

High Country News

October 27, 1986

Vol. 18 No. 20

A Paper for People who Care about the West

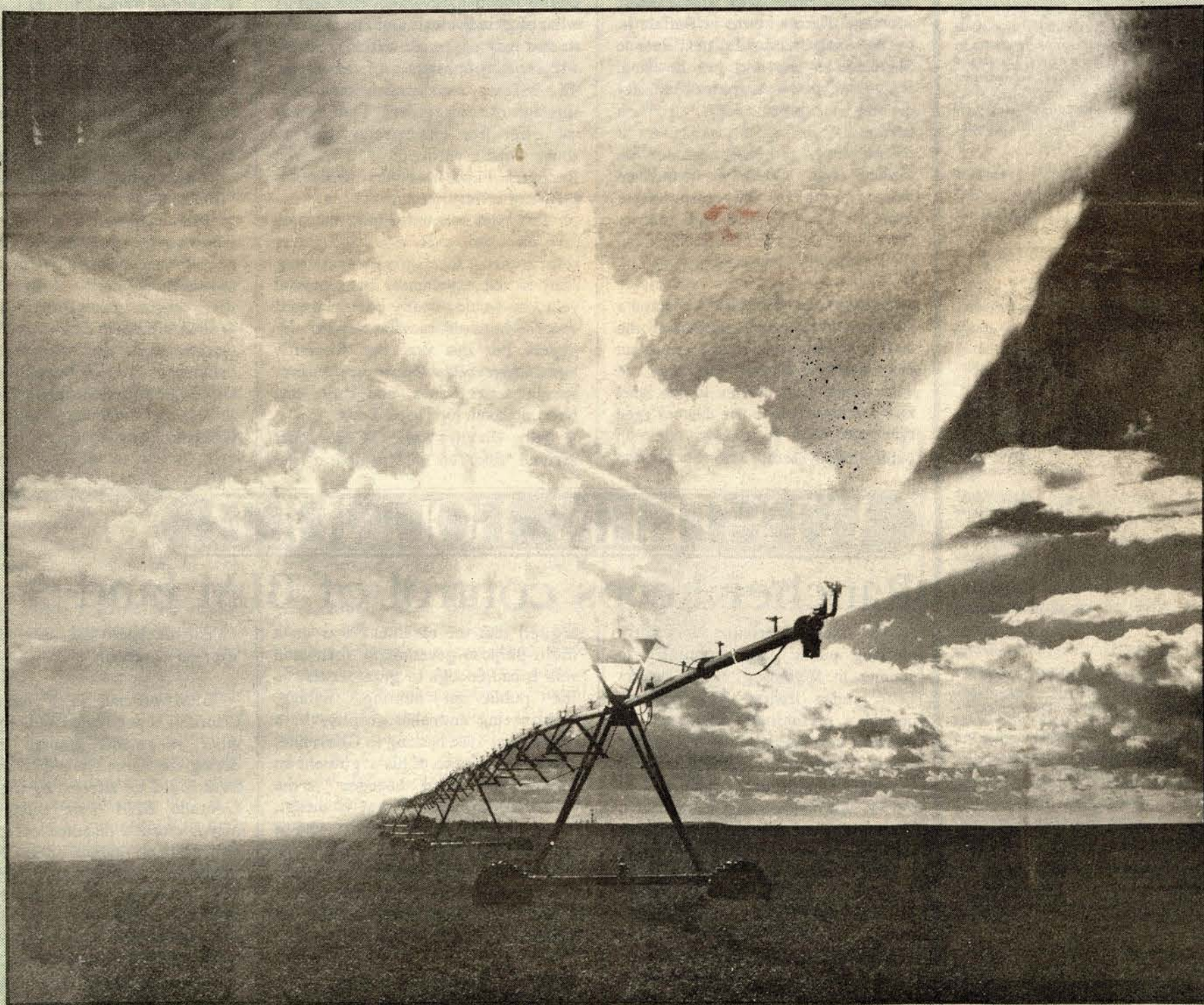
One Dollar

WATER



The Missouri River: In Search of Destiny

Lyle Axthelm, BuRec



Western Water Made Simple

The third of four special issues starts on page 8

Dear friends,



High Country News

HIGH COUNTRY NEWS (ISSN 0191/5657) is published biweekly, except for one issue during July and one issue during January, by the High Country News Foundation, 124 Grand Avenue, Paonia, Colorado 81428. Second-class postage paid at Paonia, Colorado.

POSTMASTER: Send address changes to HIGH COUNTRY NEWS, Box 1090, Paonia, CO 81428.

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Subscriptions are \$20 per year for individuals, \$28 per year for institutions. Single copies \$1.00 plus \$1.25 postage and handling.

We have received a large number of comments on the first two water issues, including two letters that asked: "What about the Rio Grande basin? Aren't we part of the West?" The Rio Grande is indeed a major river basin, and should have been included in this series. It was excluded for non-geographic reasons: time and money.

Meetings of the board of the High Country Foundation, whose sole function is to direct High Country News, always come at inconvenient times. The Oct. 12 meeting fell in the middle of the water issues and on the same weekend as snow storms at low elevations in southern Wyoming and Colorado. Luckily, the meeting was held in Sheridan, Wyoming, in the northeast corner of the state, and so we met at Sheridan College in sunny weather.

Logistically, all HCN board meetings are inconvenient wherever they are held, since board and staff are spread all over the nation. But the October 12 meeting did achieve a quorum, with Robert Wigington, Sally Gordon, Garrett Ray, Adam McLane, Tom Bell and Kate Missett present. The long trips were made by Robert and Garrett, who came up from Colorado's Front Range, and by Adam, who came over from Helena, Montana. Kate's home in Buffalo is, by Wyoming standards, next door to Sheridan, so she and her husband, R.J. Cox, threw a party Saturday evening to allow HCN to meet northern Wyoming. Those present at the very lively gathering included two former High Country Foundation board members, Wyoming state legislator Lynn Dickey and attorney Dave Palmerlee, as well as Wyoming pioneer Dorothy Duncan.

