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High Country

news

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Mountain pine beetle epidemics

Pine beetles munch on, policies differ

by Susan Tweit

Hiking the boundary trail along the west border of Yellowstone National Park, you cross lush, grassy Bechler meadows and climb onto a gently rolling plateau, thickly forested with lodgepole pines that are evenly spaced, similarly sized and, for the most part, dead.

Hiking north along the park boundary, the monotony of the eerie dead forest breaks only to the west, where one can see acres and acres of stumps across Island Park in Idaho, part of the Targhee National Forest. And much of what remains standing, like the lodgepole in Yellowstone, is dead.

In fact, 90 percent of the lodgepole pine in the Targhee National Forest is dead, according to forest supervisors.

A small black bug is responsible for much of this destruction. This mountain version of "Jaws" has chewed through 4.5 million acres of lodgepole and ponderosa pine in the western United States in recent years, according to U.S. Forest Service estimates. Entomologists call it *Dendroctonus ponderosae*; in layman's language, the mountain pine beetle.

Pine beetle epidemics have affected forest management throughout the Rocky Mountains and responses to the destruction vary as much as the land use.

Forest managers are responding to mountain pine beetle epidemics not with clouds of pesticides, but rather with an environmentally-based management philosophy which the Forest Service terms "integrated pest management," according to Bob Gale, forester for the agency's Washington office.

Mountain pine beetle is a native species. Unlike some other forest pests, it has probably existed as long as the pine forests and has so far proven impossible to eradicate.

Pine beetle epidemics are natural. The beetles exist in small numbers in all western pine forests. Periodically populations build and kill many acres of trees. Epidemics were first noticed in the early 1900s but had certainly been occurring before then.

Lodgepole and ponderosa pine are the major hosts for mountain pine beetles in the Rockies. The beetles have definite size preferences, usually attack-

ing trees larger than four to five inches in diameter.

Adult beetles attack living trees in mid- to late summer. They bore long tunnels through the inner tree bark, laying eggs along the tunnels.

The eggs hatch within a week. The small white larvae feed on tree sap, boring their own tunnels at right angles to the main tunnel. These tunnels weaken the tree by cutting off its circulatory system, and also create the intricate tracery known as "beetle wood." The beetles also introduce a fungus into the circulatory system which, combined with the tunnels, kills the tree.

Larvae winter in the tree, go through several developmental stages and emerge as adults the next summer to start the cycle over.

"At epidemic levels, a lot of trees can be killed in one or two years," said entomologist David Holland, who is with the U.S. Forest Service in Ogden, Utah. In 1979, 70,000 dead trees were counted in one 200,000-acre area in Utah. "The next year, 350,000 dead trees were tallied in the same area," Holland said.

Mountain pine beetle epidemics currently affect 4.5 million acres of western

forests, according to Mark McGregor, bark beetle entomologist with the Forest Service in Missoula, Montana. "We've never had an outbreak as bad as the one we're experiencing now," he said.

Epidemics in northern Idaho and Montana account for over half of the total acres, according to McGregor. Other problem areas are scattered throughout the rest of the Rockies in western Wyoming, Colorado, Utah and northern Arizona, as well as the Black Hills of South Dakota.

Susceptibility of pines depends on stand density, and tree age, size and health. Research shows that dense stands of similarly sized and aged trees are most prone to beetle outbreaks. Trees larger than eight to nine inches in diameter and around 80 to 100 years old, or stressed by competition or other factors, are more likely to die.

Pine bark beetle epidemics are a "natural occurrence" in these conditions, said Bill Parson, timber manager for Burlington Northern Railroad's lands around Bozeman, Montana. He and many other forest managers in both



(continued on page 12)

WESTERN ROUNDUP

Wyo. water bill sails through

The Wyoming state legislature has passed a \$50 million water development bill that is either a "farsighted water policy" or "a blatant boondoggle," depending upon the point of view. The bill provides money for 27 different water projects in various stages of development throughout the state.

Proposed by Gov. Ed Herschler (D) and passed easily in both houses, the bill recognizes four stages of development for water projects throughout the state. Level I is reconnaissance study; II is feasibility study; III, development; and IV, construction.

There are only eight projects in the development category, representing a total appropriation of about \$23 million. However, the most controversial project is an \$8 million loan to the Sheridan Little Horn Water Group, the same water rights holders who proposed using their water for a coal slurry pipeline last year. That project was rejected.

Warren White of the State Planning Coordinator's office said, "A lot of work has already been done on that project in previous years. The Little Horn group is now getting into the nitty-gritty technical stuff that has to be done — allocating water among the Crow Indian Tribe, Montana and Wyoming, monitoring flows and resolving other conflicts." Part of the money will go toward negotiating a settlement with Montana and the Crow Tribe in Montana, who also claim part of the water from the Little Big Horn.

However, a memorandum from the Wyoming Water Development Commission questioned the wisdom of state investment in the project. The memo, from staffers to WWDC head Mike

Reese, said, "A detailed review of the enabling legislation...leads to the inescapable conclusion that the state of Wyoming is being asked to take the entire risk of a major water development project, with the Sheridan Little Horn Water Group reaping excessive financial rewards (\$7,000,000 to \$15,000,000 annually) while contributing only water rights of minimal value." The memo also questioned the propriety and legality of a group of private water rights holders negotiating for the state with Montana and the Crow.

In addition, according to a story in the *Casper (Wyoming) Star-Tribune*, the entire water development package was put together without any assessment of need for the water. According to the paper, the WWDC was asked to prepare an analysis of the program, but it was not completed by the time the legislation was being debated.

White said, however, "We've been working on this policy for several years. Between the governor's office and the WWDC, several things just fell into place." White also said, "Of the eight projects that are in level III, nearly all of them are for rehabilitation and safety problems."

State Sen. Tom Stroock, a Republican from Natrona County, said, "I'm very disappointed in the legislation. I'm a strong supporter of water development, but the projects in this bill are a collection of dusted-off old projects that we'll now spend \$27 million to restudy. The construction projects are a giveaway to owners who seemed to come along because there was some kind of panic about water development."

"We're paying \$8 million to the Little Horn group so that they can prove up their water rights with only a promise that, if they are successful, they'll repay the state — without interest — and work out some kind of deal for the water. But there's no specification about what that deal will be."

"Every lawyer in the Senate argued for this bill, but if they were advising a pri-

vate client, they'd never have advised him to enter an agreement like this."

Tom Wolf of the Wyoming Outdoor Council said, "We want to give the governor credit for taking the initiative on this issue, but the level of debate has been low. They haven't focused on any of the big policy issues — trans-basin diversions, the need for water in various parts of the state or pricing structures to make water attractive to agricultural users. We're going to spend a lot of money on water development that we may or may not need."

Despite the misgivings, the bill went through the legislature with scarcely any objections.



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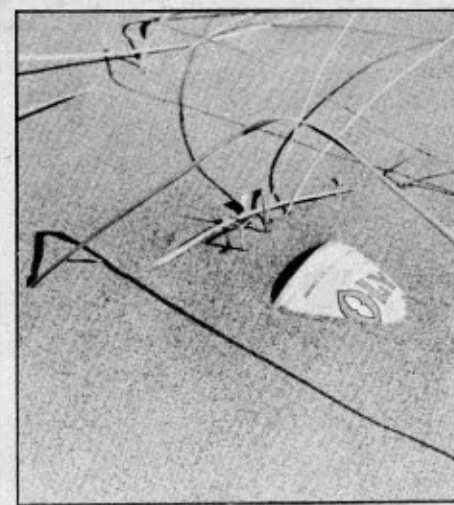
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Colorado bottle bill disputed

Consumer activists and a coalition of labor, government and community groups in Colorado are campaigning for beverage container reuse and recycling legislation. Led by Coloradans for Recycling (CFR), a non-profit political action group, they hope to put a referendum on the November ballot requiring refundable deposits on beer and soft

Dear friends,

As of March 1, *High Country News* director Geoff O'Gara has turned over the helm of the paper to our new director, Jill Bamburg. Jill has moved to Lander from Jackson, Wyoming, and she brings with her a solid business and management outlook as well as considerable editorial experience. In short, she was the perfect candidate for the director's position.

Jill was born and raised in St. Louis, Missouri, where she graduated from Washington University with a degree in English. She moved to Jackson in 1974 — "I was one of those rare people who had a job before I came" — as a reporter for the *Jackson Hole Guide*, one of the town's two weekly newspapers. Within nine months, she was promoted to editor, a position she held for about a year.

After stepping down as editor, she wrote a weekly column for the *Guide* on "subjects of my choice." In 1976, she left the West for South Carolina "to see if there was life outside Jackson Hole." For seven months, she served as program development coordinator for a regionwide public television broadcasting network, developing new programs for the participating stations.

Discovering that there apparently wasn't any life away from the Rockies, Jill moved back to Jackson. "Since I didn't want to be a cocktail waitress," she said, "I opened an advertising agency." Her agency did well enough to support her and she also resumed writing her column, as well as doing some copy editing for the *Guide's* crosstown rival, the *Jackson Hole News*.

When HCN's director job opened up, Jill was one of the first applicants. She



said, "I was ready for a change — a more concentrated commitment to one entity. My efforts were beginning to feel sort of scattered in Jackson. This paper presents a new challenge. I think it has a huge untapped potential, mostly in terms of increased circulation. It's a good product and I'd like to see it read and appreciated by more people."

As director, Jill has a number of responsibilities. She will do fundraising, serve the function of publisher, and contribute editorially to each issue. In an organization in which everybody does a little bit of everything, Jill will do a little more of everything than most.

Geoff has stepped down as director to devote more time to his writing and a small publishing firm he is beginning.

He will continue to serve as a part-time associate editor for HCN, so O'Gara fans need not despair — his deathless prose will not vanish from these pages.

Other good news has struck during the past fortnight. Circulation manager and bookkeeping whiz Betsy Schimelpfenig and her husband Tod had a baby boy, David, on February 27. And, former HCN photographer Sara Hunter-Wiles and her husband Steve had a boy as well, on March 1. Mothers and sons are all doing fine.

—the staff

drink containers. About 39,000 signatures are needed.

The proposed law would establish a minimum five-cent refund value on beer and soft drink glass, metal and plastic cans, bottles and cartons; require that these containers be recyclable or refillable; ban pop-top openers on cans and nonbiodegradable container connectors (six-pack plastic rings); reimburse retailers and/or redemption centers for handling costs; and be implemented during a phase-in period of one to two years, with a target date of January 1, 1984.

If successful, Colorado would join Oregon, Maine, Vermont, Iowa, Michigan and Connecticut as a state that has enacted a "bottle bill." One 1979 Oregon Department of Environmental Quality study estimated that, due to container recycling, energy sufficient to heat 55,000 homes was saved. Recycling legislation has decreased the need for waste disposal and landfill space, as well as reducing litter clean-up costs. About 95 percent of the containers are returned. Refillable bottles are recycled an average of 20 to 30 times each.

U.S. General Accounting Office and Stanford Environmental Law Society studies showed a net increase of between 350 to 4,600 jobs in states with bottle laws. These jobs are mainly in packaging, distribution and handling. Oregon now has 325 redemption and recycling centers, operating as a spin-off of their 1970 legislation.

Support of the initiative has pitted CFR and their coalition against the bottling/brewing industry and beverage retailers. Robert Steele, owner of two grocery stores in Ft. Collins, said returnables will slow down grocery store check-outs and require new systems, creating problems of cost, space, safety and sanitation for retailers. "For the grocery business, this would be a step backwards," he said. "We're just reaching the point where nonreturnables are moving for us. For me, the customer is the judge, and that is what they are buying."

Brewer Adolph Coors Company is spearheading the Colorado opposition, which will unite the Colorado Beer Distributors Association, Rocky Mountain Food Dealers and the National Association of Retail Grocers, among others. According to Bob Menges, manager of a Coors recycling center which currently processes 20,000 pounds of glass and aluminum monthly, Coors feels that voluntary recycling is working and the container refund law would raise both costs and prices.

The opposition has launched an extensive, \$2 million education campaign, complete with promotional films. A contract for \$800,000 of media services has already been signed.

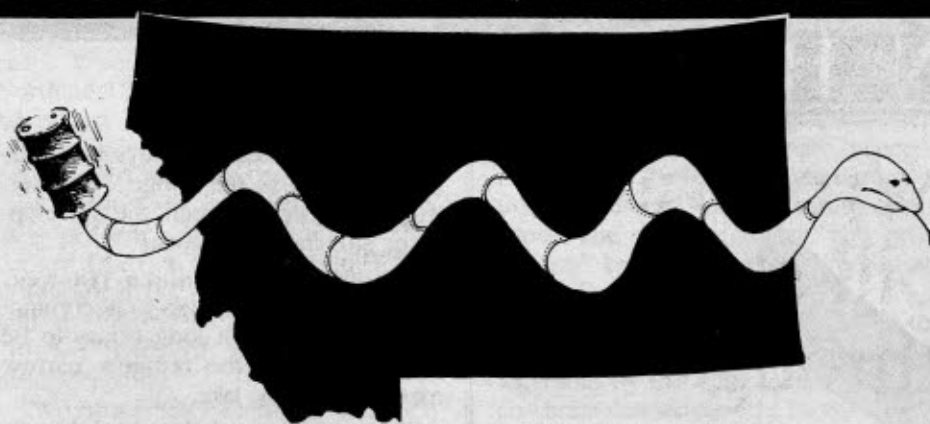
A similar initiative drive was attempted in 1976, when bottlers, brewers and retailers spent \$500,000 to defeat the effort. However, CFR canvassers have contacted more than 250,000 people in the Denver area and will soon be going door-to-door throughout the state.

Bill Sperry of the CFR said, "Polls have shown that the public is in favor of container reuse/refund laws. The industry has to change public opinion, we only have to reinforce it."

— Ginny Bulger

Northwest pipeline approved

The Army Corps of Engineers announced February 23 it would approve construction permits for the proposed Northern Tier oil pipeline. Brig. Gen. James W. van Lobel Sels, the Corps' North Pacific Division engineer, said objections by the U.S. Fish and Wildlife Service and the Environmental Protection Agency had been resolved.



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The Fish and Wildlife Service had asked the Corps to certify that the Northern Tier facilities at Puget Sound in Washington, which would include tanker berthing and unloading areas at Port Angeles and 18 miles of pipeline through the Strait of Juan de Fuca and under the Sound, could withstand a very large earthquake — 7.5 on the Richter scale — and underwater landslides.

With those same concerns, the Washington State Energy Facility Site Evaluation Council recommended in January that the state application be denied.

Washington Gov. John Spellman (R) has until mid-April to decide if he will agree with the council's recommendation or issue the permit. Despite pressure from the Reagan administration to okay the project, Spellman is expected to say no.

The state permit is the final hurdle for the Northern Tier Pipeline Company, which has spent five years and \$55 million in its attempt to build the \$16 billion line. The pipeline would pump Alaskan and foreign oil from Puget Sound 1,500 miles across Washington, Idaho, Montana and North Dakota to Clearbrook, Minnesota for shipment to Midwest refineries. All other states along the route have approved the firm's application.

In December, 1980, the National Audubon Society singled out Northern Tier's project as a "priority target," charging it would turn the north entrance to Olympia National Park in Washington into a supertanker port.

Getty Oil Company of Los Angeles owns 30 percent of Northern Tier while U.S. Steel, Westinghouse, Burlington Northern, MAPCO Inc., and three smaller corporations share the remainder.

—John Soisson

Unsuitable for unsuitability petition

A Wyoming Audubon group is caught between a land ownership quirk of history and the federal government's lack of foresight. The Cheyenne High Plains Audubon Society, in an attempt to comply with state and federal law, petitioned the state Environmental Quality Council asking it to designate certain lands in southern Wyoming unsuitable for coal mining.

However, the land ownership is in a checkerboard pattern of alternating federal land grants to railroads designated in the 1800s and non-federal sections. Therefore land use decisions affecting state and private land are meaningless without federal decisions.

The federal government, which owns 84 percent of the surface rights in the disputed area, has reserved the authority to rule on suitability petitions for federal lands.

The Audubon group will now have to file a separate federal petition, according to Wyoming Assistant Attorney General Weldon Caldbeck, to the federal Office of Surface Mining. The petition covers 432 sections or more than a quarter million acres near Medicine

Bow, Wyo. The group is concerned about scientific, wildlife, archeological, historical and recreational values of the lands.

The state will study the value of the coal and of the resources mentioned by the Audubon group, although Caldbeck said it will be difficult to make these decisions for the non-federal lands alone. A hearing will be scheduled within 10 months, which Caldbeck said will likely be a joint state-federal hearing.

