chafee in the Senate and Tom Evans in the House—to prohibit the federal government from funding commercial and residential growth on undeveloped barrier beaches and islands. Such a policy could save the federal taxpayers millions of dollars while discouraging human-induced devastation of these pristine natural treasures. The Chafee-Evans bill would establish a coastal-barrier resource system and deny new federal spending on those undeveloped areas for almost every purpose—including new construction of sewers and roads, new loans for home construction and economic development, and federal flood insurance policies for new construction or substantial improvements.

There are, however, exceptions to these prohibitions. Federal assistance for coastal water-dependent energy activities and exploration would be permitted, as well as the maintenance of existing channel improvements, and dredge-and-fill activities. Federal funds would also be available for air and water navigation aids and devices, fish and wildlife protection and enhancement programs and national security activities.

Within three years, the Secretary of the Interior would be required to report on areas especially valuable to fish and wildlife. A final report would be due within five years, to include an inventory of the fish and wildlife resources within the barrier system and recommendations for the conservation of these natural resources. The report would also recommend whether the funding prohibitions in the act should be deleted, modified or expanded.

Cutting off federal funding in our undeveloped barrier areas is an important first step that must be taken soon. In addition to the strong support we have received in Congress for this legislation, members of the administration have indicated support for our bill.

We are confident that with this kind of backing in Washington, and the help of concerned citizens and environmental groups around the country, we will see this plan to protect undeveloped barriers become a much-needed reality.

In 1908, President Teddy Roosevelt, one of this country's first environmentalists, spoke these words, which still ring true:

"The prosperity of our people depends on the energy and intelligence with which our natural resources are used. It is equally clear that these resources are the final basis of national power and perpetuity."

We suggest that an intelligent way to build our national power is to save dollars at the same time we save our barrier areas and their precious animal populations. □

Please write your representative and senators and ask that they cosponsor the bills, H.R. 3252 in the House and S. 1018 in the Senate. To be put on a mailing list for the *Barrier Islands Newsletter*, please send your name to Jim Elder, 330 Pennsylvania Avenue, S.E., Washington, D.C. 20003.

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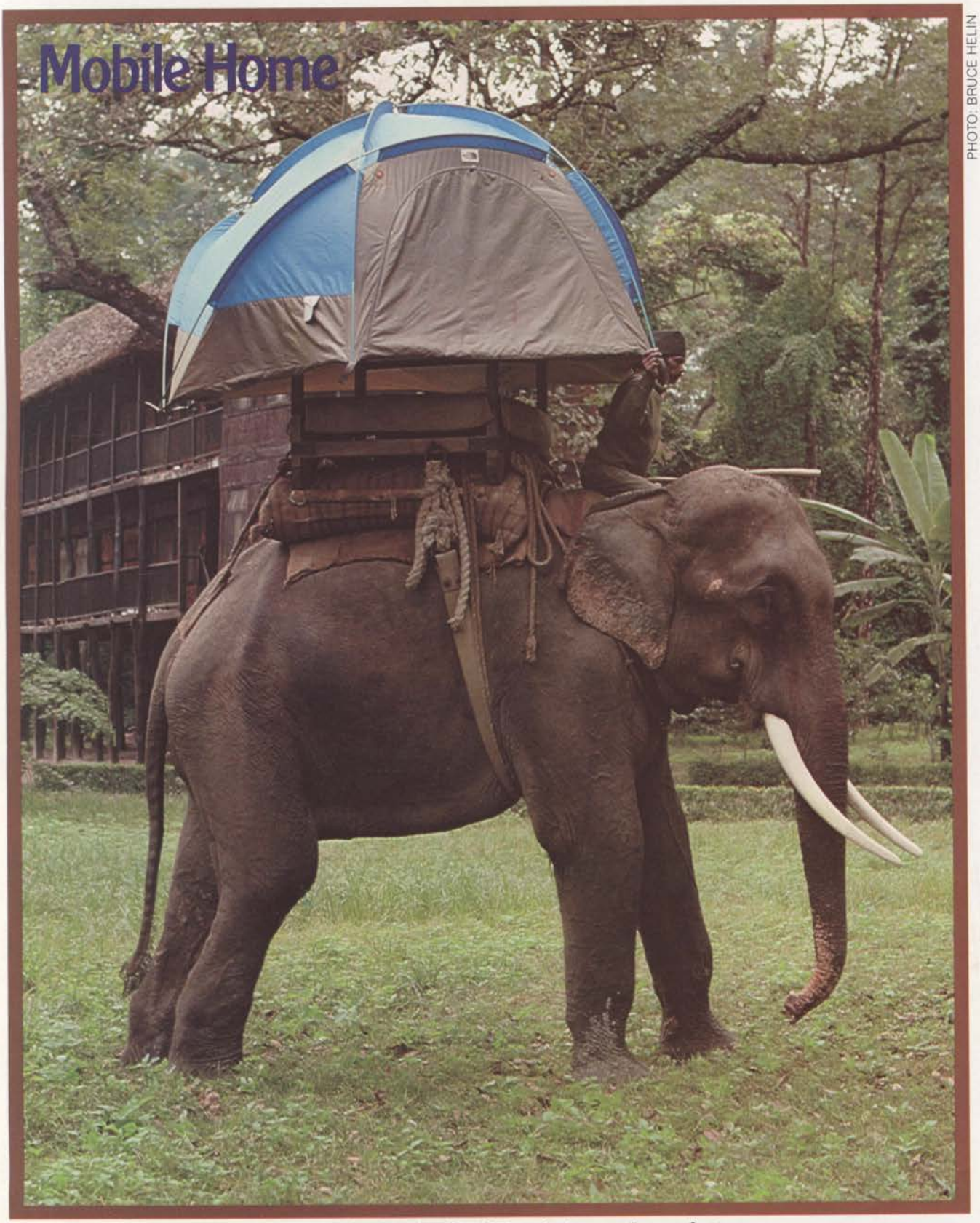

