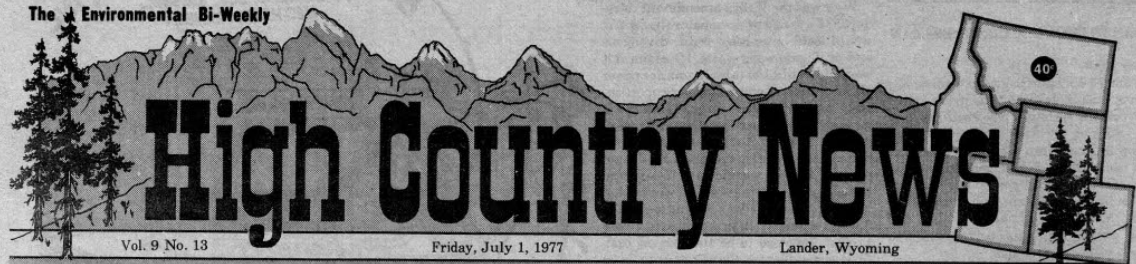


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The Environmental Bi-Weekly



Vol. 9 No. 13

Friday, July 1, 1977

Lander, Wyoming

Cowtown's manure means megawatts

by Joan Nice

Nobody claims manure is elegant. But Fred Varani claims that, strangely enough, manure can provide an "elegant solution" to some of the problems facing the country.

Take Lamar, Colo., for instance. Lamar's city-owned utility can't get natural gas to run its brand new power plant. To convert Lamar's boilers to coal-burning would be expensive. But Lamar has feedlots. Manure from these operations, when converted to gas in an enclosed tank, could be used to fire the existing power plant. What's more, water used to cool the power plant can then be used to warm the gas tank. The odorless sludge left over from the process can be hauled outside of town to enrich the fields that nourish the fuel source — cattle.

Despite the fact that this scheme is based on manure, it's an elegant solution, says Varani, a mechanical engineer with experience designing equipment for sewage treatment plants, who is now vice-president of Bio-Gas of Colorado, Inc. "It's the only solution we've found that fits."

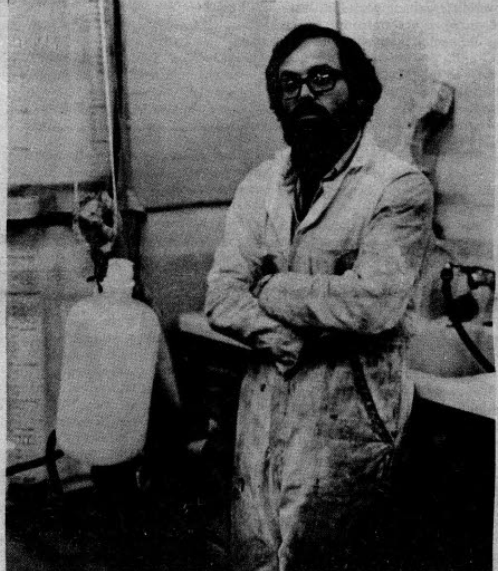
"Burning coal really wouldn't please anybody. If they converted to coal, they'd probably spend two or three times as much as they would for a digester; they'd have to dig up Wyoming; ship it down here; make air pollution out of it; and let it settle. That just doesn't appeal," he says.

Bio-Gas, a four-year-old, five-person firm, is completing feasibility studies on the methane digester for Lamar. The firm knows there is enough cattle manure in the area to provide electricity for the 20,000 or so people the plant serves. They are now working with a waste water treatment engineering firm to determine how much gas from the manure would cost.

Varani jokes about his small company and its lowly object of interest. But dressed in a white coat, amid manure samples and tanks in a large garage-office in Arvada, Colo., he looks serious. He stirs up brews of different kinds of waste and water in sealed glass bottles, immerses them in a tank of warm water, and lets the anaerobic (without oxygen) digestion process work. At the end of the day, he measures the amount of gas produced by various samples. After everyone else has gone home from work, he vents the gas outside.

His neighbors complain about the gas's "rotten egg" smell, which is hydrogen sulfide. But if the gas were being burned instead of thrown away, the hydrogen sulfide would also burn and odors wouldn't be a problem, Varani says.

Varani says he is "totally mechanically



COAL-FIRED POWER PLANTS produce electricity, pollution, and holes in the ground. Manure, on the other hand, can yield power while avoiding coal's undesirable products. "It's a solution that fits," says Fred Varani of Bio-Gas of Colorado, Inc.

oriented." But he grew his first house plant last year — with sludge left over from the digestion process. He points to it proudly; it is flourishing. He says people come around regularly to get gallon jugs of the dark, nutrient-rich fertilizer.

Bio-Gas has done research and public education in its few years of existence, rather than commercial work. Not that it hasn't tried to convince people to buy and build digesters. Up until now, the market hasn't been ready, Varani says. Only recently has the firm started to get its first commercial inquiries.

The process they're selling is fairly simple. In a sealed tank, agricultural and other organic wastes can be converted into biogas, which is 70% burnable methane gas and 30% carbon dioxide. Even with the carbon dioxide, biogas can be burned with minor adjustments in the same stoves, heaters, and power plants that use natural gas. The process produces a nearly odorless liquid fertilizer as a by-product.

The system is sustained by wastes, yet it wastes nothing, Varani says.

"You don't need a fancy facility to build this," Varani says. His traveling biogas demonstration last year unearthed "a lot of people with digesters out there" — most of them built out of 55 gallon drums.

"There's nothing complicated about this. It's just a skill. A digester is less tricky to build and manage than raising the corn or chickens that feed it in the first place," Varani says.

Bio-Gas first made news when it declared in 1974 that it had joined forces with (continued on page 4)

Ski resorts, logging imperil Madison

by Robin Tawney

A ski resort, power line, and timber development are threatening one of the nation's largest contiguous roadless expanses — Montana's Madison Range. The development of these projects may preempt efforts to get part of the range, the Taylor-Hilgard area, included in the National Wilderness System. Critical grizzly habitat could also be irreversibly impacted.

The roadless Madison range extends 75 miles from the Spanish Peaks primitive area near Bozeman, Mont., south to Hebgen Lake on the western edge of Yellowstone Park. Taylor-Hilgard is a 289,000 acre area proposed for wilderness study by Sen. Lee Metcalf's (D-Mont.) Montana Wilderness Study Bill (S. 393). The area



HILGARD BASIN in the Madison Range. Photo by Rick Graetz.

includes potential critical grizzly bear habitat. Unfortunately, it also includes some Burlington Northern timber inholdings, a convenient power line route for the Big Sky ski resort, and is adjacent to the area approved by the Forest Service for the Ski Yellowstone resort.

The Madison range offers much in the way of "blue ribbon" trout streams, scenic grandeur, clean air, wildlife, and wilderness. Consequently, developers are attracted to the area, and they are putting increased pressure on the area's resource base.

SKI YELLOWSTONE

The Ski Yellowstone resort has been awaiting its special use permit for some

(continued on page 6)



HCN Letters

MAN WITHOUT A CONGRESSMAN

Dear HCN,

I am fed up. I am disgusted. I am rapidly losing what little faith I had in the American political system. I plead with you to do an article on my chief problem, because I know it is not mine alone by a long shot.

I read a lot of environmental literature, agree with most of the goals of the environmental movement, and would like to help. Most environmental writers end their articles with pleas for the readers to "write your congressman."

This is all very well in most states, but is a joke in some states, such as Utah. In Utah, people who are concerned over the environment HAVE NO CONGRESSMEN. We do not have any representation in Congress.

I tried once to write to one of Utah's elected congressional "representatives," on an environmental matter and received such a mess of irrational invective in return that I don't care to repeat that process. I have, in desperation, written congressmen of other states, but received replies indicating, in roundabout ways, that they couldn't mess with the pork barrel affairs of another state.

So what are people like me to do, who live in places remote from citizen environmental organizations, in states such as Utah where the elected state and federal representatives represent only the special interests, not the citizens at large? We effectively have no voice in public affairs.

Doesn't this serious problem deserve a little attention?

Frank Cox
Moab, Utah

WALLOP'S COMMITMENT

Dear HCN,

As one who has followed the Clean Air Act amendments for more than two years, and who was lobbying in Washington during the Senate vote on them, I would not describe Sen. Malcolm Wallop (R-Wyo.) as a legislator whose "commitment to clean air remains strong." (See HCN 6-17-77, "Wallop defends clean air votes")

Senator Wallop's voting record and his public and private statements concerning clean air have been confusing and contradictory. It is only partially true, as reported by his staff in the June 17 article, that he opposed efforts to allow serious smog intrusions into national parks and wilderness areas.

Senator Wallop did vote against the Stevenson amendment, which would have allowed an 18-day exemption from the "prevention of significant deterioration" standards, but only after his constituents mounted a considerable lobbying effort. The next day, however, Senator Wallop introduced his own amendment, which was

different in technical aspects but would still have allowed an 18-day exemption. It would have allowed similarly devastating consequences for the National Park and Wilderness Preservation Systems. He later withdrew the amendment at the request of the public works committee.

Why was the Wallop amendment introduced? I was told by the senator that S. 252 would foster inter-basin water diversions and profligate water waste. He claimed it would force utilities to build smaller power plants, which would consume proportionately more water than large plants in the cooling process, and that the bill improperly balanced air and water considerations in energy siting decisions. He did not present a single specific case to substantiate his claims. It is known, however, that under Senator Wallop's amendment, the 3,000-megawatt Intermountain Power Project (proposed to be the largest coal-fired power plant in the country) could be built eight miles east of Capitol Reef National Park.

There may, in fact, be energy facility siting cases where water availability for power plant cooling does not mesh with the need to protect air quality values. But putting the world's largest industrial facilities on the doorstep of our national scenic treasures is wholly inappropriate and wrong.

It is worth noting that Senator Wallop voted for an amendment to the bill, S. 252, that would have certainly exacerbated the power plant siting difficulties he claims the bill creates. The amendment, offered by Jake Garn (R-Utah), would have given mandatory Class I status to all national parks and wilderness areas regardless of size. S. 252 extends strict air quality protection (Class I) to national parks over 6,000 acres and wilderness areas over 5,000 acres. The Garn amendment, by extending Class I status to more areas, would aggravate the very conditions Senator Wallop objected to because it would further restrict facility siting options. Senator Wallop's vote on the Garn amendment and his statements about the bill's "rigidity" cannot be reconciled. Either this section of the bill was too rigid or too flexible — it cannot be both.

I suppose Senator Wallop could claim that the 18-day variance would provide sufficient leeway to afford all parks and wilderness areas Class I protection. The important point is that the variance obliterates the protective status of a Class I designation. Again, as an example, it would allow Intermountain Power and similar projects to be built within 10 miles of national parks. Can someone endorsing such a position be considered a strong clean-air advocate?

The issue of "non-attainment" areas, those parts of the country that exceed federal air quality standards, telescopes

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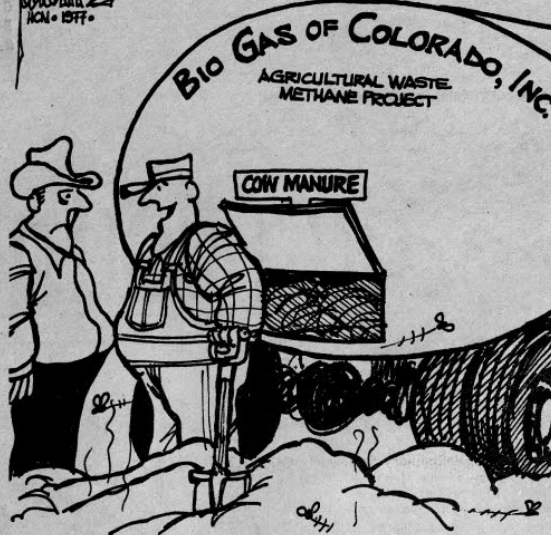
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Editor 2
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ALL I CAN SAY IS: IT'S A GAS!

Senator Wallop's clean air position. In most non-attainment areas, auto emissions are the major cause of unhealthy air. How unhealthy? The National Academy of Sciences estimates that 15,000 people a year die from air pollution, and 4,000 from auto pollution alone; millions of people suffer from asthma, emphysema, bronchitis, pulmonary edema, and other pollution-related respiratory diseases.

The auto industry's attempts to weaken and delay implementation of emission standards would cause twice as many attacks of lower respiratory disease in children, according to a 1976 report of the federal panel on Air Quality, Noise, and Health. Nevertheless, Senator Wallop supported the auto industry's position. Aside from the associated health problems, easing standards for tailpipe emissions would make it very difficult for non-attainment cities to ease chronic unemployment problems by restricting their ability to attract new jobs under EPA's much-publicized "trade-off" policy. It would also back cities into a corner, forcing them to burn expensive clean-burning fuels (natural gas and low-sulphur oil) while making clean-air regions "suffer from

burning coal" — the very thing Senator Wallop complained about in the HCN article!

I submit that if Senator Wallop is in fact a strong supporter of clean air, his voting record would be very different. He would not have voted against the Baker compromise on autos, and he would not have introduced his PSD amendment. His record speaks for itself.

On clean air issues, environmentalists have lost an ally they thought they could count on.

Ron Rudolph
Energy Consultant
Friends of the Earth

Methane

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Editorials



July 1, 1977

Colstrip: symbol of resistance or of futility?

When Sen. Edmund Muskie and a majority of the Senate voted for Sen. Henry Jackson's amendment exempting Colstrip units 3 and 4 from prevention of significant deterioration requirements of the Clean Air Act, they apparently considered the issue unimportant. One power plant is a small concession to make to assure a vote for the amendments.

We hope the conference committee, which is to begin work soon, will throw out

the amendment. In Montana, Colstrip is a symbol that stands for much more than just one power plant.

For ranchers, Colstrip has been the rallying call that spurred them to form the oldest, strongest environmentalist-rancher group in the region, the Northern Plains Resource Council. The smoke that even the existing two units emit daily into the skies over their ranches has been one of the main issues in their struggle, a symbol

of the future portends for the coal-rich area.

Proponents of the clean air bill — those who say it is designed to give people in clean air regions the tools to protect their air — should have realized the national importance of Colstrip, too. The first group to ever utilize the protective classification system mandated by the act was the Northern Cheyenne Indian tribe, 20 miles south of Colstrip. The tribal council applied

for the reclassification to Class I air, following through with dozens of expensive studies and a public hearing.

Granting of the Class I request probably would have prevented Colstrip's second two units from being constructed. The U.S. Environmental Protection Agency (EPA) ruled — more than once — that the giant complex would have to comply with significant deterioration regulations and thus could not degrade the clean air over the reservation, if the tribe's Class I redesignation is granted.

However, a district court has ruled that Colstrip 3 and 4 would not have to comply. The decision is now being appealed and most observers familiar with the situation still think Colstrip is bound to lose.

The question is simply whether construction had begun on the two units before the significant deterioration regs went into effect in June 1975. Construction is just now going to begin, and at that time, no site preparation work had been done nor had the companies proposing the units applied for a state air permit. The judge — and Sen. Jackson — suggest a narrower definition for "commencement of construction."

In fact, while the companies were trying to convince EPA they were not subject to these federal regulations, they were telling state officials that they were — and that they would comply with them. They wanted the state to believe the two units would have no serious harmful impact so their application would be granted.

Now if Congress should interfere and exempt the companies from obeying the law, it will be a serious blow, not only to the quality of the air surrounding the plant and hanging over the reservation. It will also erode faith in the Clean Air Act as a tool for the use of the people. The Colstrip plant will become a symbol of the futility of resistance.

—MJA



Guest Editorial



BOR neglecting human rights on the riverside

(Editors' note: Preliminary findings of the study team indicate the Sweetwater may not be long enough to be considered. See story in "Western Roundup" this issue.)

by Dave Sumner

The page one articles on the Sweetwater River and the basic inventory for the Wild and Scenic Rivers System scheduled for the Rocky Mountain region in 1978 raise two problems (see HCN 6-17-77).

The 25-mile limit. Nothing in the Wild and Scenic Rivers Act specifies how long a river or river segment must be to qualify for the national system. Regarding the matter of length, Interior and Agriculture Department joint guidelines on the act say:

"The river or river unit must be long enough to provide a meaningful experience. Generally, any unit that is included in the system should be at least 25 miles long. However, a shorter river or segment that possesses outstanding qualifications may be included in the system."

In other words, the primary criterion is "meaningful experience," not whether a segment is 9.5 miles long (like the Sweetwater) or 25 miles long (like those covered in the basic inventory). However, in the years since 1970, the 25-mile figure has rather generally been extracted from context and used as dictum — presumably because it's both safer and easier to be rigid about the length of a river than it is to be perceptive about the "meaningful experience" it offers or the "outstandingly remarkable" qualities it possesses.

Private lands. That private lands have been allowed to become a roadblock to river protection under the Wild and Scenic Rivers Act may well be the single greatest tragedy of its almost nine-year history. The act itself details a very open and flexible mechanism for dealing with private lands. This only makes sense. When Congress wrote and passed the act in 1968, it knew full well that this country's rivers had historically attracted settlement — and that a good bit of the "outstandingly remarkable" river shoreline in the U.S. is now privately owned. Despite these facts, Congress insisted that river protection was a national priority ahead of some private property rights. The fact that there are private lands along a river was never meant to influence its qualification for the national system.

That this has, in fact, happened can only be attributed to a lack of commitment on the part of the Bureau of Outdoor Recreation (BOR) and the U.S. Forest Service (USFS). The agencies have a flexible and limited system of scenic easement to pre-



MEANINGFUL EXPERIENCE. The law says that a river in the National Wild and Scenic River System need only to be long enough to provide a "meaningful experience." Federal officials, however, are surveying only stretches 25 miles or longer. It's safer and easier to be rigid about length, says river buff Dave Sumner, but you may leave some remarkable stretches of river unprotected.

vent degradation of a shoreline of wild and scenic rivers. Sure, the easements do prohibit a private landowner from putting up tacky billboards, building high rise condominiums, and the like. But in very, very few cases do they do anything but bind a landowner to present land uses.