This is the first unsuitability petition filed in the state of Wyoming under the federal strip mining regulations of 1978.

— Marjane Ambler

Land sales profit the federal kitty

In an effort to make the federal government some money, the Reagan administration's 1983 budget calls for selling \$1 billion worth of public lands.

The concept was drawn up by the Council of Economic Advisors and calls for the selling of surplus, expensive-to-manage lands, usually found in small lots and adjacent communities. *Public Land News* reports the program would complement Interior Secretary James

Watts efforts to transfer some federal lands to states.

PLN also reports the concept is not new, but the high priority placed on the sales is. The idea has caught the attention of several congressional leaders, including Sen. Paul Laxalt (R-Nev.), a Sagebrush Rebellion advocate.

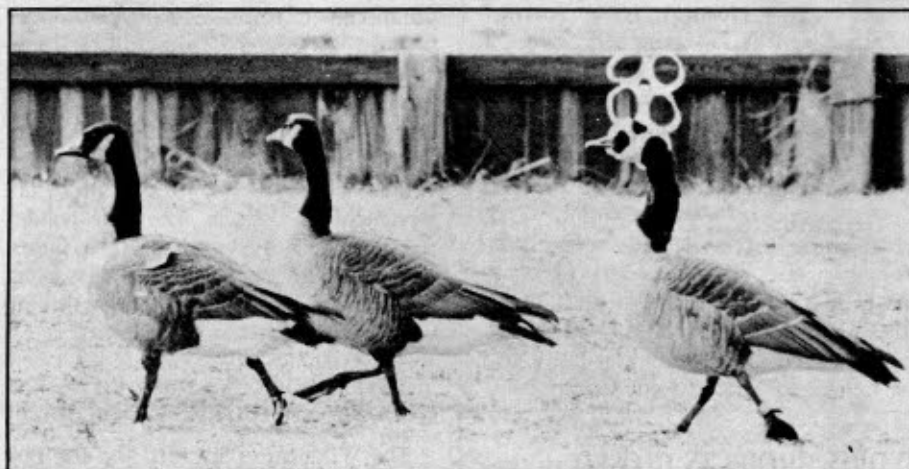
Also behind the effort is Sen. Charles Percy (R-Ill.), who introduced a bill in October proposing an inventory of all public lands except wilderness areas, parks, monuments, historic sites, refuges and Indian lands. Elaine Newport, staff assistant to Percy, said lands most likely to be sold would be properties held by the Department of Defense, Department of Energy and the Government Services Administration.

However, she said some Bureau of Land Management lands that are contiguous to communities might be considered for sale also, as those communities often need adjacent land for growth. And, lands that are commercially leased for grazing or logging could be considered, Newport said, if it is found they are being leased far below the going market. Many of those leased lands are in national forests or Bureau of Land Management holdings — areas that conservationists are afraid may be sold out from under the American public.

Percy, Laxalt and other proponents of the land sale feel it is only reasonable to sell some of the government's capital assets (public lands) considering the economic woes of the country. Debbie Sease of the Sierra Club's Washington, D.C. office, agreed it is not a bad idea to sell some federal properties. However, she and other environmentalists are afraid the sale will get out of control and turn into a successful rebirth of the Sagebrush Rebellion.

"We currently give the minerals on the public lands away, get routinely cheated on oil and gas royalties, lease valuable grazing lands at less than their market values and subsidize the logging industry's timber harvest," Sease said. "It would make more sense to conduct our business on a sound basis rather than to sell our birthright to the highest bidders."

BARBED WIRE



That'll be thirty days or thirty dollars. The Utah state legislature has passed a law requiring that the Great Salt Lake not rise higher than 4,202 feet above sea level or fall lower than 4,190 feet.

The insurance company never saw the Titanic, either. An Interior Department spokesman, reacting to criticism about the membership composition of the National Public Lands Advisory Council, said, "Just because we might talk about matters of land use planning doesn't mean we have to have land use planners on the council."

Honesty isn't always the best policy. An Interior Department spokesman, commenting on criticism of Secretary Watt's proposed moratorium on wilderness mineral leasing until the end of the century, said, "They (critics) may have

obtained early drafts...Whatever anyone claims to have obtained is worth no more than the paper it is written on..."

Stalking the wild metaphor. Comments on the "new federalism" at the National Governors' Conference:

"It's too early to tell whether it was a window of opportunity or a trap door... through which the state could fall. After experiencing a momentary exhilaration of free-fall, the states could be brought up short by a fiscal noose..."

— Montana Gov. Ted Schwinden (D)

"I think this is the beginning of a pretty good romance... The safety net ought to be a national function."

— Arizona Gov. Bruce Babbitt (D)

"We're within the ballpark and we can talk to one another."

— Georgia Gov. George Busbee (D)

WESTERN ROUNDUP



Development threatening AZ refuge

Development is threatening the marshes and shallow lakeshore of Havasu National Wildlife Refuge in Arizona, home to the endangered Yuma clapper rail, wintering grounds for migratory waterfowl and spawning ground for an important sport fishery. If a California developer is successful in gaining permits from the U.S. Fish and Wildlife Service and the Corps of Engineers, a pleasure boat canal will cut across the marshes and the shallow lakeshore will be dredged for navigation.

The proposed canal and dredging activity are "a violation of the purpose of the Havasu NWR," according to the Arizona Game and Fish Department, because they could lower the water level necessary to maintain the marshes. Boat traffic and dredging activity would

disturb bird life, and dredging would destroy the shallow lakeshore, nursery for the lake's striped bass population.

Robert Weaver, environmental biologist with Arizona Game and Fish, said, "It looks right now like the Corps of Engineers will deny the permit for the canal," but he doesn't know about the FWS.

Havasu NWR encompasses the marshy areas along the east shore of Lake Havasu, a reservoir in the lower Colorado River on the California-Arizona border south of Yuma, Arizona. It is the northernmost of three refuges on the lower Colorado created to protect winter feed and shelter for many species of migratory ducks and geese according to Dick Gilbert, assistant manager of the refuge.

Other species of birds, mammals and fish are permanent residents, among them the endangered marsh bird, the Yuma clapper rail.

California developer A.L. Wulfek plans a \$1 million to \$3 million marina with berths for 350 boats, condominiums and single family dwellings, shops,

motels, and possibly an airport on his land adjacent to the refuge. However, the refuge lies between the development site and Lake Havasu.

Wulfek wants to build a 100-foot-wide canal, deep enough to accommodate 30- to 40-foot long boats to be dredged across the refuge's narrow marshland to the lake.

Weaver said even if the canal doesn't drain the marshlands, the continued boat traffic and the dredging necessary to keep the canal navigable at low winter water levels would disturb the birds during critical winter and spring months.

According to assistant manager Gilbert, thousands of striped bass are caught in the area which would be dredged.

Bill Roe, commissioner of the Arizona Outdoor Recreation Coordinating Commission, said that conservationists are concerned about this development because much marshland, scarce in the arid West, has already been lost. The project should be investigated thoroughly and approval given only if it seems "especially justified," he said.

Havasu NWR once encompassed the entire lake area, according to biologist Weaver, but the main body of the lake was withdrawn on the Arizona side for multiple use. The California side is an Indian reservation. The only areas remaining under FWS management are at the lower and upper ends of the reservoir.

Weaver characterizes the refuge as a "very productive and unique area of the Colorado River, with diverse habitats, flora and fauna." He said the Game and Fish Department is pleased with the public protest over the project, from both conservation and other groups.

— Susan Twell

Tribe denied referendum

An Interior Department attorney has ruled that Northern Cheyenne tribal members' demand for participation in every future resource decision is not provided for under the tribal constitution.

In January more than 500 tribal members signed a petition asking that coal negotiations be suspended until a comprehensive plan was prepared and approved by referendum vote. They also asked that every future resource decision that might jeopardize the reservation's clean air be subjected to referendum (HCN, 1/22/82).

However, Ted Meredith, field solicitor in Interior's area office in Billings, Montana, said the constitution's referendum process could be used if tribal members questioned a specific ordinance or resolution after it had been passed.

Many tribes once operated by consensus decision making, and the neighboring Crow Tribe in Montana still makes decisions by votes of all adult tribal members. However, the Northern Cheyenne Constitution, adopted in 1936 under the Indian Reorganization Act, provides for representative government.

The coal development question may be moot. Tribal attorney Calvin Wilson said the council has been unable to find companies interested in forming partnerships with the tribe for developing coal just outside the reservation boundaries. The petitioners were concerned about such development. While the tribe owns some land off the reservation, it does not own mineral rights on those lands and has insufficient capital to invest.

Coal development on the reservation has not been considered because of the

HOTLINE

CONTROVERSIAL APPOINTMENT

President Reagan's nominee to run the Environmental Protection Agency's \$1.6 billion "superfund" program for toxic waste cleanup is a former employee at a company accused of major toxic waste violations. Nominee Rita M. Lavelle was the chief spokeswoman for Aerojet-General Corporation in a multimillion-dollar lawsuit brought by the state of California against a subsidiary accused of allowing trichloroethylene, an industrial degreasing agent to seep into the water table in the early 1960s and '70s. The site, which covers almost 8,000 acres, was among the 115 most hazardous dumping areas listed last fall by EPA head Anne Gorsuch.

HYDRO PROJECTS CLOSED

The Tri-County Reservoir Project on the Gunnison River east of Delta, Colorado, and the Juniper-Cross Mountain Project on the Yampa River West of Craig, Colorado, have had funding cut indefinitely by Colorado-Ute Electric Association. President Girts Krumins said high interest rates and the competition with coal-fired generating plants made the two projects economically unfeasible to continue. And, in the case of the Juniper-Cross Mountain project, estimated to cost \$160 million, an additional \$45 million was needed to meet state and federal environmental regulations.

TAX BREAK FOR MINING

Under the 1981 tax bill, the mining industry will pay no taxes on income from new investments this year and will receive what amounts to a tax subsidy

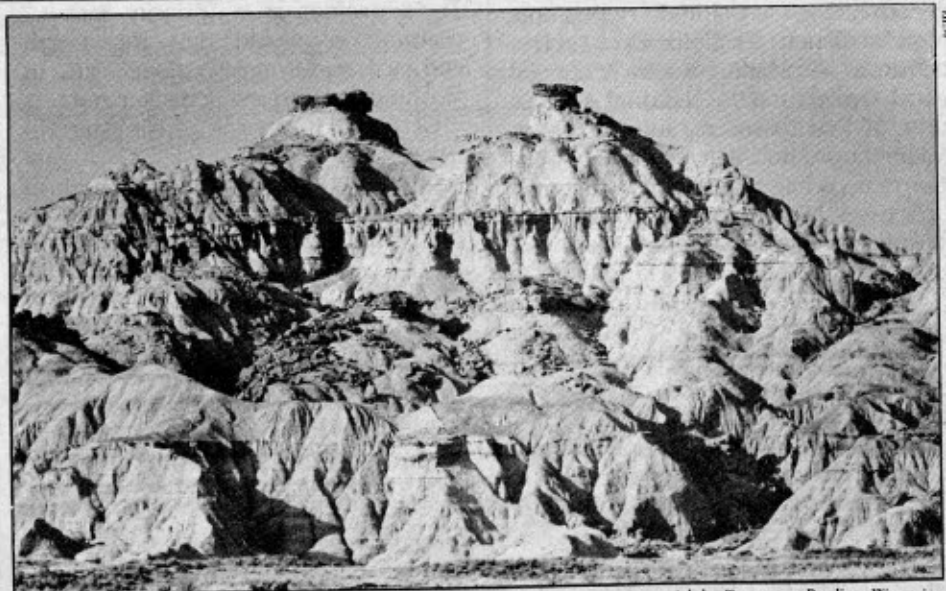
for past investments. According to studies by the Treasury Department and the Council of Economic Advisors, the effective tax rate on new investments in mining went from 28.4 percent under the old law to minus 3.4 percent under the new law. A spokesman for the Council of Economic Advisors has defended the legislation as a means of "reducing taxation of capital" that will consequently act as a "spur to investment." Critics contend the differential tax treatment of various industries under the new law will attract capital to industries with lower tax rates, distorting investment patterns and reducing productivity.

OPPOSING WILDERNESS LEASES

The Wilderness Society and the Bob Marshall Alliance have filed suit seeking to cancel 13 recently issued oil and gas leases in Deep Creek, a 42,000-acre area adjacent to the Bob Marshall Wilderness in Montana. The Deep Creek area, which was recommended for further planning in RARE II, was the only area in the lower 48 states to receive a "perfect" wilderness rating — 28 out of 28 points — in the Forest Service evaluation. The leases were issued in January of this year by the director of the Bureau of Land Management after appeals and protests by conservation organizations were denied.

PARK FEES ON THE RISE

Interior Secretary James Watt has proposed an increase in national park user fees, with the revenues to be spent for park operations and maintenance rather than set aside for parkland acquisition as they presently are. He told the



Adobe Town near Rawlins, Wyoming

House Interior Subcommittee on Public Lands and National Parks that his target is to collect \$50 million in fiscal year 1983 — triple the amount collected last year. He suggested the entrance fee to Yellowstone National Park, now \$3 per car, should be at least doubled, and he called for other increases in campground fees. While Watt would not need congressional approval to raise the visitor fees, he would need approval to earmark those revenues for park operations.

TAX FOR LIGHT RAIL

Denver's prospects for mass transit got a boost from the Colorado legislature recently when the Senate Finance Committee unanimously approved an innovative method for businesses to tax themselves to help finance a proposed \$1 billion light rail transit system. The business tax would be used to supplement funds raised by a .75 percent sales tax increase that Denver voters will be asked to approve in an election later this year.

WILDERNESS STUDY UPHELD

The Interior Department has rejected a Koch Industries, Inc. appeal of the 85,710 acres of wilderness study designation of two Adobe Town units in the Rawlins and Rock Springs, Wyoming, districts of the Bureau of Land Management. Koch Industries owns oil and gas leases in the two units, including one active well site, and has projected a full development program for the area, involving drilling, pipelines and access routes. The Interior Department administrative judge wrote that Koch Industries failed to prove the BLM had not adequately considered all factors involved in the designation.

HIGH PRICE OF CONSERVATION

Natural gas customers in Montana have done a good job of cutting consumption — and that's one of the reasons Montana Power Co. plans to reward them with higher rates. An MPC official told the Associated Press that loss of industrial customers was the biggest factor in the requested rate hike.

protectionist stance of many tribal members, as evidenced by the referendum petition.

Oil development, which many tribal members believe causes less environmental and social disturbance than strip mining, is proceeding. The tribal council signed an oil contract with Atlantic Richfield Company, and drilling will begin in the spring.

— Marjane Ambler



EPA lifts dumping ban

After a four month ban on all dumping of hazardous liquid wastes in landfills, the Environmental Protection Agency is lifting the ban for at least three months to determine how much liquid waste dumping should be allowed.

Eric Finke, chemical engineer with the EPA's Denver office, said the ban was put into effect November 19, 1981, on an order made during the Carter administration. He said the EPA announced at that time it would probably postpone imposition of the dumping ban. "We are just now getting around to that," he said.

In the Denver office region (Colorado, Wyoming, Montana, Utah and North and South Dakota), Finke said no hazardous liquid waste dumping in landfills was allowed after November 19. He said this three month ban will "not create any more hazards" than were present before the ban.

Gary Dietrich, director of the EPA's Washington, D.C. office of solid wastes, said the lifting of the ban has been "blown out of proportion and misunderstood."

"We simply made a mistake," Dietrich said in reference to the November ban. He said the order was too far-reaching, banning all hazardous liquid wastes from landfills instead of allowing disposal of a certain amount. He said the three-month period will allow EPA to correct that mistake.

"We meant to minimize the hazardous liquid in containers, not ban liquids completely," Dietrich said. "And indeed, that's what we're trying to do — to make it more reasonable and practical."

According to the *Wall Street Journal*, the EPA lifted the ban because industry said restrictions were "too extreme" and required "extraordinary high-cost management practices to achieve compliance." Dietrich said the agency did hear from several hundred people, including representatives from industry, who felt the restrictions should be eased.

Coal sale gets the nod

The U.S. Interior Department has announced that it will go ahead with a lease sale of 2.24 billion tons of coal in the Powder River Basin of Wyoming and Montana on April 28, 1982. Interior Secretary James Watt said it will be "the largest sale of federal coal leases in the

history of America." Environmentalists say it's unnecessary.

Interior, under the auspices of the Bureau of Land Management, will offer 17 tracts for leasing. Nine are "maintenance tracts," or lease acreage designed to be added onto existing mining operations. The other eight are "new production" tracts, which will represent new mine openings.

