

The Environmental Bi-Weekly



High Country News

Vol. 9 No. 6

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WE ALL NEED CLEAN WATER is the theme of this year's wildlife week (see story on page 7). Drawing entitled "Her great treasure!" by Olaus J. Murie shows a female mallard and her nest. For more of Murie's work, in celebration of wildlife week, see the centerspread.

Joseph Wood Krutch, a voice for the deserts

© 1977 by Peter Wild

At the corner of Grant and Swan, customers in Dunkin' Donuts tend to their coffee and stare dully out at the pine-topped Catalinas. Each year the mountains recede farther into the aerial scum produced by the Southwest's fastest growing city. Across the street is an anomaly, several acres of creosote bush and cactus hemmed in by a shopping center, a trailer court, and subdivisions.

A realtor's prize, some may think: the plot was the home of America's most eloquent speaker for desert preservation, Joseph Wood Krutch. Twenty years ago he wandered here when the city was miles away, watching the migrations of the pileolated warbler, marveling at Scorpio, known as the Hand of God to the local Papago Indians, "straggling downward in the southern sky."

Year after year Tucson grew toward him. "He was heartbroken to see it," says his widow, who still lives on the little patch of desert in the middle of urban sprawl. Individually, many Americans have felt heartbreak at the loss of familiar surroundings, yet the public attitudes that

fuel the expansion go back to the nation's origins.

Early settlers struggling to stay alive in the gloomy forests along the Atlantic seaboard compared their plight to that of Israelites wandering in the "howling wilderness" of the Bible. To them, according to Paul Brooks, the woods inhabited by wild beasts and marauding Indians, "... was a place of temptation, the Devil's domain. To subdue it was not only a practical necessity, it was holy work." Their battle to hack permanent communities out of vegetative chaos was harsh enough, yet little did settlers anticipate what lay ahead on the other side of the waste of trees.

When over two centuries later they reached the arid regions beyond the Mississippi — where a man had to "dig for wood and climb for water," where "everything has either horns or thorns," as the popular sayings go — they must have felt that they had passed through the very gates of hell. Cattle died of thirst, crops turned to dust; the sun went over day after rainless day with maddening regularity. Unable to adjust to the new circumstances, some pioneers simply went out of their minds.

In the 19th century, a few writers such as

Thoreau caught the literary public's fancy with their celebrations of wild nature, but readers gave lip service to their views more as pleasant escapism than as workable approaches to the environment.

Not until around the turn of the century, when the wilderness was all but gone, did a relatively secure and comfortable life permit serious re-evaluation of attitudes toward the natural heritage. Less fearful of raving lions and rampaging Indians, some sons and daughters of the frontiersmen looked about them, took a deep breath, and saw the folklore, the history, the plants and animals that their parents had missed in their frenetic efforts to stay alive. Such novelists as Mary Hunter Austin, Willa Cather, and Zane Grey considered pristine mountains and deserts essential to what they viewed as a unique and profound Western experience. If many early novels about the West tend to have improbably romantic plots, they come closer to social realities by emphasizing nature as a healing balm for recently overcivilized man.

From that position it was only one step for more recent authors to raise their readers' sensitivity. Aldo Leopold and Joseph

(continued on page 4)

ENERGY:

Utah legislature vows to make more and use less

by Joan Nice

The Utah state legislature appears to have both enraged and delighted its environmental constituency this session. The 60-day session ended March 11.

Utah, the first among its sister states to require all new buildings in the state to meet energy conservation standards, also partially cleared the way for a new Kaiparowits-sized power plant about 12 miles from Capitol Reef National Park.

A spokesman for Utah Gov. Scott Matheson says he thinks the session was extremely productive on energy matters. "He's gratified that he now has the tools to deal with the energy issue," says Joe Platt of the state planning office.

In a state which is known for its pro-energy development stands, environmentalists, too, were generally pleased with the session. Jan Johnson of the Utah Environment Center calls it "the most successful session" she's witnessed in her four years of involvement in the state.

On the other hand, both Matheson and Johnson are critical of certain bills. Matheson did not sign two important energy bills

that he considers unconstitutional. Since he didn't veto them either, however, they slipped into law.

The most controversial of the two was the Intermountain Power Project bill, SB 198, which allows IPP's proposed 3,000 megawatt coal-fired power plant to finance itself with tax-free municipal bonds. By passing the bill, the legislators took "a long stride towards realization" of the project, according to the *Deseret News*.

The bill's sponsor, Sen. Robert Bowes (D-Spanish Fork), said that he hoped it would help retrieve the jobs and money Utah lost due to the cancellation of the Kaiparowits project.

Like Kaiparowits, the IPP project is to produce 3,000 megawatts of power, will be located near a national park, and is vigorously opposed by environmentalists.

The bill will save the \$4 billion to \$5 billion project \$80 million to \$100 million in federal taxes. The measure amends the Interlocal Cooperation Act to allow Utah cities to join with out-of-state cities to form a political entity to sell municipal bonds to finance the project. Municipal bonds are (continued on page 12)



Arizona Historical Society Photo

For the most part Joseph Wood Krutch was a shy, introverted man — not the type to mount the barricades for the threatened environment.

SAWDUST STOVES



HCN
Letters

SLIDE SHOW 'MISLEADING'

Dear HCN:

Charles Nation's "Conservation slide show" featured in the February 11 *High Country News* contained several misleading statements regarding Community Action of Laramie County's greenhouse.

The greenhouses were not designed by Malcolm Lillywhite, but by a group of teenagers from 14 to 17 years of age after attending a workshop conducted by Lillywhite. This was accurately reported in an earlier issue of HCN in an article by John Pena.

You also mentioned "the small entry door and the poorly designed vent openings." The youthful architects designed the small entry to accommodate the three and four year old Headstart children who attend school at the Ecology Lab next to the greenhouse. Our other greenhouses have conventional doorways.

Now to the vents. To insure proper ventilation, especially in the summer, it is necessary to circulate the air through the greenhouse. This is achieved by placing several vents at ground level allowing cool air to be sucked into the greenhouse as the warm air vents allows warm air to escape from the vents at the top.

This advice is for the instructor who "has to climb a ladder twice a day to adjust the vents." This seems to be a very small price to pay for utilizing a free source of energy. Besides, there is a pole with a small hook on the end that was designed for opening and closing the vents without climbing a ladder.

Gary Garber, research assistant
Community Action of Laramie County
Cheyenne, Wyo.

Dear HCN,

Your recent presentation on wood stoves brought to mind sawdust furnaces in Oregon and Colorado. Natural gas was late in coming to Oregon, and oil and coal were shipped in. Local coal was suitable only for forced draft by industrial users. The prevailing fuel was sawdust bought by the cubic yard and stored in basements and garages. It was put in a cone-type hopper and fed the special grated ordinary coal furnace by gravity or a screw (auger) device.

It burnt clean, was pleasant in odor, and cost little. Later it was used on ranches in central Colorado. Furnace installers didn't know how to start the fire. They got the grates from Portland.

R. A. Rowe
Denver, Colo.

JUNG'S COMPLEXITIES

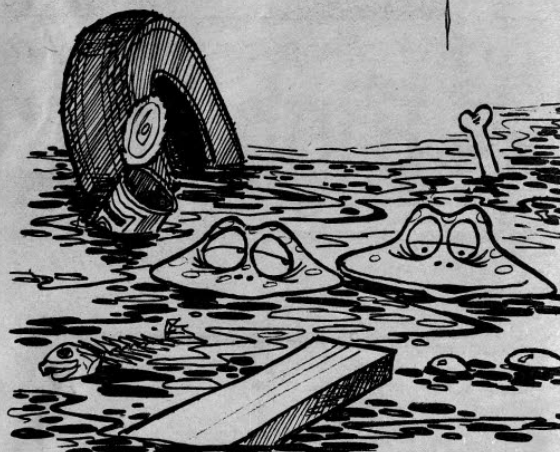
Dear Mr. Wild:

In response to your article on Aldo Leopold in the Feb. 11, issue of HCN, I feel the need to point out to you that you, yourself, have fallen prey to precisely what you accuse Drs. Jung and Franz of doing; namely, imposing neat categories on far more complex systems.

Your interpretation of Jung's process of individuation is appalling if for no other reason than the point which you were attempting to make. I know of very few other masters in the field of psychology who had a better sense of the interconnectedness of all life than did Carl Jung. Further, Jung's writings and work vastly enriched the field of psychology by stressing the importance of man's spiritual nature, a level which modern psychology is just now beginning to integrate, and an aspect of mankind which Leopold, himself, I should think also experienced. To use Jung's writings as an example of a "simple scheme" is totally unjustifiable, especially in light of his extensive cross-cultural studies, which not only spanned the globe, but the history of man as well.

Mr. Wild, unfortunately, Aldo Leopold's last chuckle is on you!

Anne Adamcewicz
Washington, D.C.



BOBCAT CORRECTIONS

Dear HCN,

I had some problems with the way I was quoted in your bobcat article (HCN 1-28-77), though nothing major.

First of all you say that I think the Fish and Wildlife Service records give a "fairly accurate" picture of bobcat fluctuations. Not so. I think the figures are the "best available."

Finally, you say I suggest an "immediate moratorium on the taking of bobcats." Rather, I said "each state in which cats are being exploited should consider an immediate halt to the taking of bobcats."

Hank Fischer
Defenders of Wildlife
Washington, D.C.

DEVASTATING TANKER TREND

Dear HCN,

The Poseidon Adventure. Earthquake. The Towering Inferno. Supertanker. Supertanker? This might well be the title of Hollywood's next shocking disaster movie. The recent rash of tanker accidents, totaling 10 since the Argo Merchant ran aground December 15th, could be a phenomenal coincidence. More likely, it represents the beginning of an ecologically devastating trend. A trend which emphasizes the urgent need for intensive research and development of non-polluting, inexhaustible sources of energy.

Politicians point proudly to the \$100 million allocated annually to sun, wind, and geothermal energy research. Yet this is just a "drop in the bucket" compared to our \$110 billion defense budget. Without energy, the most sophisticated weaponry in the world is worthless. Total energy independence is critical to our nation's security. Development of environmentally safe energy supplies is paramount to our physical and mental well-being.

Why the reluctance to significantly increase funding for energy research? Has big business closed the minds of politicians and top level bureaucrats to the possibilities?

Perhaps the recent tanker tragedies are

a "blessing in disguise." Maybe their oil slicks will produce a restructuring of national priorities.

Budd Titlow
Golden, Colo.

ANOTHER WILDER FAN

Dear editors:

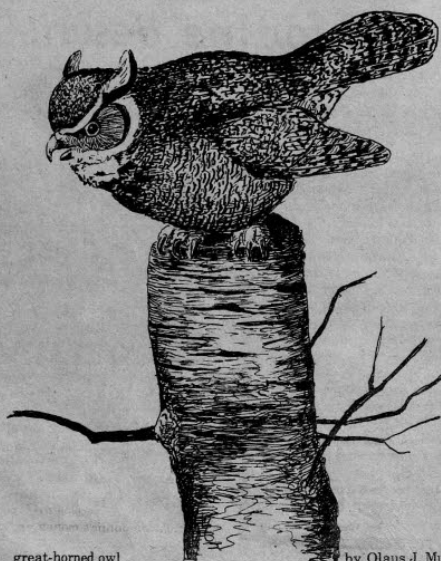
There are several more important things to worry about than book reviews, but I have an idea that Peter Wild at least momentarily missed more readers than he realized with his slur in a recent column. Cathy Scott, in the Jan. 28 "Letters," suggested tactfully that maybe he was thinking of the TV series of that name rather than the original book, which is, of course, from the young-reader oriented series by Laura Ingalls Wilder. The TV episodes are supposedly based on Mrs. Wilder's books, but judging by the very few that I have seen, they do not actually bear much resemblance to the books.

If Wild was referring to the "Little House" books, as I assumed he was, and if he really considers that their account of frontier life is "flaccid... designed to stimulate lachrymose heats at the sacrifice of reality," then I think it would be appropriate if he would devote a future column to one or more of the books and expand upon his statement. Mrs. Wilder has always been very highly regarded as a children's writer, and a remark like Wild's should not be tossed out without having some basis offered for it.

I suggest that you ask Wild to at least clarify whether his comment was intended for the books or the TV series. Then those of us who may have felt like pushing him gently off the bank into Plum Creek can at least know whether there was any point to our reaction.

Del Owens
New York City, N.Y.

(Editors' note: Peter Wild has assured us that he was referring to the TV series. Those Laura Ingalls Wilder fans ready to gently push him into Plum Creek can relax.)



great-horned owl

by Olaus J. Murie



Editorials

HCN

Fear of industry no reason to fund bad water projects

At Interior Department hearings on the Savery-Pot Hook reclamation project, Colorado and Wyoming officials made a strong plea for saving the agricultural project from President Jimmy Carter's budgetary ax because otherwise the water would go to the energy industry.

Wyoming Gov. Ed Herschler, Colorado Gov. Dick Lamm, U.S. Rep. Teno Roncalio (D-Wyo.), Colorado Department of Natural Resources Director Harris Sherman, and others cited the "clear decision" between having the Bureau of Reclamation (BuRec) and the U.S. taxpayers develop the water in the Little Snake River Basin for agriculture, or letting industry dam and divert it. All said or implied that the adverse environmental impacts of Savery-Pot Hook would be preferable to the impact of having a coal-fired power plant or similar development in the basin.