With scenic easements selling for as much as 75% of the outright fee title purchase of a piece of land, it's a darn good deal. How would you feel if you had a piece of property along the Sweetwater, for example, that was worth \$100,000 on the real estate market — and if a guy from BOR showed up one day saying, "We'll pay you \$75,000 to do nothing except keep that piece of land as is." I'd love it.

The problem is that neither the BOR nor the USFS has taken the time or made the effort to approach riverside landowners, on a one-to-one, open, personal basis and explain to them how the Wild and Scenic Rivers Act really works. In case after case, agency "teams" have simply cruised into towns near proposed rivers, and held public meetings. It's like, "Well folks, here we come and here's what's coming." To my knowledge, the various provisions of the act were never clearly explained to the people of Cortez or Dolores, Colo., prior to the Dolores River study, or to those of Craig, Colo., prior to the Yampa River study. Fears of federal meddling, land grabs, lost tax base and the like were simply allowed to fester, and boil over. To the extent that this is allowed to occur, the BOR and the USFS are contributing to the public, local hostility to wild and scenic

rivers. Some of this distrust and opposition is, admittedly, unavoidable; however, much more could probably be averted if agency people sought out individual landowners and dealt with them as such rather than as faceless locals, dumb ranchers, etc.

This is not an impossible notion. Minnesota has a state wild and scenic rivers system that has gone extremely smoothly in significant part because Mike Priesnitz of the state's Department of Natural Resources has gone out, knocked on doors, sat at kitchen tables, and generally made the effort to deal with individual landowners on an honest one-to-one basis. Closer to home here in the West, employees of the Soil Conservation Service often work in a similar fashion when laying the ground for small watershed projects.

Thus while private lands are a concern as any river is considered for possible inclusion in the National Wild and Scenic Rivers System, they are a big, bad barrier only in so far as the agency concerned wants to make them such. A little lack of consideration for individuals much more closely involved with rivers than most bureaucrats will ever be can do a great deal of harm.

To put it another way, perhaps it's time that President Carter's perspective on human rights, on plain everyday caring, be brought to bear on the domestic scene as well — in this case, on wild and scenic river studies.

Dave Sumner is a free-lance writer and river rat residing in Denver, Colo.

Yet a better idea from Ford

The Ford Motor Company has announced that it will begin building its 1978 model cars this week, but will call them 1977 models. This would enable the company to avoid installing anti-pollution equipment required by the current law for 1978 model cars. Ford hopes to have the law changed, and the "redesignation" of the cars is a delaying tactic until Congress relaxes standards.

It is refreshing to see that U.S. industry hasn't lost any of the resourcefulness that has made America what it is today — dirty. But, upon consideration, perhaps Ford's "better idea" can serve other purposes. If there is a law covering something, simply call it something else.

Suppose, for instance, a logging company wanted to clearcut lodgepole pine in Bridger-Teton National Forest. Environmentalists could counter by saying that those aren't lodgepole pine at all, but Mountain Sagebrush. The new name would dramatically diminish the value of the resource. The forest would be saved.

Strip mining could also be stopped, by calling coal "mud." No one would strip mine for mud.

The possibilities for this new tactic are enormous. It's a wonder no one ever thought of it before.

—DSW

4-High Country News — July 1, 1977

Manure means megawatts. . .

(continued from page 1)

the world's largest cattle feedlot—Monfort of Colorado, Inc.—to build a solar-heated methane digester that would produce four million cubic feet of methane gas per day. Monfort was to provide the manure; Bio-Gas was to build and operate the plant.

While the idea was applauded as an ingenious solution to Monfort's waste disposal problems and the natural gas shortage, Bio-Gas never found funding to go ahead with the project.

Varani blames the conservative nature of financiers. "Financiers want to see 40 plants exactly like the one you're going to build—and they want to see the books for the last 10 years. We could show them digesters in 55 gallon drums, and we could show them large sewage digesters, but we could not show them large digesters operating on animal wastes. Our 55 gallon drum didn't impress them."

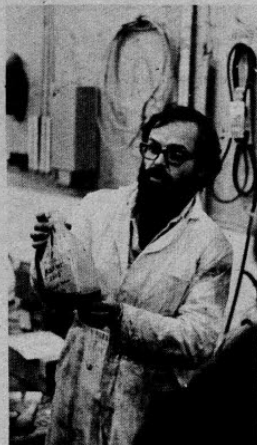
Hank Brown, vice-president of Monfort, says the company probably would build such an operation themselves if they were convinced it were profitable.

"We're not satisfied that the technology is fully researched," Brown says.

Since no one has been willing to make a commercial investment, Bio-Gas has sought out and been sustained by public money and consulting work over the last few years. With a grant from the Four Corners Regional Commission, Bio-Gas built a methane-powered truck that toured Colorado, Utah, New Mexico, and Arizona last summer.

The Bio-Gas staff members who traveled with the truck brought back "amazing" stories, according to Varani. In Clovis, N.M., near the Mexican border they found some farmers are spending as much as \$400,000 a year for natural gas to generate the power to irrigate their fields of cotton, corn, and sorghum. They are about to go out of business because of this rapidly rising cost.

"There's a place where a methane digester makes sense," Varani says.



FRED VARANI of Bio-Gas of Colorado, Inc., is working to provide an "elegant" solution to the power supply problems in Lamar, Colo. Manure is the answer, Varani believes.

On a dairy in Lafayette, Colo., Bio-Gas decided a methane digester didn't make financial sense yet, however. The 400-milker farm was able to get cheaper (interstate) natural gas than the Clovis farmer, who was buying intrastate gas.

A 6,000 gallon tank mounted on the methane powered truck was designed to handle the dairy's wastes. The tank was able to produce enough gas to power the operation, but it would have taken 20 years to pay for itself in natural gas saved. To be considered a good investment the payback period would have to shrink to 10 years, Varani says.

Varani has concluded that digesters make sense for people using propane or intrastate natural gas—but not interstate gas, unless the price continues to climb. If someone wanted to build a digester himself, however, costs could be cut by one-half and even the interstate gas customer would profit by switching to the generation

of his own gas.

Varani freely admits that Bio-Gas had trouble with the truck. They built a "portable swamp" and "nature did not want this as a portable process," he says.

At each stop on the truck's tour, technicians discovered that the vibrations of travel had plugged up pipes in the system. To the amusement of townspeople all over the Southwest, when they tried to take the pipes apart, they were showered by manure.

"It's worse than a dam breaking because you know what's behind it—manure," Varani says.

Despite problems, the truck was an overall success. "You can drive down the road, put in some manure, and it will keep on generating," Varani says.

This year the truck is spending a sedentary summer "feeding algae" with the fertilizer it produces at a research lab 40 miles south of Albuquerque, N.M.

The truck is a big research step beyond the 55 gallon drum Bio-Gas first held up to financiers. Now the firm has even more to show—a 400 gallon "pilot plant" at its office and lab and the digester it designed to heat a large commercial greenhouse now under construction in Cheyenne, Wyo.

But the firm's main interest this year is the Lamar power plant. The town, with a population of approximately 7,500, has 40,000 cows at or near the city limits. It has manure available at \$1.50 a ton and a manure hauling industry already established that could take on the extra task of hauling wastes from the methane digester back to the farmers' fields.

Lamar's power plant, run by the Arkansas Valley Power Authority, has a once-through cooling system that produces 110 degree water at the rate of 15,000 gallons per minute. Now they pour that water back into the river. Varani sees the water as "a perfect heat source for a digester," taking obvious delight in the technological neatness of the scheme.

"Suddenly instead of buying coal from you in Wyoming, Lamar is finding fuel in their backyards. And the money for that fuel goes to their neighbor—the guy who owns the feedlot—who spends it in town."

"This is self-sufficiency on a city-wide level. I'm really happy with the concept," he says.

BIO-GAS BOOKS

Bio-Gas of Colorado, Inc., has four publications for sale:

Energy Potential Through Bio-Conversion of Agricultural Wastes, Final Report to Four Corners Regional Commission, by John L. Burford, Jr. and Frederick T. Varani. This report discusses the anaerobic process, gas production of different manures, location of wastes in a four-state area, a large utility methane plant and its impact. 196 pages, \$3.

Energy Potential Summary. Approximately 40-page summation of the above book. Includes maps and charts, \$1.

Methane on the Move; A Discussion of Small Anaerobic Digestion Units, by Fred Varani, Wayne Turancliff, and Susan Schellenbach. A complete description of the mobile digester plant, journal of the Southwest tour, designs of four digesting units, and a discussion of the economics of small digestion units. Approximately 80 pages, \$2.

Set of Shop Plans for Four Digestion Units, Sized 2,250 to 18,000 cubic feet. Includes blueprints and specifications. Cost covers production, printing, and mailing, \$15.50.

To order a report send a check to Bio-Gas of Colorado, Inc., 342 East Third St., Loveland, Colo. 80537.



Metcalf, Melcher clash on wilderness

The Montana congressional delegation is engaged in a battle royal over Sen. Lee Metcalf's (D-Mont.) Montana Wilderness Study bill (S 393). Sen. John Melcher (D-Mont.) charges that Metcalf's bill would "lock up" areas of Montana by making them instant wilderness, that some of the nine areas under consideration do not possess wilderness qualities, that the lands involved would be removed from multiple use management, and that the bill was pushed through the Senate while Melcher was in Montana and couldn't vote on it, according to the Missoulian.

Metcalf responded with a heated attack, saying that Melcher had not approached the specific measures of the bill. He says S 393 does not create instant wilderness; "the bill deserves to be debated on its merits and not in vague generalities." Metcalf said a great deal of work and study had gone into the bill, and that the dispute showed a fundamental difference in the way that the senators approached wilderness. "All of this follows the traditional bow of 'I approve of wilderness, but...'"

On the House side, Rep. Max Baucus (D-Mont.) convinced the House Indian affairs and public lands subcommittee to delete three areas from the Endangered American Wilderness bill (HR 3454). The areas deleted were the 86,000-acre McGregor-Thompson area, the 28,900-acre Welcome Creek area, and the 22,000 acre Mt. Henry area. The Carter Administration had recommended instant wilderness for both Mt. Henry and McGregor-Thompson.

Bio-Gas basics: putting wastes to work

(Ed. Note: Bio-Gas of Colorado, Inc. (6620 Kendall Ct., Unit C, Arvada, Colo. 80002), provided the following information about gas-producing waste digestion systems.)

Q.) What can be digested in one of these systems?

A.) Basically any organic material can be digested; however, each material must be handled differently and be prepared for digestion in its own manner. Some materials which have been digested in Bio-Gas of Colorado's pilot plant are:

1. Feedlot steer manure
2. Stable bedding from horse barns
3. Dairy sewage
4. Dairy manure
5. Poultry manure (egg operation and broiler house)
6. Mushroom compost
7. Organic garbage (trash and paper)
8. Cotton gin trash
9. Faunch manure
10. Straw (wheat)
11. Sawdust

As can be seen, the list is long. Some materials require additional nitrogen to be added, others require additional organic carbon, so each must be treated in a unique manner.

Q.) How much gas can I get from my manure?

A.) Digestion is an energy conversion process whereby the energy values in manure (remember buffalo chips?) are converted into an

easy to use, clean, modern fuel—methane.

Since we are converting energy from one form to another, the amount of gas we get is directly proportional to the amount and quality of organic feedstocks we put into the machine.

In general, one cattle unit can produce about 10 pounds of manure solids per day which can be converted into 30-50 cubic feet of methane per day.

Q.) Does the residue from the digester have any value?

A.) The residue from the digester is, in some experts' opinions, the most valuable of the digester's products.

All of the nitrogen and other plant nutritive values are still contained in the residue from the digester. The residue is a black, thick, virtually odorless, heavy liquid which when applied to the fields either through irrigation, use of a liquid manure spreader, or soil injection adds these nutrient and humus values back to the soil.

A significant advantage of the residue when compared with the original manure is the lack of odor and lack of attraction for flies and pests. The residue is the manure in a "stabilized" form. The smell, so to speak, has been volatilized off in the form of gas and the residue is basically back to an unobtrusive odorless liquid. The material can be lagooned and stored without fear of neighborhood or official complaints and the fertilizer values available upon demand.

Q.) How much does a digestion system cost?

A.) Again, it depends on the size of your operation. Roughly for 50 cattle units, a cost of \$400 per cattle unit should be estimated. For 100 cattle units, \$300. For 200 cattle units, \$250. For 300 cattle units, \$200.

Above the 300 cattle unit size, the machine would be custom designed and priced from the factory, and the above figures are given only to allow a rough estimate. The exact price will depend on options and level of automation desired in any individual unit.

Q.) What is the value of the gas?

A.) Propane is currently selling for \$3.50 to \$4.50 per million Btu of fuel value. Methane (natural gas) is selling from \$1-\$2 per million Btu depending upon location. These prices are expected to escalate steadily.

Each cattle unit is worth from 30,000-50,000 Btu of methane per day or 10.5 to 22.5 cents of gas energy per cattle unit per day, depending upon comparison price and output.

Therefore: 50 Cattle Units equal \$5.25 to \$11.25-day; 500 Cattle Units equal \$52.50 to \$112.50-day.

Q.) Is the gas usable in my existing equipment?

A.) Yes, with some minor adjustments, like changing the size of gas jets and readjusting the air shutters. Raw bio-gas is composed roughly of 70% methane and 30% carbon dioxide. Natural gas is almost pure methane.

Roadless designation stepped up

An unprecedented time of decision has arrived for roadless areas throughout U.S. Forest Service lands. No longer will these parcels of land be bandied about among wilderness advocates, the logging industry, ranchers, miners, trailbikers, and snowmobilers, the Forest Service hopes.

Beginning in mid-July, nationwide hearings and workshops will be held to gather public input on roadless areas. The Forest Service will begin this summer by asking the public to check the accuracy of their inventory maps. In the fall the Forest Service will go back to the public and ask them to help decide each area's fate. Should it be designated wilderness or declared ripe for development — or should its potential be studied further?

This will be an important chance to voice opinions on roadless forests and grasslands before they are categorized by the Forest Service in late 1978, according to Bruce Hamilton, Sierra Club regional representative.

A complete map inventory is only available for the Western region, according to

Tim Mahoney of the Wilderness Society. "Public input will be more important for the Eastern forests and the grassland regions, since the complete inventory is not in existence there," he says.

The summer hearings will also field opinions on the National Wilderness Preservation System: what its size, distribution, character, and uses should be.

A second round of hearings, tentatively scheduled for late fall or winter, will discuss what the status of each area should be.

The roadless areas will be divided into three groups. The first is "instant wilderness" — areas generally agreed upon as deserving wilderness status. Controversial and/or unexplored areas will be shifted to a Forest Service study committee for further evaluation. Finally, release areas — areas obviously unsuitable for wilderness — will be made available for development within seven to nine months.

At issue is the question of just how much wilderness is enough. Some areas to be examined lie within already proposed wilderness lands, but many others are scat-

tered across Forest Service lands. Whether these areas will be withdrawn as instant wilderness or removed for possibly years of evaluation will be decided by the Forest Service following the public hearings and a period open for written comments.

M. Rupert Cutler, assistant secretary of agriculture, says hearings and written comments will establish the public as "a full partner in helping us address the different uses of the millions of acres of roadless land in the National Forest system."

The Wilderness Society is seeking several changes in the process as outlined by Cutler. Mahoney says these include delayed environmental impact statements to assure that "the decisions are not made in haste or political heat." The society also seeks a consistent standard for the "need for development" of release areas. Their suggested criteria include questioning the industries' ability to survive without further wilderness encroachment and a comparison of the costs and benefits of such development.

Public input will be given more weight than any other factor, according to the Forest Service. The agency says that educated, thoughtful recommendations will be valuable tools in preserving these scattered roadless areas.

Meetings on the areas are expected to be scheduled for the first three weeks in August in towns near Forest Service lands throughout the West. **High Country News** will publish the schedule in a future issue. In the meantime, contact the Forest Service for information about local meetings.

In addition to the meetings, a national poll conducted by the Forest Service is planned for later this year.

Environmental controls ignored in race to complete oil pipeline

The **Wall Street Journal** reports that although the Alaskan oil pipeline was completed almost on time, builders of the line had to cut some corners on environmental safeguards in order to do it.

In May, two federal-state monitors wrote: "There is no environmental quality control in the area whatsoever. In our opinion, it is beyond belief that the quality-control program is so lax at this late stage of construction," according to **WSJ** reporter Richard D. James.

"We should have shut the whole thing down until they (Alyeska) provided an adequate quality-control program. They never did the job they should have, and it caused some inexcusable environmental damage," Charles A. Champion, state pipeline coordinator, says.

Most of the damage is from oil leaks and improper sewage treatment. In addition, erosion caused by the project, which Alyeska was repeatedly told to control, has led to "canyons" in the tundra so massive that the monitoring team says you could lose a truck in them.

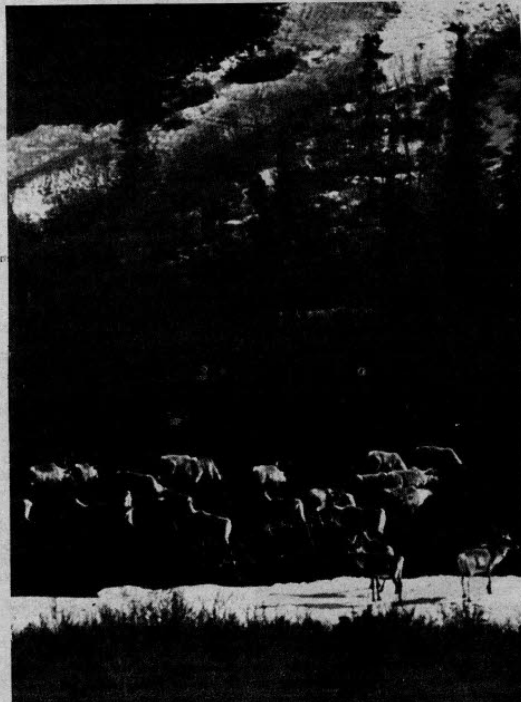
In some cases, Alyeska has chosen to revise environmental requirements. For example, in 1975 nearly 40% of the underpasses for big game were two feet lower than required to allow for migration. Although the matter was brought to Alyeska's attention before construction resumed last year, one-fifth of the crossings built in 1976 were still too low. After asking for a variance and putting off corrective action for more than a year, Alyeska now is working on the crossings. In many cases, earth has been excavated beneath the pipe to provide the required clearance, resulting in more erosion.