The recommendation of tonnage to be leased is only slightly higher than that suggested by the state-federal regional coal team that studied the Powder River Basin resources. A spokeswoman for Montana Gov. Ted Schwinden (D) said Schwinden was satisfied with the leasing levels proposed for the Powder River Basin in Montana. Schwinden has criticized Watt in the past for ignoring leasing recommendations made by the Fort Union regional coal team.

However, Reed Zars, staff director for the Powder River Basin Resource Council, a rancher-conservationist group in northern Wyoming, said, "This is completely unnecessary. The amount of coal under lease now will supply our needs well into the next century." Zars said the final environmental impact statement on the leasing is "very, very poor. It did not present any meaningful discussion of alternatives — it was either a large lease or nothing. There was no alternative for staging — leasing different amounts in different years."

Zars said, "Behind it all is what's happening to the coal market. There is currently a 100 million ton a year overcapacity now. That will remain into 1990 and electricity sales aren't growing."

To test the competitive waters, Interior will use intertract bidding on four leases near Ashland, Montana. Responding to a request from Schwinden not to lease two of the four tracts in the area, Interior said it would accept bids on all four, but would not lease the two receiving the lowest bids. Those two tracts may be offered for sale in another auction two years from now.

Paying for oil shale electricity

Colorado utility users may foot the \$417 million bill to provide electricity to the Western Slope's oil shale industry, according to a study by the Colorado Energy Advocacy Office.

William Schroer, director of CEOA, said that during a year's study of possible impacts from oil shale development, his group calculated that residential electric consumer bills would increase from \$75 to \$100 per year in the 1980s to pay for the electrical demand by the oil shale industry.

Schroer said the study is an alert to the Public Utility Commission and consumers that reform in regulatory policy is necessary to assure a fair method of allocating electrical costs. He said the PUC is a "terrible and irresponsible commission" and that unless they feel pressure about this problem, residential consumers will be the losers.

Dale Cunningham, supervisor of consumer affairs for the PUC, said, "The PUC is sensitive to this issue and doesn't want to see small users subsidize the big industries."

And Public Service Company of Colorado told the *Denver Post* it has a three-year-old policy that any new large demands for electrical power by the oil shale industry will be paid by the industry, not other customers.

Cunningham said there are a number of rate allocation approaches that might be considered, but the PUC will make decisions on a case-by-case basis.

Schroer said the PUC has no special rate system for oil shale industrial users at present and he fears they will average all electrical costs to all customers unless they are strongly opposed.

WILD HORSE SALE POSSIBLE

Idaho Senator James McClure (R) is reportedly testing political waters on a bill that would allow the Bureau of Land Management to sell unadoptable wild horses to help defray the operating costs of the agency's wild horse program. The bill is one of several proposals being considered as an alternative to the agency's new \$200 adoption fee — a fee which has reduced the number of potential wild horse adopters without fully covering the roundup costs of about \$400 per horse. Proponents argue that sales of horses too sick, lame or old for adoption could mean better management for wild horse herds and their range. Opponents argue that the definition of "unadoptable" will become overly broad once sale revenues begin coming in, eventually decimating the wild horse population.

WEST ELK CONFUSION

The decision in late January by Dyco Petroleum Company to let expire seven of their oil and gas leases in western Colorado's West Elk Wilderness came about after Sen. Gary Hart (D-Colo.), conservationists and the U.S. Forest Service debated over the legality of the original leases to Dyco in 1972. Hart had written Interior Secretary James Watt urging the leases not be renewed and describing the USFS's inability to explain irregularities in their granting of these particular leases. At first the USFS seemed as confused as Hart over the process that took place to grant the leases, but now Deputy Regional Forester Sid Hanks said the agency did nothing against policy. Dyco, who said they let the leases expire because of little energy potential in the area, also holds four other leases in the area which will expire in July.

CITING WATT

A congressional committee voted February 25 to cite Interior Secretary James Watt for contempt of Congress for invoking President Reagan's claim of executive privilege in refusing to supply information on Canadian energy and investment policies. The President maintains that the relevant documents relate to the conduct of foreign affairs, which the courts have held to be a function of the executive branch. The House Energy and Commerce Committee believes otherwise and the matter now goes to the House, which must decide whether to seek criminal prosecution of Watt. Contempt of Congress is a misdemeanor, punishable by up to \$1,000 in fines and up to a year in jail.

BEARS BEARING UP

Cliff Martinka, biologist at Glacier National Park, thinks the grizzly bear is having a better time of it these days. The park managers, Martinka told the *Missoulian*, are responding more quickly to bear problems and bear relocations are working. Martinka said he favors the limited hunting season (25 bears) around the park. He noted that the Glacier-Bob Marshall Wilderness complex connects to grizzly habitat in Canada; whereas the Yellowstone grizzly population is now cut off from the northern habitat by civilization and will therefore be harder to sustain.



James Watt

COURT HITS 'AVOIDED COST'

A federal court last week rejected regulations requiring utilities to buy power from small-scale electricity producers such as wind farms and hydroelectric dams as not necessarily being in the best interests of utility consumers. The Washington, D.C., Circuit Court of Appeals ruled in a case brought by New York's Consolidated Edison and American Electric Power, a midwest utility, against the Federal Energy Regulatory Commission. "Avoided costs" — what it would cost the utility to produce the power from a new source of its own — was often higher than regular charges to utility customers, argued ConEd, so that it could, in effect, force up consumer prices. FERC officials called it a bad decision, and even utility industry officials said they expected it to be overturned.

NO PADDLE POLICY

The National Park Service has reversed a 1979 decision to prohibit the use of motorized craft on the Colorado River through the Grand Canyon. The new policy permits the use of motorized boats and rafts on the river any time except between September 15 and December 15, when only non-motorized boats may be used. This is timed to coincide with the fewer planned motorized boat trips. The NPS's paddle policy suffered a setback in 1980 when Sen. Orrin Hatch (R-Utah) successfully placed a rider on a Interior Department appropriation bill that prohibited any funding to any park service plan forbidding a motorized craft on the river. Hatch's provision has expired, but the NPS took it upon itself to continue the policy, for fear of congressional intervention.

Northwest nuclear future is all in the past

by John Soisson

On January 22, 1982, the board of directors of the Washington Public Power Supply System voted unanimously to stop construction of their nuclear power projects 4 and 5. By halting the plants, the directors sent a message to the 88 public utilities and cooperatives that had sunk billions into the country's most grandiose nuclear power scheme: There's no such thing as electricity too cheap to meter. To nuclear power proponents across the country, the message may be even more dire.

Ever since last spring, the WPPSS board had tried desperately to save the two plants — one at Hanford Nuclear Reservation in southeast Washington and the other at Satsop, east of Aberdeen, Washington — by putting together a package of financial commitments from the utilities in their consortium. When this salvage plan failed in early January for lack of support, they had no choice but to call it quits.

For proponents of atomic power on the WPPSS board — and for Wall Street investors who had believed in their scheme — the pain was eased a bit by the three nuclear plants that remained. For the more financially astute, however, it was enough to make them wish they had joined the three businessmen who had resigned from the board earlier in the month to avoid being associated with the debacle.

The story of WPPSS (called Whoops in the Northwest) 4 and 5 is the story of the nuclear industry in the United States. Anyone interested in learning how the industry can "come to the edge of financial disaster," as Bankers Trust Company has said, should look to Seattle where the consortium is headquartered.

In the few years after Commonwealth Edison began the first commercial

production of nuclear power at its Dresden plant near Morris, Illinois, on July 4, 1960, nuclear energy was the utility industry's Prometheus.

During the 1960s, national demand for electricity grew at a rate of 7.6 percent a year, and nuclear torches were seen as the light of the future. The drop in growth to 5.4 percent in 1971 didn't douse the fire.

But the Arab oil embargo of 1973 and the resulting economic slump caused factories to slow production and consumers to economize. Demand for electricity grew only 0.6 percent in 1974. By 1976, it had rallied to 6.3 percent and nuclear plant activity reached its high water mark: 236 plants were on the drawing boards or underway.

In the Northwest, the cheap hydroelectricity produced by the federally-owned Bonneville Power Administration and consumed by the region's 10 power-hungry aluminum plants, encouraged greater industry and consumer use. Little attempt was made to economize and conserve. The region grew at a rapid pace.

Private utilities in the Northwest built plants in the Rocky Mountains and shipped electricity a third of the way across the country to feed the Northwest demand. Long trains of coal were delivered from the Great Plains for local facilities. And enormous schemes like the Washington Public Power Supply System's five nuclear plants lit stars in the eyes of their backers.

But, the same climbing interest rates and out-of-control inflation that had damaged the nuclear industry elsewhere in the country sent the construction costs for plants 4 and 5 skyrocketing. In 1974, the estimated cost of the two plants was \$2.22 billion. By 1981 the price had jumped to \$11.77 billion.

Wall Street investors, who had profited from earlier WPPSS bond investments, began to get nervous. They

doubted if ratepayers who backed the bonds would be willing and able to make good on them. They balked at further investments in 4 and 5.

The other three nuclear plants owned by the consortium had a margin of security for the bond market. BPA had agreed to purchase 100 percent of the electrical production of plants 1 and 2 and 70 percent of plant 3. With a federal agency underwriting the plants, investors saw them as a good risk.

But 4 and 5 were different. There were no BPA guarantees for their output. And high prices and an economic slowdown were causing a fall in electricity demand in the Northwest as had occurred elsewhere. Investors wondered if WPPSS would be able to sell the electricity from 4 and 5 to anyone.

That left the members of the consortium in a dilemma. On the one side was the "spiral of impossibility" — large capital programs led to poor cash flow, which in turn necessitated more bond sales. This increased the debt-to-equity ratio and made the bonds less attractive. That resulted in poor bond sales, worse cash flow, higher electricity prices, reduced demand for electricity and subsequently less attractive bonds.

On the other side was the high cost of abandoning the plants. Uncompleted construction contracts would have to be bought and the bonds already sold would have to be paid. That also meant rate increases.

In the end, the WPPSS board decided that calling it quits was the cheapest way to go.

Two people who have closely followed the WPPSS collapse from the beginning are Jim Lazar, a Seattle-based economist who frequently appears on behalf of consumer organizations at utility hearings throughout the Northwest, and Elliott Greenbaum, a bond analyst with M.A. Weissner and Company, a Wall Street municipal bond company.

"WPPSS is a symptom, not a cause,"

said Lazar. "The utility industry — not just WPPSS — got in too deep."

"We've advised our people to get out of bonds for nuclear plants," Greenbaum said. "The old liners still support utility bonds for nuclear plants — for them it's apple pie, the American way and nuclear power. But they'll be out of jobs in no time. The industry was riding on WPPSS and it's close to dying now."

According to Lazar, the failure of plants 4 and 5 will have two major national impacts.

"In the first place," he said, "even the *Wall Street Journal* said that 4 and 5 are key to the national nuclear future. Many more nuclear plants will now be cancelled. The Tennessee Valley Authority is already reviewing its entire nuclear program."

"In the second place, this will make it even more difficult for the energy industry to finance nuclear construction."

Both Lazar and Greenbaum agreed economics is writing the epitaph for the nuclear industry, yet to understand why, it's necessary to understand several decisions the industry made which sealed its own doom.

"It's the unwillingness of the industry to standardize that has hurt it most," said Lazar. "The five WPPSS plants alone use three different designs." Other countries, he said, have standardized and committed themselves to one design which has helped them keep their nuclear industries alive.

WPPSS managing director Robert Ferguson admitted that choosing three designs for the consortium's plants was a mistake. "It means a multiplicity of contractors, a multiplicity of spare parts, a multiplicity of training procedures and a multiplicity of problems," Ferguson said.

In spite of all evidence to the contrary, the nuclear industry decided to construct bigger and bigger plants, assuming that the larger plants would be more cost effective.

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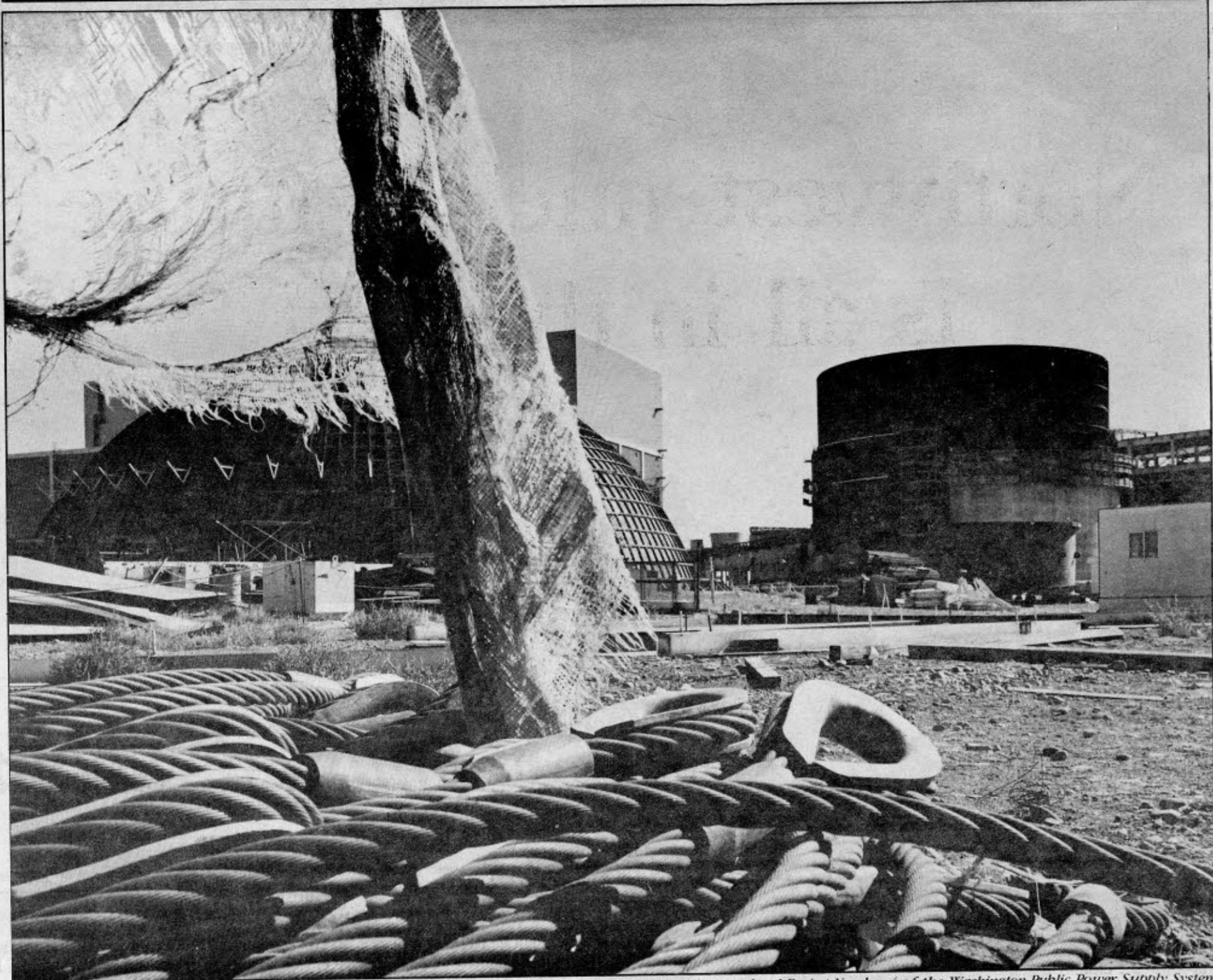
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“The (nuclear) industry was riding on WPPSS and it’s close to dying now.”

— economist Jim Lazar

And while the plants got bigger, so did the size of the projects to build them. But no other single project in the United States was near the size of the WPPSS venture. That obsession with bigness led to innumerable construction problems which made it difficult to get new plants built.

The financial troubles WPPSS is having with plants 4 and 5 may be nothing compared to safety problems with the other three plants. According to Lazar, nuclear scientists throughout the country say that plant number 2 at Hanford has more defects than the troubled Diablo Canyon plant in California. Plant 2 is about 87 percent complete and officials hope to load fuel there sometime in September 1983.

Plant 1, also at Hanford, is scheduled for fuel loading in December, 1985, and plant 3, near Satsop, Washington, which is 43 percent complete, should be ready for fuel loading by mid-1986.

Even with the plague of problems, inflation and high interest rates delivered the final blow.

Nuclear plants are heavily capital intensive. Greenbaum says that, in the 1960s, about 10 percent of the bonds on the national market were for the utility industry. Today that figure is 33 percent, largely because of nuclear plants. No new plants have been ordered in the United States since 1975.