The meeting was relatively straightforward. The board adopted a statement of purpose, instructed the staff to investigate a computer system that would allow the use of subscribers' first names in the label and possibly replace the current aged typesetter with a modern desktop publishing system. The board also

gave staff some guidelines for the preparation of the 1987 budget, to be considered at the Jan. 17, 1987 meeting.

The only contentious discussion was about circulation. HCN now goes to a record-setting 5,100 subscribers. There are good reasons for having a (relatively) large circulation -- especially the fact that news about issues reaches more people. But a large circulation can also be a burden. The paper has an excellent renewal rate of 70 percent, but it still must find 1,500 new subscribers each year to replace the 30 percent who drop the paper.

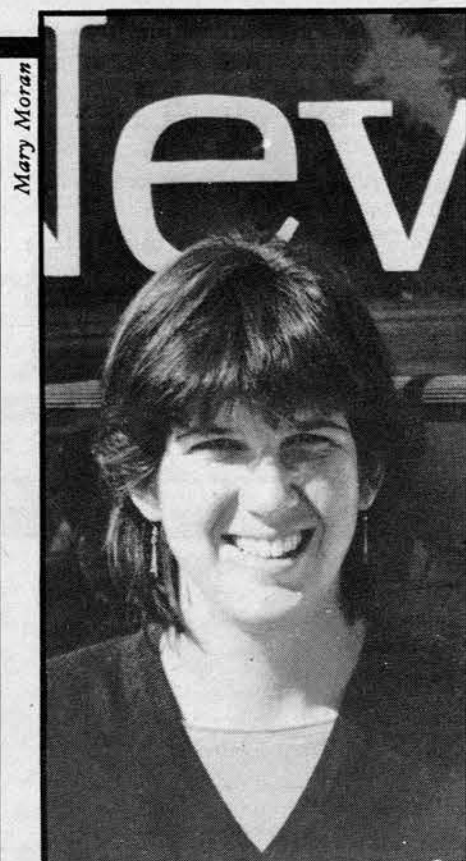
The alternative to seeking new readers is shrinkage and eventual death. So the real question is: What is HCN's natural size? What is the pool of potential readers? If we use clever direct mail letters to attract readers outside those who care about the issues covered here, those new subscribers will fall away when asked to renew. At the same time, the paper has a mission to reach all those who might stay with HCN.

Those issues were struggled with at the meeting, and the board then instructed staff to budget for modest growth in 1987.

We were reminded of how the paper manages to grow spontaneously by a letter from Louise Moody of Grand Junction, Colorado. She sent us a list of 23 individuals and families she thinks may appreciate HCN, and we will send them samples of the paper. The best way to reach new readers is through existing readers. That is why we offer free gift subscriptions to those who contribute \$50 to the Research Fund, and why Christmas gifts are so important.

The 1986 Research Fund has thus far attracted over 350 individual contributions; that is the most rousing start in our experience. In a normal year, we would already have thanked several hundred contributors in the paper. But this year the Research Fund drive coincided with the four special water issues, and there has been no room for Thank Yous.

New intern Kate McIvor just arrived from an internship at the



Kate McIvor

Montana Wilderness Association where she reviewed forest plans and clipped newspapers -- perfect practice for her clipping duties at HCN.

She was surprised by Paonia's early snowfall on Oct. 12 and hopes to be skiing soon. She plans to do a lot of travelling around Colorado's Western Slope during her three months here.

Kate is from Lafayette, California, and graduated from Wesleyan University in Connecticut this June. She hopes to return to Montana after her stint at HCN and intern at the Montana Environmental Information Center during the legislative session. She is trying for a world record for the most internships held before landing a "real" job.

We neglected to credit the following photographers for their photos accompanying the center-spread map in the HCN Columbia River basin issue (10/13/86): Chuck Williams/CRITFC for the Columbia Gorge and the Warm Springs fishermen on the Deschutes River; David Spear for Montana's Clark Fork Valley; and the Idaho Power Company for Hells Canyon Dam.

--the staff

WESTERN ROUNDUP

Rancher keeps control of BLM land

The issue of private landowners blocking public land continues to simmer in Wyoming. U.S. District Court Judge Ewing Kerr recently upheld a preliminary injunction he issued a year ago that denies public access to a private road that leads to Bureau of Land Management land on top of Elk Mountain in southern Wyoming. Short of a helicopter, there is no public approach to the BLM land.

The judge said the federal government has the right to use the private road under some circumstances, but the general public does not. The ruling allows Elk Mountain Safari Company, a hunting company formed 20 years ago by several area ranchers, to continue to charge hunters \$260 to use a road upgraded and partially constructed by BLM in 1957. BLM secured the easement to build the road from one of the ranchers, Norman Palm of Palm Livestock Co. The access allowed BLM to build and maintain a fire lookout on Elk Mountain, which was closed in 1962.

U.S. Attorney Richard Stacy

argued that the easement was on a multi-purpose government form and was broad enough to grant access to the public for hunting, fishing, sight-seeing and photography. In a September 1986 hearing in Cheyenne, Stacy based much of his argument on the use of the word "licensee" in the easement, contending that it meant, "any member of the public who is allowed to come upon the public lands with due regard to land management decisions." Judge Kerr found that Stacy's "expansive interpretation" of "licensee" had no merit.

Stacy called the decision "a big victory for people who use public land for profit and a big defeat for the people of Wyoming." He questioned, "If we're not the licensees, then what are those people that Palm lets on his land for \$260?" He said the combination of this ruling and the 1979 U.S. Supreme Court decision in *Leo Sheep vs. U.S.* constituted "a triple whammy to the public." Stacy said *Leo Sheep* did away with the notion of implied easements and this

recent decision did away with an express easement.

BLM officials in Wyoming and Colorado have expressed fear that other easements granted to BLM during the same era and on the same form could be affected by the ruling. Colorado BLM State Director Neil Morck cited a disputed easement in Rio Blanco County, near Meeker, where an "administrative easement" was drawn up in the early 1940s in language similar to the Elk Mountain document. In recent years, the landowner has blocked access during hunting season. Morck said, however, that in Colorado, "clouded" easements are less of a problem than not having "easements to begin with."