But will building Savery-Pot Hook guarantee an agricultural future for the basin? We doubt it. There's too much coal already under lease in the basin to assure agricultural domination. And once the coal is leased and the energy companies decide to develop it, the needed water flows toward money.

The Jim Bridger Power Plant east of Rock Springs, Wyo., wasn't built anywhere near available water, but that didn't stop its promoters from building the plant and pumping water in from the Green River 50 miles away. Power plant promoters in Wyoming's Powder River Basin have proposed importing water from the Green River (some 400 miles distant) or from the Big Horn River (100 miles away and on the

other side of the Big Horn Mountains).

If industry didn't import water into the Little Snake Basin, it could very possibly muscle its way into the basin by buying up agricultural water. For example, the



Wheatland, Wyo., area had a strong agricultural base and little available water, but that didn't stop the Missouri Basin Power Project from coming in, buying up agricultural water, and drilling wells to supply its 1,500 megawatt coal-fired power plant.

If local landowners, conservationists, and state officials are serious about keeping industry out of the Little Snake Basin there are more direct, more effective ways to do it. One way would be to request Class I air designation for the locality which could effectively block large power plants from siting in the area. Another possible step

would be for the states to gain greater control over transfers of water from agriculture to industry. Lamm recently signed an agreement with Interior Sec. Cecil Andrus which gives the Colorado governor veto power over the sale of water to industry from federal reservoirs in his state that were built for irrigation purposes. Other governors should consider similar agreements.

Savery-Pot Hook should be debated on its own merits. We shouldn't be "forced into building poor projects to avoid worse projects," as Colorado conservationist Bill Mounsey suggested at the hearings.

We believe the agriculture v. industry conflict is a smokescreen being used to cover up some fundamental problems with the project. Carter and his staff called for a re-evaluation of Savery-Pot Hook and possible zero budgeting for the project in fiscal year 1978 because it has serious drawbacks.

The two reservoirs to be built are located in active landslide areas, and an earthquake was recently recorded in the same area. The U.S. Fish and Wildlife Service (FWS) has recommended that the project not be built because of projected adverse impacts on two endangered fish species downstream and the loss of habitat for elk, deer, sage grouse, and other wildlife. BuRec argues that the impact on wildlife won't be as severe as FWS forecasts. This difference of opinion has never been resolved.

The cost of the project would be \$75.7 million, according to BuRec. It would provide supplemental irrigation water to as many as 106 farms, at an average cost of \$714,150 per farm. That's a high price to pay for extra water that will be used to convert marginal agricultural rangeland into hay meadows for livestock.

BuRec's most favorable figures show the government would get 89 cents in benefits for every dollar spent on the project, according to the *New York Times*. Local farmers will pay back some of the costs of the project, but if the dams are geologically unstable and the investment per farm unit is so large, farmers may discover it's a bane rather than a boon.

We aren't sure if the project is as bad as it looks on paper, but Carter's call for a re-evaluation of the project seems clearly justifiable. If Savery-Pot Hook can withstand

the rigors of Carter's re-evaluation and is found to be a good agricultural project, it deserves to be built. But if the project has unreconcilable safety, economic, and environmental problems it could weaken the agricultural community in the basin, which would only hasten the day when industry moves in. —BH

Conservatives' lavish handouts aid IPP plant

State legislators in the West are known for their conservatism. We have come to expect them to produce laws which bolster the free enterprise system and leave the individual alone to solve his own problems. But lately, while they have remained consistent in their stinginess towards the individual, they have lavished government handouts on big business.

Utah's recent legislative session offers a particularly poignant example.

To assuage their guilt for not having helped out the Kaiparowits coal-fired power plant enough to keep it alive, Utah legislators have begun tossing handouts to Kaiparowits' twin brother, the Intermountain Power Project (IPP).

The legislators passed a law which would allow IPP to finance its giant proposed plant with tax-free municipal bonds, just like a municipality, while paying state and local taxes, just like a private entity (see story page 1). In short, they have given IPP all the cushy advantages of a public entity, while giving Utahns most of the financial benefits of sheltering an expensive private project.

It's clearly illogical, special-interest legislation (and probably is unconstitutional, according to Utah Gov. Scott Matheson), and it will save IPP and its multi-billion dollar project around \$100 million. The bill also gives a dangerous boost to a project which seems to us to be dubious, both financially and environmentally.

Why does the project need to be buttressed by government subsidization? To answer, we should look at why its twin brother was cancelled.

Kaiparowits fizzled, not simply because environmentalists didn't like it, as is so often reported in the news. But, more importantly, it died because the utilities involved were uncertain that they could sell the enormous quantity of power the plant would have produced — 3,000 megawatts, enough to serve approximately three million residences.

Saving IPP \$100 million in taxes will only cloud the economic realities that the Kaiparowits utilities had to face and crowd out truly private enterprises, which may be able to offer the state better sites, more reasonably-sized plants, and even cheaper electricity.

The Utah legislature, a group which prides itself in being as stodgy as they come, is doing some major meddling with the free enterprise system.

When will these "conservative" legislators, bless them, become more conservative with the public's money and natural resources? —JN

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4-High Country News — Mar. 25, 1977

Krutch. . .

(continued from page 1)

Wood Krutch helped the public to see wilderness as having value, not only scientifically and esthetically, but also — in the current terminology — for itself. And from there it was just one further though belated step to demands for preservation of a precious and fading natural legacy.

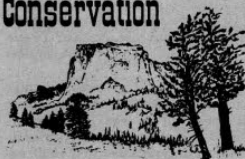
Deserts stretch around the Rocky Mountains from the Mexican border to the state of Washington. To put it statistically, about 75% of the land west of the Mississippi receives less than 20 inches of precipitation a year, a fact that John Wesley Powell pointed out to a stunned Congress in 1878. Hence, if one thing characterizes the Western experience, it is aridity. In recent years, Joseph Wood Krutch probably did more than any other writer to change society's opinion toward what it had long looked on as undifferentiated wasteland. But he came to his own appreciation of the arid region late in life and, like many conservationists, by an improbable route. When he did come, he brought with him a perception of America that had been maturing for 50 years.

Born in 1893 in Knoxville, Tenn., he majored in mathematics at the local state university. However, the son of a merchant soon had enough of farmers snoring in their wagons around the public square the night before market day. After graduation he fled to what he took to be the dazzling Babylon of New York. Krutch might have been Knoxville's maverick, reflecting a strain of nonconformity traceable to a line of German nobles, but in New York he was no profligate son. Abandoning mathematics, he earned his M.A. degree in the humanities from Columbia University. In 1924 he received his Ph.D. in literature and married a French Basque nurse visiting relatives in the United States.

Over the next 25 years, Krutch's career reflects the successful urbanity of the Knoxville boy. He taught English and journalism at prestigious Columbia, where he established lifelong friendships with such academic lights as Mark Van Doren. In the city that considers itself the very center of the nation's culture, he became a luminary in his own right, serving as drama critic of *The Nation* in the liberal magazine's heyday.

Publishers brought out his scholarly works on an impressive variety of subjects:

Conservation



pioneer series

Boccaccio, Cervantes, Samuel Johnson, Poe, Proust, Stendhal. One volume foreshadows his later concern for conservation. In 1929, prophetically on the very eve of the Great Depression, he published his most controversial book, *The Modern Temper*. The series of essays rejected the wild optimism based on blind faith in science fashionable in the '20s. But for that, and a sensitive study of Thoreau in 1948, there was hardly a hint of the future environmentalist in Krutch; he was the brilliant country boy made good in a citified literary world.

With middle age came an epiphany.



Photo courtesy of the Arizona Historical Society

Joseph Wood Krutch

His relationships with desert life were private and essentially religious — if that word is applied to those things that inspire wonder, that give shape and definition to a person's life.

More to indulge his wife than to please himself, for years Krutch had divided his time between the city and a country home in Redding, Conn. One winter night after completing the Thoreau book, he sat reading a nature essay, "... and it suddenly occurred to me for the first time to wonder if I could do something of the sort." In his imagination he heard New England's traditional announcement of warm weather, the chirpings of a little frog known as the spring peeper. He wrote:

"Surely one day a year might be set aside on which to celebrate our ancient loyalties and to remember our ancient origins. And I know of none more suitable for that purpose than the Day of the Peepers. 'Spring is come!', I say when I hear them, and: 'The most ancient of Christs has risen!' But I also add something which, for me at least, is even more important. 'Don't forget,' I whisper to the peepers; 'we are all in this together.'"

The words delighted him with their contrast to the "serious and rather...solemn" prose of his scholarly books. He went on to complete *The Twelve Seasons*, a series of whimsical essays, one for each month.

But for three factors, Joseph Wood Krutch might have spent the rest of his life penning gentle nature pieces about New England. Even rural Connecticut is not as rural as a nature writer with developing sensibilities might wish. To the shock of sophisticated city friends, in 1950 he retired from teaching, packed, and moved to Tucson, Ariz. His explanation was blunt: "I came for three reasons: to get away from New York and the crowds, to get air I could

breathe and for the natural beauty of the desert and its wildlife."

He settled on the outskirts of Tucson, then a small, quiet city, and published one book — sometimes two — a year on the arid heritage he was exploring in Arizona and surrounding states. While his popularity as a nature essayist grew, so did abuse to the deserts he loved. The activism of Defenders of Wildlife and the Sierra Club won his support; local scientists persuaded Krutch to become a trustee of the newly founded Arizona-Sonora Desert Museum, an office he held for 20 years.

In the '60s, NBC recognized the public's beginning concern for its environment. The network broadcast three television specials featuring the Southwestern writer on tour of the Grand Canyon, the Sonoran and Baja deserts.

Yet unlike his stormy contemporary, Bernard DeVoto, for the most part Joseph Wood Krutch was a shy, introverted man, not fond of meetings and not the type to mount the barricades for the threatened environment. Instead, he preferred to write about his fascination. His relationships with desert life were private and essentially religious — if that word is applied

to those things that inspire wonder, that give shape and definition to a person's life. The beauty of his later writings lie in insights that re-create the freshness and clarity of the author's original experiences. Krutch was teaching his readers to see with new eyes.

His first book on the Southwest, *The Desert Year* (1952) described the delicate but powerful drama of the changing desert seasons. Krutch marveled at the complicated chemistry that triggers cactus seeds precisely when temperature and moisture conditions are most favorable. Armed with a flashlight he strolled through the washes and mesquite, telling in almost mystical terms in *The Voice Of The Desert* (1954) about the strange nocturnal flutterings of the Pronuba moth around the yucca plant.

In the revelations about desert life that he shared with a nationwide audience he saw a lesson. On deserts, "... life is everywhere precarious, man everywhere small." Yet technological civilization is a blind alley; especially in the fragile arid regions, man is destroying the very land that sustains him in order to surround himself with abundance. "Abundance of what?" Krutch asked. Do more freeways, more highways, more television sets make people happier?

A travel book on Baja, *Forgotten Peninsula*, (1961) concretized his position. In lower California he saw virtue in an economy of scarcity, where people carefully used and reused resources. He had said earlier, "I am no ascetic and, so at least I believe, no fanatic of any other sort. I am not praising want and I have no romantic notion that distresses should not be relieved." To Krutch, poverty that robbed people of their dignity was not picturesque.

However, in rural Baja the scattered population lived in a healthy balance with the environment. The writer pointed out that the worst social problems occurred in the northern part of the Mexican state, where masses of Anglo tourists crowded the spreading network of paved roads. Along with the influx came not only a disrupted life for the local people but permanent destruction of their heritage: "One after another the most accessible mountains and beaches are turning into Coney Islands of horror..."

In Mexico, as well as in the rest of the world, man had laid a trap for himself — and he was falling into it. In its drive for progress Western civilization had abandoned primitivism and saw uncontrolled technological development as its only goal. Krutch knew that technology can serve society, but he felt that man lacked the wisdom to keep it from becoming a mindless tyrant.

Some years before he died in 1970, the former Columbia professor of English chuckled about his amateur status as a scientist: "I probably know more about plants than any other drama critic and more about the theater than any botanist." However, some scientists are quick to fault his books, particularly for their anthropomorphism. Other critics claim that the state of human affairs does not justify Krutch's doubts about modern civilization.

To judge for himself the reader might consider the nation's progress and then turn to the books. Of the dozens he wrote, *The Desert Year*, *Forgotten Peninsula*, or the autobiographical *More Lives Than One* would be good places to start.

"I probably know more about plants than any other drama critic and more about the theater than any botanist."

—Joseph Wood Krutch

To protect farms

Congress may save stream valleys from stripping

by Dan Whipple

The federal strip mining bill has been awash in controversy since it was first introduced several years ago. One of the most controversial sections of the legislation would regulate strip mining on alluvial valley floors.

A fundamental problem has hampered debate. While geologists and hydrologists can usually agree on where an alluvial valley begins and ends at a specific site, there is no agreed-upon general definition. Nevertheless, federal legislation must deal in generalities.

The result is that one side in the debate rarely knows what the other is talking about. One man's alluvial valley is another man's mountaintop.