Without a backer like BPA for plants 4 and 5, the WPPSS consortium agreed to combat the two economic demons by

financing the plants through “hell or high water” agreements. The participating utilities agreed to pay for the plants whether they got any power from them or not.

“It’s a widely used procedure,” Lazar said. “WPPSS is just the biggest user of it.”

But those agreements have never been tested in court and the contracts may be unenforceable. A case currently pending in Springfield, Oregon, has challenged the authority of a utility to make ratepayers pay for a plant that will never produce electricity.

Lazar said that some utilities simply can’t afford to do that — they would have to double or triple their rates. Since many of the WPPSS partners are small rural co-ops, such hikes in the retail price of electricity would bankrupt the farmers and ranchers who have to pump water from 600 or 700 feet for their center pivot irrigation systems.

Such enormous price increases would likely cause a ratepayer revolt, and force most of the utilities to go bankrupt and default to WPPSS. If enough of them default, said Lazar, it would be virtually impossible to raise the additional funds needed for the remaining three plants. That would force WPPSS into bankruptcy and a default on its billions of dollars worth of bonds.

Besides the “hell or high water” agreements that WPPSS stands on, the sponsors built another shaky financial leg for themselves. Plants 4 and 5 were financed solely out of bond sales. There

were no funds collected from ratepayers to pay any costs. Interest on the construction bonds had to be paid by issuing more bonds.

“Wall Street deserves to take a bath for assisting in financing an uneconomical project,” Lazar said. “The utilities deserve it because they bit off more than they could chew.”

Studies by the Natural Resources Defense Council and the General Accounting Office have indicated that cost-effective conservation measures could take the Northwest through the 1990’s with surpluses of electricity. Nuclear plants 4 and 5 have never been needed. And the studies showed the coal-fired Colstrip plants 3 and 4 in Montana and the Creston coal plants 1, 2 and 3 in Washington, plus all additional plants now planned for the Northwest but not yet under construction are unnecessary.

The NRDC study, for example, established that residential conservation measures alone, costing far less than plants 4 and 5, could save more than 2500 average megawatts of capacity by 1990. WPPSS 4 and 5 would have produced an average of 1370 megawatts had they been completed.

And a recent Washington State University study indicated that even WPPSS plants 1, 2 and 3 could become unnecessary, a multi-billion dollar white elephant. That study estimated a 1.7 percent annual growth in electrical demand in the Northwest for the years ahead. The last official utility estimate was 3.2 percent. At the lower growth

rate, the study said, there are enough cost effective alternate resources currently available to displace all five WPPSS plants.

On February 10, 1982 the largest single public offering of municipal bonds in history took place: \$859 million for WPPSS plants 1, 2 and 3. By the time WPPSS repays all of those new bonds, including principal and interest, the total cost to ratepayers will be \$4.6 billion.

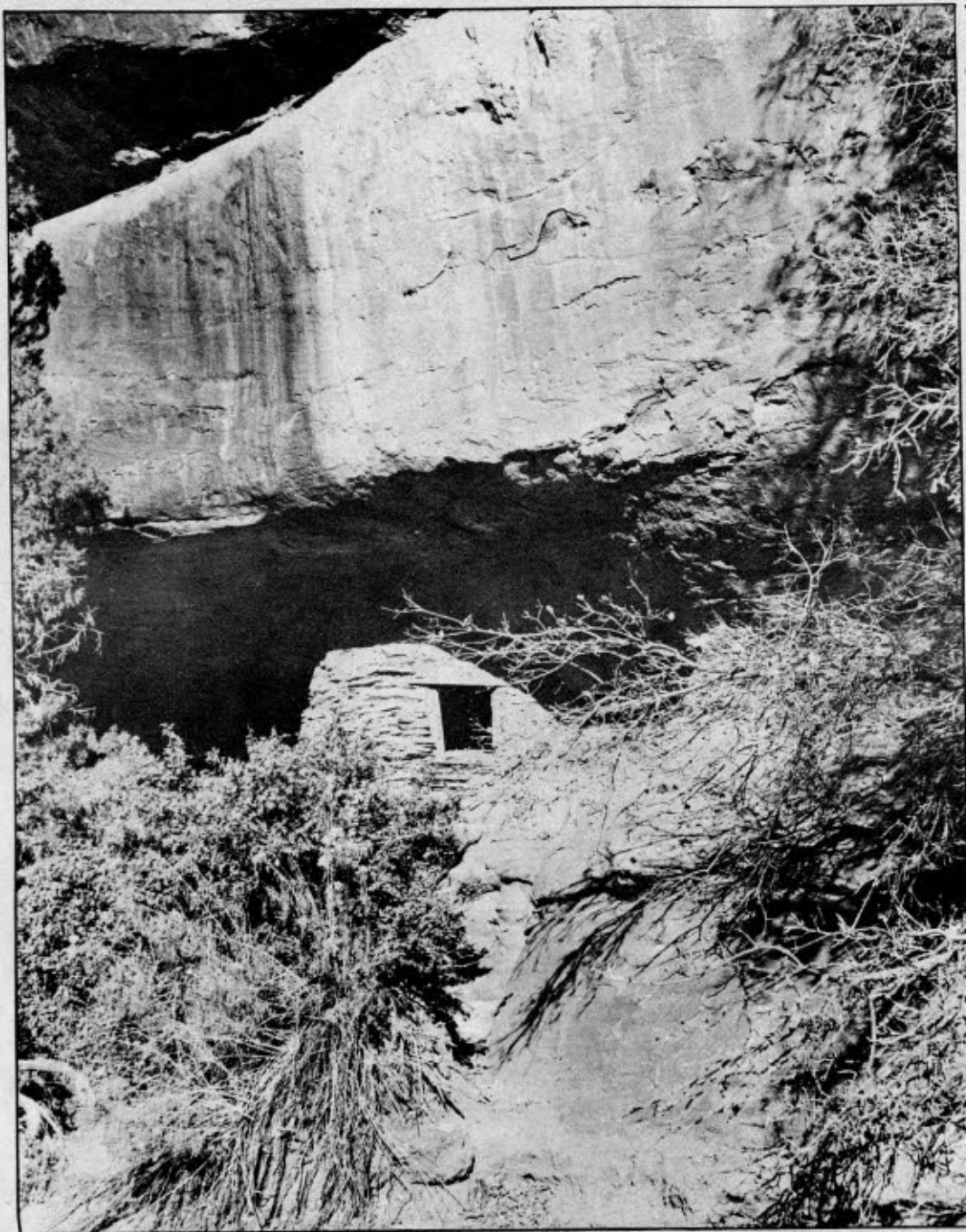
Since the BPA was underwriting the three plants, investors saw the 15 percent interest the bonds would pay as a sure way to a large, quick profit.

Despite the cost and safety issues, nuclear advocates call for more. Larry Chokie, the U.S. representative on the International Atomic Energy Agency study group attempting to develop codes for inspection of operating plants, recently decried the decline of nuclear construction in the U.S. And the Reagan administration, while cutting deeply into other energy programs, has proposed increased federal funding for nuclear power.

“You keep bailing out bad management and you’ll never get good management,” said economist Lazar. “In a free market there would be no nuclear industry.”

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John Soisson is a freelance writer based in Portland, Oregon, and a frequent contributor to *High Country News*. This article was paid for by the HCN Research Fund.



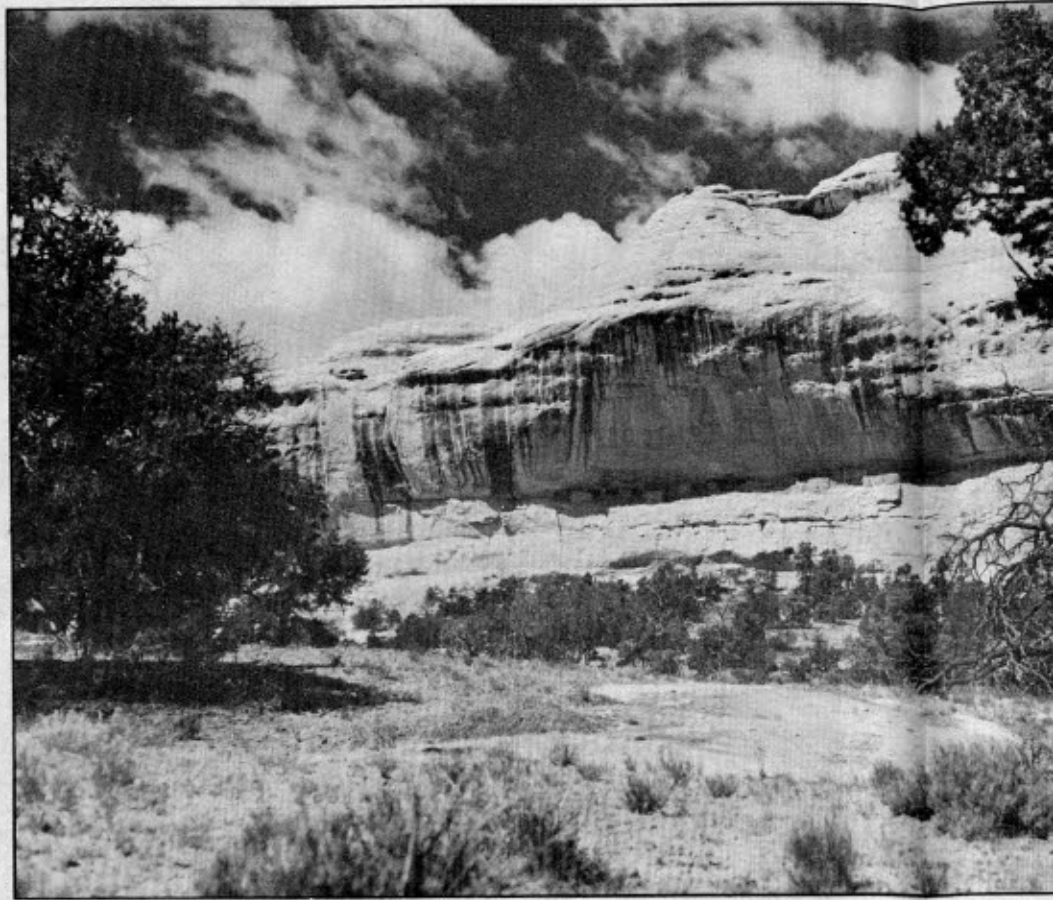
Granary, Horse Canyon, Canyonlands National Park, Utah



Petroglyphs, Salt Wash, Arches National Park, Utah



Catch-basin for rain, Sun Temple, Mesa Verde National Park, Colorado



Thirty-room ruin under overhang, upper Salt Creek,

Anasazi: boom an

by Russell Martin

At noon we stand on a bare stone bluff that looms above the point where the thin line of Lion Canyon empties into Johnson Canyon, three miles south of the Mancos River in extreme southwestern Colorado. The landmarks anchor me in place: the high plateau of Mesa Verde sweeping gently north from the river, with its thick cover of pinon and juniper trees; the glacial, snow-wrapped peaks of the La Platas in the northeast — an alpine world at the fringe of this high desert, just out of reach; Ute Mountain against the west — a sentinel, bundled heap of a mountain that rises abruptly out of a barren plain; and haughty Shiprock, the Rock With Wings of the Navajos, at the edge of the San Juan River in New Mexico, twenty miles to the southwest.

Burnished sandstone cliffs drop vertically away from the northern wall of Lion Canyon. Shallow caves reach into the wall in four places, and in them are the ruins of four villages built 800 years ago from sandstone blocks carried up from the talus beneath the cliffs and mortared into place. Some roofs and walls have given way, but the multi-storied houses are more than the shambled remnants of some forgotten occupation. They shine softly in the glaring sun, integral parts of the cliff, yet obviously born of a different kind of creation. A hawk lifts up from its momentary perch inside the cave just opposite us. It finds a thermal in front of the canyon wall and sails up into the sky.

Sotuknang, nephew of the creator and the one who shaped the universes, said to the people: "The name of the fourth world is *Tuwaqachi*, World Complete. You will find out why. It is not all beautiful and easy like the previous ones. It has height and depth, heat and cold, beauty and barrenness. It has everything for you to choose from. What you choose will determine if this time you can carry out the plan of creation on it or whether it must in time be destroyed..."

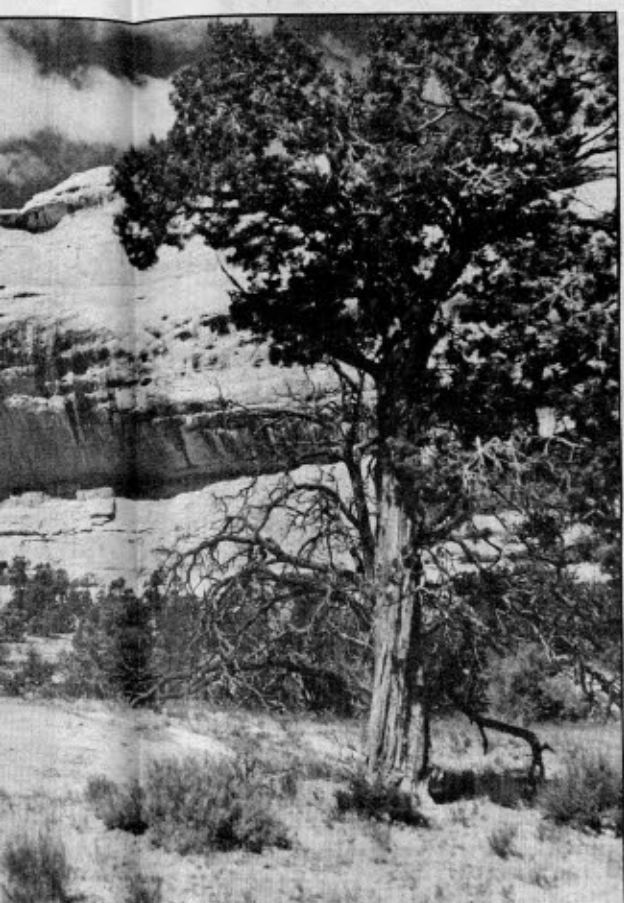
Sotuknang spoke to the ancestors of the Hopi, a small, valiantly enduring tribe of Indians who today live on three spare and rocky mesas in northeastern Arizona — descendants of a people who, a millenium ago, shaped a rich, complex and hauntingly brief civilization among the cliffs, canyons and tree-blanketed mesas of the Southwest.

The nephew, as recounted in Hopi mythology, told the people who had emerged into the fourth world to begin migrations to north, south, east and west before finally settling in the arid country between the Colorado and Rio Grande Rivers, in *Tuwanasavi*, the vital center of World Complete. The people did as he told them, as was part of the plan.

The vanished people are called *Anasazi*, a Navajo word that has been translated as "those who were here before us." Other Navajo speakers say that "old strangers" or "enemy ancestors" more carefully approximate the meaning. Hopi descendants of the Anasazi call the old ones *Hsatsinom*, "the people of long ago" — who probably knew themselves simply as "the people."

The Anasazi became culturally distinct from the large, dimly-understood group of Southwestern aboriginal peoples that archeologists define as the desert culture — nomadic hunters and gatherers — about 100 B.C. The earliest Anasazi grew corn but they foraged throughout wide areas of the plateau region for the bulk of their food supply.

During the early years of what was the nascent Christian era on the banks of the Mediterranean, the Anasazi lifeway on this continent began to grow quickly in



Overhang, upper Salt Creek, Canyonlands National Park, Utah



Ruin, Edge of the Cedars State Historical Monument, Blanding, Utah

m and collapse in American pre-history

complexity, influence and numbers. The people began to devote much of their time to growing corn and squash and, because of the sedentary demands of the fields, they began to build simple pithouses — permanent structures dug shallowly into the earth, covered with roofs built from posts and a latticework of branches, brush, grasses and dirt.

The people's move toward urbanization began between 700 and 900 A.D. At about the same time their technical abilities and aesthetic sense flourished. Pithouses began to be closely clustered, sometimes with adjoining walls. Pottery evolved stylistically and was carefully and beautifully painted.

By the year 900, houses were built almost exclusively above ground, with upright walls constructed of mortared sandstone, and the clustering of houses increased. At least one special ceremonial room, usually circular and entirely underground, began to be constructed in almost every village. Hopis call similar structures *kivas* and continue to use them for complex religious rites and as a sort of men's club house.