Otto Schultz, a member of the Committee for Public Access in Meeker, said he is concerned about a trend he sees developing in his area. Land values, he said, are now based on the amount of federal land that can be enclosed.

--Katharine Collins

As goes the West, so goes the U.S. Senate

Six out of eight races for Senate seats in the West currently held by Republicans may determine which party controls that body in the 100th Congress.

In these races, the Democrats not only have a shot at controlling the Senate, they could also make significant inroads in this strongly Republican region. It may be done by effectively turning some typically Western issues involving land and resources on their heads.

The eight states are Arizona, Oregon, Idaho, Nevada, North Dakota, South Dakota, Washington and Oklahoma. A ninth race in California pits Democratic incumbent Alan Cranston against Republican Rep. Ed Zschau in what should be a close contest. Only in Arizona, where Republican Barry Goldwater is retiring and Republican Rep. John McCain is considered a strong favorite as his successor, and Oregon, where incumbent Robert Packwood is also favored, do the Republicans seem secure.

Five of these Western states -- Idaho, Nevada, North Dakota, South Dakota, and Oklahoma -- were caught up in the Reagan revolution. Voters were moved by Reagan's ability to express their mistrust of the federal government, which is often the flip side of the region's dependency on federal dollars and programs. He also won support by backing important resource industries, such as oil, gas, and timber, and by his sympathy for local movements, such as the Sagebrush Rebellion.

In these five races, typically Western issues involving farming, resource industries and the environment are central to the elections. But the incumbents face stiff challenges from popular Democrats who have effectively turned around some of these issues, placing the incumbents on the defensive.

•The most vulnerable incumbent could well be South Dakota Sen. James Abdnor. Abdnor faces a strong opponent, Rep. Thomas Daschle, who is currently the odds-on favorite. The key issue here is the farm crisis. Abdnor has failed to distance himself from the Reagan administration's farm policy in the midst of the most severe crisis on the Western plains since the 1950s. Daschle, in contrast, has been an advocate of emergency farm supports and should benefit from this effort.

•In North Dakota, the farm crisis has also helped create a volatile and unpredictable electorate. Incumbent Mark Andrews, once a safe candidate, is now considered one of the most vulnerable Republicans. On farm issues, Andrews, perceived to be a hard-working advocate of the state's beleaguered farmers, has managed to avoid some of the negative fallout facing other incumbents. His challenger, State Tax Commissioner Kent Conrad, is focusing instead on personality and approach and is closing rapidly on Andrews according to local opinion polls.

•In Oklahoma, a combination of the farm crisis and the collapse of oil and gas prices is playing an important role. Here, Democrat and one-time incumbent Don Nickles, ahead in early polls, is facing Rep. James Jones, who chairs the House Budget Committee and is a ranking member of the powerful Ways and Means Committee.



Pete Souza, the White House

Ronald Reagan

Ironically, Nickles has incurred the wrath of agribusiness and water industry interests by being a little too consistent in his fiscal conservatism. He has opposed several water development projects while backing plans for the Tall Grass Prairie Reserve. Nickles also is sponsoring an amendment to the small reclamation projects bill that would impose full market interest rates on repayment costs for such projects. Jones, meanwhile, has avoided these controversies and has focused instead on how to deal with his state's endangered economy. This might also turn out to be one of the most expensive Senate races.

•In Idaho, a state with an undeserved reputation for its hostility to environmentalism, environmental issues are central in Gov. John Evans' challenge of incumbent Steve Symms. Symms, who was the only member of the Senate Environment and Public Works Committee to vote against Superfund legislation, is particularly

keen on contrasting his attempt to oppose wilderness legislation with Evans' support for more wilderness areas. Evans approaches this issue in terms of Idaho's "heritage" and "quality of life." In this way he has built support among hunters and fishermen, as well as Idaho's small band of eco-activists.

•Nevada has also been a stronghold of the Reagan revolution. Today, however, Republicans are under attack for the administration-backed plan that selected Nevada as one of three sites for a nuclear waste facility. Ex-Democrat and former Rep. Jim Santini, designated the heir apparent by retiring Sen. Paul Laxalt, has had to contend with this nuclear albatross. Santini is presently lagging behind Rep. Harry Reid, a popular Las Vegas-area politician.

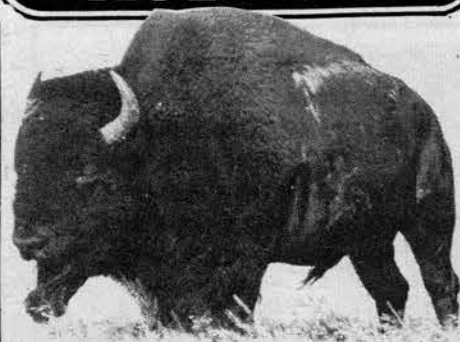
•Washington is the one state where a Republican incumbent will benefit most by distancing himself from the president. Washington is a state where environmental sentiment runs strong, and there are marked contrasts between the Seattle area with its urban liberalism and more conservative and less populated rural areas to the east.

Sen. Slade Gorton is being challenged by Brock Adams, who served as Secretary of Transportation in the Carter administration. Gorton is running as pro-environment, but conservation organizations have blasted him for making exaggerated claims about his support for wilderness legislation. Gorton has emphasized his independence and is running ahead of Adams.

In many ways these Western Senate races, particularly in conservative strongholds, are a plebiscite on the Reagan revolution, but this time on the Reagan program rather than the personality of the president.

--Bob Gottlieb and Peter Wiley

HOTLINE



Litigious wildlife

Ed Bachtel of Jackson, Wyoming, says he has appointed himself "attorney" for an annoyed bison that attacked Anni Lilli Heuser in 1983. Last month Heuser sued the Interior Department for \$10,000 in bison-caused damages. Bachtel told the *Jackson Hole News* recently that his client is now peaceable, having undergone psychiatric counseling, and promises to wear a pedestrian sign with a slash through it to warn potential victims. Bachtel adds that the buffalo also plans to counter-sue the tourist for \$20,000 to cover psychiatric fees.