At the federal level, there are at least two separate operating definitions of an alluvial valley — the U.S. Environmental Protection Agency's (EPA) and the U.S. Geological Survey's. Both of these are different from the one contained in H.R. 2, the strip mining legislation now under consideration.

Everyone agrees that alluvial valleys are an important part of the environment. They are the areas in which sediment is deposited by flowing streams. They are often important surface and subsurface water aquifers and the most productive lands on a ranch or farm.

The federal strip mining bill says, "Alluvial valley floors" means the unconsolidated stream-laid deposits holding streams where the water availability is sufficient for subirrigation or floor irrigation activities." This general definition is backed up by specifics in the committee report on the legislation. Even with Congressional guidelines, however, the boundary of an alluvial valley is often a subjective judgment.

POTENTIAL FOR DISASTER

The mining of a valley floor has potential for disaster. According to a draft report prepared for EPA by ICF, Inc., a Washington, D.C., consulting firm, "The equilibrium found in alluvial valley floors can be upset by mining operations." The report says that the disruption of the delicate hydrologic balance of the floor can have a long-term effect on water quantity, quality, direction of flow and the height of the water table. Consequently, the productivity of agricultural lands could decline.

In addition, the report says, extensive mining of alluvial valleys could, by disrupting water tables, affect agricultural lands well removed from the mine site.

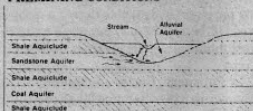
However, alluvial valleys are often the most attractive sites for strip mining in a lease area. Since valleys are formed by the river's erosion of the upper layers of sediment, the thickness of overburden is less than in surrounding areas, making mining more economical.

According to the ICF report, reclamation potential for the valley floors is unknown. Failure to properly segregate spoils and replace them in the stream bed can result in complete disruption of the aquifer. For some specific sites, however, engineering solutions are possible, ICF says.

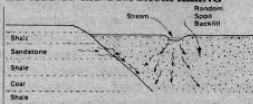
Jack Ratchye of Peter Kiewit Sons argues that valley floors are easier to reclaim than more arid areas. Since there is a lot of natural water flow available, he says, the vegetation takes hold better.

Peter Kiewit Sons has a stake in the controversy because a portion of their proposed Whitney Mine north of Sheridan,

PREMINING CONDITIONS



IMPACT OF RANDOM BACKFILLING



POSSIBLE ENGINEERING SOLUTION



MINING IN STREAM VALLEYS.

The three diagrams above illustrate the impacts of mining in alluvial valley floors. The drawings were taken from "Effects of Mining Methodology on Reclamation Planning," by Richard D. Ellison in RECLAMATION OF WESTERN SURFACE MINED LANDS, ERT, Inc., March 1976.

Wyo., lies in an alluvial valley of the Tongue River.

The major provision relating to alluvial valley floors in H.R.2 does not prohibit valley floor mining — unless the operations would "interrupt, discontinue or prevent farming on alluvial valley floors that are irrigated or naturally subirrigated." Land on alluvial valley floors that is of marginal economic value is excluded from protection. Such marginal lands include undeveloped range lands or areas "of such a

small acreage as to be of negligible impact on the farm's agricultural production."

The bill would also prevent mining that would "adversely affect the quantity or quality of water in surface or underground water systems that supply these valley floors."

ICF says that the protection of alluvial valley floors required by the bill can apparently be achieved without major limitations in Western mining.

The federal bill would regulate alluvial valley floor mining only in states west of the 100th meridian. This line of longitude roughly bisects South Dakota and forms the eastern boundary of the Texas Panhandle.

An aerial survey taken by EPA of 88 mine sites west of the 100th meridian indicates that less than three per cent of the leased areas lies within alluvial valley floors, using the definition from H.R. 2. Assuming that only the coal lying directly in the valley floors would be withdrawn from mining, only between 0.6 billion to 2.4 billion tons of the total Western reserve base would be affected by the federal law. Strippable reserves in the West total 87 billion tons.

There is a possibility, however, that the law could affect more coal than that. Of the 88 sites that EPA examined, 62 of them (70%) contained an alluvial valley floor in some part of the lease. ICF says that under one interpretation of the strip mine legislation, the regulations could impact not only those mines on the valley floors, but also those mines that affect water flowing into the valley floors.

Under this assumption — that mining would be prohibited at about one-half of the proposed mine sites having any part of the leased area within a valley floor — 12.6 billion tons of the reserve base could be affected.

As presently written, the federal law would "grandfather" out of compliance those mines already operating in alluvial

valleys, but not those which have been granted permits but did not produce any coal during the year prior to the enactment of the law.

STATES REJECT PROTECTION

The strict regulation of valley floor mining seems to be unpopular with state legislators in the West. Both Montana and Wyoming legislatures recently defeated bills that would have imposed controls on the practice.

The Wyoming legislation was supported by an agriculturally-based conservation group, the Powder River Basin Resource Council (PRBRC).

The Wyoming House version proposed a broad definition similar to that in H.R. 2. Like the federal bill, the Wyoming bill required that the protected land be valuable for agriculture. But, unlike the federal bill, the state bill would probably have protected even undeveloped range land that had the "capacity" to produce crops, whether it was actually producing them or not. Whatever the intent, the bill garnered little support and never escaped from committee.

In Montana, Gov. Thomas Judge proposed an energy policy that advocated protecting valley floors. But, he then proposed legislation defining a valley floor so narrowly that the State Lands Department said it would not affect any of the coal mining operations contemplated in the state. Sarah Ignatius of the Northern Plains Resource Council said, "Unless you mine through a river, you will probably be outside of what's covered by (Judge's) definition."

The Montana Senate killed even this limited bill in committee.

In addition to the predictable opposition of coal companies, to alluvial valley regulations, some citizens have organized in Sheridan, Wyo., specifically in opposition to the PRBRC's support of regulations. A real estate man named Vince Johnston

(continued on page 7)

A tribute to Brandy, a forester

by Robin Tawney

Brandy was a forester.

In fact, he started out in the Forest Service when it was just 10 years old. When "retired" in 1955, he had been supervisor of the Bitterroot National Forest, headquartered in Hamilton, Mont., for 20 years and had watched the character and direction of the agency slowly change from the model envisioned by Theodore Roosevelt, Gifford Pinchot, and Aldo Leopold.

That direction and its subsequent impact on the Bitterroot forced G. M. Brandborg not to retire but to keep up a stiff regimen of at least eight-hour work days until his death at 84 on March 11, 1977.

Brandy's concern for Forest Service policy spawned the clearcut controversy of the 1960s and early 1970s. The Bitterroot received national attention as a forest and watershed scarred by the greed of men concerned only about how much timber they could get out and how fast it could be cut.

He would take anyone on a field trip to witness the devastation. His knees had been weakened by an earlier injury so where they once propelled him sturdily up the steep slopes of the Bitterroot Mountains, his later forays were made by jeep. But whether he had to support himself with a cane or could stand alone on his "confounded knees," Brandy still carried out his mission to stop the destruction of



G. M. BRANDBORG seemed as invulnerable as his beloved Bitterroots.

Photo courtesy of THE MISSOULIAN.

the watershed, wildlife habitat, and life zones of the Bitterroot National Forest.

Even when his knees and arthritic pains forced him to bed, Brandy would pull a table up close and conduct business as usual. He received visitors in that attic "bedroom" of his and wore calluses on his forearms from countless hours spent writing letters in a prone position.

Every time you saw Brandy you could be sure that he'd admonish you to read this, or that, some letter, magazine article, or book that had passed his great oaken door. He read voraciously — all kinds of publications, most environmentally oriented — and offered the best to his friends.

It wasn't until the day he died we knew he was gravely ill. That was Brandy's way. We knew he'd go some day. Good heavens, he was 84 years old. Yet, still, he seemed as invulnerable as his beloved Bitterroots. He, like they, could stand the gouges and ravages of misuse and time. But no man is a mountain.

Brandy wouldn't want us to grieve. He'd want us out there, fighting the next battle. Because Brandy lived for the future, knowing things would get better, that someday the policy makers would wake up.

The greatest tribute we can make to him is to rededicate our lives to Brandy's good fight. And thank God we had the honor to know a great man.

6-High Country News — Mar. 25, 1977

Senators, states rally to save reclamation projects



THE JAMES RIVER in South Dakota would be channelized as part of the Oahe Diversion. Oahe is one of the water projects President Carter has recommended for zero budgeting in FY 1978. Photo by Larry Lockard and courtesy of the U.S. Fish and Wildlife Service.

Reckoning from Washington

by Lee Catterall

Guy Martin knows what it's like to be held hostage by a band of angry men.

He didn't have a gun pointed in his face, but his captors — the Senate Energy and Natural Resources Committee — seemed hostile enough. Committee members told Martin they had no intention of recommending the Senate confirm him as Assistant Interior Secretary for Land and Water Resources until they know exactly what he thinks of corking federal water projects that are dear to them.

The committee ultimatum followed a stormy White House session between the President and more than 50 members of Congress, and preceded a defiant 65 to 24 vote by the Senate to stop the President from cutting off money for any water project this fiscal year.

Democrats and Republicans alike are livid, and the President is adamant. Martin, who has been commissioner of natural resources in Alaska, discovered the full extent of anger the President has generated on Capitol Hill. There was a lack of the kind of sugary civility that generally coats such gatherings.

Sen. Floyd Haskell (D-Colo.) sneered at the "lack of credibility" shown by the Carter Administration surrounding the President's proposal to stop 19 federal water projects unless studies to be completed by April 15 prove them worthwhile. "I'm extremely critical of the way the White House has handled this whole thing," Haskell said.

Martin looked glum when Haskell demanded that he bone up on the projects and return to the committee when he had completed his homework. "You've put me in a very difficult position," Martin mumbled.

Haskell and others consider the Carter proposal not only a political position disagreeing with their own; they consider it a personal affront to a number of people in Congress who have had a very high — and not necessarily inaccurate — view of their own power.

Previous Republican administrations

have accepted that perceived power on the water issue itself, toning down suggestions to Congress. For example, the Interior Department wanted a new formula for estimating costs and benefits of future projects, but decided not to apply that formula to projects being constructed, as Carter has done informally.

"We recognized that it would not only be political folly to grandfather them in, but it would be illegal (to do it formally)," Wyoming native Jack Horton, who held the job Martin will assume, told Reckoning.

By attacking present projects, Carter has assaulted the political plums members of Congress have pinned at the top of their record of achievements.

"You're looking at the only thing congressmen and senators can take and go back home and say, 'Look, this is what we brought you,'" said an aide to Sen. Bennett Johnston, (D-La.), who sponsored the successful amendment defying the Carter proposal. Johnston, incidentally, was Carter's campaign manager in Louisiana and considers himself instrumental in the narrow Carter victory there.

Before the vote on the Johnston amendment, which may have been little more than a protest vote because the President is targeting the projects mainly for next fiscal year and not the current one, some people in the Carter camp had a glimmer of hope that Congress would take the proposal kindly. However, while Carter's chief environmental advisor, Katherine Schirmer, said, "We're not thoroughly thrilled with it (the Johnston vote)," she added that the White House was "not entirely surprised" by it.

Still, she said, the President plans to stick to his proposal and not be influenced by the political pressure from Congress. His challenge to Congress on this thorny issue can be seen as an all-telling part of his past renunciation of politics-as-usual in Washington. That view is one that got him elected, and one from which he is not likely to capriciously depart.

The furor over President Jimmy Carter's review of water development projects and his proposed budget cuts for some projects (see HCN 2-25-77, p.7) came to a head this past month at public hearings and in Congress.

In February, Carter announced he was reviewing 320 water projects to see if they met basic environmental, economic, and safety standards. Carter targeted 19 projects sponsored by the Bureau of Reclamation and the Army Corps of Engineers for possible zero budgeting in fiscal year 1978. Since the announcement, project proponents have been fighting to keep their pet developments alive and environmentalists have been mounting a campaign to kill the most undesirable projects.

Projects singled out for possible zero budgeting include the Central Arizona Project, the Central Utah Project (Bonneville Unit), the Garrison Diversion in North Dakota, the Oahe Diversion in South Dakota, Savery-Pot Hook in Wyoming and Colorado, and Dolores and Fruitland Mesa in Colorado.

At hearings held around the West this week the controversy flared. In most cases the projects were supported by state politicians and water user groups and opposed by environmentalists. Proponents cited the need for more reservoirs to avert future drought problems, the need for more water by farmers and cities, the need for each state to use all the water it is entitled to, and the wasted effort of giving up on projects that are partially completed. Environmentalists stressed the loss of free-flowing rivers, the inundation of wildlife habitat, safety problems at some dam sites, and the poor public investment when project costs exceeded expected benefits.

SENATE SLAPS CARTER'S HAND

On March 10 the U.S. Senate told Carter to quit tampering with authorized water projects. By a vote of 65 to 24 an amendment to the emergency jobs bill sponsored by Sen. Bennett Johnston (D-La.) was adopted which: 1) states water projects are essential to reducing unemployment, 2) requires the President to spend money appropriated for the projects for FY 1977, 3) states the discount rates used for re-evaluating projects should be the same as the one used when the projects were authorized rather than the higher current rate, and 4) states that if Congress appropriates future funds for these projects, the President shall spend them.