The state has filed civil and criminal court actions against Alyeska in at least a dozen instances, and more would have been filed if the state had the manpower to prosecute.

State figures show that more than 300,000 gallons of oil have been spilled in more than 1,000 separate incidents. Federal authorities advised Alyeska in 1972 to install flow meters on oil lines to detect leaks. However, some camp fuel systems didn't have meters as late as May 1976. When one was being installed, a 40,000

gallon leak was discovered that had been unnoticed.

Alyeska concedes it has had some problems, but a company official in charge of managing environmental protection says, "Overall, I think we've done as good a job of protecting the environment as we could."



Caribou in the tundra at Mt. McKinley National Park.


WATER POLICIES HEARING

A hearing will be held July 28-29 in Denver and other cities to discuss several proposed changes in national water policy. The changes will focus on five areas — revising water resource planning and evaluation criteria, cost sharing for federal projects, institutions, Indian water rights and federal reserved water rights, and water conservation. Option papers addressing each of these areas will be published in the Federal Register on July 15.

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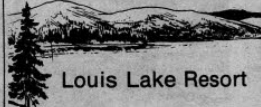
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Madison Range under siege. . .

(continued from page 1)

time. In a letter to the Forest Service last fall, one of the stockholders issued a thinly-veiled threat over the delay. He wrote that if the resort didn't receive its permit, shareholders "would try to recoup their investment dollars as quickly as they could with a minimum of consideration for the long-term impact of their (private) land disposition. Obviously, this would result in a continued hodge-podge development which characterizes the village of West Yellowstone and much of the developments in the area."

Ski Yellowstone's special use permit to construct a ski area on national forest land was approved by the Forest Service on May

The influx of visitors to a previously undeveloped area will cause increased confrontations between humans and grizzlies.

13, but the resort, first proposed in 1972, still faces challenges through administrative appeal by at least half a dozen environmental groups.

One of the concerns of environmentalists is that the resort, planned on and below Mt. Hebgen at the southern edge of the Madi-

son Range and five miles west of Yellowstone National Park, would be directly adjacent to 30,000 acres within Taylor-Hilgard tentatively identified as critical grizzly habitat. The Montana Wildlife Federation and other critics fear that intensive use of the year-round resort could spill over into the roadless portion of the mountain range and tip the delicate balance between the natural environment and human intruders.

6,500 SKIERS A DAY

Ski Yellowstone won Forest Service permission to place 10 double chair lifts, a gondola, a mountaintop restaurant and a day center on about 1,800 acres of federal land atop 8,721-foot Mt. Hebgen. These facilities will be in addition to the 493 condominium units, 224 single-family dwellings, 600 units for overnight lodging, 225 employe housing units, shops, lounges, cafes, marina, and stables planned for the corporation's 1,140 acres sandwiched between Mt. Hebgen and Hebgen Lake. Up to 6,500 skiers a day are expected to visit the resort during peak winter months.

Critics believe the influx of visitors to a previously undeveloped area will cause increased confrontations between humans and grizzlies. Since the Yellowstone Park area is one of the last strongholds for grizzly bears in the U.S., the Montana Department of Fish and Game, U.S. Fish and Wildlife Service, Forest Service, and Na-

tional Park Service are conducting an interagency study there to identify grizzly habitat and make recommendations for management.

The Montana Wilderness Association had proposed an alternative to Ski Yellowstone that was virtually ignored by the Forest Service. MWA applied for a special use permit for a non-mechanized cross-country ski area on Mt. Hebgen. The group said that its application would be withdrawn voluntarily if studies indicate that such a proposal would be incompatible with the "overriding values of roadless land and grizzly populations."

HAPHAZARD DEVELOPMENT

Part of the Forest Service's decision to grant the permit was based on its concerns for the private lands adjacent to Mt. Hebgen. No zoning exists in the area and the FS contended that denial of Ski Yellowstone's permit or granting of the MWA permit could lead to haphazard development on those lands.

Indeed, as John Hall, now Ski Yellowstone board chairman and executive vice president, threatened in his letter to Gallatin Forest Supervisor Lewis E. Hawkes, because of the "psychic exhaustion" suffered by stockholders after the long wait, if the permit was denied the corporation probably wouldn't spend the substantial additional funds to carry through a first rate, low density, planned unit development in the professional sense of the word."

Ski Yellowstone's promoters argue their development is an essential link in a "ski corridor" that would start with Bridger Bowl near Bozeman, and then head south to Big Sky, Ski Yellowstone, Grand Targhee in Idaho and end at Jackson Hole in Wyoming.

But Grand Targhee, for one, doesn't think there's room for another resort: "It will have taken us seven years to achieve a near break-even status and (assuming a continued growth) at least four more years

The Taylor-Hilgard area is part of one of the nation's longest contiguous roadless expanses — the wild Madison Range.

to recoup previous losses. . . We feel that the Forest Service has a primary obligation to existing permittees. Grand Targhee could be severely affected by this development even if only 10% of our market were to be drawn away by this new attraction. Yet to a knowledgeable analyst it must be obvious that for the project to succeed, they must eventually draw 50% or more from our existing market."

Besides addressing the "need" for another massive year-round resort, some people are questioning Ski Yellowstone's projected energy requirements at a time of energy shortage.

"With (President Jimmy) Carter's new energy policy, it's hard to understand how the Administration can okay a resort which would consume 18 megawatts of power," says Rick Applegate of Center for the Public Interest in Bozeman.

Ski Yellowstone Attorney Joe Sabol says construction could not begin before the



HILGARD-MADISON RANGE in early spring

spring of 1978, according to the Associated Press. Building could be delayed beyond that by administrative appeals planned by environmentalists. And, if those appeals fail, Applegate says that environmentalists may take the matter to federal court.

The fight over the luxury resort, then, is far from over.

BIG SKY TRANSMISSION LINE

Like most other ski resorts, Big Sky has suffered in recent years from the nationwide recession. Condominium sales have slumped and Big Sky has been besieged by a series of lawsuits. Yet despite its economic difficulties, the 10,000-acre, all-electric resort continues to pursue plans set down in the spring of 1974 to boost its power capacity.

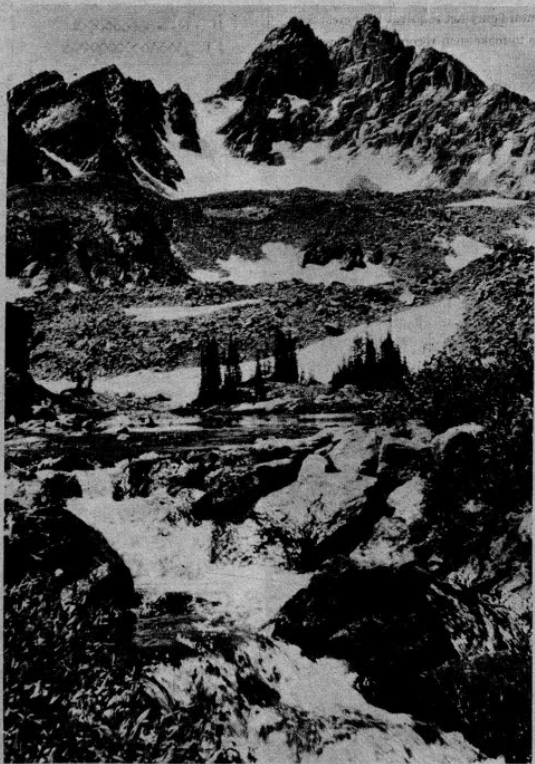
Its promoters have received a tentative okay to build a 161-kilovolt (kV) transmission line from the west to Big Sky across the roadless Madison Range, a small part of which already is under Forest Service study for possible addition to the National Wilderness Preservation System. The route proposed by Big Sky and one of its major investors and supplying utility, Montana Power Company, would follow Cedar Creek, a drainage included in the proposed Taylor-Hilgard Wilderness Study Area.

With the approval of the Montana Department of Natural Resources and Conservation in hand, Big Sky now awaits final decisions by the DNRC's board and the Forest Service.

Application to increase Big Sky's present service (a 69-kV line) was made on the basis of Montana Power's projected demands of the expanding resort and because of frequent power outages from windfallen trees and storm damage.

"The capacity of the existing (69-kV) line has been reached," DNRC's final environmental impact statement said, and "since growth in electrical demand will continue at Big Sky, the department must recognize the need for additional transmission capacity to Big Sky."

Whether electrical demand will continue, and, if it does, whether that demand would qualify as true "need" are being challenged by citizens concerned about the future interpretation of Montana's Major



HILGARD BASIN in late summer feeds Hebgen Lake. Photo by Rick Graetz.



ing sports wildflowers, snowfields, and spectacular rock outcroppings. Photo by Rick Graetz.

Facility Siting Act and about the possible loss of a roadless area included in the proposed Taylor-Hilgard Wilderness Study Area.

The siting act, passed in 1973, established economic, social, and environmental criteria which must be evaluated in siting a transmission line. The act requires that the need for proposed transmission facilities be considered along with en-

made compatible with the proposed management in the drainage."

This should be good news to Montana Power and Big Sky since they don't want the transmission line on the resort's property, especially along Lone Mountain (the ski area) because "that is an area of major scenic value," according to Gus Raam of Big Sky.

Conservationists, guest ranch operators

An economist says that Montana Power has historically overstated projected growth curves. "They substitute wishful thinking and the 'intuition' of self-interested parties" for professional analysis, he says.

vironmental compatibility.

As an expert witness for the Montana Wilderness Association during the Board of Natural Resources and Conservation hearing last fall, economist Tom Power noted that neither the power company nor DNRC had done the professional load growth analysis necessary to show public need, especially in light of the department's conclusion that Big Sky's projected electrical demands are "currently not being born out."

Power further explained that Montana Power has historically overstated projected growth curves. "They substitute instead wishful thinking and the 'intuition' of self-interested parties," he said.

Besides questioning the need to increase electric service to a luxury resort, conservationists are primarily concerned, according to Bob Kiesling of the Environmental Information Center in Helena, "that no corridor be chosen which would legally alter the wilderness character of the area between Big Sky and the Madison Valley" across the Madison Range to the west.

USE EXISTING CORRIDOR

In a recently released draft management plan for the Beaverhead National Forest, which includes the west slope of the Madison Range and about a third of the Jack Creek drainage, the Forest Service noted, "If carefully located, a power line could be

and DNRC all contend that if the line must be built that it be located in Gallatin Canyon's already existing corridor, not "out of sight, out of mind" in the back country. They fear a transmission line through Cedar Creek would be an opening "wedge" to further development of the roadless area.

Pete Combs, owner of the Diamond J dude ranch along Jack Creek, explains how a transmission line cutting through the now roadless area would affect his operation: "I suspect if the line goes in, a road will follow. Where the cow goes, the calf's going to follow. If the line (and road) goes in, it will put me out of business as far as dude ranching is concerned. . . . We'll become sort of a satellite to Big Sky."

Another option, to altogether avoid routing a line to Big Sky, would be for the resort to produce its own on-site power. Diesel fuel already is being used to power Big Sky's ski lifts. Raam calls suggestions that Big Sky produce its own power "incredible."

BUCK CREEK-YELLOW MULES

Just south of Big Sky in the east-central portion of the proposed wilderness study area, Burlington Northern has received tentative FS approval to build two logging roads in the Buck Creek and Yellow Mules drainages to gain access to its presently unharvested inholdings. Since both drain-

ages are now roadless, the roads would effectively end the wilderness potential of 5,000 acres and open the door to further encroachments on public lands. And according to the FS, "an additional 5,000 acres would have reduced wilderness quality because of the visual influence" that timbered lands and roads would have on adjacent roadless lands."

Buck Creek and Yellow Mules are part of the Hilgard Hold Area, 224,000 acres of national forest land set aside in 1958 at the urging of the Montana Wilderness Association. Then-Gallatin Forest Supervisor Charles L. Tebbe assured citizens "that until such time as a comprehensive study is made, the service would refrain from logging or road development . . . we are simply going to stay out of the area with roads and logging."

The study Tebbe referred to was never completed. Yet since 1967, according to a report by the Wilderness Institute at the University of Montana School of Forestry, some 3,000 acres of wildland ostensibly protected by the Hold Area agreement now has roads and has been logged.

Defending its proposal to grant the special use permits for Buck Creek and Yellow Mules, the Forest Service cites the Organic Act of 1897 (which governs the management of the national forests), as well as the agency's own manual, regulations, and policies, all of which recognize the right of landowners to gain access to their intermingled properties.

However, Senator Metcalf has noted that the FS readily could rewrite its manual, regulations, and policies if it chose to do so. He says it also could recommend revision of the Organic Act to provide for proper protection of the public interest, if that actually is necessary. The National Environmental Policy Act requires the Forest Service to make such recommendations. The FS missed an opportunity to do so last year when Congress passed some amendments to the act.

NEEDS COMPLETE STUDY

Rick Applegate cites the Parker v. U.S. case as one way the FS can overcome pressure from special interests. In the Parker case, the U.S. Court of Appeals for the Tenth Circuit in 1971 ruled that before a roadless area adjoining the Gore Range-Eagles Nest Primitive Area in Colorado could be opened to development, the Forest Service had to prepare an overall management plan which included an assessment of the suitability of the unprotected area for wilderness designation under the Wilderness Act.

The key in both the Parker case and in Buck Creek-Yellow Mules, according to Applegate, is to insist that the Forest Service conduct a complete study of the entire area before allowing any roads to go in, reducing options for the area's designation. He says, "All these lands (in the Buck Creek-Yellow Mules area) are adjacent to a primitive area — the Spanish Peaks — and all are a part of a greater wild area from the Peaks to Hebgen Lake."

Another conservationist contention, based on a 1962 opinion of then Attorney General Robert Kennedy, is that only actual settlers, not absentee corporate landowners such as Burlington Northern, are legally entitled to demand access to national forest private inholdings.

Applegate says the Center for the Public Interest will take the FS to court on these questions if the agency grants the access permit. He adds that the agency also has a duty to conduct impact studies on private land activities within national forest boundaries.

As an engineer in Montana's Depart-

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ment of Health and Environmental Sciences has pointed out, the natural resources within the Buck Creek and Yellow Mules drainages deserve some looking into. The entire area is underlain by sedimentary rocks, shales and sandstones — all extremely susceptible to erosion and landslides.

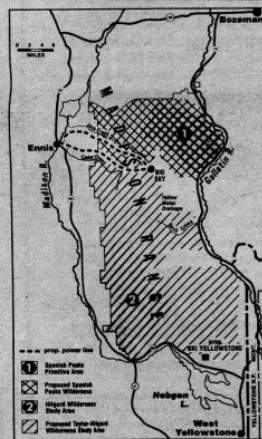
Another resource — the threatened grizzly bear — also could be irreversibly impacted by the proposed roads, according to the draft EIS. The Forest Service has identified the Buck Creek-Yellow Mules area as containing "occupied habitat," or according to official FS criteria, an area where grizzly bears are known to exist.

Alternatives to opening this portion of the proposed Taylor-Hilgard wilderness study area would be for the Forest Service to simply deny access or to either trade or buy the lands in question from Burlington Northern; the Nature Conservancy has offered to negotiate the latter transactions.

A land exchange, apparently, is nearly impossible.

"Burlington Northern has offered to get involved with the land adjustment program," says BN timber manager Bill Parson, "but the Forest Service won't identify lands to acquire." Both Parson and Gallatin Forest Supervisor Lewis E. Hawkes attribute this impasse to the refusal of environmentalists to identify public lands they would be willing to give up.

"Hawkes is right, in most cases," according to Applegate. "It's not that people are



PROPOSED WILDERNESS map courtesy of LIVING WILDERNESS, a publication of the Wilderness Society.

unwilling to trade public lands; it's that they've seen one really bad one (the BN trade for expansion of Big Sky). Anyway, we shouldn't have to trade lands on Buck Creek and Yellow Mules if it's true that building a road would cause sedimentation, increase erosion and destroy wildlife habitat. Burlington Northern is like every other landowner. There are some things they just shouldn't be allowed to do even on their own land."

Neither are the lands for sale.

"The BN timber land department is in the sustained yield business for the long term, and more timberlands are not available," Parson says. "We can't afford economically to buy more land because of inflated land prices."

So the matter remains unresolved. If the (continued on page 10)

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future leasing agreements. Stands Over Bull has been suspended by the tribe for independently negotiating with Shell Oil but has been reinstated.

MONTANA ENERGY ALERT. Montana Gov. Thomas Judge has issued an "energy supply alert" and ordered all state and local government units in several areas of the state to cut electricity consumption by 10%. Judge says the cutback is necessary because of the low water levels, which will result in drastically reduced hydroelectricity production.

CHOOSING IDAHO POWER SITE. Three sites recommended in a "superficial" study by the Idaho Public Utilities Commission (PUC) are being considered by Idaho Power for a 500 megawatt coal-fired power plant. The company says it won't recommend a specific site without more input. "We learned our lesson with Pioneer. We really got burned... This time we intend to work with all groups and collectively find an acceptable site," Idaho Power President James Bruce said. The proposed Pioneer plant was killed by the PUC because the commissioners didn't approve of the site near Boise. The legislature later directed the PUC to set minimum environmental criteria on potential sites for energy generating facilities and to rank the 21 sites in priority groupings. The PUC hired Stems-Rogers of Denver for the initial study but says it would like authority and funding from the legislature to conduct a thorough investigation of the best sites, both inside and outside of Idaho.