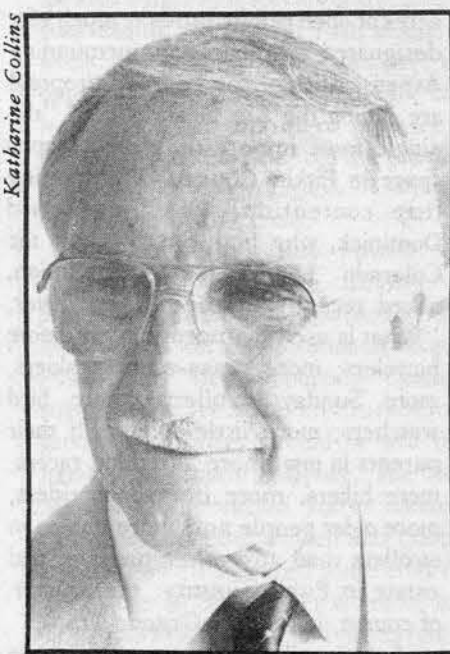
Army digs deep

The U.S. Army has agreed to pay \$6 million for a permanent water system to end contamination from the Rocky Mountain Arsenal in Denver, Colorado. The decision is a major victory, says a local citizens' group that pressed the Army for 18 months to protect drinking water for some 30,000 residents of south Adams County. Beth Gallegos, leader of Citizens Against Contamination, told the *Denver Post* that the group had expected at least a five-year battle. The Arsenal polluted groundwater with the toxic chemical trichloroethylene, which is leaching into wells. The 27-acre Arsenal and adjacent land is one of the top priority sites on the Environmental Protection Agency's Superfund list.

Wyoming to choose Herschler's successor

Unemployment, declining oil prices and decreased demand for minerals are the galvanizing concerns in Wyoming's race for governor. With three-term Democratic Gov. Ed Herschler stepping down, the candidates are two-term legislator and higher education administrator Pete Simpson, who emerged on top after a seven-way Republican primary. Son of former Wyoming Gov. Milward Simpson, and brother of Wyoming Sen. Al Simpson, he faces attorney Mike Sullivan, a political newcomer on the Democratic side. "The foremost issue in people's minds is the economy," says State Rep. Lynn Dickey, D-Sheridan, a former staffer with the Powder River Basin Resource Council. The standards that have been passed for protection of the environment are pretty well accepted now," she added, "and I guess I don't fear a wholesale retreat, no matter who is elected."

Simpson was the early choice of Wyoming Outdoor Council president John Perry Barlow, a Cora rancher. "But I'm very troubled about the things he's been saying during the campaign," Barlow said he is particularly worried about Simpson's stand on the Industrial Siting Council, which was established in 1975 to lessen environmental and socio-



Katharine Collins

Pete Simpson

economic impacts on communities. "I think the ISC might well be consolidated into DEQ (the state's Department of Environmental Quality) and limited in its review to socio-economic impact." Barlow says Simpson's suggestion amounts to abolishing the review council.

The future of the council is one of the few areas in the campaign where the candidates openly differ. Sullivan has said the basic structure of the state's environmental regulatory

machinery should remain unchanged and that he does not favor a merger. However, Sullivan said, "We need to determine if we are duplicating efforts. We don't want to require companies to do the same paperwork twice."

The state's largest citizens' organization conducted a lengthy interview with each candidate. The 8,500-strong Wyoming Wildlife Federation quizzed each gubernatorial candidate on his perceptions of the state's role in federal land management, public access to public land, and the performance of the state's Game and Fish Department. WWF's Matt Reid said the two candidates "differ very little in their views affecting the future of wildlife."

--Katharine Collins

BARBS

Small comfort.

Missoula, Montana, Mayor Bob Lovegrove had a defense to the oft-repeated accusation that he would like to see Missoula, population 60,000, become another Denver. "I never said that," he said. "I am very familiar with Denver. You couldn't fit Denver in this valley."

HOTLINE



Kennecott's Bingham Mine

Pandora's pit

The Utah Department of Health filed suit in U.S. District Court under the Superfund law last month asking the Kennecott Corp. to pay damages for ground and surface water contamination in Salt Lake County. The suit states that Kennecott and its predecessors operated the Bingham Canyon open-pit copper mine for 80 years and created large amounts of overburden and tailings. A five-year groundwater study begun by Kennecott in 1983 has already confirmed significant groundwater contamination by cadmium, copper, lead, silver, arsenic, manganese, zinc, barium, chromium and selenium.

Don Green, Kennecott Minerals Co.

The Guns of October boom in Colorado

According to a poll of 600 Coloradans last week, conservative U.S. Senator William Armstrong, Republican, could have as colleague a man even more conservative.

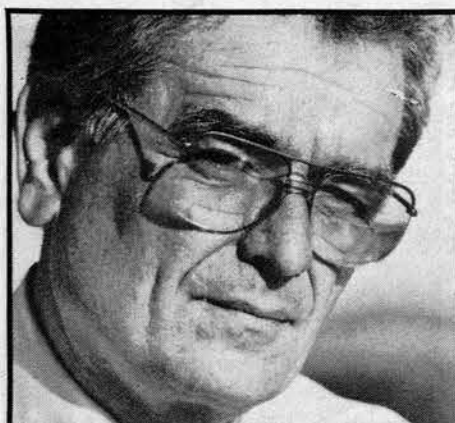
Campaigning for the seat now held by Democratic Sen. Gary Hart were two congressmen: Democrat Tim Wirth from liberal Boulder and Republican Ken Kramer from Colorado Springs, a center of research for President Reagan's Strategic Defense Initiative (Star Wars).