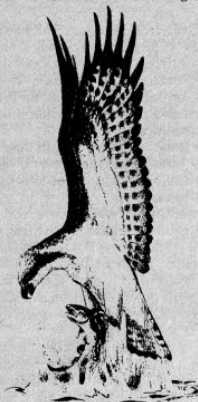
The House-passed jobs bill does not include this amendment, so its fate is uncertain.

The American Rivers Conservation Council notes that, contrary to many press reports, the amendment does not have a direct effect on the President's project budget review and budget cuts, since the project budget reviews are for FY 1975.

The National Wildlife Federation speculates that the Senate vote was designed "to

teach a new President about the congressional sensitivity to impoundment" of funds. But it notes "there has been no mention by the President of impounding FY 1977 funds."

However, if Carter doesn't plan to impound project funds he must either veto future appropriations or ask Congress for



project deauthorization to stop the projects. With a hostile, pro-water-project Congress, both these courses seem unlikely to succeed.

Carter plans to have all 320 water projects reviewed by April 15. He says that "our initial screening criteria indicate that the vast majority of these projects will be completed as planned."

Already at least 226 water projects have been screened and found to be acceptable, according to United Press International.

However, the initial screening has also pinpointed more water projects for potential zero budgeting. Development proponents are infuriated by the release of this new "hit list."

The new list includes 27 projects that initial studies indicate have environmental, economic, or safety drawbacks. Eight of the 27 were among the original 19 projects recommended for possible zero budgeting, so the latest list has 19 new endangered projects.

Among the new list of projects that failed the initial screening are: Dallas Creek, Frypan-Arkansas, and Narrows in Colorado; North Loup and O'Neill in Nebraska; Southern Nevada Water Supply; Brantley in New Mexico; San Juan-Chama in New Mexico and Colorado; Dickinson in North Dakota; Central Utah Project (Jensen Unit); and Lyman in Utah and Wyoming.

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What you can do to get clean water

The Western drought is bound to have an effect not only upon water quantity but upon water quality, the theme of this year's National Wildlife Week. "We ALL need clean water," the National Wildlife Federation, which sponsors the annual event, says.

As newspaper accounts have already revealed, the concern with what many consider "peripheral issues" — such as fish habitat, salinity, turbidity, and possibly even agricultural needs — drops dramatically as people hear they might have to cut their personal use by 50% or limit their use of electricity because the hydroelectric plant in their area won't be producing as much. In addition, smaller quantities flowing means greater concentrations of salts and other pollutants.

Consequently, it's a good year for citizens to concentrate some of their attention on their own localities' water supplies. The Federal Water Pollution Control Act amendments of 1972 put a lot of emphasis upon public participation to prevent, reduce, and eliminate water pollution.

Gregory Paul Capito, formerly a water quality official in Wyoming, offers the following suggestions for both individuals and citizen action groups: Identify a specific area of concern, such as inadequately treated sewage or industrial pollution. Research the applicable regulations and identify the agency or official who should be notified. Propose a solution, including several alternatives, taking into consideration statutory limitations, existing technology, and the economic hardship of reducing or eliminating the pollution source. Lobby, with persistence, to get the situation changed.

The U.S. Environmental Protection Agency (EPA) has published several pamphlets on water pollution control and citizen participation in environmental improvement programs. Ask for "Highlights of the Federal Water Pollution Control Act Amendments of 1972" and "Toward Cleaner Water" from EPA, Office of Public Affairs, Washington, D.C. 20460. Most states handle their own discharge permit systems for EPA, and they must supply information about the permit system, too, so contact them.

A deadline of July 1, 1977, has been set under the amendments for all industries to use the "best practicable control technology available" to prevent the pollution of waters by industrial wastes. By July 1 of 1983, they must apply the "best available" technology.

The amendments sets two goals for the nation:

- 1) To make America's waters clean enough for swimming, boating, and protection of wildlife by 1983, and
- 2) To dump no more pollutants into waterways by 1985.

Most Westerners might scoff at the first goal, knowing almost all of the waters in this region are now clean enough for swimming, boating, and protection of wildlife. In fact, many people drink water directly from the streams when they get into the hills, and others get their drinking water for their homes directly out of rivers, with only a mesh filter to clean it.

However, the West is learning that we have our own water quality problems. Ground water flowing through mine pits and spoils has been found to have large amounts of sodium, sulfates, nitrates, and trace metals. Uranium exploration drill holes have mixed contaminated water from one rock formation with water in a pure

aquifer, damaging water for miles around. Some has been contaminated with radioactivity from uranium spoils. Increasing demands on Colorado River Basin water has concentrated salts in the remaining water, which will require costly desalinization downstream.

Overuse of irrigation and fertilizer are increasing silt and nitrate loads in streams, and feedlot runoff is a serious pollution source.

State water quality agencies are also concerned with these problems and need citizen participation as "watchdogs."

The Federal Water Pollution Control Act is being further molded in the courts and in Congress now, and its effects are being felt in the marketplace.

IN THE COURTS

The Environmental Protection Agency (EPA) won what Acting EPA Administrator John Quarles called a "very important victory" recently in the U.S. Supreme Court. The court ruled that the agency has authority under Section 301 of the Federal Water Pollution Control Act to limit discharges by existing plants by establishing regulations that apply to all industries in a certain class or category.

In *Du Pont v. Train*, eight companies led by Du Pont contended that the law did not permit EPA to set industry-wide effluent limitations. They said EPA could only describe such limitations for each individual plant. The unanimous opinion of the court noted that requiring individual consideration of more than 42,000 discharge permit applications would put an impossible burden on EPA, according to *Air-Water Pollution Report*.

IN CONGRESS

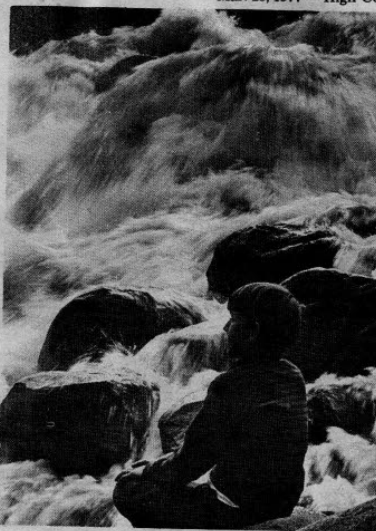
The Federal Water Pollution Control Act is up for total revision this year, and congressional action will probably take place in June. As was the case last year, the most controversial section of the act is again Section 404, which provides for Army Corps of Engineers control over filling and dredging operations. Amendments are being offered in both houses that would exclude wetlands from the corps's authority. U.S. Rep. Teno Roncalio (D-Wyo.), however, is supporting a bill that would exempt all normal farm operations, such as irrigation ditches and farm and stock ponds, from the corps' jurisdiction but would keep its authority over the wetlands adjacent to navigable waters.

Another amendment will determine how much federal money will be sent to communities for sewage treatment plants. EPA says U.S. cities must spend \$95.9 billion to build additional sewage treatment plants and sewers needed to comply with 1983 federal standards under the act. The standards would require communities to use best practicable technology.

National Association of Home Builders vice president David Stahl testified for continued funding. He says housing construction has become increasingly dependent upon the availability of adequate sewage treatment capacity. He complained that numerous local jurisdictions had imposed sewer moratoriums.

President Jimmy Carter proposed in his budget that the federal share in the program be reduced from its present level of 75%. But he would like to have \$45 billion allocated for sewage treatment construction grants in a 10 year program, according

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WESTERN WATERS may look clean, but the region has water quality problems. Photo by Pat Hall.

to Air-Water Pollution Report.

For more information on amendments to the act, contact the Clean Water Coalition through the Natural Resources Defense Council, 917 15th St., NW, Washington, D.C. 20005.

IN THE MARKETPLACE

The annual growth rate of water pollution control industry will be about 17% according to a researcher for Arthur D. Little, Inc. The researcher said this figure represents

approximately two and a half to four times the anticipated growth in the real Gross National Product, according to *Air-Water Pollution Report*.

Editors' note: Many of the news items about water quality on this page are taken from *Air-Water Pollution Report*, a weekly newsletter published by Business Publishers, Inc., Box 1067, Silver Spring, Md. 20910. Subscription price is \$175 per year.

Strip mine bill . . .

(continued from page 5)

formed the group, called Citizen's for Orderly Energy Development (COED). Johnston says that most of the state's privately-owned coal lies in those valleys. By strictly regulating the mining of valley floors, "you deprive a man of millions of dollars from his land when he may be having trouble getting by as a rancher."

The debate continues, even in the Carter Administration, which supports the strip mine bill.

Federal Energy Administrator John O'Leary told the Senate Interior Committee that the section pertaining to alluvial valley mining was subject to misinterpretation and could lead to litigation. He suggested changing the law to permit mining "which will not have a significant adverse impact on water resources supplying allu-

vial floors, and will meet the other requirements of the legislation." Other Administration spokesmen have supported the current provisions, however.

At present, it appears that the regulation of alluvial valley floor mining will survive Congress intact and be passed in the final version of the bill. The bill may pass by mid-summer and, at long last, be signed by a sympathetic president.

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In The Old Railway Yard

8-High Country News — Mar. 25, 1977

Olaus Murie, scientis



pronghorn antelope



hoary marmot



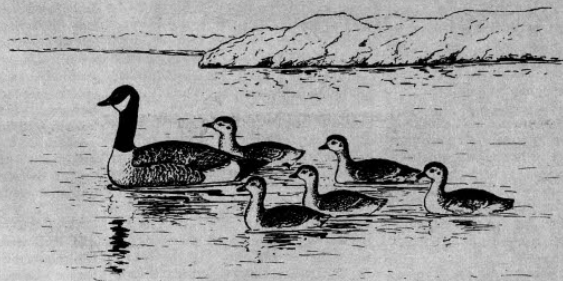
ruffed grouse



bull moose — Mt. Moran in Grand Teton National Park in background

entist with a sketchbook

Mar. 25, 1977 — High Country News-9



Canada geese



white-winged crossbill

Most people remember Olaus J. Murie as a naturalist, explorer, and writer. But as Murie conducted his now-famous studies of wildlife in Alaska, New Zealand, and Jackson Hole, Wyo., his sketch pad was always with him. Murie saw art and science as two inextricably intertwined disciplines that contributed to a holistic view of nature.

In his book *Journeys to the Far North* Murie described man's need to merge science and art:

"We have been blessed with the power to appreciate beauty — in color, form, and sound; we have been endowed with curiosity, the urge to reason things out scientifically, to wonder about ourselves and the universe. And we have imagination. Could there be a finer assemblage of powers conferred on any living creature? Poetry, Art, Science, Wonder, Awe, Philosophy — and enthusiasm. What a heritage we have, if we only let it operate! And all of these are by no means incompatible.

"Along with scientific search for truth, which must be paramount in all human endeavor, there is emerging an awareness of the poetic implications in what we learn.

...When we attain a new understanding of something in the field of science, the thoughtful scientist is filled with wonder and a degree of reverence for what we only

partially understand. A poetic appreciation of life, combined with a knowledge of nature, creates humility, which in turn becomes the greatness in man."

His widow, Margaret E. Murie, recalls in the preface of his *Journeys to the Far North* how Olaus had been encouraged to continue his art career: "When Olaus was 14, his teacher Miss King called him aside as he was marching out with the other eighth-graders of Moorhead, Minnesota, on the last day of school. At first he thought he had done something wrong, but she said, 'Olaus, I want you to promise me something — keep on drawing!' In those later years, when he was illustrating his own and others' books both in pen and ink and in color, we wished that he could have found Miss King to thank her. Aside from the drawing class in grade school, he never had an art lesson. He just 'kept on drawing.' Even before he was out of college, Olaus always carried drawing paper in the back of his field notebook and found things to sketch at every spare moment. By the time he began to think of a book about the Arctic, he had a wealth of sketches in the files to remind and inspire him."

The drawings on these pages are from Margaret Murie's private collection. They were loaned to *High Country News* to help us celebrate Wildlife Week 1977.

10-High Country News — Mar. 25, 1977



Scrubby's solar-heated restaurant.

Smokeyhouse heated, cooled by do-it-yourself solar system

Mountain Home, Idaho, has an Air Force base and the world's only solar heated and cooled smokehouse restaurant — Scrubby's. Jim Birchfield, alias "Scrubby," designed the restaurant himself. He read up on solar energy, sent off to Harry Thomason for some basic plans, and combined it with knowledge to produce a system which has cut his fuel bill drastically.

You don't need professional training to design and build a solar system, says Birchfield. "The most necessary thing is just to rely on common sense."

Birchfield's heating system involves running water over a south-facing black metal roof. The hot water is stored in a 2,250 gallon steel tank in the basement which is surrounded by rocks. He has 1,032 square feet of collector to heat a 3,354

square foot floor space. The system was home-built for \$5,534. It is a self-draining system, so freeze-up is not a problem.

Last winter, before the system was fully operational, the back up propane heating bill averaged \$350 per month. This winter the fuel bill was \$138 for December and \$88 for January.