JOINING IPP BANDWAGON. Most of the 23 Utah communities listed as original sponsors of the Intermountain Power Project (IPP) have signed up for membership in the Intermountain Power Agency, which was authorized by the 1977 legislature. The new agency will become a political subdivision with the power of eminent domain and authority to issue tax-free bonds.

NAVAJOS DEMAND POLLUTION PERMIT. The Navajo Tribal Council has voted to require any industry on the reservation or near the reservation to purchase a permit from the tribe if it is going to discharge sulfur or sulfur compounds into the atmosphere. If the plants do nothing to curb the amount of sulfur they put into the atmosphere, Navajo General Counsel George Vlassis says the penalty for the first year will be \$20 million, according to the Navajo Times. The new tribal law will affect the Navajo Power Plant near Page and the Four Corners Plant near Farmington, N.M. Vlassis says, "I would hope that the various environmental groups in the country who have pushed this kind of thing for the state and federal governments will rally behind the tribe when the environmental measure is challenged by the courts."

North Dakota makes

After a year and a half of hearings on two coal-fired power plants and a gasification plant in Mercer County, N.D., yet another obstacle has been raised. Farmers and ranchers in neighboring Dunn County have petitioned the North Dakota Health Department for Class I clean air.

North Dakota is the only state in the country that provides for groups of citizens to petition for an area of the state to be classified as Class I, which allows very little development. In the rest of the region, all of which is now designated Class II, only the state government, the federal government, or the Indian tribes can make such a request.

The health department has responded to the petition by stopping action on all per-



FOR CLEAN AIR. Stanley Pollestad, chairman of the Dunn County United Plainsmen, discusses the number of signatures gathered for a petition for clean air in Dunn County, N.D. In the background, Kermit Perhus and Raymond Hammell compare notes on the signatures they gathered.

NEW CROW AUTHORITY. A faction of the Crow tribe which seems to favor slower coal development and more tribal control has apparently gotten the upper hand in its power struggle with Crow tribal chairman Patrick Stands Over Bull. The Crow Coal Authority has asked Interior Secretary Cecil Andrus to void coal leases with Westmoreland Resources on Tracts II and III of the Crow Ceded Areas claiming that an inadequate environmental impact statement was prepared and that the terms of the leases are unfair to the tribe, according to the Billings Gazette. Ellis Knows His Guns and Dale Kindness of the Crow Coal Authority have also sent letters to the U.S. Environmental Protection Agency (EPA) and others saying that Stands Over Bull didn't have the authority to speak for the tribe in protesting the neighboring Northern Cheyenne tribe's request for clean air reclassification. In addition, the coal authority has been meeting with Shell Oil and with Peabody Coal about possible

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Jackson would exempt

While the U.S. Senate succeeded in passing Clean Air Act amendments that are much stronger than the House's version, one amendment could negate the Northern Cheyenne Indian Tribes efforts to protect air over its reservation. Sen. Henry Jackson (D-Wash.) sponsored an amendment to exempt Colstrip units 3 and 4 in Montana from the significant deterioration regulations of the Clean Air Act.

If the amendment is accepted by the conference committee, it will end a long battle between the U.S. Environmental Protection Agency (EPA), Montana Power Co. and other members of a consortium proposing the two 700 megawatt plants. EPA's efforts have been supported by the Northern Cheyenne tribe, which is the first land manager to seek Class I air redesignation in the nation, and by the Northern Plains Resource Council, a rancher-environmentalist group. Colstrip is 20 miles north of the reservation.

Montana Power Co. has contended that since it filed certain applications for the two units before the Clean Air Act was passed, they should not have to comply with the act's requirements. EPA ruled several times that the company had not "commenced construction," as defined by the act before the act was passed. However, a U.S. District Court judge in Montana ruled for Montana Power, and Jackson's amendment would specify the narrower definition of the "commencement of construction" that the judge had read into the act. The judge's ruling has been appealed.

Much of the power from Colstrip will go to the Northwest — Jackson's home territory.

The National Clean Air Coalition says that Sen. Edmund Muskie (D-Maine), the floor manager of the bill, agreed to accept several amendments to the bill, if they were narrow enough, so that it could be passed. The coalition doesn't know how many other plants might be affected by the

definition of "commencement of construction." The Senate did succeed in killing amendments that proponents of the bill said would have gutted the significant deterioration portions of the bill, including one introduced by Sen. Ted Stevens (D-Alaska) to allow an 18-day emissions variance for Class I and Class II areas. This amendment failed by nearly a two to one margin (33-61). The House had passed the 18-day variance. Douglas Costle, head of the EPA, told the Senate that the variance would have the effect of increasing by 10

Andrus holds
Apparently reluctant to wait for Clean Air Act amendments, Interior Secretary Cecil Andrus announced June 7 that Capitol Reef and Canyonlands National Parks in Utah should be studied for possible Class I air redesignation.

His action means that the U.S. Environmental Protection Agency (EPA) can take no action on the proposed Intermountain Power Project air permit until air studies are complete. According to a Utah public power official, the 3,000 megawatt plant could not be built at its proposed site 10 miles east of Capitol Reef if the park were designated Class I, which allows for almost no change in air quality.

Both parks would automatically be designated Class I under either the House or the Senate versions of the Clean Air Act amendments now being considered by a conference committee. However, in his letter to Douglas Costle, EPA administrator, Andrus said he wants to ensure that the air quality within the parks, "for which we believe Class I status may be appropriate, not be jeopardized by events that occur prior to enactment of the Clean Air Act amendments." Andrus was apparently afraid that the Intermountain project would try to avoid compliance by proceeding with its plans prior to the conference

citizens prepare EIS for clean air

mits to construct additional power facilities in the area.

However, at the same time that the department put the hurdle before the power plants, it also raised what might be an impossible barrier for the citizen group, the Dunn County Committee for Clean Air. The state, in accordance with its redesignation requirements, is asking the small group of private individuals to prepare what amounts to an environmental impact statement justifying the change to Class I, including a "thorough examination" of the possible environmental, social, and economic effects in the area, the region, and the nation and a discussion of the alternatives.

Gene Christianson of the state health department admits that such a study might necessitate the county group hiring a qualified consultant full time in the six months allowed for the report to be com-

pleted, but he says no state funds will be available to the committee.

He says he recognizes the timetable is short but the department can't keep the companies waiting too long for action on their applications.

"They (committee members) have to be dedicated to their position to go through with it — it is quite costly," he says.

Randolph Nodland, a spokesman for the group, says it would be impossible for the committee to conduct the study. To prove their dedication, the committee will probably have to fight the state requirement, he says, although a meeting is scheduled July 6 to "negotiate" with the state about the requirements.

Nodland, who is also president of the North Dakota United Plainsmen, a statewide environmentalist-rancher group, sees the health department's requirements as "just another move to discourage us, as all state decisions on coal issues have been." He says there are pressures on the department, just as there are on the legislature, from the coal industry.

During the last legislature the United Plainsmen supported a bill that would have required the state to do the necessary reports for air reclassifications, but the measure failed.

Christianson says that not only does the department have no money for such studies, but it also fears being accused of a conflict of interest since the department must rule on the reclassification request after the reports are complete and after a public hearing is held. Requiring the citizens to pay "is the proper posture for us to take," he says. He says that when the Northern Cheyenne tribe requested reclassification for its reservation, the U.S. Environmental Protection Agency (EPA) required the tribe to conduct the studies.

To further justify the state's position, he

added, "We've gone farther than any other state even thought of" by offering the citizens the opportunity to petition for clean air. "We think of it as a positive step."

The committee will have access to state studies that have already been done, including one that shows emissions from the Coyote I coal-fired power plant proposed for neighboring Mercer County would exceed Class I increments in Dunn County when added to existing plants' emissions—even without the other power plant or the gasification plant that are proposed there. Montana-Dakota Utilities and Otter Tail Power had planned to start construction on the Coyote I plant in September. ANG Coal Gasification, Inc. had proposed a gasification plant in Mercer County and contemplated one in Dunn County, according to Sheldon Green, editor of a local newspaper in the area, the *Hazen Star*.

The Dunn County committee does not oppose oil development in the area. Green says the county is in the midst of an oil boom, with three or four new wells entering production of 300-400 barrels of oil each week. In the letter accompanying their petition for reclassification, the ranchers said, "We are not against industrialization but against massive industrialization which would pollute our air, water, and land. Coal development, which is our prime concern, is here today and gone tomorrow, a one time harvest."

"Agriculture is here to stay. It is a more permanent based lifestyle. . . . Being close to the land and the Maker. Some may say a simple way of life. Simple in that we are not crowded; we have a blue sky that we can see; a sun that is not obscured by clouds of dust and pollution, and air that we cannot see. But most important we have people that love the land, their farms, and their neighbors." The petition was signed by 588 residents of the county, 30 of which were Indians from the Fort Berthold Reservation and so not counted by the state. (Christianson explained that since the reservation could request its own reclassification, they weren't counted.)

Another group, the Common Sense Committee, has sprung up in Killdeer, N.D., the center of the oil activity in the county, to oppose the petition.

CLEAN AIR
ACTION
on three fronts

Colstrip 3,4

times the amount of smog allowed for the rest of the year.

Another amendment that could have a significant effect on the West, if adopted by the conference committee, would give EPA the authority to order power plants in the East to use local coal rather than the cleaner-burning low sulfur coal produced mostly in the West. The sponsor of the amendment said it would protect Eastern coal miners from losing their jobs.

The conference committee is expected to begin work on the amendments after the July 4 recess.



up Intermountain Project with clean air request

committee's completion of the amendments.

The committee members have been appointed but have been unable to agree upon even a date to begin meeting. Because of the composition of the committee, Chris Goddard of the National Clean Air Coalition says it is a "distinct possibility" that the committee won't be able to agree upon a bill.

In addition, Carter Administration sources have indicated that if the conference committee retains some of the weak standards proposed by the House, President Jimmy Carter may consider vetoing the whole bill, which would mean the park protection would be lost.

There has been no publicity on the June 7 Andrus letter, but Intermountain Consumer Power Association director Joseph C. Fackrell has voiced his opposition to the concept. He says the IPP plant would exceed the sulfur dioxide emission standard 13 days per year. "We think this really is a small price to pay for the country to achieve energy independence," he says, according to the *Deseret News*.

In response to IPP's situation, Rep. John Breaux (D-La.) introduced and succeeded in passing an amendment to the House version of the amendments that would

allow 18-day exemptions from clean air standards (see HCN 6-3-77). The Senate defeated a similar amendment, and the committee must decide whether or not to include it.

Following the vote, Andrus was asked to

what extent the Carter administration was willing to accept compromise on air over pristine areas. He indicated the administration believes it is not reasonable to allow dirtying of clean air when the country is trying to clean dirty air.



WATERPOCKET FOLD along Hall's Creek in the southern end of a proposed wilderness area in the Capitol Reef National Park.

Photo by Virgil Olson courtesy of the National Park Service.

July 1, 1977 — High Country News-9



The HCN
Hot Line

energy news from across the country

OPEN ARTERY. As oil begins flowing through the new pipeline, the state of Alaska is trying to decide what to do with the pipeline haul road that cuts 367 miles into the previously roadless Far North. Both environmentalists and industry agree that the road presents a far greater danger to the Arctic than the pipeline does since tourists, hunters (and possibly poachers), off-road vehicle drivers, and others could have access. Alyeska Pipeline Service Co., which built the road, is not turning the road over to the state this year because it wants to give the state more time to decide what to do with it. The company is also concerned about possible security problems along the pipeline.

NUCLEAR DESIGN PROBLEM CITED. A private nuclear consultant in Oak Ridge, Tenn., E. P. Epler, says a nuclear power plant design problem could disable devices aimed at preventing a meltdown of the radioactive fuel core, the most devastating type of nuclear accident. Epler found 50 reported incidents of failures in the battery systems of about half the nation's 67 nuclear power plants, according to the Associated Press. The batteries provide power to the emergency cooling system if a plant's normal electrical power source is shut off. Epler wants the design to be changed, but the Nuclear Regulatory Commission plans a year-long study to determine if the problem is serious.

LANDOWNERS GET POWER. The House-Senate conference committee working on the federal strip mining bill has agreed to give landowners the authority to veto strip mining of federal coal under their surface. The vote was 5-4. Sen. Lee Metcalf (D-Mont.) argued that it wouldn't tie up much coal because few landowners will use it. Wyoming's law giving landowners such power has not been used by ranchers since it was passed in 1973. Landowners will also be allowed to sell their permission to the highest bidder, rather than have limits set by the government. At press time, the conferees still had to settle three of the most controversial measures: alluvial valleys protection and two issues concerning Eastern coal mining — small owners' exemption and high wall exemption.

SLURRY VOTE REVENGE. U.S. Reps. James Johnson (R-Colo.) and Teno Roncalio (D-Wyo.) said that recent votes by their subcommittees on slurry pipelines were designed to show President Jimmy Carter that Western water needs cannot be taken lightly. After Carter announced he favors giving slurry pipelines the power of eminent domain, two House subcommittees voted to delay further action on the proposal until January. Johnson accused Carter of being "indifferent and insensitive" to serious water problems in the West, as evidenced by his decision to end funding for several water projects. The Carter Administration has said, however, that dams don't create water and said the water project decision is consistent with the concept that Western development should be limited because of the lack of water in the region. The slurry pipeline would carry water mixed with small coal particles.

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Montana wilderness...

(continued from page 7)

Forest Service follows through with its recommendation to grant BN access, the issue undoubtedly will go to court. The decision in such a case could have ramifications throughout the northern United States where the railroad has land grants and elsewhere where private inholdings exist. The final EIS on BN's application is expected soon.

The impact from Ski Yellowstone won't be felt on the Madison range for some time, if at all. Administrative appeals, and possibly court action, at least by environmentalists, will postpone development.

Big Sky's proposed transmission line and Burlington Northern's plans for Buck Creek-Yellow Mules could be immediately affected by the passage of the Montana Wilderness Study Bill, H.R. 393, which already has passed the Senate, becomes law in the next few months, the Taylor-Hilgard will be "saved" for a maximum of seven years while the Forest Service analyzes the area's potential for wilderness and President Jimmy Carter is given time to consider the resulting proposal.

However, if Ski Yellowstone, the proposed roads, and the power line are not somehow stopped or delayed, they could foreclose other options for the de facto roadless areas within the Madison Range. And, each would chip away at country that is now secure for grizzlies.

Jim Posewitz of Montana's Department of Fish and Game explains the consequences: "Unless we can preserve the area's wildness, the grizzly's security will be stripped from him. When that happens it will only be a matter of time until the bear's last track will fade from the Madison Range. Should that happen we will be left with just another mountain range — high country without a spirit or soul of its own."

Eavesdropper

environmental news from around the world

LOONEY LIMERICKS

by Zane E. Coley

There once was a cow who was bright
Who made gas from dung one fine night.
Though he thought it distasteful,
To leave it was wasteful,
So he formed Bovine Power and Light.

ENDANGERED RATTLER. The New Mexican ridge-nosed rattlesnake has been proposed for the federal endangered species list. The rattler, described by the Rocky Mountain News as "shy," has a range restricted to two canyons in the Animas Mountains in New Mexico and to a small area in the Sierra de San Luis in Chihuahua, Mexico. The danger to the snake, U.S. Fish and Wildlife officials say, is overcollecting. The small snake has become a favorite among exotic animal dealers.

MULTIPLE USE CONCEPT CHANGES. Public Lands News, a Washington-based resources newsletter, says that the Carter Administration seems to be making significant changes in the government's approach to the concept of multiple use for public lands. The newsletter reports that Assistant Agriculture Secretary Rupert Cutler tipped off the new approach: "Cutler said the way to make multiple use is to identify a key value — timber, wilderness, wildlife, etc. — and manage the land with the key value receiving priority." The newsletter says that Cutler "decided the 'glib generality' of multiple use, the careful balancing of uses despite the imbalance in resources."

If you are interested in speaking out on the Taylor-Hilgard wilderness proposal, write to your Congressional delegation expressing your views on S. 393. Also, write to Forest Supervisor Lewis E. Hawkes, Gallatin National Forest, Box 130, Bozeman, Mont. 59715 about the Buck Creek-Yellow Mules roading permit. Contact both Hawkes and Forest Supervisor Robert W. Williams, Beaverhead National Forest, Highway 41, Skyhi St., Dillon, Mont. 59725, concerning the power line corridor to Big Sky.

Classifieds

"CANYON COUNTRY HIKING AND NATURAL HISTORY." Barnes. 176 pages, illustrated, \$3.95ppd. Hiking trails and routes in southeastern Utah. F. A. Barnes, Box 963, Moab, Utah 84532.

LOBBYIST POSITION OPEN. Applicants are now being sought for the position of lobbyist for the Colorado Open Space Council. Persons with experience in legislative politics, organizing volunteers and citizen groups, fund raising and writing are particularly encouraged to apply. The job includes organizing a legislative program for a state-wide coalition of environmental and conservation organizations, promoting subscriptions to and publishing a weekly legislative bulletin during the legislative session, lobbying the Colorado General Assembly, and working with other interest groups. Employment is part-time during legislative interim (until December), full-time during the session at \$600 per month. Persons who wish to apply should send their resumes to COSC, 1325 Delaware Street, Denver, CO 80204, by July 15, 1977. For further information, call COSC at 573-9241, or Mary Taylor at 442-5662.

EMPLOYMENT OPPORTUNITIES. The Northern Plains Resource Council has openings for two full time organizers. NPRC is a citizens organization of ranchers, farmers, and other citizens working on energy and coal development issues in the Northern Great Plains. Send resume, writing sample, and references to NPRC, 419 Stapleton Building, Billings, Mont. 59101 (406) 248-1154. All applications requested by Aug. 1, 1977.