For the most part, the campaign was disappointingly free of content, with both stressing love of family and state and sniping at the other's voting record. During a Grand Junction debate Oct. 19, Wirth said Kramer had never seen a weapons system he didn't like; Kramer responded by saying that Wirth had never seen a tax increase he didn't like.

On environmental issues, however, Wirth was adamant about the need to preserve and enhance the state's air and water, and he liked to remind voters that Kramer once hoped to sell off parts of a national forest in Colorado. Kramer continues to advocate that the federal government divest itself of some federal land, pointing out that Colorado is one-third federally owned.

A Harvard Law School graduate, Kramer began political life as a Democrat, but after switching parties became known as a staunch Reagan Republican. Wirth, who has a Ph.D. in education from Stanford, has been endorsed by both Denver daily newspapers and many environmental groups.

If Wirth and Kramer specialized in sniping, candidates for Congress from economically depressed western Colo-



Roy Romer

rado seemed to trade attack barrages. First-term Republican incumbent Mike Strang seemed vulnerable because of an unpaid loan -- until the close of the campaign -- of more than \$500,000 to the Farmers Home Administration. Strang also found himself reminded of a comment he made to ranchers in 1985: "Tell me why we have to save the family farm? No one yet has come up with a compelling reason for me."

A rancher himself as well as a stockbroker in the Aspen area, Strang pushed hard for a new national park centered around the Black Canyon, but opposed any new wilderness for Colorado until the question of federally reserved water rights was settled.

His Democratic opponent, Ben Nighthorse Campbell, a Cheyenne Indian, jeweler, horse-breeder, and former two-term state legislator, was described glowingly in an article by the New York newspaper, the *Village Voice*, as one of 16 liberal candidates for Congress nationwide who deserved financial support. Strang noted the liberal tag in his campaign literature,

and sent the article to many of his constituents.

Earlier, Campbell told the *Rocky Mountain News* that a liberal was someone "who introduces legislation to make smoking dope legal." Strang introduced such a bill when he was a state legislator during the 1970s.

With only a brief record as a state legislator, Campbell was hard for Strang to pin down. Strang, for example, said he supported fully the president's Star Wars defense; Campbell said he supported research but not deployment. On one point the two were directly opposed. While Strang was instrumental in preventing the Interior Department from appealing a contested sale of public oil-shale lands to private parties, Campbell opposed the sale and called it a "land grab."

In the race for governor, Democrat Roy Romer, state treasurer and a close advisor to retiring Gov. Richard Lamm, had a widening lead against his opponent in the closing weeks of the campaign. Republican Ted Strickland, president of the state Senate and a manager for an oil and gas company, seemed unwilling to meet Romer in debate. Major issues were the need for a revived economy and an improved educational system.

--Betsy Marston

BARBS

Highly-polished tarnish is very attractive.

The Oct. 16 *Denver Post* reported that the new owner of the Vail ski resort vowed to "polish what may have become a tarnish of neglect on the resort's sterling reputation."

Aspenites fight against a trail to rail proposal

A proposal to begin deluxe passenger train service from the Denver airport to Aspen across the Rockies is running into opposition from residents of the resort. They say the train will usurp a trail now used for recreation.

The Roaring Fork Railroad wants to transport air travelers on the tracks of the Denver and Rio Grande Western Railroad from Denver to Glenwood Springs, then up the Roaring Fork River valley on a Rio Grande branch line long used for hauling coal. That branch now operates only as far south as Carbondale, site of a large underground coal mine. Until just a few years ago the trains rumbled up the valley to within six miles of Aspen, to a smaller mine at Woody Creek.

For over 20 years the tracks have ended at Woody Creek. With no reason for trains to run further, the Rio Grande looked at the value of steel in the rusting rails and the tax burden of the privately owned right-of-way and chose a course now routine to all American railroads -- abandonment.

In this case the land was transferred not to the adjacent ranchers and residents, but to local government, which converted it into a trail now used heavily by hikers, runners, bicyclists and skiers. A train to Aspen, however, would mean new tracks on the old right-of-way, usurping the trail. The company promises to build a new, better trail along the same route, but groups such as the Aspen Center for Environment-

al Studies, which manages the nearby Hallam Lake Wildlife Sanctuary, are expected to take stands against any disruption to the riparian zones along the river.

Although there are thousands of acres of open public lands -- much of it designated wilderness -- surrounding Aspen, critics of the railroad proposal are calling the Rio Grande Trail "the single most important piece of open space in Pitkin County." Supporting that contention, resident David Dominick, who happens to chair the Colorado Land Use Commission, asked recently in the *Aspen Times*, "What is used by more joggers, more bicyclers, more cross-country skiers, more Sunday strollers, more bird watchers, more little kids with their parents in tow, more Triathlon racers, more hikers, more horseback riders, more older people and more babies in strollers than any other piece of real estate in Pitkin County: the answer, of course, is the Rio Grande Trail."

Some railroad supporters have retorted that the opponents are exhibiting the "NIMBY" syndrome -- "not in my backyard." Many of the critics are said to own high-priced homes along the trail. But 700 signatures on an anti-railroad petition submitted to the Pitkin County commissioners seem to speak of more general, broad-based concerns.

The commissioner's and the Aspen City Council decided to put the question to their voters on Nov. 4. Should the voters approve, the railroad plan would have to pass

through the governments' complicated, strict land-use planning process.

Randy Parten, the 36-year-old president of the Roaring Fork Railroad, says the Denver-Aspen trip is more than transportation.

"The party starts in Denver," he says, and continues for seven hours along one of the world's most scenic routes. The 10- to 18-car daily trains would include restaurants, bars, a video car, an entertainment car with live bands and four vista-dome cars. The schedule would allow travel from any major city to Aspen in one day. Coach tickets would cost \$55; vista-dome seats \$75; and first-class parlor observation car fares would range from \$100-\$150.

Parten says his Houston-based family would put up \$4.5 million of the \$18 million upfront cost of the railroad. The rest of the financing would come through debt and a private stock offering. Parten himself is now buying the rolling stock and already owns six cars, including three vista domes.