For reasons that probably have much to do with the Anasazi's agricultural achievements — their increasing ability to support large numbers of people from carefully tended fields, and the corresponding demand for many field workers — they began to group themselves into larger and larger masonry villages, some several stories high, built in isolated mesa-top locations and, later, in the arching caves in canyon walls. Concerns about defense could have precipitated the moves, but there is no evidence that they were made hastily. Architecture, in fact, reached its most sophisticated and aesthetic dimensions by about 1100. Pottery, basketry, textiles and jewelry became more refined and still more artistically decorated.

At the height of their cultural expansion, the Anasazi had become the Southwest's dominant culture. Trading within the Anasazi region and with neighboring cultures located even thousands of miles away became extensive; elaborate road systems, some hundreds of miles long and as straight as if they were laid out with surveyor's transits, were constructed, as well as what archeologists speculate may have been line-of-sight communications towers.

Irrigation, previously limited to the planting of crops in alluvial creek beds or near intermittent springs, felt the rush of technology as well. Catch-basins and dikes were built at the mouths of canyon corners to trap periodic run-off. Ditches, long canals and reservoirs carried and stored precious water for the fields and the people.

The great cities were built: Cliff Palace, where 400 people lived beneath a single burnished arch; and Pueblo Bonito, at Chaco Canyon in northwestern New Mexico — a five-story, D-shaped cluster of houses covering three acres on the floor of Chaco Wash — home to as many as 1,200 people. Pueblo Bonito was begun in the year 920, decades before most other large pueblos. It took 150 years to build, but there is no evidence that rooms or walls were added as afterthoughts. The city appears to have been built, over a span of a century and a half, to fit an original design.

In thirteen centuries, the Anasazi somehow were swept from small bands of nomadic hunters into the complex technological roles of builders, engineers, planners, agriculturists, artisans: people surviving in a forbidding landscape by adapting to its bare realities and lean resources.

Archeologists say that Anasazi culture flourished at its urban, collective peak for about 200 years. As many as seven generations knew a remarkably stable, productive world in which human endeavors were shaped by a sense of purpose, bound in balance by the natural and spiritual worlds.

But the center could not hold; the balance was betrayed. There was no mass exodus from the great cities and villages of the high plateau. Farmers did not abandon their fields in the midst of a harvest. But the people began to go. Pueblo

Bonito and other Chaco Canyon cities stood silent and empty by 1200. Then, throughout the Anasazi region, the emigrations increased. People who had for centuries known only intensely communal lives left their houses, their possessions, their buried kin, and wandered away in little bands — drifting south, southwest, southeast, searching for those elements that had made life good in the north, in quest of balance. The abandonment reached its peak in the last quarter of the thirteenth century. By the year 1300, only rockbound spirits and stalwart, hollow houses remained behind in the canyon.

We walk from the point overlooking the ruins through the timber along the rim of the canyon. The gnarled, fragrant junipers are covered with lovely blue (and bitter) berries. The pinons that grow among them have the sweet smell of pitch. The brown earth is smooth and bare except for clumps of prickly-pear and yucca and mangy grasses at the bases of trees. Then the trees give way to bald rock where nothing grows — to a great field of smooth sandstone that runs in folds across the rim, then rolls in a smooth arc off the edge. We walk out as far as we dare, and can see below us exquisite walls, the soft, exact color of the cliff, mortared into a cave that barely curves into view: Fortified House. We look for a long time; we need time to see what is there, but can't be: a sweeping cave transformed into a village, an apartment complex suspended in a wall — fifty feet above the talus, a hundred feet below the rim. How could anyone live there? My god, how did people get into the cave? How did they haul stone and mortar and water and slaughtered deer up to those heights?

There's an unsettling, overwhelming sense of mystery on the rock above the ruin — a sense of something ponderable but impossible to understand. The questions about the impossibility of construction and access give way to one more fundamental: what terrible, fanatic, or joyously-inspired motivation led that ancient people to choose that life, to devote themselves to the rock?

Perhaps they were afraid, and their clustered lives were full of apprehension. Perhaps, as the Hopis suggest, they were spiritual ascetics, and their lives were full of purpose. Perhaps living in the caves, inside mortared walls that merged with the smooth slabs of the canyon, was a means of immersion in the natural world, and their lives were lives of communion.

It may be coincidental that the Anasazi's brief era of rewards was also a time of crisis, of persistent problems that eluded adequate solutions. Or perhaps that was one of the rigorous lessons of the fourth world, that nothing exists without its complement: height and depth, beauty and barrenness, security and crisis, beginning and end.

Archeologists are certain that by about the year 1100, wandering groups of Athabascan peoples, primitive hunters and seed gatherers who roamed the mountain region on foot, began to press slowly into the desert Southwest. The wanderers, who probably were ancestors of the Navajo and Apache, surely made contact with the Anasazi, probably by raiding corn cribs or ransacking their fields. There is no evidence that the Anasazi ever went to war with the bands of interlopers, but the threat posed by the invaders must have been a persistent and troubling concern, one that spanned decades. High walls were constructed around mesa-top pueblos, enclosing houses and vulnerable kivas, and the moves into the caves seem very likely to have been made as a means of providing protection.

Some early archeologists presumed the nomads actually might have forced the Anasazi to flee the region *en masse*, but then others reconsidered: Would a large,

(continued on next page)



Cliff Palace, Mesa Verde National Park, Colorado



Pueblo Bonito kivas, Chaco Canyon National Monument, New Mexico

Kurt and Donna Darnen

People who had for centuries known only intensely communal lives...wandered away in little bands.

(continued from previous page)

efficiently organized group of people who had invested so much in a place simply give it up when pressured by groups of rag-tag thieves? Perhaps the raiders were stymied finally by the fortifications and by well-armed men who watched for them at the fields. Maybe a kind of cold war developed — the Anasazi keeping nervous and vigilant watch, the raiders laying siege whenever they could manage it.

Then more trouble. A long and cruel drought descended on the Southwest in 1276. Tree-ring data show that the plateau region was dry as a deer's skull for 23 years in succession, perhaps the most severe drought the region had ever endured. Alluvial creek beds where the Anasazi farmed must have dried and cracked open. Mesa-top fields stood fallow. Berries and pinon nuts and small game dwindled. The bleeding springs must have vanished.

If crops failed two or three years in succession, the people, hungry and desperate, would have been forced to eat their seed corn — their hopes destroyed. Surely the drought, a savage drought in an already dry land, forced them to go, in search of moisture.

But the people had endured droughts, hard droughts, before — during times when their abilities to sustain themselves were less well-honed, their lives less secure. Chaco Canyon was abandoned, empty, at least 75 years before the drought began; there were other reasons why the Chacoans fled. And if the drought was the principal reason for leaving, why did so many Anasazi go to places even more grimly dry than the ones from which they scattered? Many upland, more temperate crannies in the region were never home to the Anasazi.

But regardless of the brutal drought, additional burdens continued to mount; more pressures were heaped upon them — perhaps as much by their own devices as by the elements or alien mobs.

There is evidence that fields, cultivated yearly for generations, grew nearly sterile, stripped of their nutrients and their abilities to magically nurture crops. Would farmers have known that their soils needed replenishment or did they assume that they were somehow sterile, that they had betrayed some vital trust, some rapport with the land?

Timber, essential for roof and ladder construction, as well as for fuel, grew scarce. Every tall, erect ponderosa within scores of miles of a major pueblo was likely cut. Vast forests of pinon and juniper were downed and put to use, but the ground that was laid bare blew away in the winds and rushed away in muddy torrents after storms. Water that surged onto canyon floors could have cut deep arroyos, destroying alluvial basins, making diversions of water impossible.

And the people themselves, their burgeoning numbers, must have posed straining demands for additional houses, clothing, cookware, tools, meat and precious vegetables. Increasing individual specialization would have been an absolute necessity, meaning correspondingly greater demands for efficient organization and harmonious relations. Imagine: 15,000 people along the barren banks of Chaco Wash; at least as many on the suspended heights at Mesa Verde — societies that may have been so successful at carving good lives for their people from meager raw materials that the people themselves became the crucial concern, their numbers a greater liability than the dearth of water or the profusion of rock.

One of the enchantments of our glimpses, in these waning years of the twentieth century, of the world of the Anasazi is that we will never know, precisely and unquestionably, why that hearty, determined people gave this country up. That secret, if anywhere, is couched in the rock, whispered by juniper trees, unrevealed.

But we do know something about what pushed them away — enough to fascinate, perhaps enough to alarm us into speculation about whether any people can endure, and thrive, forever on the face of a harsh and haggard land.

There is no doubt that the Anasazi were vexed by hostile wanderers for generations. The drought was bitter and mean and must have seemed endless. And Anasazi populations grew enormous. But there is this perplexity: Wouldn't a resourceful, ingenious people have seen how they were crippling themselves? Why didn't they restructure themselves into groups whose impacts and demands were diminished? Did they fail to understand the alternative? That question gnaws at me, makes me uneasy.

The migrant Anasazi, carrying only a few possessions and the mythic weight of thirteen centuries, settled again in three wide areas: along the northern banks of the Rio Grande, and at two locations in the drainage of the Little Colorado, near present Zuni and Hopi villages.

Although the people remained recognizably Anasazi for many decades, a spell had been broken. Some haughty, vibrant spirit had been exorcised when they came down from the cliffs. Masonry was strangely inferior to what it had been only a few years before. Pottery and textile manufacture regressed. Complex irrigation systems, roads, great cities built from grand designs, disappeared for a long era. Finally, all that remained of "those who were here before us" were their mythic religious traditions, their ages-old commitment to arid land, and, in the empty country to the north, their houses shaped from rock.

We climb into the pickup and drive through the timber around the head of the canyon and park again near the rim, across a quarter-mile of still, dry air from Fortified House. Below us, out of sight, are the four ruins on this side of the canyon wall. We climb easily down, at a place where the wall is fractured, to a trail that winds beneath the vertical rock and connects the ruins. We walk through three of the empty towns. The silence beneath the arches is stunning, strong. The air is cool, almost damp, in the shade of the caves. At a seep spring — a soft, moist patch of ground beneath a looming mass of rock — we find the paw-prints of a cougar, who seems to know that this thin canyon is named for her, is her domain.

The trail disappears when we come to the fourth cave, to the ruin called Eagle's Nest. The cave is the largest of the four, its broad arch sweeping two hundred feet above the edge of the talus where we stand. A hundred feet above us a long, thick slab of rock, too tough to be undercut by moisture, juts out from the recessed wall of the cave — and there, anchored to it, is the ruin, its lovely, delicate walls pitched at the dangerous edge of the slab.

We carefully hug the rungs of a huge wooden ladder as we climb to the edge of the overhang, then creep along a slim path into the ruin. Some roofs remain perfectly intact, their juniper beams as dry — drier — than the rock. The walls of a kiva, still partially roofed, hold adobe plaster and red paint in places; the retaining wall, impossible to build, is still stout and high.

But I'm uneasy, frightened, not so much by the height as by the overwhelming, ponderous tone of the place — a place magnificent and forever mysterious in its construction, its abandonment and its long survival.

I look for a long time out into the canyon and think: We are a fine, wonderful species. But we are bent on disintegration. Our endeavors, our lives, our legacies won't last — though they may gleam, momentarily, like the sun on polished rock.

And perhaps that's all we're really charged with learning in this fourth world, World Complete, world with a lean beginning and a puzzling end.

+++

Russell Martin is a freelance writer in Dolores, Colo. This article was paid for by the HCN Research Fund.

BULLETIN BOARD

GRASSLAND INSTITUTE

The Denver Audubon Society is offering its eighth annual Grassland Institute June 13-19 at the Crow Creek Campground on the Pawnee National Grasslands. The Institute blends the arts, sciences and humanities in looking at the prairie ecosystem and the human place in it. For further information, contact Ed Butterfield, 17410 E. Nichols Place, Parker, Colo. 80134 or (303) 690-5019.

SALMON AND STEELHEAD PROTECTION

The Pacific Northwest Electric Power and Conservation Planning Council will hold a public hearing Mar. 23 in Boise, Ida., to obtain initial public input on a regional fish and wildlife plan that will determine the fate of Idaho's anadromous salmon and steelhead runs. The hearing will be held at the Idaho Game and Fish Department office, 600 S. Walnut, Boise, from 8:30 a.m. to 5 p.m. and 7 to 10 p.m. Those wishing to make statements should contact Torian Donohue at (503) 222-5161.

FOREST SERVICE SEEKS VOLUNTEERS

Volunteers are needed to serve as campground hosts on the Wasatch-Cache National Forest in Utah. The hosts (usually couples) spend the summer at the campground and perform various duties, including monitoring and light maintenance of facilities and providing information to the public. The season runs from June 15 to Sept. 15. Interested people should call one of the Forest Service offices in Salt Lake, Kamas, Ogden or Logan, Utah; or Evanston or Mountain View, Wyo.

GREAT PLAINS GEOLOGY BOOK

The USGS is offering a new 51-page booklet called "The Geologic Story of the Great Plains." Written for the layman and enhanced by color photos, maps and tables, the booklet explains what and where the Great Plains are, how they were formed and how they influenced American history. The booklet, USGS Bulletin 1493, is available for \$4.50 per copy from the Government Printing Office Bookstore, 720 N. Main St., Pueblo, Colo. 81003.

AMERICAN INDIAN ARTS CONFERENCE

The UCLA American Indian Studies Center and the Malki Museum will host "Sharing a Heritage: American Indian Arts Conference," May 28-29, on the UCLA campus. Two hundred participants are expected to attend talks exploring the historical, anthropological, literary, ethnomusicological and educational aspects of American Indian art forms as they depict the community life of the American Indian. For further information, contact Judith Takata, American Indian Studies Center, 3220 Campbell Hall, University of California, Los Angeles, Ca. 90024.

WILDLIFE SYMPOSIUM

Papers are now being solicited for a Nov. 17-18 conference in Steamboat Springs, Colo., on "Issues and Technology in the Management of Impacted Western Wildlife." Major topic areas for the symposium will include cumulative and secondary impacts to wildlife from energy development activities, impact mitigation techniques and sensitive habitat management. Abstracts and requests for further information should be sent to Robert Comer, Thorne Ecological Institute, 4860 Riverbend Rd., Boulder, Colo. 80301.

SUMMER CAMP FOR ADULTS

The National Audubon Society is offering one- and two-week adult vacation programs at four ecology camps in Maine, Wisconsin, Connecticut and Wyoming. Enrollment fees are \$575 per person for two-week sessions in Maine, Wyoming and Wisconsin, and \$320 for one-week sessions in Connecticut and Wisconsin. Sessions run between June 20 and August 20. For further information, contact Audubon Camps, 4150 Darley St., Boulder, Colo. 80303 or (303) 499-5409.

PRAIRIE DOG CONTROL ASSESSED

The Bureau of Land Management will analyze four management schemes ranging from total eradication to no control for prairie dogs on public land in Phillips County, Mont. An environmental assessment for managing prairie dogs will be available in May. Contact Charles Dahlen, Area Manager, BLM, Malta, Mont. 59538, for information.

TEXAS LAND TRANSFER

"Excess" government property on Matagorda Island, Texas near Aransas National Wildlife Refuge, home of the endangered whooping crane, may be transferred to the state of Texas. The Department of Interior and the General Services Administration will prepare an environmental impact statement examining alternatives for disposal of the 19,000 acres of federal land. A meeting to discuss the alternatives will be held in Corpus Christi on March 8. Send comments to Regional Director, Fish and Wildlife Service, P.O. Box 1306, Albuquerque, N.M. 87103, by March 11, or call (505) 766-2174 for information.

SOIL CONSERVATION SCHOLARSHIPS

Scholarship money for graduate research or continuing education in soil conservation is available from the Soil Conservation Society of America for SCSA members. Applications are due May 1. Contact the society, 7515 NE Ankeny Rd., Ankeny, Iowa 50021.

LAND USE CONFERENCE

The fourth annual National Land Use Conference is scheduled for March 31 — April 2 at Golden Gate University in San Francisco, Calif. "Land Use: The New Realities" will be presented in association with the Western Governors Conference, the Western Conference (of State Legislators) and the Conference of Western Attorneys General. Registration is \$225 before March 11, \$250 after that. Contact Elizabeth Tipping, Conference Director, Golden Gate Univ. School of Law, 536 Mission St., San Francisco 94105, (415) 442-7000 ext. 7469 for information.

UTAH WILDERNESS CONFERENCE

The Utah Wilderness Association announces its second annual conference, featuring Utah Gov. Scott Matheson, Rep. James Hansen (R-Utah) and Frances Farley, Democratic candidate for Congress in Utah; on March 27 in Salt Lake City. The conference will be held at the Salt Palace, Suites G and H, 100 South West Temple, from 7:45 a.m. to 5 p.m. A registration fee will be charged. Contact the Utah Wilderness Association, 722 Judge Bldg., Salt Lake City 84111, (801) 359-1337, for details.