SOLAR RELIANT GREENHOUSE and Solar Food Dehydrator Plans. Complete blueprints to build 12x16 ft. passive solar greenhouse or 2x6 ft. dehydrator with passive air heater. Includes photo, construction drawings, materials list, and other relevant information. \$7.50 each, guaranteed. Send .25 for catalog. Solstice Publications, P.O. Box 2043, Evergreen, Colorado 80439.

HELP HCN get the word out. One way HCN keeps going is by introducing itself to new people. HCN needs volunteers to write or type names onto mailing labels. If interested, write HCN, Box K, Lander, Wyoming 82520. Thank you.



DISTAFF CORNER

THE CHILDREN MAY WANT TO KNOW

by Myra Connell

A flood of environmental literature comes to our home each week — much more than we have time to read: **High Country News**, **Wilderness Report**, **Powder River Basin Council's** releases, **Audubon**, etc. Most of this news is depressing; all of it tends to overwhelm us with the magnitude of the problems with which we are faced. The ever-increasing evidence of environmental concern on television and radio intensifies the effect of the printed matter.

In addition to being depressed, I am dumbfounded by the attitudes of those who oppose and retard the environmental movement. I wonder — do they have children? Grandchildren? And if so, do they think about what sort of world their heirs will inherit?

During the bicentennial the Atlantic Richfield Company invited thoughts on life in the Tricentennial year, 2076. A 10-year-old girl, Lisa Clark of Los Angeles, wrote "Dear Tricentennial, Here is my idea. Make a commercial with a little kid reading a letter saying 'Dear Parents: You are always saying you love us. If you really love us, you should save something for us to look forward to. So please try to do your best to keep the world livable for us, because we have to have somewhere to live, too. Also our children, your grandchildren, need a place to live, too. So this is not just your world. It's ours, too. Thank you, Your Children.'"

Well, "Out of the mouths of babes..." A little boy noticed something strange about the clock; at 12 o'clock it struck 13 times. He rushed to his father and said "It's

later now than it ever was!"

The pollution of life-sustaining elements is closing in on us. And all of us are answerable, including those who vote to weaken the Clean Air Act, those who would allow strip mining in alluvial valleys, those who hold back development of alternative energy sources.

Man's abuse of the earth and its resources was recognized in Biblical times: Micah 7:13 "the land shall be desolate because of them that dwell therein, for the fruit of their doings."

What if the polluters and destroyers were to live until the Tricentennial? How would they answer if a child inquired, "What caused that big black hole?" Would they say, "A giant badger dug it ages ago." Or would they blame Paul Bunyan? Suppose a child asked, "What is a painted bunting?" "Would he learn the answer from a picture in a dusty book? Could a child feel the spray of a waterfall and breathe its coolness by hearing a word description? Could one hear the tune of fast running water if all the streams had been dammed? Could he smell the fragrance of the pine forest from a faded photograph?"

I would like to ask the anti-environmentalists, "What would you say to the children when the mourning dove mourns no more?"



Hannah Hirschman

A mining company with a novel, romantic approach to preserving wilderness.



June 23, 1977

Dear HCN Readers,

News update: we're hurting in the trenches. We have some fine people who will be doing biological and geological field studies for the company, June through September, and numerous willing manual laborers.

But we have become involved in litigation with the huge American Smelting and Refining Co. for claim jumping on our claims.

To finance our endeavors and keep American Smelting off of our claims within the Scotchman's Peak Wilderness Study Area, we are offering a small issue of non-voting, non-revenue-producing mining certificates for \$5 apiece. Send for one today and join in our progressive lead of mining with an environmental conscience.

Sincerely,
Cesar Hernandez
President

Western Roundup HCN

Sweetwater 'too short' for scenic status

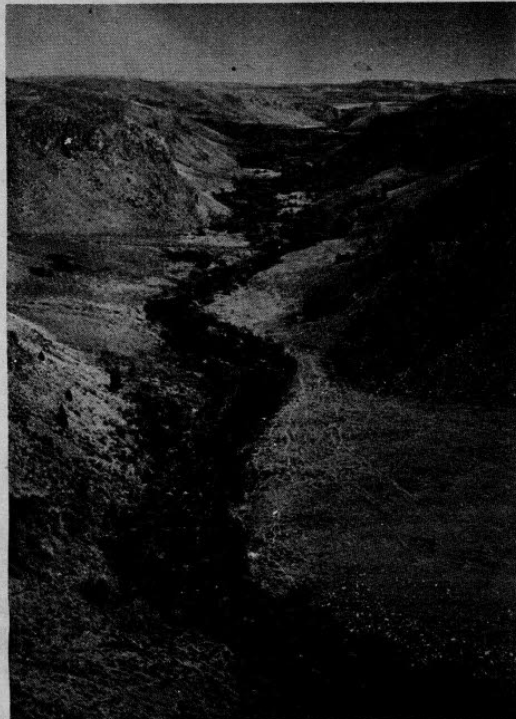
The 9.5 mile Sweetwater Canyon section of the Sweetwater River in Wyoming is "too short" for inclusion in the National Wild and Scenic Rivers System, according to the preliminary findings of an interagency state and federal task force. The canyon was found to have "significant scenic, recreational, and fish and wildlife qualities, and particularly important historical values," but that it does not meet the Interior and Agriculture Department's criteria that it be at least 25 miles long.

Other than the length of the section, the group found that the river had all of the other qualifications for inclusion in the system as a "wild" river. Even this objection could have been overcome if the river

possessed "outstanding qualifications." The study team concluded that the river did not possess these, however.

Draft legislation is now before Congress which, if passed, would authorize the study of the main stem of the river upstream from the canyon for a total of 46 miles. The added length would circumvent the study group's objections.

The Bureau of Land Management and the Bureau of Outdoor Recreation are asking for comments on the findings. They should be submitted by July 8 to BLM at P.O. Box 589, Jett Building, Highway 287 South, Lander, 82520 or to BOR, P.O. Box 25387, Denver Federal Center, Denver, Colo. 80225.



TOO SHORT? The 9.5 mile section of the Sweetwater River, known as Sweetwater Canyon, has been determined to be "too short" for inclusion in the National Wild and Scenic River System. Photo courtesy of the Bureau of Land Management.

Mysterious fish kills plague Idaho rivers

Idaho has experienced two massive fish kills in the state's waters. Between 50,000 and 60,000 fish, mostly whitefish, were killed in the Payette River, and an undetermined number were killed in Lake Lowell.

The Idaho Department of Game and Fish has been unable to determine conclusively the cause of death. The Payette River kill is believed to have been caused by Acrolyne, an algacide used to clear irrigation ditches. No evidence has surfaced to determine the cause of the Lake Lowell kill,

but the state pathologist has ruled out disease, according to the *Idaho Statesman*. Pesticides have been mentioned as a possible cause.

The state Department of Water Quality says that some of the problems may be caused by the drought. The low water levels result in higher water temperatures and higher concentrations of herbicides, insecticides, and fertilizers in irrigation runoff returning to the rivers.

Horses lose Annie, most vocal protector

One of the West's modern legends, "Wild Horse Annie," died on June 27, 1977, at the age of 65. Velma Johnston, who led the drive for the protection of the West's free-roaming horses, died in Reno, Nev., reportedly of cancer.

Wild Horse Annie took up the cause of the wild horses in the late 1950s, when many of the horses were being rounded up from public lands and sold for dog food. She was the impetus behind the "Wild Horse Annie Law" which prohibited the use of airborne and mechanized vehicles to capture horses on federal land. In 1971 she helped in the passage of the Wild and Free-Roaming Horse and Burro Act, giving the herds even further protection.

Though Johnston's ideas are controversial among environmentalists, she was widely respected for her dedication to the cause that may have saved one of the West's most romantic trademarks. In 1972 she received the Joseph Wood Krutch Medal for a "Significant Contribution Toward the Improvement of Life and Environment" and the public service award from the Interior Department for her work on behalf of the mustangs.



THANKS TO ANNIE. The herds of wild horses that now roam the western plains owe their existence, in large part, to the efforts of Velma Johnston, or "Wild Horse Annie," who died recently of cancer in Reno, Nev.

Indians work with state on hunting regs

Montana Fish and Game Director Robert Wambach says he is "as optimistic as I can be" about cooperation between the department and the Confederated Salish and Kootenai Tribes of the Flathead Reservation on hunting.

The Montana Supreme Court recently ruled that a tribal member had a right to unrestricted hunting within the aboriginal hunting territory of the tribes, even though it is outside the present reservation. The ruling means that members of the tribe

will not be subject to state regulations in an area that covers most of western Montana.

Wambach and Indian representatives are now in preliminary stages of working out regulations that the tribe could impose upon its own members since the tribes recognize that there is great potential for damage to the wildlife resource if hunting is unrestricted. Wambach is suggesting that the tribes establish seasons and game limits similar to those set by the state. The state is willing to help draft the regulations and may be able to help with enforcement by providing some money to hire tribal game wardens, according to the *Missoulian*.

The Montana court decision is one of several across the country granting such hunting privileges to Indians, according to Wambach. The trend concerns the National Wildlife Federation, which at its March convention adopted a resolution on Indian treaty rights. The resolution asks Congress to take immediate action to define Indian hunting and fishing rights as set out in the treaties and to confirm the authority of the states to regulate off-reservation hunting and fishing for all Americans. It adds, "Just Indian claims should be compensated for by suitable means other than discriminatory allocations of natural resources."

Whooper wounded; dies in Wyoming

One of the six surviving whooping cranes raised by foster sandhill crane parents was found dead near Lyman, Wyo. early in June. The bird had a wound on the upper inside of its left leg, but the cause of death has not yet been determined. The whooper was one of three that were hatched last year from Canadian eggs transplanted to sandhill nests at Grays Lake National Wildlife Refuge in Idaho. Three other whoopers were raised in the project in 1975. The entire wild whooper population numbers 65.

native plants



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12-High Country News — July 1, 1977

'Most economical, perhaps most efficient'

N.M. solar power group prefers passive designs

Keith Haggard is an unusually calm person, considering his job. He is running a low-budget, volunteer-based solar energy group. Although he is considered very knowledgeable, he was never formally trained in the field. He picked up his expertise in a hurry, by reading, experimenting, and teaching. He deals with a couple of dozen letters a day, a busy phone, frequent speaking engagements and sometimes over 20 visitors in the office at a time.

Haggard is executive director and a founder of the New Mexico Solar Energy Association in Sante Fe.

The association has served as the model for a myriad of groups around the country. It has over 1,500 members in 25 states and 6 foreign countries and a board of directors that includes many of the luminaries in the solar energy field today.

At the first meeting in 1974, Haggard brought together all the people he knew in the Sante Fe area who had done work in the solar field. That included a number of experts with a broad range of opinions. It included decentralist philosopher Peter Van Dresser, who built solar water heaters in Florida in the '30s. It included Steve Baer of Zomeworks and Bob Reines of ILS (Integrated Life Systems) Laboratories, both young, well-known champions of the do-it-yourself, non-mechanized approach to solar technology. It also included architects, engineers, academicians, and scientists from the Sandia and Los Alamos Laboratories, some with more traditional approaches to the new technology.

Haggard recalls some "table pounding and fist shaking and arm waving at that first meeting." It took the diverse group six months of haggling to come up with a simple set of bylaws.

"But it was well worth that slow and painful process," Haggard says. "We have managed to embrace diversity of outlook and opinion without flying apart."

Despite the diversity, Haggard admits that the group generally has a bias toward passive solar energy design, where nature does most of the work to heat and cool a house, rather than fuel-consuming pumps and fans.

Haggard also endorses the concept. He says the passive approach is the most economical and "perhaps even the most efficient" approach.

"The irony is that for years people have been working with active (mechanical) systems because they're easier to test and



KEITH HAGGARD, learning by teaching. He and the New Mexico Solar Energy Association are helping people design their own solar homes.

Photo courtesy of the New Mexico Solar Energy Association

write papers about than passive ones. We have all known for a long time that the passive approach works, but getting the numbers to prove it is not so easy," he says.

Haggard was among the founders of a firm called Sun Mountain Design that specialized in designing passive solar

homes that could be built out of local materials. The firm rejected what they called "high-cost, high technology" work and attempted to make every aspect of a house save or produce energy. Before the seven members of the firm recently disbanded, they had completed the design of six homes. At one, now the home of the association's chairman, Dr. J. D. Balcomb, the sun supplies 80 to 90% of the heat needed — mainly because of the way the house was designed.

BARN RAISINGS

Among the association's primary aims are information and skill dissemination. The association puts on an average of four conferences a year, in addition to seminars and workshops. Haggard calls the workshops "barn raisings," where students learn about solar energy by actually building a solar greenhouse, water heater, or crop dryer. The group publishes a monthly *Bulletin*, a mix of solar energy information and association news.

Recently, the association has begun a series of design workshops for people who want to build their own passive solar homes. The \$45 workshop is open to eight or ten students at a time. Most of these people have taken the association's introductory courses, and by the end of the three three-hour sessions with architects and engineers, are capable of doing the calculations necessary to design their own solar home, Haggard says.

Haggard, whose academic training is in the field of philosophy, says teaching

taught him most of what he knows about solar energy. He taught a solar energy course for three years at the school of architecture at the University of New Mexico and for four years in continuing education classes in Sante Fe.

Now Haggard works with a staff of three part-time assistants and "innumerable" volunteers at the association office, which for the past two years has been funded by a \$108,000 grant from the New Mexico Energy Resources Board. The money has allowed them to set up an office and a library with 20 small branches around the state, to publish their *Bulletin*, to hold workshops, and to send speakers around the state.

Haggard doesn't expect that the grant money will be available again next year. So there is talk at the association office of becoming more businesslike, "of charging a little bit of money for the things we've been giving away."

The association is a member of the American Section of the International Solar Energy Society (ISES). It was the first group to convince ISES to accept chapters at the regional rather than just the national level. Now there are about 20 local chapters of ISES in the U.S., most of them with bylaws modeled after the New Mexico Solar Energy Association's.

Membership in the association is \$10 a year. For a sample copy of the *Bulletin*, send \$1 and a stamped, self-addressed envelope. The July issue focuses on solar greenhouses.

Dear Friends,

Who is Peter Wild?

We are often asked that question. We have had to answer in the past without ever having met the man. Since 1974, he has been *High Country News's* distant benefactor and collaborator. He has blessed us in the highest way — with his time and talents.

We have admired Wild's skill as a writer and his commitment to conservation — and we have been pleased by his affection for *High Country News*. Neatly-labeled manila envelopes arrive from him regularly. They are always on time, and they are always good. So good, in fact, he makes an editor feel downright useless. "Editing" his manuscripts is pleasure reading.

He teaches creative writing and literature at the University of Arizona in Tucson. Doubleday has published three books of his poetry: *Cochise, The Cloning, and Chihuahua*. The first book of the trilogy was nominated for a Pulitzer prize in 1973.

In time left over from his poetry and his teaching, Wild monitors new books on the environment and reviews the best of them for HCN. Among other articles, he has produced nearly a book-length manuscript on the conservation pioneers of the West, which we have been publishing piece-by-piece over the past year. He has covered some of the most distinguished forbears of the conservation movement: Steven Mather, John Wesley Powell, Aldo Leopold, Bernard DeVoto, Joseph Wood Krutch, Gifford



Peter Wild, HCN's benefactor and collaborator

Pinchot, Mary Hunter Austin, and Olaus Murie (with Enos Mills and John Muir still to come). Having looked at the past, he is now at work on portraits of our contemporaries: William O. Douglas, David Brower, Ed Abbey, and others. You can understand why, though we had never met him before he made a brief visit to Lander early this month, Peter Wild was among HCN's most respected friends.

But even before we met him, we knew Wild pretty well from his writing. We had sensed that he was a kind and curious character who would rather share joy than vent spleen, for instance. That was clear from his book

reviews. Most book reviewers enjoy panning books, playing lofty critics. Wild prefers tackling good books. For his own and the readers' sakes, he ignores mediocre works, unless he feels there is a good reason readers need to be warned against them.

We had also noticed that Wild enjoyed writing about flamboyant, dramatic characters like Gifford Pinchot and Mary Hunter Austin. But his letters to us and his visit indicated that he is not of that ilk himself. We found him full of the plain richness of a man devoted to his art, not his image.

Even when asked about his poetry, a field in which egos tend to be large, Wild refused to puff up. His poetry comes quickly, simply, intuitively, he told us. It is writing prose which takes work.

We spent parts of three days with Peter and his wife, Sylvia. We found them such good company, we couldn't help ignoring newspapering for a while to savor the visit. We came back to work invigorated, from having finally met these dear, longtime friends.

As you notice, HCN includes two sections this week. This is only the second time in the paper's history that we have published 20 pages. Hopefully continued increases in advertising revenue will allow us to provide more space for news more often in the future.

In The News

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Journeys to the North led Olaus Murie into battles for wilderness

©1977 by Peter Wild
 Drawings by Olaus Murie

Perhaps no country in history altered its environment as quickly as did the United States in the first dozen or so decades of its existence. Cheap land, new technologies, and a swelling population — the very factors that gave the new nation muscle — also tended to leave the land a shambles, its wild species extinct or pushed into remnant populations.

By 1885 Yellowstone National Park sheltered the only buffalo herd of any size, reduced to 400 individuals from the estimated 60 million that once grazed from the Appalachians to the Pacific. Though a contingent of the U.S. Cavalry tried to protect them, the species dwindled as scarcity made its destruction more profitable. Poachers sold the shaggy heads for \$500 in Billings and Helena.

For generations migrating passenger pigeons caused trees to collapse, so great were their numbers. In 1914, Martha, the last of her kind, died ignobly in the Cincinnati Zoo. Similar if less dramatic fates awaited the white-tailed deer, bear, elk, moose, prairie chicken, and other animals that meat packers had shipped East by the carload. Whether in New Hampshire or Colorado, hunters stepped into the emptied woods and wondered where their free supply of protein had gone.