To cool the building, Birchfield runs water down the north face of the roof during the summer nights. He then blows air across the cool water and into the restaurant. This method keeps the inside temperature about 25 degrees below the outside temperature, Birchfield claims. The cooling bill averages \$12 per month.

Scrubby's is located south of Mountain Home on the road to the Air Force base.



The HCN Hot Line

energy news from across the country

NUCLEAR STATES RIGHTS. U.S. Rep. Morris Udall (D-Ariz.) has introduced a bill that would give states veto power over licensing decisions for nuclear power plants, according to *Energy Daily*. Under the two bills that Udall proposes, states could impose stricter standards than those of the federal Nuclear Regulatory Commission. Udall says the current regulatory framework is "out of step with the times."

PLUTONIUM RECOVERY OPPOSED. Friends of the Earth (FOE) and an Oak Ridge, Tenn., area resident have petitioned the Nuclear Regulatory Commission to intervene against a license application by Exxon Nuclear Co. to build a plutonium recovery and recycling facility near Oak Ridge. The petition cited a number of concerns, including cost, safety, uranium supply, and nuclear proliferation considerations. A nuclear reprocessing facility chemically recovers plutonium from spent nuclear fuel for reuse in other plants. No reprocessing facilities are now in operation in the U.S.

INDIANS OPPOSE PIPELINE. The chairman for the Council of Yukon Indians, Daniel Johnson, told a U.S. House subcommittee that his tribe would not accept construction of a trans-Canada natural gas pipeline from Prudhoe Bay, Alaska, across a part of the Yukon it claims. He said his tribe was opposed to any pipeline through the Yukon until its land claims are settled by the Canadian government. The Arctic Gas proposal, which

has been recommended by a Federal Power Commission (FPC) judge, crosses the Yukon. Environmental groups that are pushing for a different route warned several months ago that the Arctic Gas proposal ignored the potential effects of Indian land claims. Johnson told the subcommittee that negotiations between the Canadian government and the Indians could delay construction for many years, according to United Press International.

GOVERNORS SUPPORT STRIP BILL. Montana Gov. Tom Judge testified before the Senate committee considering the federal strip mining bill saying he and other Western governors support the bill, provided it contains provisions for giving states authority over reclamation programs. He said it is imperative to protect landowners from "outright seizure" by the federal government if the government wants the coal beneath their land. However, he disagreed with the Mansfield amendment, which would prohibit any federal coal from being mined if it was under private surface. Speaking on behalf of the Western Governors Regional Energy Policy Office, he supported the strong alluvial valley protection measures in the House bill.

TOUGHER SO₂ REGS? Due to improvements in sulfur dioxide (SO₂) scrubber technology, the Environmental Protection Agency (EPA) says it may tighten its sulfur dioxide standards for new and modified coal-fired power plants. EPA has begun a study to document the need for upgrading the standards in response to an Aug. 6 petition by the Sierra Club and the Oljato and Red Mesa Chapters of the Navajo Tribe to require a 90% reduction in SO₂ emissions. EPA's New Source Performance Standards issued in 1971 were based on technology capable of removing 70-75% of the SO₂ from the stacks of a coal plant.



energy news of the Rockies and Great Plains

S.D. WATER FOR SLURRY. The South Dakota Legislature has approved a bill that would provide for an aqueduct being built from Oahe Reservoir across South Dakota to Wyoming to carry water for Energy Transportation Systems, Inc.'s (ETSI) proposed slurry pipeline. ETSI would get 20,000 acre-feet, and communities along the aqueduct would get 10,000 acre-feet. Before a water permit can be issued, a contract approved by the legislature and collateral to be supplied by ETSI would have to be agreed upon. Under the proposal, the company will pay the state a fee for the water it wants as well as \$2 million a year above the cost of the water.

CARTER TO SUPPORT SHALE PROJECT. President Jimmy Carter will ask Congress for money to finance a demonstration oil shale plant in northwestern Colorado in his April 20 energy message, according to a story in the *Denver Post*. The proposal is expected to call for a small plant, producing 5,000 barrels of oil a day. An administration source said, "This will be a research and development project, not a crash program to provide large amounts of domestic oil to turn through our refineries." Meanwhile, a group of Western Colorado officials has told U.S. Sen. Floyd Haskell (D-Colo.) that they like his idea to promote the federal government building oil shale demonstration plants in the area. But they tell him that if two plants were built, they would need more than \$155 million in impact funds for local governments, according to *The Weekly Newspaper*.

COWBOYS AND INDIANS. The Crow Indian tribe and the state of Wyoming have both objected to the Northern Cheyenne's request for a Class I air designation. Both objections are based on fears that the designation would hinder coal-related development in areas close to the Northern Cheyenne reservation. The Environmental Protection Agency (EPA) says that the administrator will not have to balance the interests of the two objecting parties before deciding on the reclassification. Before the objections, EPA was only required to determine that the request was not "arbitrary and capricious."

REFIGURING FAIR MARKET. Despite new federal leasing regulation requiring companies to pay the fair market value for coal leases, the Bureau of Land Management (BLM) in Colorado is developing a new formula to guarantee that bids below market value can be accepted, according to *Coal Week*. The Interior Department has had to reject several bids in the past eight months that were too low, and BLM hopes to change the situation. Sometimes the position of a coal tract in relation to geographic factors and other mining companies' leases limit the bidders. Consequently, *Coal Week* says, BLM may figure in such things as the amount of royalties lost to the state and federal governments by not leasing the tract, the state severance taxes lost, and the loss to the nation of locking coal in the ground.

GASIFICATION PROPOSALS MERGED. ANG Coal Gasification Co. and Natural Gas Pipeline Company of America, which were pursuing separate North Dakota coal gasification plants, have announced that they will construct one scaled-down version of the plants as a joint venture. The first phase plant will have a capacity of 125,000 cubic feet per day and be located in Mercer County, N.D., near Beulah. Project cost is estimated at \$600-million with the companies supplying 25% each and the rest of the financing dependent upon federal loan guarantees.

UTILITY SEEKS FLAT RATE. Intermountain Gas Co. has asked the Idaho Public Utilities Commission for permission to establish a flat-rate schedule for residential, commercial, and industrial users, according to the *Idaho Statesman*. Consumer groups across the country have been pushing for such rate schedules, which even out the rates paid per unit of energy by all users rather than allowing large users to pay less as most utilities do. R. Dean Grimm, president of Intermountain, said that although it costs his company less to deliver gas to larger users, the flat-rate schedule will perhaps help in the conservation of energy.

RADIOACTIVE AIR OVER WASATCH. During the winter months, radioactive air pollution in Salt Lake City, Ogden, and Price, Utah, often exceeds guidelines set by the Nuclear Regulatory Commission, according to a radiation researcher from the University of Utah. Dr. Robert C. Pendleton said his study included radiation produced from burning fossil fuels, natural radiation from rocks and soil surfaces, and radiation from waste piles, according to the *Deseret News*. He said radioactive air pollution has reached a point where it is no longer tolerable.

INDIAN PROTECTION SOUGHT. Harris Arthur, executive director for the Shiprock Research Center in Shiprock, N.M., has asked Congress to adopt a comprehensive Indian lands program for strip mining until Indian tribes can write and enforce their own regulations. Arthur, speaking before the House Interior Subcommittee on Energy and the Environment, said he was concerned about what he called "hasty decisions" sometimes made by tribal councils in leasing. Arthur is a Navajo Indian. Navajo Tribal Chairman Peter McDonald has been accused of promoting more energy development on the reservation than many of the tribal members want. "Lack of federal or tribal authority makes our people fair game for large, non-Indian energy interests," Arthur says. Hearings in the House on federal strip mine legislation are over, and the House subcommittee members are visiting strip mine sites now.

BLM MAY NAME NOMINATORS. The U.S. Bureau of Land Management (BLM) may have to release the names of more than 240 nominators of coal leasing tracts and the tracts they nominated, according to *Coal Week*. The Interior Department's Solicitors Office made the decision, but it must be affirmed by Secretary Cecil Andrus. Releasing the names with the tracts would answer a formal objection filed by several landowners and a newspaper who criticized the secrecy policy. The Interior Department then asked all nominators whether or not they would object to releasing the information. Of the 341 nominators, 178 responded. The 94 who objected will not be released, but all those who did not object or did not respond will be released, according to *Coal Week*.

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Groups challenge N.W. Colorado coal statement

One of several lame duck proposals for massive new Western energy development left by the Ford Administration is now facing review by Interior Secretary Cecil Andrus. Conservationists are urging Andrus to reject an environmental impact statement (EIS) on coal development in north-west Colorado. Colorado Open Space Council (COSC), the Environmental Defense Fund (EDF), Colorado Mountain Club, and Friends of the Earth have charged that the EIS inadequately assesses impacts of the proposed development, that some of the actions of the previous administration related to the EIS are already in violation of the National Environmental Policy Act (NEPA), and that it sets a bad precedent for future regional EISs planned by the department.

They say that because of the timing of the EIS, only one per cent of the areas formally nominated for coal leasing are considered in the EIS.

The Bureau of Land Management (BLM) in Colorado, which prepared the EIS, however, denies that there have been violations of NEPA. In its preface to the final draft of the EIS, BLM says that the statement is not intended to be sufficient in itself as an environmental analysis. "No leasing will be authorized solely as a result of that statement," according to Bob Moore, who coordinated the study for BLM.

On June 1, 1976, when the Ford Administration lifted the moratorium on federal coal leasing and announced a new

leasing system called EMARS (Energy Minerals Activity Recommendation System), Western ranchers and conservationists vigorously protested the decision, saying there was no proven need for further large-scale leasing. Heedless of this, former Secretary of Interior Thomas Kleppe ordered the preparation of 12 regional EISs to get EMARS and more coal development underway.

The Northwest Colorado Draft EIS, covering a three county region, was released soon after Kleppe's order, and two months before the EMARS nominations were due. Preparation of the draft began six months earlier. Environmentalists charge that this EIS, which is to be a model for the remaining 10 regional coal EISs, was put together as a "political rush job" to beat the change in administrations. The draft was criticized by conservationists, the state of Colorado, the U.S. Environmental Protection Agency, and other governmental agencies.

The final version of the EIS was published just days before President Jimmy Carter took office, and the decision to approve or disapprove the EIS now rests with Secretary of Interior Cecil Andrus.

Asked in a telephone interview whether he thought the timing of the EIS release was based on politics, Moore said he didn't see what difference the timing makes. He explained that the BLM was already far

along in its planning process when the Interior Department changed its leasing regulations. He says it didn't seem "reasonable or prudent" to delay release of the statement, thus delaying action on some mining applications that had been on file for two years. "Coal mining in north-west Colorado is like the timber industry in Oregon. It's an ongoing thing; people are dependent upon it," he says.

The EIS projects an eight-fold increase in coal production in the area by 1990, most of which would be strip mined. The three counties would then be producing five times the 1975 coal output of the entire state.

Of the five specific proposals that are considered in the EIS, conservationists charge that two of the mining plans have already involved violations of NEPA. The plan for the Energy Fuels Corporation, which operates the largest strip mine in Colorado, was approved by the U.S. Geological Survey (USGS) in 1975 "on an interim basis" without an EIS. The EIS for Energy Fuels was written and circulated after approval had been granted and mining begun.

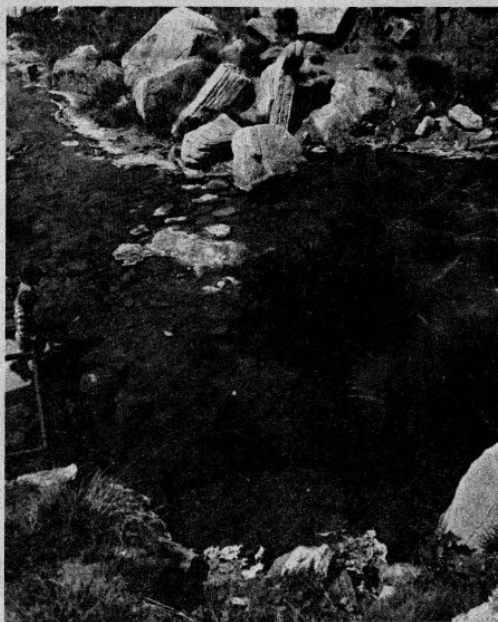
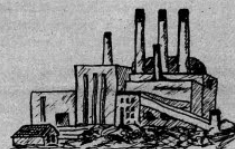
In the case of W. R. Grace's proposed Colowyo Mine, a moving pit 1½ miles long and 400 feet deep, the Interior Department in December decided that Grace didn't have to wait until the EIS was approved to begin mining. Instead, Grace was given permission to start operations under an "interim mining plan." COSC and EDF have called upon Interior to revoke approval of this plan and to comply with NEPA and the Department's own regulations.

Moore says that mining in both cases was approved because the companies had

coal contractual obligations to fulfill. Energy Fuels' lease was approved under what the Interior Department calls "short term criteria." He says the lease acknowledges that stipulations could later be added after the impact statement is complete.

The W. R. Grace mine was a "USGS problem, not a BLM problem," Moore says. He says the company had a permit for an underground mine. It was allowed to get a "modification" of the mining plan permit rather than having to apply for a new permit since the company had a contract requirement to fill. Moore admits that the modification to open pit mining rather than underground mining was a significant change.