The railroad debate comes at a time when residents along the Roaring Fork River valley are debating future transportation options. The state highway from Glenwood to Aspen overloads with heavy rush hours each weekday and has earned a reputation as "Killer 82." Pitkin County has been pressuring the Colorado Highway Department to widen the road to four lanes to improve safety. Yet Aspen voters recently rejected widening the highway's entrance to

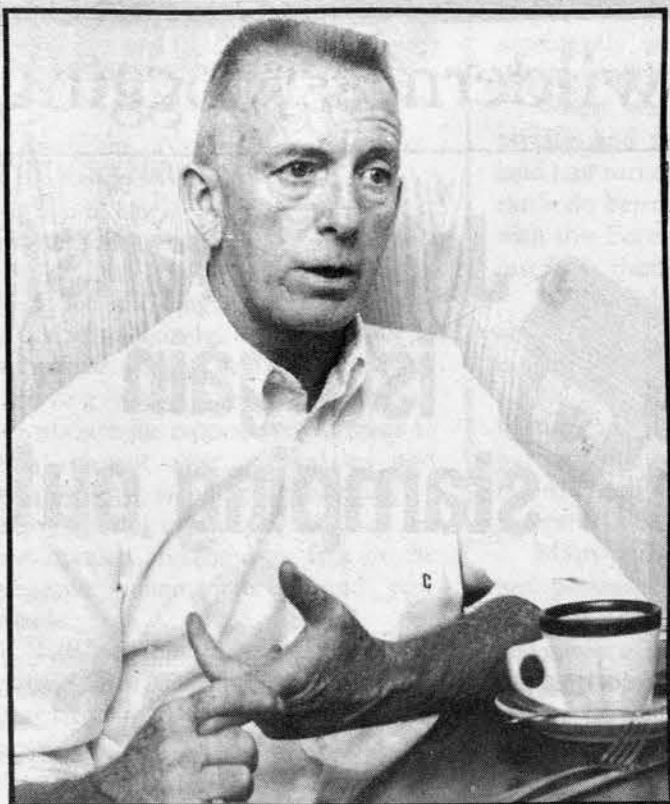


When the Roaring Fork Railroad Company brought a sampling of private cars to Carbondale Oct. 3, residents welcomed the enterprise with dancers dressed as a product once hauled extensively by rail out of Carbondale -- potatoes.

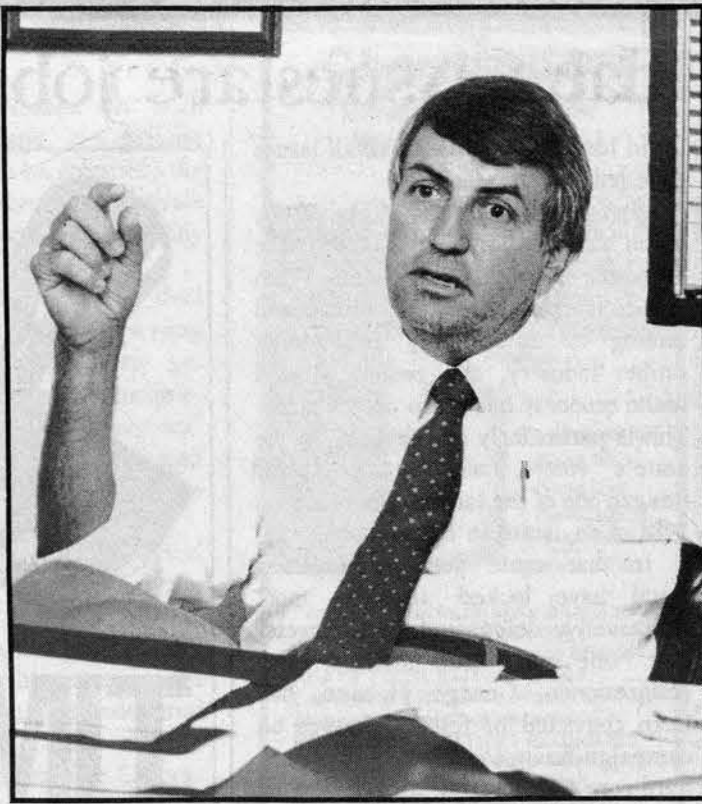
their city to four lanes. Traffic congestion is widely recognized in the city as a threat to vacations the resort would like to promote.

Should the railroad pass in the polls Nov. 4, Parten says he intends to have trains rolling by November 1987, exactly on time to celebrate the hundredth anniversary of train travel to Aspen.

--Gary Sprung



Brant Calkin



Garrey Carruthers

Photos by Bill Mohr

Watt ally may be New Mexico governor

They're not running against each other. But two long-time foes could make New Mexico's Nov. 4 election a referendum on the environment.

Republican Garrey E. Carruthers, once assistant secretary of the Interior Department under James G. Watt, is leading the race for governor. In another race, Democrat Brant Calkin, a former national Sierra Club president, is the front-runner for New Mexico commissioner of public lands.

In both races the stakes include whether New Mexico stays tied to the West's traditional resource-extracting industries or preserves its mountains and deserts for a more balanced economy. Each campaign seems to pit entrenched ranching and mining interests against an emerging environmental movement based largely in Albuquerque and Santa Fe. "This is a watershed election," says Jay Sorenson, a University of New Mexico political scientist. "It will show whether the good old boys will maintain their stranglehold on New Mexico politics."

Carruthers, a 47-year-old agricultural economist, faces Democrat Ray B. Powell, a retired Sandia National Laboratories vice president, in the race for governor. Calkin, 52, is opposed by rancher and banker William R. (Bill) Humphries, a former New Mexico State University regent, for a post that controls 9.2 million acres of land producing more than \$200 million a year in revenues for public schools, universities and other institutions.

New Mexico's incumbent Governor Toney Anaya is a Democrat and the state remains heavily Democratic, but the slide in oil prices has crippled the state's economy, undercutting revenues from oil and gas leasing on state-owned lands and focusing attention on a growing state budget deficit. The state is among others in the West searching for ways to attract tourists and new industries.