They ignored their own role in the obvious habitat destruction and the world's greatest animal slaughter. Instead they did the human thing: they blamed coyotes, foxes, eagles — whatever was at hand. Equally eager for handy villains, the government launched poisoning programs aimed at the few predators left on the eroded and clearcut lands of the public domain. A twisted concept of democracy, that each man was free to exploit resources as he saw fit, had combined with ignorance to decimate the nation's game in one enthusiastic burst.

The United States was not alone. According to their abilities, other developing countries of the New World joined in the free-for-all. Yet it is ironic that the nation



most efficient in the destruction also led in research and reform.

The colonists had brought the concept of hunting regulation from Europe. By 1880 all the states in existence had restrictions of one sort or another, but enforcement was spotty, and the laws did not face the real

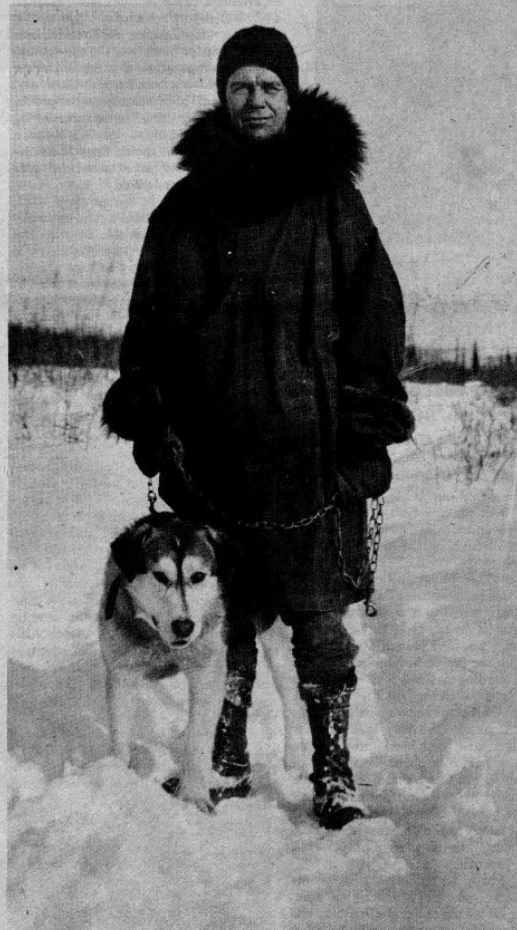
problems behind the decline. What had worked in Europe, where few but the wealthy pursued large game, and these on well-regulated reserves, was failing in a land of free enterprise v. nature.

In the midst of the rout, Thomas Jefferson, John James, and George Bird Grinnell

represented a kind of naturalists' counter-culture. They studied flora and fauna, frequently out of sheer fascination — eccentricities indeed in a land thriving on exploitation.

Such men as John Wesley Powell kept prodding Congress for needed support, and when the government embraced science in the closing years of the 19th century, a new era began. Professional botanists, foresters, and mammalogists now found places in a government that was creating the forerunners of the Park Service, the Forest Service, and the Fish and Wildlife Service.

With the other hand, however, the government continued to give away the public's land, nod at the clearcutting of forests, and poison innocent wildlife. With the rest of the country, the government shared a double standard toward the natural heritage. But gaining a foothold, a few men were revealing to an increasingly educated and sympathetic public the subtleties involved, that the passenger pigeon didn't simply fly away into oblivion. And though their interests extended far beyond game species, they began to receive acclaim for their wildlife studies from hun-



OLAUS MURIE and a favorite sled dog, Jack, in 1922. Photo by Jesse Rust

Temperatures of 40 below in subarctic Canada brought out both his endurance and sensitivity. "There was a feeling of purity about the whole thing, as if I were in a holy place," he said.



ters, especially city hunters, and from arms manufacturers, who saw their profits disappearing with the animals.

In the ranks of the scientific bureaucracy that coalesced in the first decades of the century, Olaus Murie is at once typical and outstanding. Like many ambitious boys, he worked his way through school to obtain the necessary credential, a degree in science. Then followed field trips, years of government service, publishing. However, it wasn't only that he became an expert in several areas that distinguished him from other colleagues — though that certainly helped; his scientific expertise gave his voice authority in a society that dotes on the specialist. It was more the voice itself, the warmth and vision of the personality behind it. Murie could move others to preserve America's wild places.

His government career was not a series of plodding steps up the bureaucrat's ladder to success. In the youth of our grandparents, there were still blank spots on the maps of Canada and Alaska, species that had not been studied in depth, Eskimos that had not seen a white face. His career contained the stuff of adventure that kept the readers of Jack London on the edges of their chairs, though for his part the young biologist emphasized the thrills of everyday nature rather than of danger. Furthermore, Murie had the luck to explore and investigate independently in a way that perhaps is not possible today.

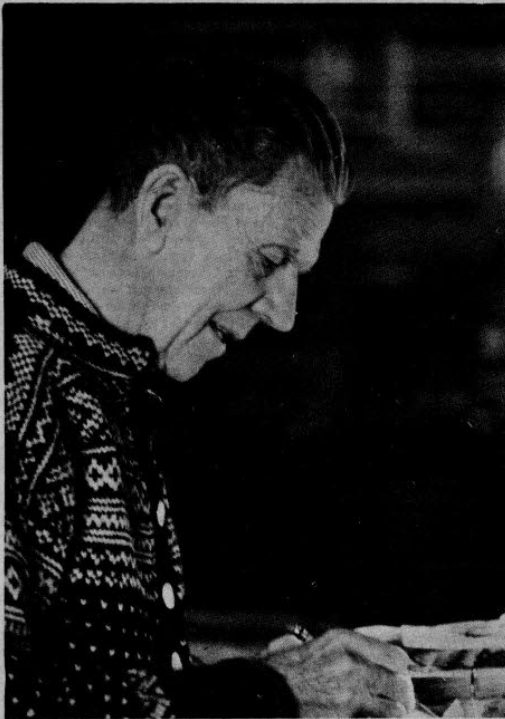
Once, tired of driving a dog team for (continued on page 14)



hairy woodpecker

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Murie inspired wilderness fight. . .



Murie's authority in science and long experience with the government bureaucracy, combined with amiability and strength, served him well in his most lasting contribution: motivating others.

(continued from page 13)

hours, only to spend the evening filling out meaningless forms about his activities, he informed his superiors that they'd have to be satisfied with one report a month. They nodded and let him have his lead — a phenomenon hard to imagine in the age of the computer.

A close family life and wild countryside offered compensations for his financially poor and strenuous boyhood. Less than 10 years after arriving from Norway, Murie's father died, leaving his immigrant wife with a house, one cow, and three young sons. The boys pitched in, selling milk, picking potatoes, plowing for local farmers. With his brother Adolph, who also became a distinguished biologist, Murie paddled a homemade canoe up and down the Red River near his home in Moorhead, Minn., looking for bird nests while keeping an eye out for imaginary Indians — good training, it would turn out, for his future work.

After high school, he enrolled in Fargo College, across the river in North Dakota. Money was short, graduation uncertain. But when his biology professor, Dr. A. M. Bean, took a new teaching position in Oregon, he wrangled an assistantship for his most ambitious student.

In 1912, at the age of 23, Murie graduated from Pacific University. During World War I, he would have his nerves tested in the Army balloon service, whose observers studied enemy lines suspended from large and bulbous targets. Ten years

later, he would earn a Master of Science degree from the University of Michigan, and he eventually received an honorary doctorate from his alma mater of undergraduate years.

For the time being, however, he began his 30-year profession as a field biologist by collecting specimens and taking wildlife photographs for the Oregon State Game Warden. It was not a prestigious job, but it was a job, the first in his chosen field, and he was learning the skills that would make a distinguished career possible.

When a break came two years later, he was still young, relatively inexperienced but eager, and there were no entanglements to hold him back. The Carnegie Museum in Pittsburgh had hired a collector to accompany explorations in subarctic Canada, but the man weighed the dangers against family responsibilities and backed out. Would Murie like to go in his place? Of course he would.

The expedition, consisting of an ornithologist leader and Murie as assistant, stepped off the train near the southern end of Hudson Bay, where they met their two Ojibway guides. "I looked around," the young biologist remembers. "We were on the bank of a river thickly flanked by spruce forest as far as one could see. . .

Before us, stretching far into the north, lay the unknown." Then they got into their canoe to spend the summer paddling north through the blank spaces on their map.

At one point they beached on a barren

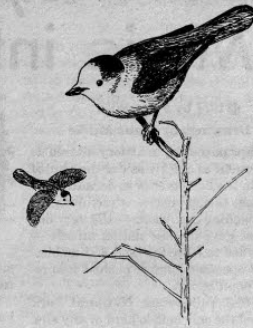
island in the bay to prepare bird specimens and rest from hours of fighting a head wind. Far from the routes traveled by Indians, in the brief respite the tiny expedition nearly met its end. After the four had stretched their legs a bit, they looked up to see the canoe gliding away high in the water. Impulsively, Murie plunged in, only to feel that "a deadly chill was creeping over me as I floundered in the icy water" of the subarctic sea. A cramp gripped his leg as the canoe skimmed blithely off before the wind. He barely made it back. Meanwhile, the two Indians were busy lashing together drift logs with a bit of wire that happened to be in the skinning outfit. They managed to retrieve the canoe, which had blown against another island.

For all the dangers, Murie reveled in the experiences. In the fall the expedition officially ended, but he stayed on in the north, traveling with Eskimos and Cree Indians on their winter hunts over the snowbound muskeg. Temperatures of 40 degrees below zero brought out both his endurance and sensitivity. "There was a feeling of purity about the whole thing," he says wandering about in a frigid night, "as if I were in a holy place. . . ." Echoing Enos Mills, he called what others looked on as harsh and uncivilized a "wonderland."

Two years later, in the spring of 1917, Olaus Murie again struck out by canoe for the Carnegie Museum, this time up the Ste. Marguerite River. The goal of the little band was to become the first scientific expedition to cross Labrador from the St. Lawrence River north to Ft. Chimo, a trading post near the Arctic Circle. From the end of May through the middle of August the group met three people, an Indian carrying a canoe, followed by his wife with their baby in her pack. Again, maps were inaccurate or nonexistent. For 750 miles they paddled and portaged, sometimes losing their way in Labrador's labyrinth of river systems.

At one point the Indian guides threatened mutiny. But to Murie wildlife was the main excitement: "All at once I found the place alive with birds. A ruby-crowned kinglet appeared. . . . He came up close, showing his ruby crown and his bright white-ringed eye. At intervals he sang and I could see his throat vibrate. . . ."

Though he might not have been consciously aware of the fact, by the time he was 30 Murie had added impressive skills to his college training. He was adept at collecting, he could speak Eskimo, and most importantly he had proved that he could do scientific work in the inhospitable northland. The U.S. Biological Survey (now called the Fish and Wildlife Service) sent him to Alaska in 1920. Despite frantic gold rushes and the establishment of fishing and lumber industries there were great



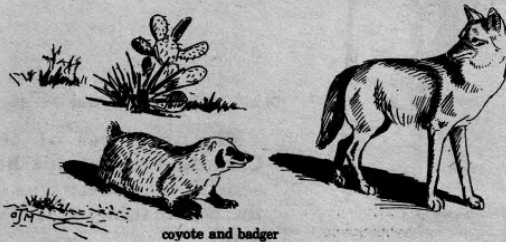
gray jays

gaps in solid information about the territory, which had been in the nation's possession for less than 60 years. Areas as large as some states in the Lower 48 were practically unknown.

Geography at least stays put. Even less was known about Alaska's wildlife. In a country hard on most barnyard species, white men as well as natives depended on the wandering caribou for much of their protein. If the herds declined, it meant hardship, if not starvation, in the North. For six years — by dogteam, on snowshoes, by poling boat, by river steamer — Murie crisscrossed Alaska, serving as a fur warden, studying the brown bear, banding waterfowl. The duties were incidental to his main assignment: probing the dynamics of Alaska's caribou. The result, *Alaska-Yukon Caribou* (1935), remains a standard text for mammalogists.

Romance is difficult in Alaska, at least it was in the days when hunter or biologist might be gone in the wilderness for months at a time. But at three o'clock on a summer morning in the little log church of Anvik, Margaret Thomas, carrying a bouquet of arctic poppies, married Olaus Murie.

As field biologists will testify, the choice of a wife is crucial. Some friends of the couple considered Murie's work and doubted that the marriage would last. They didn't count on the spunk of Mrs. Murie, the first woman graduate of the University of Alaska. Nor did they count on her own joy in wilderness, on her love for her husband. The first day of their marriage, Margaret Murie says, ". . . we suddenly looked at each other with laughing eyes, knowing that we were together and ready for anything." Hundreds of miles from the nearest pediatrician or marriage counselor, they worked as a team. When a baby came, they took it along on trips, feeding it powdered milk mixed with water from the Yukon River. In 1962 Margaret



coyote and badger

Olaus and Margaret Murie worked as a team. When a baby came, they took it along on trips, feeding it powdered milk mixed with water from the Yukon River.

Murie captured the ruggedness and charm of their experiences in *Two In The Far North*, a book illustrated by her husband.

Pleased with his work on caribou, in 1927 the Biological Survey sent him to Jackson Hole, Wyo., to investigate the famous elk herd that ranged near the Teton. Like the caribou, the elk were suffering from the pressures of modern civilization. Murie's *The Elk Of North America* (1951) joined his earlier book as a necessary text. In 1954 his *Field Guide To Animal Tracks* became a unique aid for amateurs and professionals alike in identifying wildlife.

Over the years he traveled widely — to Norway, British Columbia, New Zealand, the Aleutian Islands — and had a variety of interests — writing, lecturing, and illustrating books, notably J. Frank Dobie's *The Voice Of The Coyote* (1949). Still, until his death in 1963 the log cabin on the banks of the Snake River would be his home base and still is a gathering place for conservationists from around the world.

There is a photograph of Murie that tells more about him than a list of his publications or a summary of his awards. The biologist is dancing with a group of Aleuts, arms raised, smiling. The spontaneity comes through the snapshot: this is no civilized white on a condescending lark with the local natives, but a man sharing a central joy. He reflects on his research that "the happiest experience of all (was) getting acquainted with the people."

Yet Murie was no sentimental pushover. Once during their courtship, his future wife snapped at his "everlasting good nature." His response: "Look, if you want a fight, you can have it." Beneath the warmth, she testifies, "was steel within." These qualities — his authority in sci-

ence and long experience with the government bureaucracy, combined with amiability and a strength based on self-confidence — served him well in his most lasting contribution: motivating others. In 1945 he retired from government service and became director of the Wilderness Society, an organization he served in executive capacities until his death.

His life began before the invention of the automobile and ended after Hiroshima. He recognized the deception in a technological society that offered a lavish degree of physical comfort in some areas but at the price of overcrowding, pollution, and constant spiritual frustration. His philosophy is best summed up in a comment he made on the Eskimos, who each winter faced the possibility of starving:

"As I think of my sojourn among the Eskimos of Hudson Bay, I realize that there was no law there — no officers in uniform. People reacted to each other in a natural way. We, as humans, have certainly not reached our human goal; we are only on the way. I am convinced that in the evolution of the human spirit something much worse than hunger can happen to a people."

For him a reserve of wildness was necessary to a sane civilization, a wildness that had largely disappeared during his lifetime.

In the main that philosophy parallels the thinking of Aldo Leopold. Basically, they arrived at similar views from different approaches. As in nature, variety means strength, and the differences meant unique contributions from each. Because of bureaucratic frustration, Leopold quit the Forest Service in 1928. On the other hand, Murie made a career in the Biological Survey, far more sympathetic to wildlife than its sister agency. Thus he was able to have

a direct bearing on the government's wildlife policies. Because of his love of hunting and his utilitarian training in forestry, it took Leopold years of struggle to arrive at his philosophy — one that Murie seems to have accepted from boyhood.

Significantly, Leopold deserves the credit for establishing the nation's first wilderness area; in later years he helped found the Wilderness Society. Yet his lasting monument is *A Sand County Almanac*, a book that endeared him to the public. Much of Murie's writing is specialized; his greatest contribution was his personal ability to move others.

For years along with Leopold, Howard Zahniser, and others, Murie worked for passage of the Wilderness Act, which now protects at least a portion of America's wild

heritage. Unfortunately, he died a year before the act became law. However, he had one great satisfaction in later years. At the age of 67 he led an expedition to Alaska's Brooks Range. Soon after, partially as the result of his urgings, the Secretary of the Interior created the Arctic National Wildlife Range in northeastern Alaska.

The posthumous *Journeys To The Far North* (1973) is a good place to catch the flavor of Murie in the wilderness. The Muries' reminiscences of Jackson Hole country, *Wapiti Wilderness*, appeared in 1966. John G. Mitchell's "Where Have All The Tuttu Gone?" in the March 1977 issue of *Wilderness*, is an update on Alaska's beleaguered caribou.

Locals skeptical of ERDA plan to manage Mercer Co. growth

by Sheldon Green

A federal energy agency has its eye on establishing a rural conservation research laboratory in lignite coal-rich Mercer County, N.D.

The Energy Research and Development Administration (ERDA) plans to experiment with using waste hot water from electrical generating plants to heat buildings, for example, and also test other forms of energy conservation.

Mercer County was selected by ERDA because it presently has two coal-fired electrical generating plants in operation and plans call for two more generating plants and at least one coal gasification plant to begin construction within the next year.

Tied with the research laboratory is a growth management plan, which, if approved by local authorities, would use joint powers legislation to handle impact alleviation. The county's 6,000 population is expected to more than double in the next three years, and ERDA insists on a relatively stable environment in which to conduct its energy experiments.

Local citizens have not been outwardly enthusiastic, however, about the federal plan because they fear loss of local control in decision making. Local officials will decide this month whether or not to accept it.

In a series of meetings during early June, ERDA's Washington, D.C., consulting firm and former North Dakota State Sen. Robert Stroup met with each school district, city, and the county commission to enlist support for the plan. They managed to write a draft proposal for the organization of an Energy Development Board. Stroup, who was responsible for writing the state's first coal severance tax legislation and reclamation laws is a Mercer County native. He was hired by the consulting firm to help sell the ERDA plan in Mercer County.