Summarizing, Brad Klafehn of COSC says, "In general, this ill-conceived, politically-motivated, and hastily put-together regional EIS does not present a regional plan for action. Instead, it shows that development will proceed at a rate determined by industry." His organization and the EDF have asked Andrus to demand that the EIS be withdrawn from active consideration until it is revised and updated. They asked that no specific actions should be approved under the EIS until an "adequate regional environmental impact statement is prepared."



HOT SPOT IN WYOMING. A few individuals in Thermopolis, Wyo., think the city should investigate the potential of heating public buildings with the hot springs under their town. However, the superintendent of the Hot Springs State Park says it would be better to save the water for health uses. The hot springs is a favorite mecca for recreation and health baths. About 19 million gallons of 130 degree water a day flow through the springs. One family that has heated its home for 29 years with a hot springs in the area says the only expense has been replacing the steel pipes, which corrode within nine years from the minerals in the water, according to the CASPER STAR-TRIBUNE.

Photo of Big Springs by Bob Milek.

Wyoming council scrutinizes Wheatland power plant — again

The Wyoming Industrial Siting Council is expected to make a decision within four to six weeks on whether to impose extra conditions on the siting permit for the Missouri Basin Power Project (MBPP) in Wheatland, Wyo. Opponents of the project would like to see the council impose an injunction to halt construction.

The council conducted a four day hearing to consider two major changes in the water supply situation that occurred since the first hearings a year ago. Transmission lines were also discussed at the hearing. As the result of letters from landowners criticizing MBPP's efforts to site transmission lines, the council sought further testimony to be sure the companies are fulfilling their obligations to the council under their permit.

Another hearing will be held later on transmission lines after MBPP reveals the exact proposed locations for the lines. In its permit, the council instructed MBPP that "any significant conflicts" with landowners must be resolved before the council would authorize the lines. Observers at the hearing say resolution of conflicts looks less and less likely as landowners grow more and more disgruntled about their treatment by MBPP.

While construction of the 1,500 megawatt power plant is proceeding, the dam that would supply water for it, Grayrocks, is not. The U.S. Corps of Engineers isn't issuing a Section 404 permit

until a lawsuit brought by the state of Nebraska on water flows in the Platte River is resolved. In addition, the U.S. Fish and Wildlife Service (FWS) has asked the corps to deny the permit until the impacts on sandhill crane habitat are adequately addressed and FWS assured the project won't destroy the habitat.

At the hearing this month, siting council chairman John Troughton asked MBPP how much water it could get out of its underground supplies if the dam permit were refused. The firm is preparing an answer that will be included in the material the council will be considering.

An independent report on the potential safety of the dam, requested by the siting staff, will also be considered. One reason the hearing was called was because the permeability of the soil under the dam was 1,000 to 3,000 times greater than had been estimated at the original hearing.

The other reason was that MBPP found it had to draw upon a water aquifer now used extensively for agriculture in the area instead of the deeper aquifer it previously proposed using.



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PELICAN REFUGE. Utah legislators passed a bill which will help preserve prime nesting habitat for white pelicans, Gunnison Island in the Great Salt Lake. Photo by Tom Baugh

Utah energy...

(Continued from page 1)

free of federal taxes. Municipalities are usually exempt from sales and property taxes, too. However, the bill was amended to require that the state and local taxes be paid in proportion to the amount of power exported to California.

Utah Gov. Matheson let the bill slide into law without his signature. "We don't think it can go both ways," says Platt, referring to the legislature's creation of a public entity which is to be treated like a public utility by the federal government and like a private entity by state and local governments.

Vigorously lobbying against the bill was Utah Power and Light Co., a private utility that feels the bill puts IPP in an unfair competitive position.

An IPP attorney, George Fadel, told the *Deseret News* that the bill will help the project move forward, but that it is just one of many hurdles ahead.

If Utah environmentalists view the IPP

law as the worst of the legislators' creations this year, they view the energy conservation bill, SB 109, as the best. The bill requires that all new buildings comply with a state energy conservation code after Jan. 1, 1978.

Some observers were amazed that such a law passed the Utah legislature, even with a substantial loophole that permits local entities to accept or "modify" the state code to meet their needs.

Other successful bills backed by environmentalists include:

—HB 272, which creates an Energy Conservation and Development Council. Two environmentalists told HCN that they feel confident that Gov. Matheson will appoint a fair representation of all interests to this board, which is charged with setting energy policy for the state.

—The legislature voted to purchase Gunnison Island in Great Salt Lake. The island is an important white pelican nesting spot and is said to produce 20% of the entire white pelican population.

—The legislature created a Committee of Consumer Services that will sponsor an

advocate to represent utility customers at Utah Public Service Commission (PSC) rate hearings. They also passed a bill that will require a study of the Utah utility rate system and will allow the PSC to consider the economic impact of rate increases on Utah citizens.

DEFEATS

Bills regarded by environmentalists as defeats include:

—SCR 1, an energy policy resolution which places most of its emphasis on increasing energy production. "It's an energy development policy, not an energy policy," says Nina Daugherty of the Uinta Chapter of the Sierra Club. The resolution adopts as state policy the report of the Joint Legislative Committee on Energy.

—SCR 6, a memorial to Congress and President Jimmy Carter to continue funding for the Central Utah Project, a federal water development scheme. Environmentalists regard the project as wasteful, unnecessary, and environmentally damag-

ing. Gov. Matheson says, however, "The Central Utah Project is the single means by which Utah has elected to utilize and conserve its allotment of Colorado River water."

—In a White River Development Resolution, the legislature came out in favor of damming the White River in the northeast corner of the state to provide water for oil shale development.

Environmental groups had only two full-time lobbyists at the session this year, Bob Kihm of the Council on Utah Resources and Jan Johnson of the Utah Environment Center.

"We didn't make a big deal of lining the hallways with a lot of environmental types, because that would be an irritant," says Johnson. "We let the constituency do the work by telephoning and writing letters about their concerns."

After reviewing their wins and losses, both she and Kihm are convinced that, for Utah, the low key lobbying approach is best.

Early composting toilet 'junk' — but now only glowing reports

WHITEFISH, MONT. — When Abby Rockefeller introduced the Clivus Multrum to the United States three years ago, hope grew that the meeting might result in less wasted water and less watered waste.

But, the Swedish composting toilet has, like most new products, had its share of early problems.

Glen Nelson of Whitefish is the Montana dealer for Clivus Multrum, U.S.A. "The first toilets supplied were really junk," Nelson said in a telephone interview. "But the company always did something about them."

Nelson made it clear he was talking about hardware and components of the Clivus Multrum (Latin for inclining compost room), rather than about the concept and general design.

Essentially, the Clivus is a combination toilet and garbage disposal unit that uses no water. Excrement drops into one compartment, garbage into another, and, over about three years, the two bacteriologically act on one another to produce humus. Priced at between about \$1,500 and \$2,000, the Clivus is the most expensive composting toilet in the country. Only about 500 have so far been sold in the U.S.

Nelson said most of his problems involved the garbage unit, the chutes, and the toilet bowl. "I haven't accepted a garbage unit yet," he said. The first one he received 2½ years ago was made of polyethylene. Its edges were so rough he had to file and sand them, Nelson said. The

second, he said, was hinged in such a way that "I'm sure it would have broken."

On the third, the wooden chute designed to convey garbage to the tank was cracked because, Nelson said, it was improperly built.

Another early problem was that the hinge for the toilet seat cover was a rod that went into the seat and cracked it, Nelson said. Like other Clivus customers, Nelson said he also has had some problems with odors and an early buildup of liquid in the tank. He has noticed an intense interest in the Clivus on the part of fruit flies. The tank, too, was "very fragile," Nelson said.

Two months ago, Nelson said, he sold a Clivus to a couple in Kalispell, Mont., and the main office in Cambridge, Mass., still hasn't sent them a garbage unit. "I hope that's an isolated case," he said.

All in all, however, Nelson said the company has been eager to correct any problems. It has designed new chutes and tanks, recommended the installation of a fan to prevent odors, and suggested ways to use and install the system so as to prevent the problems some early customers encountered, he said.

For himself, Nelson said he prefers the Clivus to flush toilets and the problems he encountered were not so severe that he would recommend against buying a Clivus.

In November, the *Maine Times* published a story severely critical both of the company's and its product's performances. The company was losing money,

paid little attention to dealer and customer complaints, switched from one malfunctioning component to another, and sometimes paid little attention to the recommendations of testing firms it had hired, the newspaper said.

Rockefeller, in an angry reply, accused the *Maine Times* of distorting and exaggerating the negative aspects while ignoring the positive ones, and submitted a point-by-point rebuttal.

The newspaper subsequently published letters from five Clivus owners who agreed with Rockefeller; it did not publish any letters that agreed with its article.

"We have had problems, no denying it," Rockefeller said. "The Clivus Multrum is not as romantically simple as we, like many others, had originally thought."

But to say there are no successful Multrum installations in the entire state of Maine is... at best grossly negligent...."



Truth not Consequences

The truth is High Country News keeps its eye on the developing West. The paper tries to do an honest job of reporting. The consequence of not keeping an eye on West could be disastrous. That would be a taking a chance we're not ready to take. We hope you're not ready to, either. You can help to print the truth — not the consequences — by donating to the High Country News research fund. Donations are tax deductible. Make out checks to: "Wyoming Environmental Institute — HCN Research Fund," and send to Wyoming Environmental Institute, P.O. Box 2597, Jackson, Wyo. 83001. Thank you.

The High Country News Research Fund



Western Roundup

HCN


OTTER REVIVAL

The Colorado Division of Wildlife is trying to bring otters back into the state. In 1976 the division released three at Cheesman Lake near Denver and six on the Gunnison River. It eventually hopes to establish 12-18 otters at each site. The division also plans to release otters in Rocky Mountain National Park and in the Aspen-Vail area.

Trapping, mining, and dam-building all contributed to the decline of the small fur bearer, which needs open water in the winter to survive. The last otters in Rocky Mountain National Park were seen in the 1950s.

Photo courtesy of Colorado Division of Wildlife.

Oahe foes may lose election gains

When a group of South Dakota farmers opposed to the Oahe Irrigation Project gained control of the Oahe Conservancy Subdistrict Board, they thought they'd be able to stop the controversial project. Instead, state officials may change the system, stripping the six members of the United Family Farmers elected to the 11-member board of the power they had sought. Up until the time the farmers won the election, the subdistrict board had served as the \$457-million federal irrigation project's guiding voice. Now U.S. Sen. George McGovern, Gov. Richard Kneip, and many state legislators are pushing a bill in the state legislature which would take power over the water project from the conservancy district and give it to the state. "What they're trying to do makes a sham of the election and of the democratic process," George Piper, president of the United Family Farmers, told the *Minneapolis Tribune*. "We played by the rules of the game. We won. They lost. And now they're trying to change the rules."

Kennecott delays air cleanup again

For the second time, Kennecott Copper Corp. is asking the U.S. Environmental Protection Agency (EPA) to give it more time to come into compliance with the national ambient air standards. The first cleanup deadline set by EPA was mid-1975. Later EPA extended the deadline to July 31, 1977. This month Kennecott announced it would need yet another six months to clean up emissions from its Magna copper smelter. "An accumulation of adverse factors, including delays in material and equipment deliveries and engineering design changes, has resulted in Kennecott's inability to meet the present compliance schedule," according to the company.

Cheyenne water scheme under fire

The U.S. Environmental Protection Agency and three state agencies have joined Wyoming conservationists in criticism of a Forest Service land use plan on the Huston Park area in the Sierra Madre Mountains south of Rawlins, Wyo. The plan is prejudiced in favor of the city of Cheyenne's water collection facilities, according to John A. Green, regional administrator of EPA in Denver. The plan is contained in a draft environmental impact statement issued by the service, which proposes dividing the 63,000 acre Huston Park Sub-Unit into three land management units — a small wilderness and two other units which would allow the city of Cheyenne to take Huston Park water out of its basin of origin to Cheyenne for municipal use (see HCN 1-28-77, page 7). The plan provides for 29,000 acres of Huston Park to be studied for wilderness classification, but environmentalists have said that 48,000 acres should be studied. Wyoming's Office of Industrial Siting Administration, Game and Fish Department, and Water Quality Division of the Department of Environmental Quality were also critical of the draft statement. Spokesman for the siting administration and the water quality division question Cheyenne's need for the water. The Game and Fish Department says that the Forest Service hasn't adequately considered the wildlife resource. "Protection of existing water quality is best served through adoption of those alternatives which would set aside the greatest amount of land for wilderness study," says John F. Wagner of the water quality division.