The New Mexico Constitution makes the land commissioner trustee for state lands, with a legal duty to earn as much revenue from them as possible. But previous commissioners, bowing to a Legislature dominated by livestock and mineral industry allies, leased coal, oil and gas and grazing rights at bargain rates. Even now, leases to develop state lands empower stockmen and oil companies to keep

the public off except for licensed hunters during big-game season.

As trustee for state-owned lands and resources, "the land commissioner is more powerful than the governor," notes the current commissioner, Jim Baca. Baca, a Democrat elected four years ago with environmentalists' support, lifted oil and gas royalty rates, started phasing in higher grazing fees, and drafted plans for urban development on state lands eight miles from downtown Albuquerque. Traditional state land-users have resisted Baca's efforts, and ranchers have gone to court in an effort to block grazing fee increases.

Even after Baca's improvements, "the Land Office is really a sleeping giant," Calkin maintains. Calkin pledges to inventory state lands, put more state Land Office employees out on the ground, and negotiate exchanges that would consolidate scattered state tracts into more manageable holdings. Arguing that the state must reduce its reliance on oil and gas revenues that now provide 95 percent of state land receipts, Calkin wants to encourage recreation and tourism on key state land parcels. As a way to open lands to the public, he proposes selling \$10 recreation permits granting access to most state holdings.

In the June primary, Calkin took 40 percent of the vote to upset two other Democrats, including former commissioner Alex J. Armijo. But Humphries, 40, may be the first credible Republican candidate for land commissioner since the 1920s. Humphries is campaigning around a proposal to set up a five-member oversight board to review state land administration. Environmentalists dismiss the proposal as an attempt by ranchers to emasculate the land commissioner's authority.

Calkin's victory demonstrated that environmentalists can be a force in New Mexico politics, at least within the Democratic Party. But with a backlash against Anaya's Democratic administration running strong throughout the state, conservationists fear that Carruthers will be the state's next governor.

As assistant secretary of the Interior Department for land and water resources during President Reagan's first term, Carruthers earned a reputation as a "gut fighter" for Watt's controversial policies. He

presided over Watt's efforts to accelerate federal coal-leasing in the West, including New Mexico's San Juan basin. Carruthers had earlier formed close ties in the "little Texas" ranching country of southeastern New Mexico with stockmen who were leaders in the livestock industry's rebellion against Bureau of Land Management grazing regulations. Conservationists charged that when Carruthers was assistant secretary in charge of the BLM, he approved budget cuts and rules that allowed public rangelands to be overgrazed by ranchers.

Watt resigned under fire in 1983, but Carruthers stayed at the Interior Department through the end of Reagan's first term, afterward returning to New Mexico to run for governor. He defeated five other Republicans in the June primary after a campaign in which environmental issues played no role.

Carruthers speaks proudly of his role in shaping Interior Department policies under Watt, and he backs expanded timber harvests from New Mexico's national forests and resumed coal leasing in the San Juan basin. "I would like for New Mexico to have the opportunity, through federal coal leasing, to go out there and see if there's a market," he told the *Outdoor Reporter*, a New Mexico Wildlife Federation publication.

His opponent, Ray Powell, 66, although a long-time advisor to previous Democratic governors, has little record on environmental issues. Powell has been courting Calkin's supporters, telling environmental groups that once elected he will rely heavily on Calkin's advice. The New Mexico Conservation Voters Alliance has endorsed both Powell and Calkin.

But Powell angered some environmentalists in September when he told oil producers that he had preferred an opponent of Calkin's in the primary. That left conservation activists with a tough choice between working for Calkin and working against Carruthers. If Powell loses badly, a Republican sweep could carry Calkin to defeat. "The prospect of Carruthers and a Republican land commissioner working hand-to-hand suggests a state version of the Reagan-Watt-Carruthers policies," Calkin himself says, "and I consider that pretty frightening."

--Tom Arrandale

HOTLINE



Don R. Eckelberry

Easy prey

The total population of endangered whooping cranes is increasing this year, but an experimental flock in the West is having some problems. U.S. and Canadian biologists began the experimental flock in 1975 by placing eggs from a Canadian whooper flock into the nests of sandhill cranes nesting in Idaho. Since then the foster parents have raised 25 whoopers, but of this year's batch only two survived of 11 chicks that hatched. U.S. Fish and Wildlife biologists say the unusual loss is due to a drought that allowed coyotes and foxes easy access to the marsh nests. The Rocky Mountain flock, which is expected to number 25 to 27 this year, nests in Gray's Lake National Wildlife Refuge in Idaho, and winters at the Bosque del Apache National Wildlife Refuge near Socorro, New Mexico. The total whooping crane population is expected to be about 177 this year, including 40 cranes in captivity.



The main whooper flock migrates an arduous 2,500 miles twice a year to and from their nesting grounds in northern Canada and wintering grounds in Texas. The 'foster' flock travels 850 miles between Grays Lake National Wildlife Refuge in Idaho and Bosque del Apache National Wildlife Refuge in New Mexico, with stopovers in Monte Vista National Wildlife Refuge in Colorado.

BARBS

"Hi, I'm Nellie... Why don't you and I..."

Sen. Jesse Helms, R-N.C., inadvertently placed the transcript of a "dial-a-porn" call in the Congressional Record last month while urging protection for children from obscene telephone messages. Helms was not pleased with the accidental insertion, but nonetheless called the report containing the message "persuasive, scholarly and well done."

HOTLINE

Two deaths

A female grizzly bear was shot and killed Oct. 7 in Yellowstone National Park as she dragged away the partially eaten body of a wildlife photographer reported missing the day before. An autopsy and board of inquiry determined that William J. Tesinsky, 38, of Great Falls, Montana, died from wounds inflicted by grizzly bear No. 59. At the scene of the attack near Otter Creek three miles south of Canyon Junction, rangers found Tesinsky's camera mounted on a tripod and an elk bugle. The film contained no photos of grizzlies. Bear No. 59 had been seen this summer with her two cubs chasing down elk calves and, once, putting on a road show for a crowd of tourists. Rangers considered No. 59 a neutral bear, having had contact with park visitors but exhibiting little fear of people. However, on Sept. 4 she and her cubs were relocated from the Canyon Campground area, where she was beginning to teach her cubs how to feed from bear-proof dumpsters. Bear No. 59 returned to the area two weeks later without her cubs. Park officials and bear experts have issued warnings to stay clear of the bears, which are hungry and farther from their usual haunts this season due to a shortage of whitebark pine nuts.