The Energy Development Board, which must be implemented before ERDA will begin its conservation experiments, would operate on a \$100,000 annual grant from ERDA and provide the county with a full-time director and a staff of at least two professional planners. The board would "open doors" for impact funding, seek the rezoning of land for housing and business developments, re-write a county comprehensive plan, and coordinate community development.

Representatives from each school dis-

trict, city, and the three county commissioners would sit on the board. The group would be scheduled to disband in 1980.

ERDA's role, according to one top official, would merely be "a fly on the wall" to watch impact alleviation plans before undertaking its experiments. The official also said that Mercer County was chosen from 12 Western state energy development sites because it is still on "the ground floor" in preparation for energy development.

More meetings are planned for mid-July, with possible implementation of the growth management plan this fall. This would coincide with ERDA's fiscal year which begins in October.

Presently, Mercer County has an outdated 1968 comprehensive plan, but no county or city planners are now working on impact alleviation.

Denver challenges water reserve

The Denver Water Board has taken on the U.S. government in a court suit challenging federal claims to "reserved rights" on water in national forests. The challenge is expected to be a "landmark case that undoubtedly will go all the way to the U.S. Supreme Court," according to the board's special counsel, Glenn Saunders.

The U.S. government contends that when federal enclaves, such as national forests or parks, were established, a water right was also reserved, by implication, for the purposes the reserve was established. For instance, the reserved rights for a national forest might include minimum flows for fisheries or for recreation. The U.S. government also says the priority date for the water right is the date that the enclave was set aside. By Western water law, rights with earlier dates get priority if there is a shortage.

The Denver Water Board lawyers maintain that the Colorado Constitution, accepted by Congress more than a century ago, declares that all unappropriated water in the state is the property of the people in the state, according to the *Denver Post*.

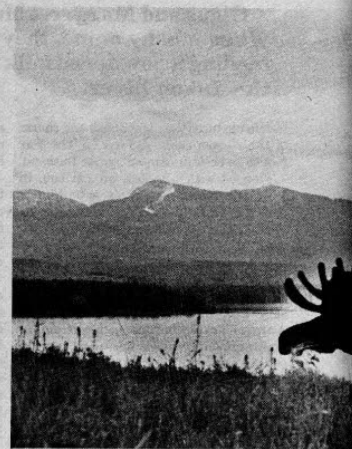
The controversy concerns water rights Denver is seeking to protect in forest reserves in several areas of western Colorado. A special water referee appointed to settle a dispute over 250,000 acre-feet of water on the Western Slope found in 1975 that Denver should not get the water.



MARGARET AND OLAUS MURIE at their home in Moose, Wyo.
Photo by Phyllis Stevie



TRYING TO MATCH STRIDE, a young calf moose is learning about the big world of Montana outdoors from his mother. Photo courtesy of Montana Dept. of Highways.



BROWSING ON YELLOWSTONE LAKE at sunset.

The moose: stubborn creature

by Sarah Doll

The ungainly-looking, unpredictable moose is the largest member of the deer family, and is probably the largest antler-bearing mammal that's ever lived. The ancestors of the present-day moose came to this continent over a land bridge between North America and Asia that was uncovered during the Great Ice Age one and a half million years ago. Environmental differences have produced the four different subspecies that exist in this country today. The one most familiar to Rocky Mountain residents is *Alces alces shirasi*, or the Shiras moose, which lives in western Wyoming, parts of Idaho, and western Montana.

A mature Shiras moose will be 8-10 feet long and 5½ to 7½ feet high at the shoulder. Weight will be between 900 and 1,400 pounds. The species found in Alaska and the Yukon, *Alces alces gigas*, may weigh 1,800 pounds.

The appearance of the moose is unique, and it is rarely mistaken for any other animal. Its coloration is brownish-black with a lighter belly, which serves as protective coloration when the moose seeks cover in the forest. Its large body sits on stiltlike legs that seem too small. Its neck is topped by a long mane that stands erect when the animal is angry. Other characteristics that make the moose unique are its long, pendulous nose, with upper lip protruding over the lower, and the "bell," a dewlap hanging from the throat that apparently serves no purpose.

Like all other members of the deer family, moose walk on their third and fourth toes. Evolution has eliminated the first toe, and toes two and five are "dew claws," or horny projections on the back of the leg. Moose tracks measure about six inches long and four and a half inches wide.

To detect danger the moose is dependent on its excellent senses of hearing and of smell. Its eyesight is poorly developed.

Seemingly not as skittish as the other members of the deer family, its first reaction to danger is usually to stand and look at the threat, as if trying to decide what to do next. Although the moose usually feeds in the open, if possible it stays close to wooded areas, so flight will involve only a short run for cover.

For the most part, the moose is a solitary animal. When groups of them are seen together, it is usually only because there happens to be a good food supply in the area. They have no interactions as a group. However, a bull will stay with a cow for several days during mating season, and young bulls will sometimes hang around them, forming an uneasy rutting group.

Calving occurs in the spring, usually in May. Twins occur about 15% of the time. Cow moose are good mothers, but, in the case of twins, don't seem to worry much about one calf as long as the other is near. The cow usually feeds close to her calf, and is so protective that any living thing that comes within range is under immediate threat of attack. After two or three days, the calf will follow the cow, but is apt to have problems negotiating heavy brush or streams. For the first few months, neither cow nor calf travels far.

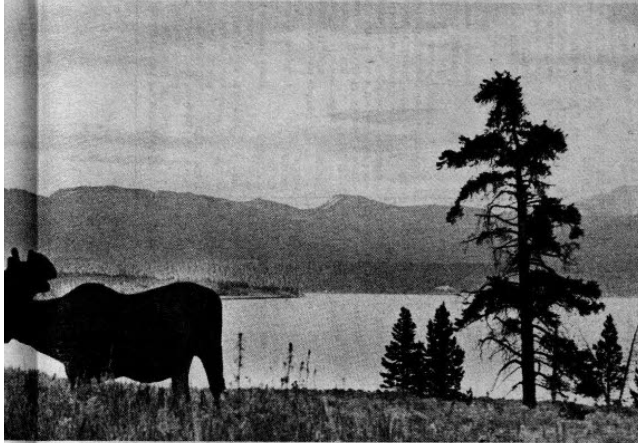
Calf mortality is greatest during the first two weeks, especially after a difficult winter, when many calves are born in a weak, undernourished condition. Drowning and predation are two principal factors of mortality.

The calves stay with the cow for at least a year, and sometimes will hang around even after the new crop of calves is born the following spring, in spite of attempts by the cow to drive them off.

Moose are browsers, and the willow is the most important food source. In the summer, when food is easily available, they feed mostly on the tender new growth. In the spring when the sap is rising in trees, they seem to enjoy eating bark off



BULL MOOSE in the rutting season. The horns are shed in the early winter and are used for jousts with other bulls rather than for protection from predators. Photo by Dick Barker.



...nset, this bull exemplifies the sometimes placid temperament of moose. Photo by Jeff Clack.

an ungainly, ature on tip-toe

trees. They vary their summer diet with aquatic plants, and are frequently seen feeding with their heads underwater. Occasionally they will completely submerge their bodies in deep water to feed, and can stay under for about a minute.

Like almost all wildlife, the moose has a more difficult time finding forage in the winter. It is forced to eat the two- or three-year-old growth of the willow, and receives much less nutritive value from this food. In general, moose are nonmigratory, but they will move 20 miles or so in search of food in the winter if necessary. Ordinarily, their movements are downward towards the lower meadows in the winter, but they have been seen on windswept ridges in the winter, taking advantage of the smaller snowpack found there.

Moose are probably hunted as much for trophies as for food. The male starts antler growth in April, after shedding the old growth the previous December. The total growth occurs in a four-month period, and the rack can reach a weight of 60 pounds. The best racks are found on prime animals between 6 and 10 years of age. After that age, the bulls develop antlers with fewer points and less symmetry. Records from the Boone and Crockett Club show the greatest antler spread for the Alaskan moose to be 77½ inches; 53 inches is the record for the Wyoming moose. The antlers are not used much for defense against predators, a job usually done with the hooves, but are used against other bulls occasionally during the mating seasons.

Moose in Wyoming have only a few predators besides man to fear. The grizzly bear can take an adult moose in the spring when heavy snows hamper the moose's movements and it is in a weakened condition after the long winter. Other predatory animals found in Wyoming, Montana, and Idaho have little effect on moose populations. The bobcat, coyote, lynx, and black bear are capable of taking a moose calf, but

usually are thwarted by the cow. The wolf, in the few areas where it still exists, is the major moose predator. Most wolf kills occur in the winter, when other game is scarce and the moose must flounder through deep snowdrifts. However, if a strong, healthy moose doesn't lose its nerve and try to run, exposing its rear legs to the slashing teeth of the wolf pack, it can usually hold off the pack until it gets discouraged and looks for other prey.

While moose hunting increased as the white settlers moved into North America, the overall effect on moose populations hasn't been all bad. In fact, moose have extended their range into new areas in this century. The Jackson Hole area of Wyoming is a good example. Explorers of the early 19th century did not report seeing any moose at all; by 1912 there were 47 moose in the area. The Big Game Inventory of 1968 showed an estimated 700 moose living in Jackson Hole. The probable reason for this and other range extensions was the cutting and burning of the forests by settlers, which opened up large new areas to the browse plants needed by the moose.

Conflicts between moose and man have been inevitable, however. The moose is stubborn and unpredictable, and attacks on snowplows and locomotives have been reported, most often with fatal consequences for the moose. Moose tend to use man's roads in the winter for easy travel, but will refuse to give up the right-of-way to cars, also with disastrous results.

Moose habitat faces the same threats from man's projects as does that of all wildlife. Habitat along the upper reaches of the Green River in Wyoming, presently the home of the largest concentration of Shiras moose in North America, is threatened by the proposed Kendall Dam, for example.

Material for this article was drawn from *The World of the Moose*, by Joe Van Wormer.

I look out in the morning to see a huge moose come swimming downriver. He swims so silently that only the ponderous rack marks his approach. He climbs ashore directly across the river and prances off, neck extended, a big chocolate-brown mélange of an animal, heavy head out of place on graceful racehorse legs, surprisingly light-footed and fleet.

—Ann Zwinger
RUN, RIVER, RUN



ENJOYING A GOURMET MEAL, this Wyoming moose hardly appears to be the swift, graceful creature he is in motion. Wyoming Travel Commission photograph.

News - July 1, 1977

<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>The American Star Ins. Co. 360 Sansome St., San Francisco, Calif. 94108 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$21,184 Total Premiums Received \$21,184 Total Deductibles \$15,042,818 Total Admitted Assets \$15,042,818</p> <p>Liabilities Direct Benefits and Losses Incurred 12,789,974 Total Admitted Assets 1,900,000 Capital Stock Paid Up 1,278,974</p> <p>Income during year ending December 31, 1976 10,087,882</p> <p>Expenditures for year ending December 31, 1976 10,647,149</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>American Star Life Ins. Co. 900 North Meridian Street, Indianapolis, Ind. 46207 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$44,104 Total Premiums Received \$44,104 Total Deductibles \$1,461 Total Admitted Assets \$42,643</p> <p>Liabilities Direct Benefits and Losses Incurred 42,643 Total Admitted Assets 42,643 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 22,632,397</p> <p>Expenditures for year ending December 31, 1976 20,674,778</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>American Title Ins. Co. P.O. Box 01-0022, Miami, Fla. 33101 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$13,882 Total Premiums Received \$13,882 Total Deductibles \$1,461 Total Admitted Assets \$12,421</p> <p>Liabilities Direct Benefits and Losses Incurred 12,421 Total Admitted Assets 12,421 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 15,082,878</p> <p>Expenditures for year ending December 31, 1976 14,521,382</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>American Union Ins. Co. 900 North Meridian Street, Indianapolis, Ind. 46207 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$11,882 Total Premiums Received \$11,882 Total Deductibles \$1,461 Total Admitted Assets \$10,421</p> <p>Liabilities Direct Benefits and Losses Incurred 10,421 Total Admitted Assets 10,421 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 22,632,397</p> <p>Expenditures for year ending December 31, 1976 20,674,778</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>American Mutual Ins. Co. 250 Midland Road, Menlo Park, Calif. 94025 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$16,471 Total Premiums Received \$16,471 Total Deductibles \$1,461 Total Admitted Assets \$15,010</p> <p>Liabilities Direct Benefits and Losses Incurred 15,010 Total Admitted Assets 15,010 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 27,272,045</p> <p>Expenditures for year ending December 31, 1976 25,942,882</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>American Mutual Ins. Co. 144 W. 4th Street, Providence, R.I. 02903 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$4,082 Total Premiums Received \$4,082 Total Deductibles \$1,461 Total Admitted Assets \$2,621</p> <p>Liabilities Direct Benefits and Losses Incurred 2,621 Total Admitted Assets 2,621 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 17,209,882</p> <p>Expenditures for year ending December 31, 1976 15,981,098</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>American Mutual Ins. Co. 440 Lombard Street, Worcester, Mass. 01605 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,700 Total Premiums Received \$1,700 Total Deductibles \$1,461 Total Admitted Assets \$223</p> <p>Liabilities Direct Benefits and Losses Incurred 223 Total Admitted Assets 223 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 16,678,465</p> <p>Expenditures for year ending December 31, 1976 17,207,201</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Anchor Ins. Co. Cushman St. at 22nd Street, Phoenix, Ariz. 85016 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,274,900 Total Premiums Received \$1,274,900 Total Deductibles \$37,851 Total Admitted Assets \$1,237,049</p> <p>Liabilities Direct Benefits and Losses Incurred 1,237,049 Total Admitted Assets 1,237,049 Capital Stock Paid Up 2,001,183</p> <p>Income during year ending December 31, 1976 130,492,082</p> <p>Expenditures for year ending December 31, 1976 129,676,892</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Anchor Ins. Co. Cushman St. at 22nd Street, Phoenix, Ariz. 85016 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,274,900 Total Premiums Received \$1,274,900 Total Deductibles \$37,851 Total Admitted Assets \$1,237,049</p> <p>Liabilities Direct Benefits and Losses Incurred 1,237,049 Total Admitted Assets 1,237,049 Capital Stock Paid Up 2,001,183</p> <p>Income during year ending December 31, 1976 130,492,082</p> <p>Expenditures for year ending December 31, 1976 129,676,892</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Anchor Ins. Co. Cushman St. at 22nd Street, Phoenix, Ariz. 85016 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,274,900 Total Premiums Received \$1,274,900 Total Deductibles \$37,851 Total Admitted Assets \$1,237,049</p> <p>Liabilities Direct Benefits and Losses Incurred 1,237,049 Total Admitted Assets 1,237,049 Capital Stock Paid Up 2,001,183</p> <p>Income during year ending December 31, 1976 130,492,082</p> <p>Expenditures for year ending December 31, 1976 129,676,892</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Anchor Ins. Co. Cushman St. at 22nd Street, Phoenix, Ariz. 85016 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,274,900 Total Premiums Received \$1,274,900 Total Deductibles \$37,851 Total Admitted Assets \$1,237,049</p> <p>Liabilities Direct Benefits and Losses Incurred 1,237,049 Total Admitted Assets 1,237,049 Capital Stock Paid Up 2,001,183</p> <p>Income during year ending December 31, 1976 130,492,082</p> <p>Expenditures for year ending December 31, 1976 129,676,892</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Anchor Ins. Co. Cushman St. at 22nd Street, Phoenix, Ariz. 85016 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,274,900 Total Premiums Received \$1,274,900 Total Deductibles \$37,851 Total Admitted Assets \$1,237,049</p> <p>Liabilities Direct Benefits and Losses Incurred 1,237,049 Total Admitted Assets 1,237,049 Capital Stock Paid Up 2,001,183</p> <p>Income during year ending December 31, 1976 130,492,082</p> <p>Expenditures for year ending December 31, 1976 129,676,892</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Anchor Ins. Co. Cushman St. at 22nd Street, Phoenix, Ariz. 85016 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,274,900 Total Premiums Received \$1,274,900 Total Deductibles \$37,851 Total Admitted Assets \$1,237,049</p> <p>Liabilities Direct Benefits and Losses Incurred 1,237,049 Total Admitted Assets 1,237,049 Capital Stock Paid Up 2,001,183</p> <p>Income during year ending December 31, 1976 130,492,082</p> <p>Expenditures for year ending December 31, 1976 129,676,892</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Anchor Ins. Co. Cushman St. at 22nd Street, Phoenix, Ariz. 85016 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,274,900 Total Premiums Received \$1,274,900 Total Deductibles \$37,851 Total Admitted Assets \$1,237,049</p> <p>Liabilities Direct Benefits and Losses Incurred 1,237,049 Total Admitted Assets 1,237,049 Capital Stock Paid Up 2,001,183</p> <p>Income during year ending December 31, 1976 130,492,082</p> <p>Expenditures for year ending December 31, 1976 129,676,892</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Associated Indemnity Corp., Calif. 94116 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$114,421 Total Premiums Received \$114,421 Total Deductibles \$2,384 Total Admitted Assets \$112,037</p> <p>Liabilities Direct Benefits and Losses Incurred 112,037 Total Admitted Assets 112,037 Capital Stock Paid Up 1,278,974</p> <p>Income during year ending December 31, 1976 49,204,738</p> <p>Expenditures for year ending December 31, 1976 48,716,815</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Associated Life Ins. Co., Chicago, Ill. 60601 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$4,380 Total Premiums Received \$4,380 Total Deductibles \$1,461 Total Admitted Assets \$2,919</p> <p>Liabilities Direct Benefits and Losses Incurred 2,919 Total Admitted Assets 2,919 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 15,197,815</p> <p>Expenditures for year ending December 31, 1976 14,840,768</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Assurance Company of America P.O. Box 1126, Baltimore, Md. 21208 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,238,505 Total Premiums Received \$1,238,505 Total Deductibles \$1,461 Total Admitted Assets \$1,237,044</p> <p>Liabilities Direct Benefits and Losses Incurred 1,237,044 Total Admitted Assets 1,237,044 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 284,169</p> <p>Expenditures for year ending December 31, 1976 282,937</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Association Life Ins. Co. 748 N. 2nd St., Milwaukee, Wis. 53203 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$1,100 Total Premiums Received \$1,100 Total Deductibles \$1,461 Total Admitted Assets \$263</p> <p>Liabilities Direct Benefits and Losses Incurred 263 Total Admitted Assets 263 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 28,717,277</p> <p>Expenditures for year ending December 31, 1976 28,417,260</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Atlantic Mutual Insurance Co. 46 Wall St., New York, N.Y. 10005 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$3,332 Total Premiums Received \$3,332 Total Deductibles \$1,461 Total Admitted Assets \$1,871</p> <p>Liabilities Direct Benefits and Losses Incurred 1,871 Total Admitted Assets 1,871 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 130,618,907</p> <p>Expenditures for year ending December 31, 1976 130,019,109</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Atlas Assurance Co., Ltd. U.K. Branch 59 John St., New York, N.Y. 10038 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$26,674,325 Total Premiums Received \$26,674,325 Total Deductibles \$1,461 Total Admitted Assets \$26,672,864</p> <p>Liabilities Direct Benefits and Losses Incurred 26,672,864 Total Admitted Assets 26,672,864 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 7,205,534</p> <p>Expenditures for year ending December 31, 1976 6,644,281</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>	<p>DEPARTMENT OF INSURANCE STATE OF WYOMING</p> <p>Associated Doctors Health and Life Ins. Co. 38265 Warrington Ave. St., Birmingham, Ala. 35299 BUSINESS IN WYOMING FOR THE YEAR ENDING DECEMBER 31, 1976</p> <p>Assets Total Premiums Received \$4,500,000 Total Premiums Received \$4,500,000 Total Deductibles \$1,461 Total Admitted Assets \$4,498,539</p> <p>Liabilities Direct Benefits and Losses Incurred 4,498,539 Total Admitted Assets 4,498,539 Capital Stock Paid Up 9,212,285</p> <p>Income during year ending December 31, 1976 10,760,041</p> <p>Expenditures for year ending December 31, 1976 10,111,998</p> <p>Code: I certify that to the best of my knowledge and belief, the insurer above named is in all respects in compliance with the laws of this State relating to insurance, and it is duly authorized to transact the business of insurance in the State of Wyoming.</p> <p>Dated May 26, 1977 John T. Langdon Insurance Commissioner</p>
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HCN Bulletin Board