COAL GASIFICATION EXPLAINED

"Underground coal gasification promises to be a relatively low cost, environmentally sound method for producing clean fuels from currently unmineable coal deposits," according to D.R. Stephens, author of *Underground Coal Gasification — A Leading Contender in the Synfuels Industry*. The report, prepared for the Department of Energy, is available for \$6 from: National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, Va. 22161.

FISH HABITAT REPORTS

Two new reports in a series on river-spawning fish have been published by the U.S. Forest Service. "Effects of Mining," General Technical Report PNW-119, and "Effects of Livestock Grazing," General Technical Report PNW-124 evaluate the results of these land uses on fish habitat. Single copies are available free from the Pacific Northwest Forest and Range Experiment Station, 809 N.E. 6th Ave., Portland, Ore. 97232.

NEW COLORADO FOE OFFICE

Friend of the Earth, a citizens' environmental group, has opened a Colorado Western Slope office in Grand Junction. The office will focus on oil shale development issues. Contact Connie Albrecht, FOE, Colorado West office, Upper Story Mall, 530 Main St., Grand Junction, Colo. 81501, (303) 464-7173.

CLEAN UP FOR BLM

Do you want to clean up for the Bureau of Land Management? The BLM is accepting bids on cleanup contracts for seven southwestern Wyoming recreation sites. Contact the BLM Rawlins District Office, 1300 Third St., Rawlins, Wyo. 82301, (307) 324-7171 or the BLM Lander Area Office, Hwy. 287 South, Lander, Wyo. 82520, (307) 332-4220 before March 23 for details.

ADDITIONAL N.M. WILDERNESS

A 6,000 acre additional wilderness study area may be considered for inclusion with the Gila Box WSA in eastern Arizona pending decision of the Interior Board of Land Appeals. Contact the Safford District Office, BLM, 425 E. Fourth St., Safford, Ariz. 85546, (602) 428-4040 for details.

POWER PLANT PROPOSED

The Bureau of Land Management seeks public comment on Public Service Co. of New Mexico's proposal to construct a 2,000-megawatt coal-fired power plant about 35 miles south of Farmington. Written comments should go to Leslie Cone, Project Manager, BLM, P.O. Box 1449, Santa Fe 87501, by March 26.

NUCLEAR ARMS SYMPOSIUM

A nuclear arms symposium will be held in Lander, Wyo., April 16-18, sponsored by the Lander United Methodist Church, Third and Washakie Sts., Lander 82520. Dr. Sherman Janke, professor of engineering at Montana State University in Bozeman, and members of the Alliance for a Nuclear Free Future, also from Bozeman, will speak on arms development and the arms race. Contact Rev. John Stark or Rev. David Donkle at (307) 332-3188 or the address above for further information.

RENEWABLE ENERGY DIRECTORY

Wyoming Solar Industries Association and Western SUN are compiling a Wyoming renewable energy business directory to list businesses involved in solar, wind, micro-hydro, biomass and geothermal energy. A consumer information section listing national, state and local renewable energy sources will be included. To be listed, businesses should contact WyoSIA, 4000 Springs Dr., Rock Springs, 82901, (307) 382-9161 by March 5. Free copies will be available to the public after April 5.

MORE COLO. OIL SHALE LEASING

The Colorado Bureau of Land Management seeks public comment on additional oil shale leasing proposed for the Piceance Basin in northwestern Colorado. BLM will hold the following public meetings in Colorado prior to developing an environmental impact statement on the proposed leasing: March 24, 7 p.m., in Meeker at the Fairfield Center, 200 Main; March 25, 7 p.m., in Grand Junction at the Ramada Inn, 718 Horizon Dr.; and March 26, 2 p.m., in Denver at the Airport Ramada Inn, 3737 Quebec St.

ENERGY EDUCATION FOR TEACHERS

The Department of Energy is financing workshops to increase teachers' knowledge of energy research and technologies. Workshops will be held at colleges and universities in 1982 and 1983. Contact Don Duggan, Office of Energy Research, ER-44, DOE, Washington, D.C. 20585, (202) 252-1634 for information.

COLORADO RECYCLING

Coloradans For Recycling, a Denver- and Colorado Springs-based public group, has begun a petition drive to qualify the Beverage Container Reuse and Recycling Act for the November general election ballot. Signatures of 39,000 registered Colorado voters are needed by July to place the beverage container refund legislation on the ballot. Contact Dave McWharter, Coloradans For Recycling, 1711 Pennsylvania, Suite 104, Denver, Colo. 80203, (303) 863-0292 for petitions and information.

GEOLOGY MAP OF N.A.

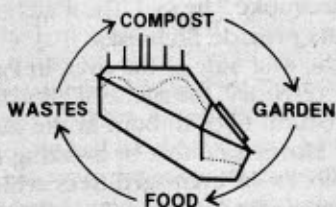
A color map showing more than 4,000 ore deposits and the geology of North America, from Greenland to Panama, has been published by the U.S. Geological Survey. The map "Preliminary Metallogenic Map of North America," is available for \$10 from Branch of Distribution, USGS, 1200 S. Eads St., Arlington, Va. 22202, or Branch of Distribution, USGS, Box 25286, Federal Center, Denver, Colo. 80225. Include check or money order to USGS and specify the map name.

WYO. COAL MINES PROPOSED

A hearing on the draft environmental impact statement for the North Antelope Coal Mine, which would affect 2,700 acres of land in and near the Thunder Basin National Grasslands, is scheduled for March 11 in the Campbell County Community Recreation Center, Gillette, Wyo., from 7 to 9 p.m. Copies of the draft EIS are available and written comments should go to the address by April 1. The final EIS on the proposed Antelope Coal Mine, which would affect 5,900 acres in Converse County, Wyo., is available from Richard E. Dawes, OSM, Brooks Towers, 1020 15th St., Denver, Colo. 80202, (303) 837-5421.

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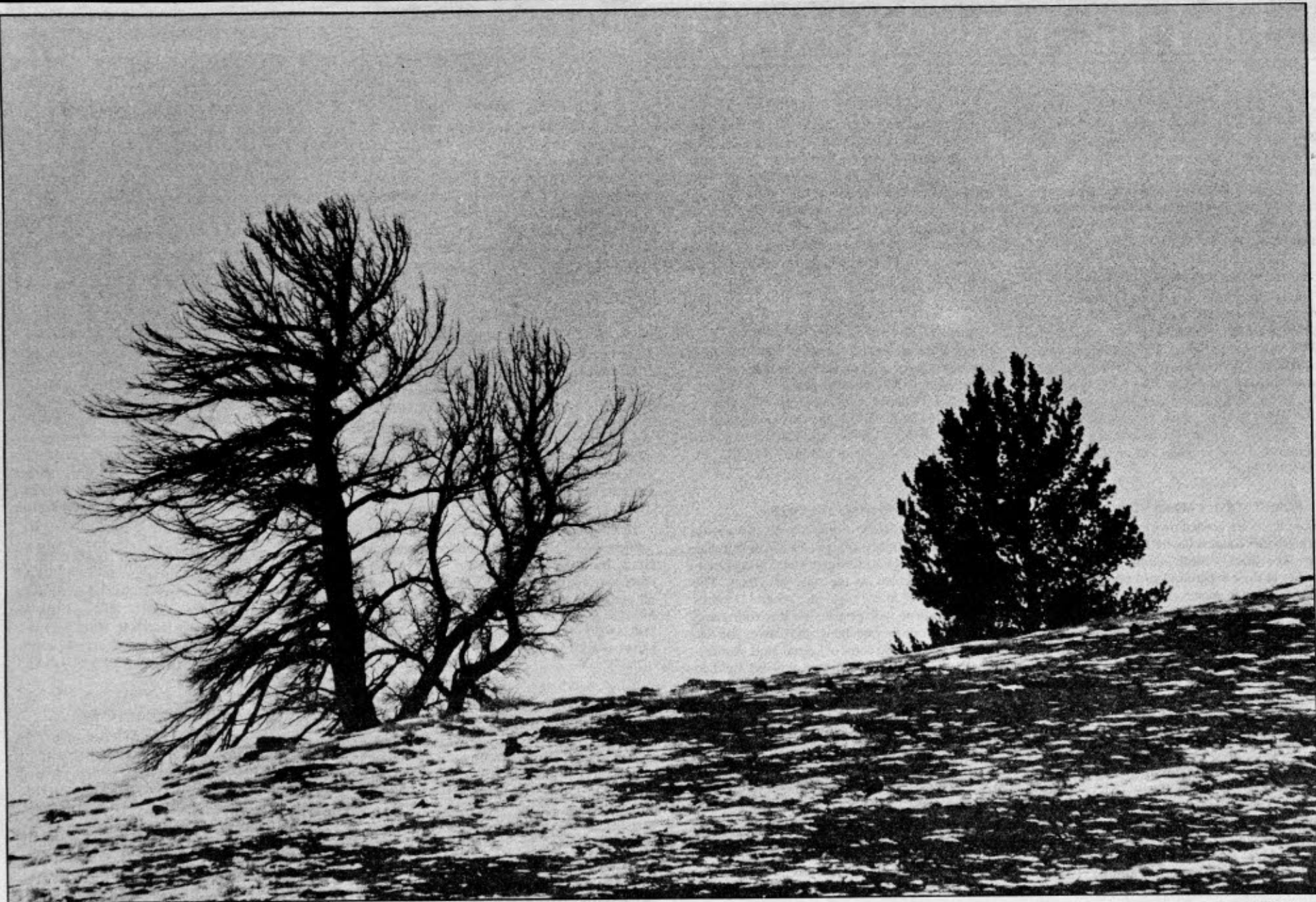
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Mike McChesney

Attempting to eradicate mountain pine beetles with pesticides is like taking an aspirin for appendicitis.

Beetles...

(continued from page 1)

industry and government believe that preventive management — growing healthier forests to resist beetle attack — is the key to minimizing future destruction.

This is the integrated pest management philosophy adopted by federal government agencies in the late 1970s. Prior to that, in the late 1960s and early 1970s, forest pest management relied heavily on the aerial application of pesti-

cides. "Pesticide use was widespread," said Gale, "because it was a cheap treatment method."

Aerial spraying proved less than effective. Attempting to eradicate mountain beetles with widespread use of pesticides is, said Holland, "like taking an aspirin for appendicitis — it doesn't get rid of the problem, just keeps it away longer."

"Also," said Gale, "the cost of chemicals (pesticides) and of aerial application skyrocketed with the cost of oil in the 1970s." Now other preventive

methods are being researched and used to combat mountain pine beetle.

Where timber production is economically feasible and not damaging to the environment, intensive timber farming methods are used, Gale said. These methods all involve increased timber harvesting and road building.

Harvesting — both clearcutting and thinning — is used to break up large contiguous areas of dense, even-aged trees, explained McGregor, because those stands are particularly vulnerable to beetle kill.

Preventive management, in the Forest Service and timber industry view, is based on increased timber harvest in areas considered high risk for pine beetle epidemics, said Gene Lessard, Forest Service entomologist in Denver.

However, access to many forests is difficult and road construction is expensive, especially considering the currently depressed timber market.

Some foresters, like the Forest Service's McGregor and Burlington Northern's Parson, are confident that current economic problems are short-lived and

Beetle controversy across the North Fork

The North Fork of the Flathead River valley in northern Montana is the site of one of the worst beetle epidemics in the northern Rockies. Hundreds of thousands of acres of dead forest fill the valley: East of the river, in Glacier National Park 292,000 acres are affected, and across the river to the west, in the Flathead National Forest and private lands in the river bottom, 197,000 acres have been hit by the beetles.

"If you could fly over the North Fork," said Bob Morey, resource management specialist for Glacier National Park, "you'd be amazed at the view below." West of the river, he said, "looks kind of like a battle zone." Here clearcuts replace the dead forest. The river valley itself, forested before the most recent beetle epidemic started in 1969, is now peppered with small logged openings. East of the river are acres of brown lodgepole pine forest, discolored and dying from beetle infestation, Morey said.

Because pine beetle epidemics are natural events, the National Park Service

"just lets nature run its course," said Morey. He explained that they do not try to control the beetle epidemics because the Park Service is charged with preservation of the natural ecosystem, not resource management. "Anyway," he said, "neither pesticide or logging can control pine beetle epidemics."

On the opposite side of the North Fork, the Flathead National Forest is in the business of timber production. They therefore follow a different management strategy; they are attempting to control the epidemic by harvesting most of the infected stands, according to Jim VanDenburg, forest silviculturist.

Their accelerated harvest program, based largely on clearcutting, is controversial. The large amount of logging involved, according to Bill Cunningham, Wilderness Society representative in Helena, Montana, is a serious threat to the undisturbed nature of the North Fork area. Clearcutting, in combination with other developments proposed for the area, "could destroy some of the most important wildlife habitat in

the country," he said (HCN, 3/6/81).

The upper North Fork is essential habitat for grizzly bear, as well as bald eagles and the threatened timber wolf, according to biologists with the Border Grizzly Research Project in Missoula, Montana.

Logging and associated development like access roads are far more harmful to wildlife than beetle epidemics, Cunningham explained. The Park Service policy of allowing beetle populations to cycle naturally is more appropriate to wildlife management, he said.

The Park Service's Morey said that, though large numbers of trees may be killed by beetle epidemics, the result is no different than a wildfire; the trees eventually grow back. Human interference disturbs wildlife more than the epidemic itself.

Conservationists and biologists are particularly concerned about a group of sales planned by the Forest Service to salvage dead timber in roadless areas near the Canadian border. "These sales are unnecessary because there simply is

no great demand for this timber," Cunningham said.

VanDenburg said the Forest Service is having trouble getting the timber harvested because of the poor market and will sell it at a loss, but "without some harvesting and breakup of the fuel (the large areas of dead trees) the area will go up in smoke," he said. The roads and clearcuts provide firebreaks.

On the east side of the river, in Park Service territory, the agency is allowing some natural fires to burn in the pine stands. Morey said that by breaking up large blocks of even-aged trees which occur after a fire, vulnerability to beetle epidemics is reduced.

The Forest Service plans to prevent future destructive pine beetle epidemics by managing for tree species diversity, according to VanDenburg. They will thin the young pines, leaving other, beetle-resistant species like larch, fir and spruce to grow for timber. These trees produce much more valuable lumber than pine, he said.

— S.T.

won't affect long-term demand for timber supplies. Others disagree, particularly managers dealing with areas where attacks are not as severe and forests not so productive.

Lessard said most outbreaks in Wyoming, Colorado and the Black Hills are small and locally intense. Under such conditions, allowing the beetle epidemics to follow their natural cycle produces "beautiful wildlife habitat," said Lessard. Openings in the forest created when the larger trees are killed favor grass production, providing increased forage and other benefits for wildlife.

Where individual trees have high aesthetic value, they are sprayed with pesticides, Lessard said. "It is expensive (costing around five dollars per tree) and the pesticides we use are restricted because of the potential harmful effects on the environment," he said.

The National Park Service also recognizes the natural role of mountain pine beetles. Unlike other timber managers, however, the Park Service is in the business of preserving ecosystems, not producing timber, said Don Despain, research biologist at Yellowstone National Park. He said public reaction to their policy of allowing pine beetle epidemics to progress naturally "seems favorable." However, it is not comforting to small landowners who lose most of their trees in a beetle epidemic to know that, with proper management, a healthy stand will not fully grow back for 80 to 100 years.

If small landowners organize, they can get help from local or state forestry offices to combat beetle epidemics. In these cases, trained workers spray healthy trees to prevent beetles from spreading. The Colorado Front Range Project, a cooperative effort involving various federal and state agencies and private landowners, has successfully stopped beetle epidemics in an area west of Boulder.

State and local preventive management programs throughout the Rocky Mountains may be endangered by federal budget cuts, however. Colorado State Forest Service officials report decreases in U.S. Forest Service pest control funding for state programs.

Another problem is dead wood left by current and past beetle epidemics. On the Targhee National Forest, for example, forest officials said beetles have killed 1,000 to 2,000 trees per acre in places. Some of this is harvested. Lumber mills buy the better logs for building material; the poor quality logs go for paper and pulp. The Idaho Stud Mill in St. Anthony, Idaho, gets up to 70 percent of its logs from beetle-killed trees on the Targhee.

Traditionally, the Forest Service has relied on commercial timber operators to buy and harvest the dead trees. Now, due to the depressed timber industry, they not only can't sell the dead timber in many areas, "they can't give it away," said Holland.