Forest chief halts gerrymandering

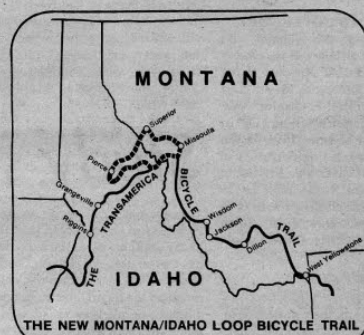
A decision by Forest Service Chief John McGuire on the Nezperce National Forest in Idaho will mean that roadless areas can't be gerrymandered out of existence by "piecemeal planning," according to a spokesman for the Sierra Club. At stake in the decision was a 450,000-acre proposed Gospel Hump Wilderness Area in northern Idaho. Nezperce National Forest officials had put pieces of this tract into nine different planning units. In response to an administrative appeal brought by local and national environmental groups, McGuire ruled that the procedure violated Forest Service regulations requiring that adjacent roadless areas be evaluated as a whole. He also said the action violated an agreement resulting from the lawsuit, *Sierra Club v. Butz*. He ordered a new environmental impact statement and consideration of the wilderness values of the entire contiguous roadless tract. The chief also stopped a timber sale which was about to go ahead in the area. "This is a clear message to every forest supervisor to stop fragmenting large roadless tracts . . . before it is fairly considered," says Dennis Baird of the Northern Rockies Chapter of the Sierra Club.

30" of topsoil best for reclamation

Studies conducted at the Northern Great Plains Research Center at Mandan, N.D., indicate that 30 inches of topsoil is the most effective for raising wheat on land that has been strip mined, according to the *Hazen Star*. The analysis was part of a study by the center with Basin Electric and Consolidation Coal Co. The studies showed that the 30 inches must be returned in separate layers of subsoil and topsoil materials. The studies also showed that depths of more than 30 inches were no measurable advantage. The same dryland soil management techniques used on unmined land can be used to restore productivity to mined land, according to the study. The studies were conducted over a five year period to determine the ability of reclaimed lands to sustain different varieties of grain crops and grasses planted on varying depths of subsoil and topsoil, according to the *Hazen Star*.

Defenders say trona ponds still deadly

Trona ponds in Southwest Wyoming continue to kill hundreds of ducks "while the U.S. government sits on its hands," charges Defenders of Wildlife. Evaporation ponds used by the trona industry attract waterfowl, but when the birds land they become encrusted with decahydrate crystals which can lead to death (see HCN 9-26-75). The companies have been trying to save the birds by scaring them away from the ponds and picking up and washing off those that land on the ponds. Defenders says this effort is not enough and is asking the U.S. Fish and Wildlife Service (FWS) to require the companies to come up with an alternative to open evaporation ponds. Defenders is urging FWS to consider bringing suit against the trona companies under the Migratory Bird Treaty Act.



BIKECENTENNIAL GROUP READY FOR '77

Bikecentennial, the nonprofit cycling organization that celebrated the nation's bicentennial on a 4,500 mile TransAmerica Bicycle Trail, will offer bicycle trips again this summer. New to the program are loop trails, 350 to 500 miles long, in Kentucky, Virginia, Idaho, and Oregon. The group will also offer eight trips on the TransAmerica trail, including the 90-day ride from Oregon to Virginia.

The loop shown by dotted lines on the map above winds through the Lolo and Clearwater National Forests of Montana and Idaho. The loop is about 300 miles of backwoods roads, mostly dirt or gravel.

For more information, write Bikecentennial, P.O. Box 8308, Missoula, Mont. 59807.

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HCN

Bulletin Board



LOONEY LIMERICKS

by Zane E. Cology

We animals down by the creek,
Think swimming in sludge pools is bleak.
We all need clean water,
Each fish, frog, and otter,
Let's clean up for wildlife week!

E-DAY FORUM

Walter J. Hickel, former governor of Alaska and former Secretary of the Interior, and David R. Brower, president of Friends of the Earth, will be the featured speakers for an energy forum in Golden, Colo. The forum — "What Happens When the Oil Runs Out?" — will be held at the Colorado School of Mines March 31. There is no registration fee. For more information, contact William Scott Graeme, forum coordinator, E-Day Forum, Colorado School of Mines, Golden, Colo. 80401.

COMPUTER MATCHMAKER

The U.S. Energy Research and Development Administration (ERDA) is now putting together a computer system that will match interested homeowners with the solar systems best for them. Homeowners will supply information on their floor space, climate, family size, and insulation, and ERDA will tell them which system would be suitable. For more information on Solcost, contact ERDA Office of Public Affairs, Washington, D.C. 20545.

BREEDER COMMENTS SOUGHT

The Energy Research and Development Administration (ERDA) is seeking public comments on the U.S. plan for fast breeder reactor development. Information on the Liquid Metal Fast Breeder Reactor program is available from ERDA, Office of Acting Assistant Administrator for Nuclear Energy, 20 Massachusetts Ave., N.W., Washington, D.C. 20545. The information is also available from a Western office — Albuquerque Operations Office, Kirkland AFB East, H St. at Pa., Albuquerque, N.M. 87117, Thomas R. Clark, deputy.

MISSOURI BASIN GOVERNORS

The drought, energy development, and federal water use policies will be among the topics at the Second Missouri River Basin Governors' Conference May 3-5 at the Omaha Hilton Hotel in Omaha, Neb. The governors' conference will be held in conjunction with the Missouri River Basin Commission regular meeting. Secretary of Interior Cecil Andrus has been invited to be one of the speakers. Registration fee for the conference is \$25 and should be sent to MRB Governors' Conference, MRBC, Suite 403, 10050 Regency Circle, Omaha, Neb. 68114.

ENERGY BOND

Montanans will assess the impacts of energy modifications on their standards of living at a free public conference at Eastern Montana College, Billings, April 3-4. The conference will open with a "technology exchange," a fair-like atmosphere for the public to meet and talk with people engaged in technologies such as small scale manufacturing and renewable energy. Speakers for the conference will include Pete Mondale, the Vice President's brother; Wilson Clark, energy advisor to California Gov. Jerry Brown; and Norman Maclean, author of *A River Runs Through It*. For information, contact the Institute of the Rockies, 622 Evans, Missoula, Mont. 59801, or call (406) 728-5352.



JOHN MCCOMB is leaving his position with the Sierra Club in Tucson, Ariz., to become a lobbyist for the club in Washington, D.C. Photo by Joanna McComb.

SIERRA CLUB REP NEEDED

The Sierra Club is seeking applications for the position of Southwest representative, with staff responsibility over club operations in Utah, Colorado, New Mexico, and Arizona. John McComb, the present representative, is moving to Washington, D.C., to be a public lands lobbyist for the Sierra Club. The Southwest representative is provided with an assistant and has supervisory responsibility over the Utah Wilderness Coordinator. Anyone interested should contact Associate Conservation Director Paul Swatek, 530 Bush St., San Francisco, Calif. 94108. Phone (415) 981-8634.

SHAPING IDAHO

A conference will be held April 1 at the College of Idaho in Caldwell on "Shaping Idaho's Future." The one day conference will consider agriculture, timber production, water, and fish and wildlife habitat. To register, write the Regional Studies Center, the College of Idaho, Caldwell, Idaho 83605.

A report on coal leasing on state land in New Mexico has revealed that the state is losing millions of dollars on leases that have never been developed. The Southwest Research and Information Center, which compiled the report, recommends the state discontinue all leasing of coal on state lands until policies are adopted to bring the state's program into compliance with federal leasing regulations and to "genuinely maximize the benefits received by the people of New Mexico."

The loss to the state has resulted from several factors:

—The state has no regulations to prevent companies from holding leases for speculative purposes. Consequently, although 140,000 acres have been leased since 1973 and although royalty levels seem to be fair, no coal has been produced. So no royalties have been paid on coal sales.

UTILITY REFORM GUIDE

Citizens interested in rate reform in their states may want to get the Environmental Action Foundation's newly revised *Utility Action Guide: Resource Materials on the Electric Power Industry*. The guide is free, and it catalogs the best studies, articles, legal briefs, testimonies, and books for people working for reform of the electric power monopolies. Write and send a self-addressed legal size envelope to the Environmental Action Foundation, 724 Dupont Circle Bldg., Washington, D.C. 20036.

FLATHEAD WILD RIVER

The final environmental impact statement on the Flathead Wild and Scenic River Project has been released and is available at several county libraries in Montana and from the Flathead National Forest ranger stations in Kalispell, Columbia Falls, Whitefish, Hungry Horse, and Big Fork, Mont. The statement covers three forks of the Flathead, which were added to the Wild River System last October.

COAL MEN MEET

The presidents of Union Pacific and Burlington Northern and the assistant director of the U.S. Bureau of Land Management (BLM) will be among the speakers at the Coal Production and Transportation conference at the Brown Palace in Denver, Colo., April 13-14. Representatives of the coal operators, the National Coal Association, utilities, and railcar suppliers will speak on such topics as the status of slurry pipelines, the Carter Administration's policies, railroad coal hauling plans, and New Mexico coal. For an invitation, contact PLM, Inc., One Embarcadero Center, San Francisco, Calif. 94111.

RAINBOOK

A 256 page book of the resources for appropriate technology is being published by RAIN, a monthly information access journal. The book includes the best of the journal in addition to new material on compost toilets, solar greenhouses, community economics, municipal utilities, land trusts, natural pest control, and community radio stations. Copies can be ordered for \$7.95 from RAIN Magazine, 2270 N.W. Irving, Portland, Ore. 97210.

NUCLEAR FILMS

Two films on the nuclear power controversy, "Lovejoy's Nuclear War" and "Nuclear Reaction in Wyhl," are available from Green Mountain Post Films (P.O. Box 177, Montague, Mass. 01351). Each can be purchased by public interest groups for \$100 or rented for \$15. Both are 16mm, 60 minutes long, and in color.

COLORADO SOLAR GROUP

A solar energy association has formed in northeast Colorado to help local people "solarize" homes, locate information resources, lobby for solar incentives, and swap skills and experience. For information, contact the chairman, Vern Tryon, Box 307, Eaton, Colo. 80615.

AUDUBON CONVENTION

The National Audubon Society will hold its annual convention in Estes Park, Colo., on June 9-12. Convention sessions will cover conservation issues including mining law, clean air, returnable bottles, and clean water. Field trips are planned to Rocky Mountain National Park and the Pawnee Grasslands east of Fort Collins. Registration is \$15 and most field trips cost extra. For a brochure on the convention write NAS, 950 Third Ave., N.Y., N.Y. 10022.

ALASKA LANDS HEARINGS

At the request of many conservationists, Congress has scheduled public hearings across the country on Alaskan lands decisions. The hearings will be held in Washington, D.C., April 21, 22, 25, and 28; in Chicago May 7; in Atlanta May 14; in Denver June 4; in San Francisco June 18; in Seattle June 20; in Sitka July 5; in Juneau July 7; and in Ketchikan July 9. Anyone who wants to testify should request permission from the House Subcommittee on General Oversight and Alaskan Lands at least one week before the hearing. Write: Rep. John Seiberling, 1324 Longworth Bldg., Washington, D.C. 20515. Written testimony will also be accepted. A coalition of environmental groups is coordinating lobbying efforts for Alaska lands. To contact them, write Alaska Coalition, 620 C St., SE, Washington, D.C. 20003. Phone (202) 543-4312. The coalition has brochures available upon request.

Study says N.M. losing riches

A report on coal leasing on state land in New Mexico has revealed that the state is losing millions of dollars on leases that have never been developed. The Southwest Research and Information Center, which compiled the report, recommends the state discontinue all leasing of coal on state lands until policies are adopted to bring the state's program into compliance with federal leasing regulations and to "genuinely maximize the benefits received by the people of New Mexico."

The loss to the state has resulted from several factors:

—The state has no regulations to prevent companies from holding leases for speculative purposes. Consequently, although 140,000 acres have been leased since 1973 and although royalty levels seem to be fair, no coal has been produced. So no royalties have been paid on coal sales.

—The two fees the lessor pays upon obtaining the lease — lease fees and advance royalties — have remained "ridiculously low," according to the center. Some leases have sold for one or two cents an acre. Advance royalties haven't been increased since they were established in 1912, despite the fact that coal prices have increased by 350% in the state.

—The State Land Office hasn't appraised the value of the coal resources it offers for lease and so can't set a minimum bid.

The author of the study, John Lieben-dorfer, says the lack of state revenue will soon become critical. As natural gas and oil production is reduced by more than half as predicted, the state's educational institutions will become more and more dependent upon coal monies. The center figures \$3.2 million has been lost in the last four years.

Before any additional leasing is allowed, the center recommends that several steps be taken: The state should determine the extent of coal deposits and establish minimum bids for every tract offered. Rental and advance royalty rates should be adjusted. The state should adopt a comprehensive plan for development of its coal resources, including determining which lands are most suited for coal mining and which most suited for other uses.

The 36-page report may be of interest to not only New Mexico citizens, but also to others who might want to scrutinize their own states' leasing programs. Copies are available from the Southwest Research and Information Center, Box 4524, Albuquerque, N.M. 87106. The price is \$1.50 to individuals and nonprofit groups and \$4.00 to institutions. The project was supported by a grant from the Ann Maytag Foundation.

Sewage irrigation cleans up streams

by Mark Peterson

Picture a clean flowing stream. Add sunshine and warm days. Wash in growth-stimulating nutrients released from a sewage treatment plant. What's the result? An over-fertile, weed-choked stream.

While there isn't much communities can do to stop the sunshine and warmth, there are steps some communities are taking to prevent sewage nutrients from reaching lakes and streams. One such community is El Jebel, Colo. Located about 15 miles northwest of Aspen, this community of 1,000 is one of a growing number of communities taking an innovative approach to sewage treatment by recycling their sewage wastes.