July 1, 1977
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ENVIRONMENTAL HISTORY

A book called **American Environmental History**, a study on the exploitation and conservation of natural resources in the U.S., is available from Boyd and Fraser Publishing Co. for \$10 in paperback and \$20 in cloth. "This well-written book puts it all in perspective," according to **The Workbook**. It was written by Joseph M. Petulla and is 399 pages. It is available from the publisher at 3627 Sacramento, San Francisco, Calif. 94118.

STRIP MINE BLASTING REPORT

The Center for Science in the Public Interest, a Washington-based environmental group, has published a report entitled, "Strip Mine Blasting: A Study of Vibrational Pollution." The 124-page report is available from Reports Department, CSPI, 1757 "S" Street, NW, Washington, D.C. 20009, for \$25.

SUMMER WYOPASS MEETING

The annual conference of the Wyoming Planning Association will be held July 21 and 22 in Shell, Wyo. The agenda includes a Forest Service Land Use Planning panel discussion and a presentation by Beth Givens from Old West Regional Commission on "Energy Data: where to find it and how to retrieve it."

FIRE MANAGEMENT

A Draft Assessment of Forest Fire Control and Management in Glacier National Park is available for public inspection at park headquarters in West Glacier, Mont. A three-page summary may be obtained by writing to the Superintendent, Glacier National Park, West Glacier, Mont. 59936.

WILDLIFE RECLAMATION WORKSHOP

Ecology Consultants, Inc. plans an intensive workshop Sept. 19 and 20 on the Colorado State University campus in Ft. Collins. Topics include surface mine reclamation, wildlife habitat, and special techniques. Information is available from Dr. Russell Moore, Box 2105, Ft. Collins, Colo. 80522, (303) 493-8878.

HEAT EXPO '77

Montana Community Action Program Directors, the Montana Energy and MHD Research Institute, and the National Center for Appropriate Technology will hold a Home Energy through Appropriate Technology (HEAT) Expo July 21 to 23 in Kalispell, Montana. The seminar will include eight speakers, hands-on workshops, discussions, films, and slides covering energy conservation, furnace maintenance, insulation, wood heat, solar reliant greenhouses, and passive solar techniques. A pre-registration fee of \$7 should be sent to HEAT EXPO '77, care of NCAT, P.O. Box 3838, Butte, Mont. 59701. Questions can be answered by Meladee Martin at (406) 723-5474.



ROADLESS AREA GROWS

The Scotchman Peak roadless area is more than twice as big as the U.S. Forest Service originally estimated. Land use planning efforts that followed the agency's roadless inventory five years ago have caused Kootenai National Forest officials to adjust their estimate from 37,020 acres to 77,504 acres. The land use plan for the area will be discussed at public meetings June 22 at the Methodist Fellowship Hall in Troy, Mont., and June 23 at the Clark Fork School in Clark Fork, Idaho. Both meetings will begin at 7:30 p.m.

MONTANA FORESTS PLAN

A review draft of the U.S. Forest Service's "Central Montana Planning Area Guide" is ready for public comment. The planning area includes about six million acres in the Beaverhead, Deerlodge, Helena, and Lewis & Clark National Forests of central Montana. Copies of the draft are available at Forest Service offices in Great Falls, Helena, Butte, Dillon, and the Northern Region headquarters in Missoula. Comments should be sent to USDA Forest Service, Northern Region, Attn: Planning, Programming & Budgeting, Federal Building, Missoula, Mont. 59807.

HALT CLAIM JUMPERS

The Northwest Citizens for Wilderness Mining Company, INC. (NCWMC) has become involved in litigation with the American Smelting and Refining Co. over ASR's alleged claim jumping in the Scotchman's Peak Wilderness Study Area. To finance their endeavors and keep ASR off their claims, they are offering non-voting, non-revenue-producing mining certificates for \$5 apiece. The NCWMC advocates pick-and-shovel mining with an environmental conscience. Send for the certificates at Star Route, Noxon, Mont. 59853.

TRANSMISSION LINE GUIDE

The U.S. Forest Service has published an inventory guide for the location of electrical transmission lines in the national forests and grasslands of northern Idaho, Montana, North Dakota and western South Dakota. Copies may be obtained from the Forest Service offices in those states.

RENEWABLE ENERGY HANDBOOK

The **Montana Renewable Energy Handbook** explains renewable energy systems and directs citizens to publications, groups, and individuals that can provide more information. The 36-page booklet was prepared by Kye Cochran of the Alternative Energy Resources Organization. It is available from Bill Christensen, director, Montana Energy Advisory Council, Capitol Station, Helena, Mont. 59601. Inquire about price.

NATIONAL WETLANDS MAPS ISSUED

The National Wetlands Inventory Program of the U.S. Fish and Wildlife Service will be publishing a series of wetland maps, depicting topical wetland information on U.S. Geological Survey base maps of all 50 states, territories and possessions. Wetland boundaries and types will be shown using a new classification system with stronger definitions, making the scientific data easily transferable between states and among regions of the country.

YOUR SPOT IN THE FOREST

If you have the time and like camping, you can become a volunteer campground host for the Forest Service, according to the American Forest Institute. For supervising the campground of your choice, you'll get a designated campsite for the duration of your stay.

BOOM PROBLEMS

Boom town problems are detailed in a report entitled "Awareness and Perception of the State to Local and Regional Needs Created by Energy Production or Extraction Facilities." The report was prepared for the U.S. Department of Housing and Urban Development by the Urban Land Institute, 1200 18th St., N.W., Washington, D.C. 20036.

STATE-OF-THE-ART REPORT

The Energy Research and Development Administration (ERDA) has issued a 376-page report describing the current "state-of-the-art" of fossil energy technology. "Fossil Energy Research Program of ERDA, FY 1978," ERDA 77-33, is available from the Government Printing office for \$5. Stock number is 060-000-00065-4. The research program includes coal liquefaction, high and low Btu gasification, direct combustion, power turbines, MHD systems, and enhanced recovery of oil and gas.

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In The Old Railway Yard

20-High Country News — July 1, 1977



The Vanishing White Man

by Stan Steiner, Harper and Row, New York, 1976. \$12.95 hardback, 309 pages.

Review by Tex Garry

Stan Steiner is acutely aware of the fact that while people shape the land, the land shapes people as well. When the whites came into the West, they found a people already there and at home with the vast dry land. This Great American Desert was a wasteland to most whites, and they either fled back East or pushed across it to the wetter, fertile West Coast.

But some whites stayed. And the land worked its magic on them. In the short space of a hundred years, it made these people its own. They were certainly different from the Indians who were there before them (and with whom they still shared parts of it). Yet in one key respect they had become more like the Indians than like

their urban kin who now come to the West intent on developing the mineral resources and expanding the industrial empires into it.

Today our country is faced with the same problem it was faced with when people first wanted to expand into the West: what to do with an indigenous culture. Steiner in *The Vanishing White Man*, has done an excellent job of showing exactly what is happening and what is planned for the West.

Ironically, the cowboys and the Indians are on the same side. Ironically, because of Hollywood; realistically because they have not forgotten to love and respect the land.

These two groups, traditionally enemies, find themselves fighting a common enemy, who could well destroy them both. Steiner doesn't just talk about this though. He has worked hard to find the people, Indians and ranchers, politicians and bureaucrats, and others involved in the struggle to save not only the land of the West but the two strongly land-oriented cultures of the West.

The book is worth reading for any one of its testaments, as Steiner calls them — statements by people, Indian and white, who are involved in the struggle to save our West. But Steiner has gone beyond parroting the words of others. He has perceptively written of the problems the Indians

have faced since the coming of the whites and which the ranchers and small town people of the West now face.

Perhaps Boyd Charter says it best in his testament:

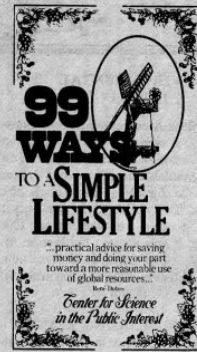
"I say we have to stand still. And fight to preserve America. We have no choice at all. We have our backs against the wall. We are going to be the last generation of Western men if we lose. There's no place to pioneer any more. Nowhere to go. Nowhere to run to. Nowhere to hide.

"When we die, America dies."

Boyd Charter and other whites like him have grown to love and respect the Land. But America, according to Steiner, has not. In this is the seed of destruction. The Boyd Charters are being pushed, hard, and are likely to be the first to go in the West, as they have been in other parts of the country.

Yet, Steiner holds out a hope: that those who love and respect the land may be able to survive this civilization and to build a new world order and life after the fall of the Western European civilization.

Wally McRae, one of the ranchers Steiner interviewed, stated that he had become an Indian, both in his approach to the Land and in his opposition to American Progress. Steiner makes it clear that many more of us need to do the same.



99 WAYS TO A SIMPLE LIFESTYLE, Albert J. Fritsch, ed., Anchor Press and Doubleday, Garden City, New York, 1977. \$3.50, paperback, 381 pages.

Review by Peter Wild

One almost blushes at the number of books on personal alternatives to the consumptive society. With their eyes on sales, publishers hasten to cash in on social change. For their part, readers stand clutching their dollars before the bewildering host of psychedelic covers, each promising a simpler and more pleasurable existence from this time forth.

Hence this review and a cautionary note. From the front of *99 Ways*, none other than Rene Dubos applauds the contents. The publisher is pushing the book, and at least two national environmental magazines recently praised it. Someone has to stand up and say that the emperor isn't wearing any clothes.

Written by people from the Center for Science in the Public Interest, *99 Ways* is well-intentioned, and in a way it does fill the stated purpose, to open the "possibilities that fit personal circumstances and to direct the reader to further information." Sounds like a worthy cause. The problem is that in trying to do everything, the book ends up doing little very well. The reader is admonished to brush after each meal to save his teeth and to stay within the speed limit to save gas. Come off it, fellas. Far better would be a thorough book on any of the 10 major categories, "Heating and Cooling," "Food," or "Solid Waste," for example.

The other side of the coin: *99 Ways* could be used as a text in basic courses on living with nature instead of against it. After skimming over the high spots, each section concludes with a set of references to the specific information that the book itself lacks.

Further, the often glib coverage leads to some downright misinformation, thus lending itself to class challenges. Just one for instance. The discussion of pets spends one of its two pages bemoaning such things as the fact that the U.S. overfeeds its cats and dogs, while millions of kids are starving around the world. So it is. Yet some student is sure to point out that couples today frequently use less resources because they substitute pets for children. Fido doesn't grow up to spend his adult life buying and discarding cars or whizzing around the world in resource-guzzling airplanes.

We'll try to keep you informed of books with practical helps on how to extricate yourself from our energy-addicted culture. In the meantime, buy carefully; unless you're a teacher with a rather specific need, this is one to steer around — despite the razzle-dazzle publicity.

Some ways to lose those lack of water blues

by Dan Ray

"But when she left me,
Oh how I cried.
You don't miss your water
Til your well runs dry."

Young Westerners are only just now learning what blues singer Otis Redding knew back in 1966. Serious drought has struck the West for the first time in 40 years. In California, two dry years in a row have depleted reservoirs and sucked the moisture from usually rain-fed foothills and forests.

The situation of other Western States is little better. 1977 may well be the driest year of the century.

Faced with limited supplies, people in California are learning quickly to cut water waste. Simple, common sense conservation measures are saving hundreds of gallons a day in houses and apartments. Improved operations and reuse of water are the new rule on farms and factories. You can reduce your own water use significantly (and save money, too) by trying these basic water conservation measures in your home or business.

INDOOR WATER CONSERVATION

Leaky plumbing is the first thing to check in your water conservation effort. Even small leaks can waste up to 400 gallons a day. A few drops of food coloring dissolved in a toilet tank can test for leaks there. If the coloring shows up in the bowl before the next flush, the valve or flapper needs to be adjusted or replaced. New faucet washers can stop slow drips in the kitchen or bathroom sink.

Toilets use more water than any other household appliance — about five to six gallons a flush. You can reduce that to three to four gallons by placing one-half gallon bleach bottles in your toilet tank. Weight the bottle with sand or gravel so it will not float, fill it with water, and set it inside the storage tank where it will not interfere with the flushing mechanism.

Commercial water conservation devices, such as toilet dams or improved flushing mechanisms, can reduce flushing volumes

even further. Low flush toilets are already being marketed by most major manufacturers. If you're replacing your toilet or putting in new plumbing, you can save water with these new models.

Most showers use up to 10 gallons a minute. An inexpensive flow restrictor can reduce that amount to three gallons a minute. Simple inserts can be made by filing and drilling scrap copper or plastic to match the template in figure A. Install the insert between your shower head and the water pipe that supplies it. Low-flow showerheads are available at many hardware and plumbing dealers. The reduced shower flows can save homeowners up to \$8 a year in hot water bills.

Other home appliances hold similar opportunities for water conservation. Faucet aerators, available at most hardware stores, can reduce splashing in kitchen and bathroom sinks.

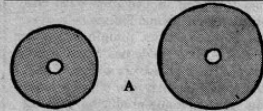
CONSERVING WATER OUTDOORS

Up to half the water used in Western cities goes for home landscaping. Over-watering alone is a major water waste. Bluegrass can survive on about half the water normally applied. Before watering, check the soil moisture by digging down six inches with a small spade. If the soil is damp, put your sprinkler away until next week. Keep grass fairly long to hold moisture better. A layer of mulch can cut evap-

oration in flower beds and gardens. Drip irrigation fixtures for home gardens can improve water efficiency, and are available at many nurseries and hardware stores. Ditch irrigation of gardens uses less water than overhead sprinkling.

In a pinch, grey water — the waste water from baths, sinks, and clothes, and dishwashers — can be used to flush toilets or as a supplemental source of landscape water. Heavy detergents and caustic chemicals that may harm plants should be avoided. Grey water use may pose health hazards from water-borne bacteria or other disease factors. Check with local health authorities before you decide to use grey water in your garden.

(Editors' note: For more information about shower flow restrictors, write Water Guard 1976, Highway 1 and Callender Road, Arroyo Grande, Calif. 93420 or Omniproducts of California, Inc. at 21241 Ventura Blvd., Suite 266, Woodland Hills, Calif. 91364. Omniproducts also produces a device to reduce toilet water waste and an aerator to cut faucet water usage.)



PATTERN FOR FLOW RESTRICTOR

FIGURE A. Showerhead restrictors can be easily made from scrap copper or plastic and installed on either a conventional shower head (½ inch in diameter) or a ball showerhead (7-8 inch in diameter).

For the conventional showerhead, use an adjustable end wrench (smooth jaws — not a pipe wrench) to carefully remove the entire showerhead. Insert the shower flow restrictor (shown on the left) into the rear of the showerhead. Be sure the restrictor rests flat against the bottom of the well. If the showerhead has a rubber washer in the housing, it should be removed before placing the shower flow restrictor insert into the shower head.

Once the insert is in place, put the washer back into the showerhead directly over the shower flow insert. Rub exposed pipe threads on shower arm with a bar of soap or pipe sealer compound to prevent leaking. Re-install the showerhead and tighten it snugly with a wrench.

For the ball showerhead, use an adjustable end wrench to carefully remove the front section of the showerhead. Insert the flow restrictor (shown on the right) into the rear of this section, making sure it rests flat against the bottom of the well. Re-install the front section and tighten it snugly with the wrench.