It is important to harvest the dead trees, McGregor said, because of the possibility of catastrophic forest fires if some of the dead material is not removed. He said the agency is gearing up for increased fire fighting activities in the coming years.

The Forest Service's Holland said firewood can be harvested in many areas where commercial timber harvest is not practical, either economically or ecologically. And the demand for firewood has grown in the last few years with the increased use of wood heat, he said.

Researchers and managers alike agree that forest fires and pine bark beetles are interrelated natural factors — large forest fires create favorable conditions for growth, developing the areas of dense, even-aged pine stands that are most susceptible to destructive beetle epidemics when mature. Subsequent epidemics kill numerous trees, leaving a lot of fuel for forest fires.

Some national parks and forests in the West have begun let-burn policies, allowing fire to burn as a natural force in

BOOKS

The Desert Smells Like Rain

A Naturalist in Papago Indian Country

Gary Paul Nabhan

Gary Paul Nabhan, North Point Press, San Francisco, 1982. \$12.50, cloth, 148 pages. Photographs.

Review by Peter Wild

Bouncing over a desert road in a pickup toward the Papago's rain-making ceremony, we see no signs pointing the way to the sacred rite, no caravans of other Anglos armed with cameras headed in the same direction. An ordinary flour sack thrown by the roadside marks the turnoff. After a few jarring miles, we arrive at a large circle of pickup trucks. By Papago design, this is no tourist event with feathered head-dresses, doeskin-clad dancing maidens and crowds of gawking outsiders. Soon we're drinking cactus wine from a Hormel frankfurter can, bewildered by tribal elders rolling in the dust, weeping, singing for rain.

One by one, the men stagger off to vomit, then weave back to down more cactus juice from tin cans. "Throwing Up the Clouds," it's called. Yet what may seem irreligious to us is not at all incongruous to Papago people, who combine an easygoing sense of fun with religious activities.

Elsewhere Nabhan claws up a cliff with Indian friends, searching for an ancient shrine. In the cave he finds bullets, sticks of chewing gum, cigarettes. Before leaving, Nabhan hangs his cap on a rock. It's an offering to Fitoi, the whimsical spirit of the place who loves to play tricks on visitors who forget to leave him little gifts.

Later on, the author describes the interior of a Papago house: "A card table, three foldups, the bulging single bed, and an ice chest served as furniture. A fruit crate was hung from one of the upright posts, serving as a shrine with a metal crucifix, a porcelain Virgin Mary, and a bottle of Excedrin displayed inside." We see no incongruity there, not for a Papago, as insider Nabhan, a graduate student at the University of Arizona, leads us through the mountain ranges and desert sweeps of this isolated corner of his state.

Yet Nabhan is far more than a cognoscente, an adept tour guide to the charms of Papago land. Primarily, he's a naturalist, an ethnobotanist studying the ecology of traditional Papago farming as contrasted to the scrape-it-clean-and-lay-the-pipe approach of American agribusiness. For centuries the Papago have grown their corn and beans in small desert plots watered by intermittent summer downpours. Scientist Nabhan finds beans in such "flashflood"

wilderness and other remote areas. What effect, if any, increased fuel loads and fire danger from beetle epidemics will have on these natural fire policies is unclear.

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Susan Tweit is an intern with High Country News.

fields higher in protein than those raised with irrigation. And that's only the first of many subtle ecological discoveries. Traditional Papago agriculture uses nature's resources more efficiently than modern methods, supplying "more food energy...with less energy in labor and fuel spent" than other methods dependent on machines — an observation that should give us reason to pause in the world of soaring gasoline prices and falling water tables.

Over the millennia, the traditional practices, "fine-tuned...to local conditions," have created ecosystems that are life-yielding to the Indians and rich in

wildlife — not to mention the wealth of folklore that weaves man and coyote, rain gods and their wine-drinking supplicants into a harmonious pattern in this arid land. All this, of course, is under attack by an industrialized society ready to bulldoze the fields over which impish Fitoi still smiles.

As short as it is, *The Desert Smells Like Rain* offers a remarkable insight, sensitive but unsentimental, combining the sound perceptions of a scientist with ecological concerns, matching humor and a sense of human frailty with tentative hope for the future.

BOOK NOTES

Least-cost Energy: Solving the CO2 Problem

Amory B. Lovins, et al, 1982. \$17.95, clothbound. Brick House Publishing Company, Inc., 34 Essex St., Andover, Mass. 01810. The authors seek to disprove the conventional assumption that ever-increasing use of fossil fuels is the only alternative to either use of nuclear power or energy scarcity and world poverty. They present an energy policy which uses new technology in energy conservation and renewable energy sources to meet the needs of society at the lowest possible economic cost.

Power & Light: Political Strategies for the Solar Transition

David Talbot and Richard E. Morgan, 1981. \$6.95, 262 pages with illustra-

tions and references. The Pilgrim Press, New York. Order from: Environmental Action Foundation, 724 Dupont Circle Bldg., Washington, D.C. 20036 (include \$1 for postage and handling). The authors believe that the public wants to and can challenge the energy establishment and turn the nation toward use of energy conservation and renewable energy sources. They present the political means for alleviating our energy problems.

The Complete Guide to America's National Parks

National Park Foundation, 1981. \$7.95, paperbound, 325 pages with maps. Viking Press, New York. Detailed information for visitors on all 357 areas administered by the National Park Service.



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14-High Country News — March 5, 1982

OPINION

Watt's wilderness proposal sets agenda for energy industry

For about 24 hours, it looked as though the Reagan administration had radically turned around and favored wilderness protection. But there was a very different morning-after look. When the fine print was read, the initiative by Interior Secretary James Watt to ban oil and gas leasing from wilderness areas for the rest of the century looked more like a generous government move to do some business planning for the energy industry.

The industry has a problem. Big discoveries in the Overthrust Belt, technical innovation, and rapid expansion of public lands open to drilling have stretched drilling and exploration equipment pretty thin. Rigs are rushed to new sites as quickly as possible, but there's a chronic shortage.

The energy companies have kept their prospectors and lawyers busy as well. With the deadline for leasing in wilderness drawing near, they are trying to get their lease applications on the books in a hurry. So far, the applications blanket millions of acres in 56 designated wildernesses. Many more acres in recommended wilderness areas are also under lease application.

What in the world would the oil industry do if those wilderness areas are opened up tomorrow? Where will they get the rigs? The Wilderness Society reports that even now 80 percent of oil and gas leases expire without exploration. Over 118 million acres currently under lease remain untouched.

Surely the energy industry can appreciate the pragmatism of Secretary Watt's proposed closure of wilderness areas to oil and gas for 20 years. That gives them plenty of time to catch up. And during that period, if the recently introduced Wyoming and Montana wilderness bills are any indication, Congress plans to open up a lot of heretofore closed, but undesignated wilderness by simply leaving it out of state wilderness bills.

Then in the year 2000, according to Watt's proposal, it will be back to square one — the withdrawal of wilderness from oil and gas development will just end, with no provision for further protection. The timing should be just about right — there will be some rigs available, some of the other lands will have been pumped out, and there will be more workers, too. What's more, the federal government will have been working hard to inventory minerals and energy in those wilderness areas between 1980 and 2000, so the industry will know where to lease.

Watt's move is audacious and a little naive. He apparently is surprised that anyone is reading the fine print and criticizing his bill.

Conservationists are so busy attacking what they view as Watt's trickery that they may have failed to recognize what an opening he has given them. Watt, it appears to us, made a big mistake. While his bill may be but a thinly-disguised bit of strategic planning for the energy industry, it makes an important concession by acknowledging public support for wilderness protection and the administration's willingness to accede to it at this time.

Watt has always known the value of defining the terms of the argument. By labelling his opponents extremists, he has put them on the defensive. By talking about all the acreage that is closed to multiple use, he has avoided the figures on how much more was open to mining, drilling and timbering. This time, his call for a moratorium on leasing landed him in the camp of the conservationists, even if the rest of his bill upset them. Watt's bill will not survive in its present form in a wary Congress. And the argument is no longer about whether we'll protect wilderness next year. Now we're arguing about 20 years . . . or longer. The terms of the argument have changed.

— GOG

Gifford Pinchot had his own James Watt

by Rolfe Larson

When the messenger from the White House arrived, Gifford Pinchot had a fair idea what the letter would say. As an outspoken conservationist in an administration rapidly moving in the opposite direction, Pinchot knew his tenure would be short.

Not that President William Howard Taft would take lightly the firing of his chief forester; Pinchot was popular throughout the government and around the country and was Taft's link with former President Theodore Roosevelt, whose continued benevolence was crucial to the new president. Only if deliberately provoked would the president dismiss Pinchot, but that is exactly what had happened.

To save the conservation movement, still in its youth after the heady days when Roosevelt had taken its cause as his own, provocation was needed. Richard Ballinger, Taft's interior secretary, was actively destroying the most important achievements of the movement. Stopping him became an obsession with Pinchot. "Any attack by

Ballinger on the conservation policy, if and when it came, would have to be met head on," Pinchot wrote. "It did come, it was met, and it was stopped in its tracks."

The appointment of Ballinger as secretary of the interior had been controversial and a case of duplicity from the beginning. Taft selected Ballinger, a Westerner, to help subdue strong opposition in parts of the West to Roosevelt's conservation policies while continuing to espouse the former president's program of employing natural resources for public benefit. However, Taft's pick for the job was not a subtle man, nor was his background unknown, as critics were quick to point out.

Ballinger was accused of turning Interior over to private industry. A popular magazine in 1909 asked, "Are the Guggenheims in charge of Interior?"

Ballinger embraced the mining industry long before taking office. In 1908, he had been attorney for a group of mining investors eager to buy thousands of the best coal lands in Alaska. Once purchased, the investors secretly planned to sell their holdings to a company con-

trolled by the Morgan Guggenheim Syndicate. Existing law prohibited the sale of public coal land to buyers who did not intend to mine it themselves. Suspecting the illegal intent, the government delayed selling the lands.

Ballinger was well qualified to represent his clients. In 1907, he had been commissioner of the General Land Office, the agency within Interior responsible for selling public land. While in office, he had given the investors confidential reports of investigations into the alleged land fraud. Although as interior secretary only two years later he removed himself from acting on former clients' pending cases at the General Land Office, he still testified for a bill permitting the land purchases.

The 1902 Reclamation Act, designed to encourage settlement in parts of the arid West, promised cheap water for farms no larger than 160 acres, though the size limitation has never been enforced. Secretary Ballinger moved early in his term to subvert the act's purpose. President Roosevelt's interior chief James Garfield had resisted attempts by large corporations to buy up many of the suitable water power

sites by withdrawing from sale millions of acres of public lands. Ballinger cancelled the withdrawals.

The secretary's cavalier action infuriated conservationists. "In all these attacks on the conservation policy, Ballinger was butting his nose against stubborn facts, like a polliwog in a bottle," Pinchot wrote. "Yet, wrong as he was, he had the power and therefore he was dangerous."

Taft's firing of Pinchot attracted a large following to the campaign against Ballinger. It also permitted Pinchot to speak more freely.

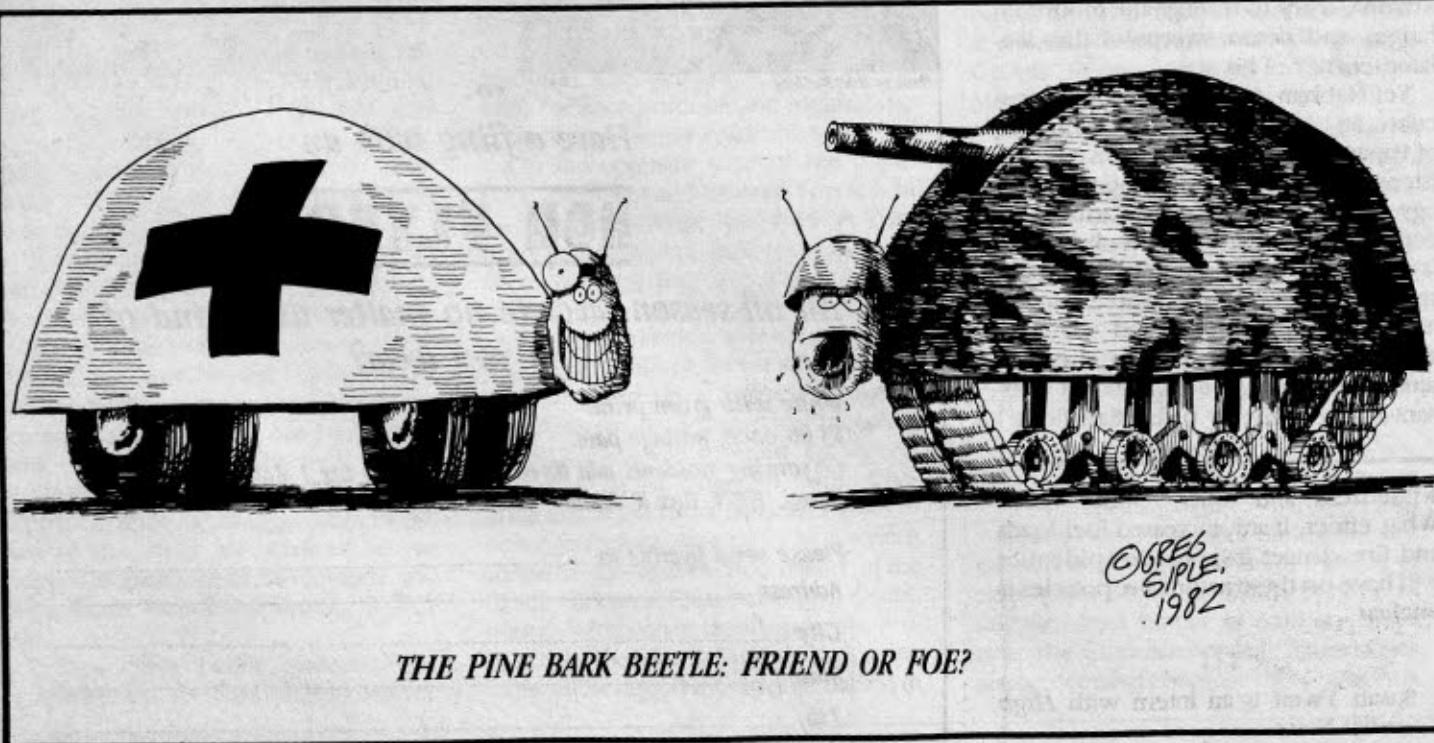
"There is no other question before us," he said in one speech aimed at Ballinger, "that begins to be so important or that will be so difficult to straddle, as the great question between special interest and equal opportunity, between the privilege of the few and the rights of the many, between the government by men for human welfare and government by money for profit."

Pinchot campaigned through the press and encouraged Congress to investigate the charges against Ballinger. A special congressional committee held five months of almost daily hearings, probing every aspect of Ballinger's policies and conflicts of interest. With the able counsel of future Supreme Court Justice Louis Brandeis, Pinchot outlined the threat posed to conservation. Brandeis persuasively argued that Ballinger had fronted for Alaska coal investors by sending them confidential Interior reports. The committee majority, however, voting along party lines, absolved Ballinger of any wrongdoing, but a severely damaging and well-publicized minority report created a public impression of guilt.

Secretary Ballinger quietly resigned early in 1911.

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Rolfe Larson is a writer and researcher for the Center for the Study of Responsive Law. This article is excerpted from a longer one in the *Amicus Journal*, fall, 1981 issue, published by the Natural Resources Defense Council, Inc., 122 E. 42nd St., New York, N.Y. 10168. Reprinted by permission.



THE PINE BARK BEETLE: FRIEND OR FOE?

IDs: first step in halting illegal aliens

by Alan K. Simpson

The Senate Immigration and Refugee Policy Subcommittee has conducted a comprehensive series of hearings on the Reagan administration's proposals to revise U.S. immigration law. In my duties as chairman of that subcommittee and as a former member of the

GUEST EDITORIAL

Select Commission on Immigration and Refugee Policy which conducted hearings in various locations across the nation, I early concluded that a complete review and redrafting of our federal immigration law must be performed in order to bring reform to our chaotic immigration policy.

The primary obligation of any government, indeed the very reason and justification for its existence, is the promotion of the national interest. Few would argue that entry into our country of reasonable numbers of refugees and legal immigrants is in the national interest — but our nation cannot accept all those that would seek our shores.

Not only have we anguished over and struggled to accept virtually uncontrolled numbers of refugees and increasing numbers of legal immigrants, we have been unable to control the flood of illegal immigrants, which adds hundreds of thousands of persons each year to the U.S. population. We are also experiencing, for the very first time in our history, large numbers of persons seeking political asylum — 95,000 applications pending — and an additional 50,000 estimated in 1982! And, unfortunately, most of the impact of this uncharacteristic type of migratory increase is concentrated within a few states.