For the past two years, Floyd Crawford, the town's manager, has been using the community's sewage wastewaters to irrigate his nearby farmlands. Wastewaters are rich in plant nutrients like phosphorous and nitrogen. Most sewage treatment processes do not remove these nutrients, and release the treated wastes — along with the valuable nutrients — into nearby streams. This stimulates aquatic weed

growth and can choke out fish life in the stream.

But when crops are irrigated with these liquids, the nutrients become trapped in the soil. There they can be absorbed by the plants, instead of being washed into waterways.

The idea is not new. Cities in Europe and the Orient have been using this method for centuries. In 1930, in Wassmannsdorf, Germany, sewage was treated in an aerobic digester before the effluent was pumped onto farmlands. The pumps were run by methane, which was produced in the digester.

Crawford first saw sewage irrigation practiced in Incinatis, Calif., where many acres of poinsettia plants were irrigated with the town's effluent. When he returned to El Jebel, Crawford asked Eagle County Health Officer Erik Edeen about the system. With Edeen's guidance, Crawford hooked up a pump and pipe segments to his conventional waste treatment plant.

Since using this method on five acres of alfalfa fields, Crawford says, "My alfalfa crop has increased almost ten-fold, and the

plants are much greener than the alfalfa treated with regular fertilizer in adjacent fields. If people would try this method, they'd become hooked on it."

Studies indicate that, in addition to cleaning up waterways and recycling wastes, land application of sewage also improves the soil's condition, reduces erosion, recharges underground water supplies, and produces crops with an unusually high mineral content. All this can be done for a cost that may be considerably less than the operation of a conventional sewage system. Crawford, for example, estimates that he spent less than \$200 converting his system to land application — a cost that will soon be made up in his lower fertilizer costs.

But Edeen warns that the method has its limitations. "You can't use this method with some wastes such as industrial wastes that contain toxic metals." Copper and zinc, for example, can accumulate in crops, poisoning plants as well as being passed along the food chain to man or livestock.

Soil type is another consideration. Surface or groundwater contamination can result when soils are sandy or shallow.

Also, Edeen says, "The idea of using human sewage on crops turns lots of people off. The public might have to be educated to accept the off-color of the irrigation liquids, and the occasional offensive odor."

The Colorado Department of Health is encouraging communities to consider this method. As a result, Hayden and Steamboat Springs, Colo., are both seriously studying the approach. In the future, more communities may adopt "sewage farming" as a means of cleaning up waterways and stretching fertilizer supplies.

High Country News-15
Mar. 25, 1977



Eavesdropper

environmental news from around the world

COURT AIR REVIEW UNLIKELY. The U.S. Supreme Court isn't likely to make a decision on significant deterioration of air quality before Congress passes Clean Air Act amendments, according to the *Energy Daily*. The newsletter says that because the U.S. Justice Department delayed filing a response brief, the court's schedule makes it impossible for oral arguments to be heard during the current session, which ends in April. Montana Power Co., Utah Power & Light, Kennecott Copper Corp., and other industry groups are arguing that the Supreme Court's decision in 1973 did not reflect the will of Congress as expressed in the 1970 Clean Air Act. In 1973, a tie vote in the Supreme Court upheld a lower court ruling that the Clean Air Act required the Environmental Protection Agency (EPA) to promulgate and enforce rules to prevent significant deterioration of areas with air cleaner than federal standards. The original suit was brought by the Sierra Club.

SYMMS IN SHADOW CABINET. The Conservative Caucus, a right-wing political organization, has appointed a "shadow cabinet" to review and criticize actions of President Jimmy Carter's cabinet. Rep. Steve Symms (R-Idaho) has been named Secretary of Agriculture in the shadow cabinet. Symms, who serves on the House Agriculture Committee, was named to Environmental Action's 1976 Dirty Dozen list.

OREGON BANS SPRAY CANS. Oregon's ban on the sale of aerosol sprays containing fluorocarbons took effect this month. The ban was ordered by the 1975 legislature but manufacturers and retailers were given until this month to prepare for the change. The ban stemmed from scientific reports that fluorocarbon sprays were destroying the earth's protective ozone layer. Other states and the federal government are considering similar legislation. Associated Press reporter Bob Baum notes that Oregon retailers are having a hard time finding out which sprays contain fluorocarbons because there isn't a labeling requirement.

ALL PART OF EVOLUTION. Citizen watchdog groups are "a natural evolutionary development that will help assure the survival of our democracy," according to a University of Chicago study. "Given the scope of our highly technical urban society it is possible that the citizen watchdog organization is here to stay." Dr. Andrew L. Bavas, dean of the College of Urban Science, headed the four-year study, which looked at 750 organizations in the U.S.

Classifieds

PHOTOGRAPHY WANTED. Faces of Women By Women. Now accepting photographic submissions for exhibit, book. Alexis Parks, Box 1917, Boulder, Colo. 80306.

HELP WANTED. Executive Director-Organizer, Montana Wildlife Federation. Provides organizing and technical assistance to local affiliates, responsible for organizing new affiliates, setting-up membership drives, and monthly newsletter. Requires travel throughout Montana. Salary: \$5,500 plus expenses. Reply to Montana Wildlife Federation, c/o David Hunter, 715 Highland, Helena, Mont. 59601.

STUFFING PARTY. You are invited to attend another in a continuing series of stuffing parties at HCN's new quarters at 331 Main Street, Lander. Stop by Wednesday night, March 30, between 7 p.m. and 10 p.m. for good cheer, good work, and good conversation. Thank you.

JOB AT HCN. High Country News needs a full-time editor-writer to live in Lander. Writing experience and familiarity with regional environmental issues essential. Photography and newspaper production skills desirable. The work is fascinating, the hours are long, and the pay is \$375 a month. To apply, send a resume and samples of news writing to HCN, Box K, Lander, Wyo. 82520 or call (307) 332-4877. Deadline for applications is April 6.



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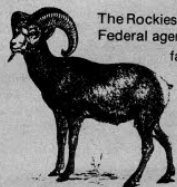
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THE CORPORATION AND THE INDIAN



TRIBAL SOVEREIGNTY AND
INDUSTRIAL CIVILIZATION IN
INDIAN TERRITORY, 1865-1907

by H. Craig Miner, Univ. of Missouri
Press, Columbia, Mo., 1976. \$11.00,
hard cover, 236 pages.

Review by Peter Wild

What the corporations did to Indian lands a century ago they are doing today to the West as a whole. By the late 19th century, the government had herded about 20 tribes from their traditional homes into the Indian Territory of what is now Oklahoma. The Chickasaw, Cherokee, and Osage lived in a vast concentration camp, theirs to keep forever, they were told, if they'd only stay out of the way of progress. Unfortunately, the land didn't turn out to be as worthless as Indian reservations were supposed to be. White settlers competing for resources in surrounding states soon discovered that the Indian Territory contained coal, oil, salt, gypsum, and iron. It had a lot of grass going to waste. It also lay smack in the middle of potentially lucrative rail routes to Mexico.

By drawing on records of the time, H. Craig Miner details the course of the invasion — the shoot outs, the bribes, the double-dealings on both sides. In a few decades many of the area's prizes were in the

hands, not of yeoman pioneers, but of the large rail, cattle, and mining interests. In short, the corporations of The Gilded Age fiddled and the government danced, as many would argue is true today in the use of resources.

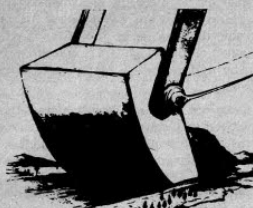
Though the account is scholarly, its effect is that of a 19th century melodrama — one in which the villains always seem to win. Greed motivated the corporations, while the Indians sat stunned on their reservations, unable to distinguish between the prophets and traitors in their midst. Elias C. Boudinot, a Cherokee, was a colorful rascal, deftly playing one side against the other for his own advantage. He advised white settlers of loopholes in the laws, and as a budding entrepreneur built a hotel, which the Cherokee tore down. On the other hand, as a tribal citizen he laid claim to lands which he then dangled before competing railroads. When an Indian newspaper, the *Tahlequah Telephone*, dared to criticize his wheeling and dealing, he walked into its offices and shot the editor dead.

For their part, when the oilmen and cattlemen weren't doing in the native Americans with violence and political chicanery, they were fighting each other for the spoils, while the Indians stood helplessly in the wings, clutching memorials and protests and learning new things about their future as viewed by the American body corporate."

Miner is an historian, not an impassioned environmentalist, though his study has wide application in both fields. He sets it in the context of a society that looks upon industrial growth as the measure of civilization. "In the broadest sense, the assumption in the western world has been that efficient use of materials in a highly refined state constitutes civilization, while a tendency to leave nature undisturbed, placing high priority upon human functions other than consumption (for example, religion), is the mark of a primitive society." In 1870 some Cherokee realized that the railroad, and all that would come with it, would mean the end of their tribal life. However, as Miner remarks, "When civilization was defined as railroad building, what, to the age of enterprise, was humanity?"

After *Bury My Heart at Wounded Knee* and *Custer Died for Your Sins*, one may want to spare himself the agony of another book on the genocide of native

Americans. On the other hand, especially in the light of current disputes over coal, oil, and National Park development in the Western states, the environmentalist will find that the parallels in the book throw his efforts for sane treatment of the land into perspective. History repeats itself, as we all know but tend to forget. With the power of the conglomerates in mind, what we need to remember is that today the whole country is Indian Territory, and all of us its Indians.



THE RAPE OF THE GREAT PLAINS

Northwest America,
Cattle and Coal

by K. Ross Toole, Atlantic Monthly
Press, Boston, Mass., 1976. \$8.95, hard
cover.

Review by Tex Garry

A book with a title like this one is fairly sure to prick the interest of a wide variety of potential readers. Aside from the few people who only read the title without looking at the dust jacket illustration, most people who will be attracted to this book probably already have an interest in energy development, the Great Plains, and/or the types of developments that have come to characterize our country in the last half of the twentieth century.

Professor K. Ross Toole provides something for everyone in those categories. But he does something even more important than preaching to the converted. By openly

admitting that he is biased and that he is deeply emotionally involved, he is able to draw people into his world, the Northern Great Plains.

He draws you in through the history and through the people making today's issue of the area's history. He draws you in through his obvious love for the land and the people. He draws you in through the all too obvious potential for losing it all if we, not only the residents of the Northern Great Plains, but all Americans, don't work to protect it from the profiteers, developers, and industrialists.

He offers a better understanding of why people have been willing to fight for this land over and over again down through the years.

And he draws you in in a way that no strictly factual, unbiased work could possibly do. The Great Plains are like the mountains or the sea or the forest or the swamp or any other piece of the earth that you can never appreciate unless you get to know it intimately, to love it.

To have denied that love would have been to deny the single most important part of the Great Plains. For in spite of its importance as a producer of grain, beef, wool, etc.; in spite of the various cultures that are unique to the area; in spite of the fact that the plentiful skies and not so plentiful waters are clean; in spite of all these and other specific reasons, the single most important part of the Great Plains is that the land grabs hold of you and doesn't let go. It forces an emotion. Those who have stayed, who have been drawn in by the land and have fallen in love with it can feel the threat.

So the final argument is not whether or not the Great Plains can produce more through agriculture or through mineral development but rather whether it is fair to kill off peoples and cultures when there are alternatives.

Toole argues strongly that what is proposed for the Northern Great Plains will do just that.

Toole has expressed the deep emotional attachment that so many of us feel for the land and is not embarrassed that that love will belittle his arguments. That is a strong lesson.

To me, someone who would argue for his life without emotion is cold enough to be already dead. Toole is certainly alive and well.

Dear Friends,

Have you ever muttered about the dry, depressing nature of environmental news?

"Not another well documented, in-depth analysis of impending doom," you've cried. "Not another stiff, sterile listing of nature's wonders. The movement's lost its sense of reality — its sense of humor."

Well, we intend to prove to all you who mourn the environmental movement's lost liveliness that you're wrong. We figure that if we at *High Country News*, who wallow in news of eco-disasters for a living, can display a sense of humor, then there must be hope for everyone who has ever dabbled in environmentalism.

We intend to prove it through a special lampoon section coming up soon, where we'll look at the absurd side of our newspaper, our causes, the movement that spawned us, and the events that spur us on.

You probably realize what a tough

assignment this will be for a sober, sincere, serious bunch like us, so if you have an idea, help us out. We welcome reader submissions. We've already put some material together, but we



can still use brief energy and other natural resource "news" items, a column from Washington, letters to the editor, a natural history piece, a book review, a conservation pioneer portrait, an alternate energy article, a

front page exposé — the sky's the limit, almost. Address your submissions to "HCN lampoon section." We'll put together the best of what we receive. Let us know if you dare to be credited with your submission.

EDITOR-WRITER NEEDED

As you may have noticed in the classifieds, we're looking for a new staff member. Our news editor, Bruce Hamilton, is leaving us to begin work in the front lines of the environmental movement as Northern Plains Representative of the Sierra Club. So we're searching for an editor, writer, and all-round good hand to take over Bruce's responsibilities here. The work is fascinating, the hours are long, and the pay is \$375 per month. If you're interested, send us a resume and samples of your news writing. Deadline for applications is April 6.

—the editors

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