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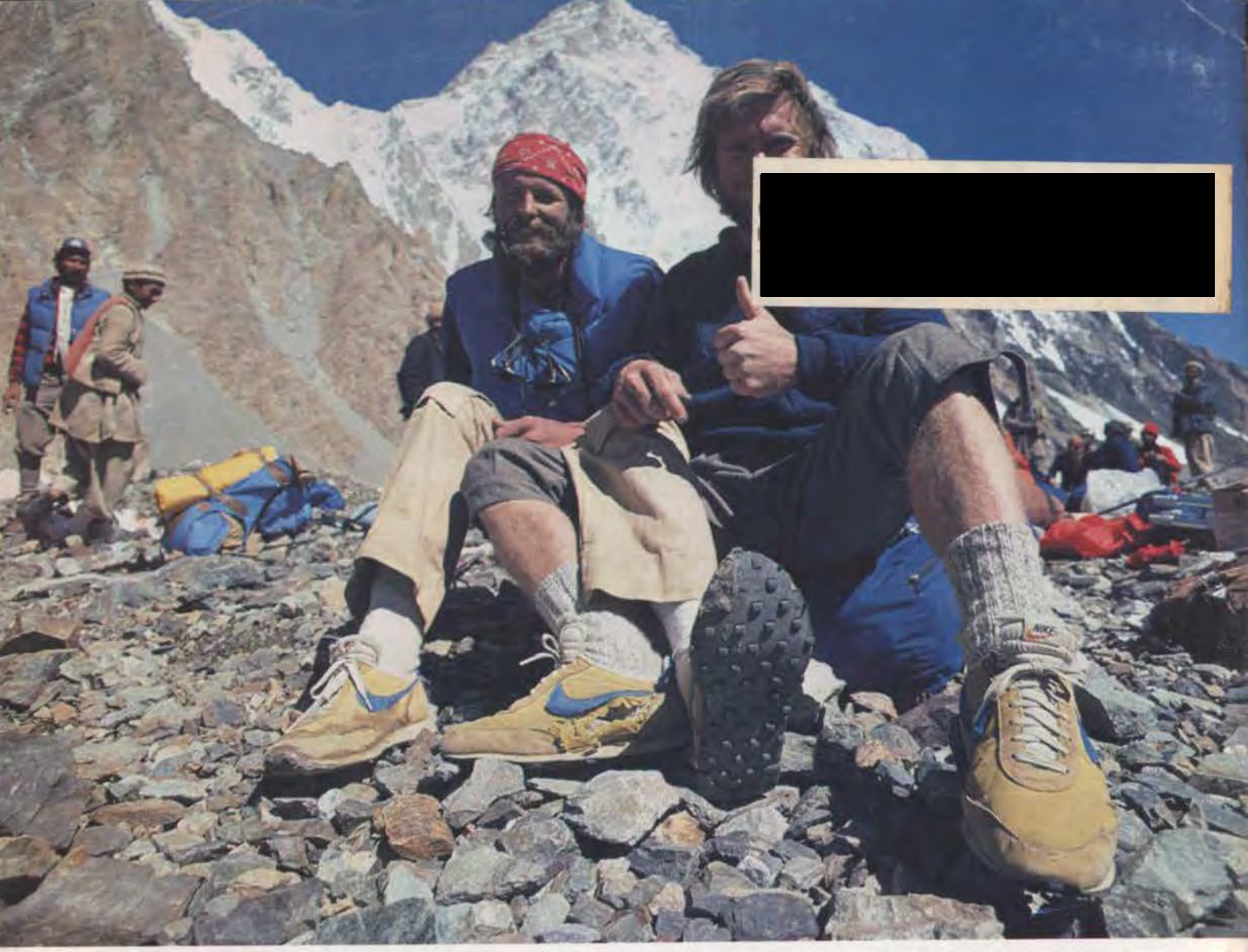

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