Illegal aliens compete for jobs with an unknown portion of America's 7.5 million unemployed, burdening not only those displaced workers and their families, but also the taxpayers, who must shoulder the cost of welfare and unemployment benefits. American society as a whole then suffers the hostility, social tension, crime and other problems related to such unemployment.

If in the future the American people determine that the national interest will be best served by the permanent or temporary entry of a greater number of alien workers, then individuals with the needed skills can be permitted to enter, under safeguards and conditions then deemed necessary. Such a possibility is not reason enough to ever again allow

unlimited or unselective entry, either now or in the future.

I support increased border and internal enforcement as a means of dealing with the severe problems of illegal entry into the United States. But that is only one step toward bringing the problem under control. Another will be the imposition of sanctions or penalties against employers who knowingly hire illegals. When the U.S. jobs which most illegal aliens are seeking are made unavailable through an employer sanctions system, then the major incentive for most of them to gain illegal entry will no longer exist.

It would not be fair to impose sanctions against employers who hire illegals until a proper system is in place that would allow the employer to verify that a job applicant is authorized to work in the United States. We are seeking a means of providing workers with documentation which they would then present to employers only at the time of hiring in order to verify their eligibility to work. A number of such systems to provide a reliable and counterfeit-resistant identifier are being considered. Whether the procedure which is ultimately chosen will utilize a worker's card or some other form of identification, it must not be substantially more burdensome to job applicants or employers than the existing requirement that a Social Security number be obtained and presented to the employer.

Within this broad subject matter, many individual issues must be addressed, but I firmly believe that if we strengthen border and internal enforcement, establish a program for identification of workers and impose sanctions against employers who knowingly hire illegals, then the essential cornerstones will be in place for a long-term resolution of the myriad related problems. Controversy has always surrounded any serious attempt to resolve complex and emotional national problems, but that assured controversy must not deter us from a thorough, constructive, compassionate and critically needed revision of our federal immigration laws. That step will indeed promote the national interest. It is a national priority of extraordinary weight.

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Sen. Alan Simpson (R-Wyo.) is chairman of the Judiciary Subcommittee on Immigration and Refugee Policy. In the coming weeks, he will introduce legislation that will propose a total revision of the Immigration and Nationality Act.

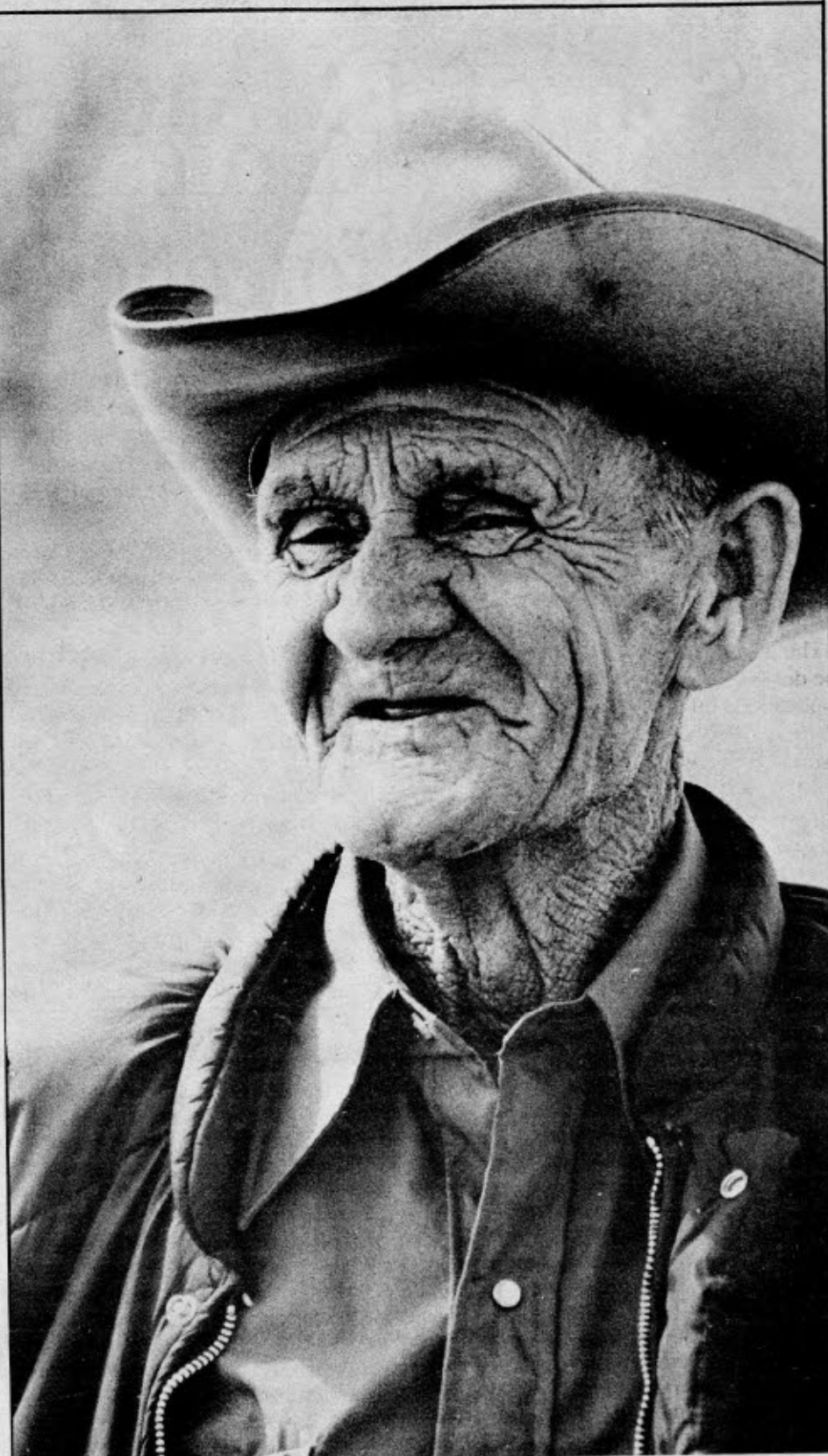


Photo by Kathy Bogan

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16-High Country News — March 5, 1982

Son of EMARS spurs coal leasing

by Brad Klafehn

On January 26, 1976, in Denver, Colorado, then Secretary of Interior Thomas Kleppe announced his approval of a new coal leasing program called Energy Mineral Activity and Recommendation System (EMARS). Rejecting an earlier plan to tie leasing to projections of national coal needs, Kleppe proposed to let the market determine which lands would be leased. Environmentalists, charging Kleppe with a major giveaway of public coal, went immediately to court to block the proposed changes.

Six years and two coal programs later on January 26, 1982, Secretary of Interior James Watt announced the results of his "comprehensive review" of the federal coal leasing program. Rejecting the existing plan which ties leasing to projections of national coal needs, Watt proposed to lease reserves "in a more market-oriented fashion." Environmentalists, fearing that Watt is initiating a major giveaway of public coal, have begun studying their options for blocking the proposed changes.

The parallels between these two scenes are not lost on environmental leaders as they examine changes in the federal coal program being proposed by the Reagan administration. Currently pending are four rule-making proceedings which contain over 300 language changes affecting Bureau of Land Management land use planning, coal leasing and management, and the diligent development of leases.

To Reed Zars, staff director of the Sheridan, Wyoming-based Powder River Basin Resource Council, the proposed changes spell a "return to something like EMARS or before when industry requests for tracts were granted routinely." Under EMARS, industry identified coal lands it wanted to acquire and the BLM's planning and leasing activities revolved around those nominations. That system was successfully challenged in a 1975 lawsuit brought by the Natural Resources Defense Council against Interior (NRDC *vs.* Hughes). A return to an EMARS-like system would comprise a major shift in the structure of the federal coal program, heading it in a direction which conservationists have resisted since the 1970s.

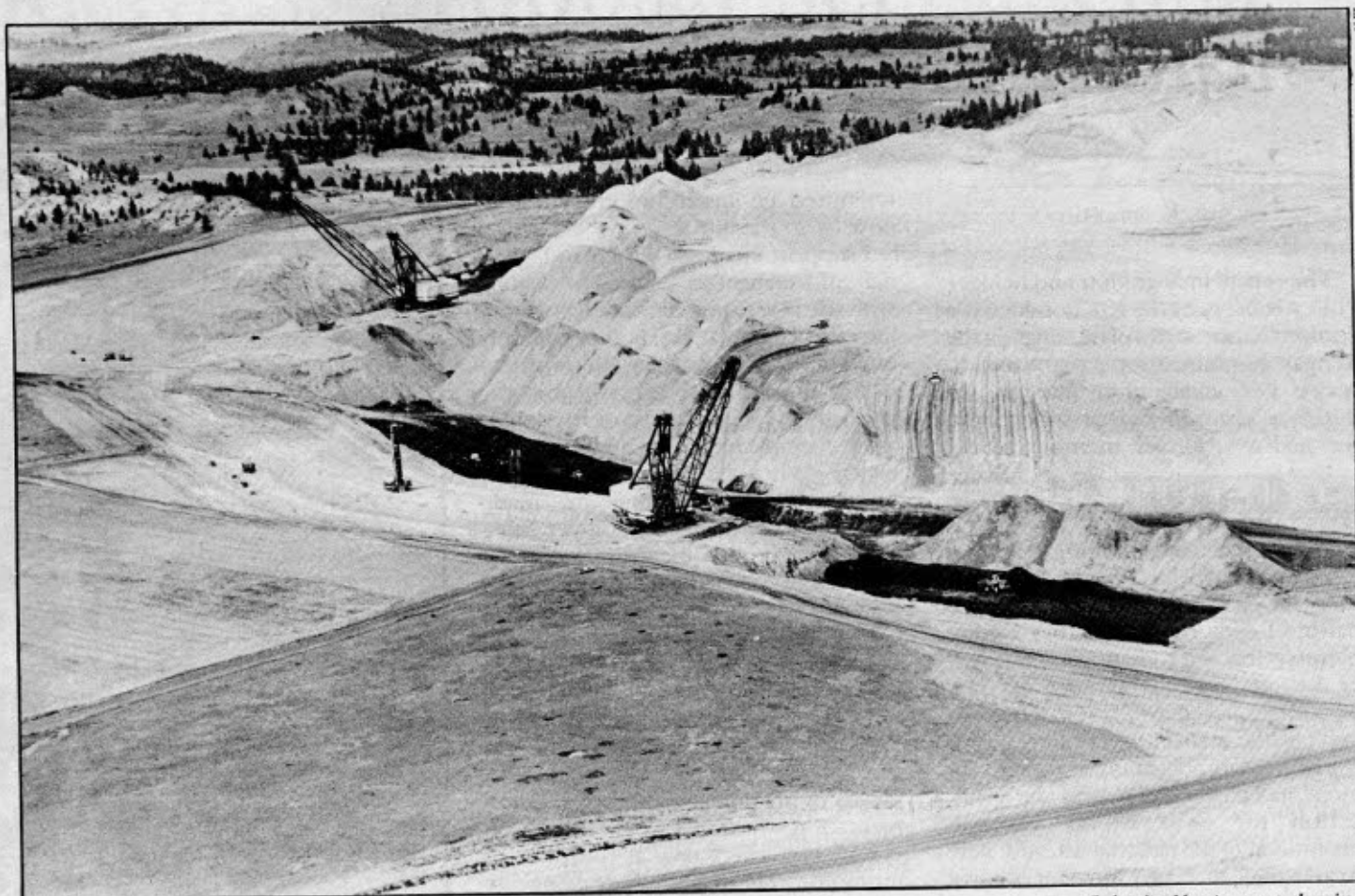
The Department of the Interior acknowledges that the many proposed changes will "ultimately accelerate" leasing of federal coal, but the government insists that the program changes are minor and that their main function is to streamline leasing.

According to Monte Jordan, chief of the BLM's Division of Coal, Tar Sands and Oil Shale, the most important aspect of the government's proposal is that it reduces the length of the coal regulations by 20 percent. Because no significant changes in the coal program were made, he said, the department decided that an environmental impact statement was unnecessary, as were formal public hearings. "It is not generally understood that the changes aren't that great," said Jordan.

Zars disagreed and said that instead of mere streamlining, the department is making "systematic changes of very important elements of the program one after the other."

The making of significant changes could force the preparation of a new programmatic EIS, which could take 18 months or longer to complete. By contrast, the department hopes to finalize the new regulations by early May and to begin using them to lease coal soon afterwards.

Rodney Weiher, director of regulatory affairs for the National Coal Association, agrees with Jordan that the



Colstrip, Montana coal mine

The Department of Interior acknowledges that the proposed changes will "ultimately accelerate" federal coal leasing.

proposed changes "are not a major departure" from the existing program. Yet Weiher does feel Interior is making some important improvements in the process.

One improvement is the new concept of leasing to provide reserves rather than to meet production goals. Under the present system, the government, through a complex computer model, forecasts the amount of coal the nation will require in future years. It then breaks that number down into production goals for each of the country's 12 coal regions and leases enough coal to enable producers to meet the region's production targets.

According to Weiher, this process was anti-competitive and led to under-leasing. It was based on the mistaken notion, he said, that there is a direct correlation between tons of coal leased and tons of coal delivered. The government tried to match coal users with coal leases on a one-to-one basis, but it hasn't worked, Weiher said.

The new policy of leasing coal for use as reserves recognizes that not all leases will be developed, Weiher said. Instead, it will treat leases as inventories which the companies can control and use when needed. Buyers will be given a greater selection of leases from which to purchase coal, and leasing will not be dependent on governmental determinations of need.

For example, Weiher said, if a utility in Arkansas wanted to sign a long-term contract now, it might be approached by two producers, each with one available lease. Under the new program, the companies could offer a wider choice of coal because they each could hold several undeveloped federal leases.

According to Weiher, the new plan is advantageous to both coal buyers and the nation. The utility could choose the lowest-priced coal from a large inventory of leases held by producers rather than from the limited assortment available now from the federal government. This means, Weiher said, that "Western coal will put the brakes on coal prices

nationwide, and even on natural gas and oil prices." It will avoid underleasing and will also have the positive effect of increasing competition among producers, he said.

Citizens groups, however, see this proposed change as the government's way of finally getting out of the business of determining need for further leasing.

Zars said Reagan's EMARS-like proposal comes at a time when need for additional large-scale leasing is especially hard to prove, both because the market for Western coal is very poor and because Interior is simultaneously moving to ease the diligent development requirements of existing leases. Zars cited an August, 1981, story in the *Bismarck Tribune* which found 8000 megawatts of electrical generating overcapacity existed in the Mid-Central Area Power Pool — the midwestern states which form the primary market for Western coal. No long-term contracts for Northern Plains coal have been signed in the past two years, he said, and noted Detroit Edison Company's current attempt to back out of its coal contract with the Decker Mine in Montana as another indication of the slack market facing Western coal producers.

In addition, Zars said, proposed changes in Interior's diligent development requirements will open for development coal which earlier studies assumed would be returned to the government. The original intent of diligence requirements was, by 1986, to force either production from or relinquishment of leases which had not produced coal in the last ten years. An estimated half-million acres of leased land may fall into that category. Interior's pending rules, however, would permit federal lessees to hold those lands as reserves without mining them until the mid-1990s or later, making the requirement of diligent development "essentially meaningless," Zars said.

Rodney Weiher said the proposed diligence changes would allow for "better treatment" of leases issued before 1976 and that they help reinstate terms

more in line with the companies' original expectations. Weiher said, "Interior has gone as far as they can go" toward resolving the unreasonable development requirements which he felt had been imposed on leaseholders by the Carter administration.

Despite the threats this new program may pose to his organization's interests, Zars said he didn't blame the coal industry for supporting the changes. They are only "acting like businessmen," he said. "It would be unwise for them not to take this opportunity to increase their stock of leases."

BLM's Jordan anticipates little opposition from environmentalists to the changes: "We hope they'll see the program is pretty much as it was. They accepted it before (under Carter) and we hope they'll do so again."

The prospect of greatly accelerated leasing under EMARS-like rules, however, does not sit well with many citizen groups. If the past is any indication, the government may be in for another protracted battle over access to the West's huge stock of unleased coal reserves.

Brad Klafehn is a freelance writer in Crawford, Colorado.

In our next issue, HCN picks at the small serving of Wyoming and Montana wilderness legislation, then washes it down with North Dakota oil. Then we'll see what it's like to be eaten up with cabin fever in the long, cold Rocky Mountain winter.