Rep. Ron Marlenee

Tree-bugging

A Montana congressman known for his pro-timbering views recently insisted that the Forest Service stop a logging operation near his chalet at Bridger Bowl, a ski area in southwestern Montana. Rep. Ron Marlenee, R, said he did not object to the timber sale nor to trees being cut near his chalet, but he was worried about the "aesthetic appearance" in a highly used area. He said he also feared that a natural windbreak protecting skiers would be removed if too many trees were cut. A *Missoulian* editorial found it ironic that "Marlenee would so strongly advocate forest development elsewhere in Montana but be so sensitive about the aesthetics of logging when it messes up his view."

BARBS

One of the very few endangered species to be brought back from the brink.

Whooping cough, which was once almost eradicated, is again a major health menace.

Idaho issues are jobs, wilderness, logging

In Idaho politics this fall all issues have led to jobs.

Along with the rest of the West, Idaho has been left in the cold by the economic surge on both coasts. From the disaster areas of agriculture and mining to the slowly rebounding timber industry, the resource-based Idaho economy has been on the skids. This is particularly aggravating to the state's voters, who gave Ronald Reagan one of the largest majorities in 1984 of any state in the nation.

In that same year Republicans could have locked up the most conservative delegation to Congress. But one of the state's two congressmen, George Hansen, had been convicted of felony charges on campaign finances. That hurt even a hard-core conservative and he lost by a few hundred votes to Democrat Richard Stallings.

In this year's race for U.S. Senate, Republican Sen. Steve Symms hopes to remain in Washington, D.C., where his seat is one of a dozen or so keys to a continued Republican majority. His opponent is Democratic Gov. John Evans, who has been neck-and-neck with Symms in the pre-election polls. The outcome of the race is likely to be as close as it was in 1980, when Symms defeated the late Frank Church by about 4,000 votes.

Symms has been a favorite of conservatives since he was first elected to the House in 1972. His personable style and sense of humor have served him well in a state small enough for a politician to know most of the power-players.

But Symms has one of the worst records in Congress on environmental issues, leading most Idaho conservationists to want to replace him with almost anyone. Evans' environmental record is seen as a vast improvement, but not so outstanding that environmental groups or individuals are beating the streets working for him.

Governor for almost 10 years, Evans is quick to point out that the economic woes of agriculture, mining and timber are caused by federal policies, including unfair trade restrictions, the deficit, a strong dollar and high interest rates. More than 65 percent of the state is federally owned. Evans also says the Republican-dominated Legislature has obstructed his efforts.

The race for governor involves no incumbent, but pits Democrat Cecil Andrus against Republican Lt. Gov. David Leroy; both are campaigning to add jobs and fuel the state economy. Andrus was a popular governor from 1971 to 1977, so much so that his stint as Interior Secretary under locally vilified President Carter did not besmirch his reputation. Andrus' work at Interior and his later associations with national environmental groups have endeared him to conservationists, but he also seems to appeal more generally. Andrus has an uncanny ability to remember people's names and people remember his term as governor for its excellent economic climate. Two weeks before the election, he was leading by 8 percent in the latest poll.

The rising star of Idaho Republicans, Leroy has worked hard to align himself with business in the state. But business has been bad and his leadership of the state Legislature has not brought results visible to many voters. Leroy is also in the no-more-wilderness camp.



John Evans
is again
stamping out

TIMBER JOBS

True to form, Governor John Evans has vetoed House Bill 711, a bill designed to help Idaho's 15,000 hard-hit timber workers.

Typically, Evans rejected a bill supported by leaders of both parties. A bill that would have redefined clean water guidelines. A bill that would have helped reduce legal maneuvers to delay and stop vital timber sales. A bill that would have given the Idaho Department of Lands the lead role in coordinating public and state agency input on timber sales.

Now that John Evans has once again turned his back on Idaho's timber workers and their families, he wants to go to Washington. He'd like to team up with Ohio Congressman John Seiberling — the same man Evans invited to Idaho to help decide how much wilderness our state needs. Evans says at least 1.2 million more acres of Idaho Wilderness should be locked up.

Just how far will he go in closing the door on timber jobs in Idaho?

Senator Steve Symms

Working effectively for Idaho timber jobs.

In the northern end of the state, Republican incumbent Rep. Larry Craig is running for re-election on a slate that calls for no more wilderness. This has given Craig's opponent, Bill Currie, the opportunity to make good use of Craig's recommendation that a paved road be punched through the Frank Church-River of No Return Wilderness to open it up for tourism. A Currie campaign t-shirt shows a picture of a freeway interchange in the wilderness in the year 2,000. But Currie is a newcomer to state politics and a long shot to unseat Craig.

As for Democrat Rep. Richard

Stallings, who squeaked by George Hansen two years ago, he faces a close race from Republican Mel Richardson, an Idaho Falls television broadcaster.

Some of the recent right-wing dominance of the Legislature may be broken in local races. Speaker of the House Tom Stivers decided to retire, which means some of the more rock-ribbed conservatives may also leave. A core group of several fringe-right Republicans, known as members of the Flat Earth Society, were defeated in the May primaries.

--John McCarthy

HOTLINE

EPA takes on LP

The U.S. Environmental Protection Agency filed suit last month against Louisiana-Pacific Corp. for operating its two western Colorado lumber mills since September 1984 without the required federal permits. "L-P is a significant violator, which saw significant economic gain by not complying with our regulations," said Steven Frey, an EPA environmental engineer. Frey added, "We intend to collect penalty to insure they don't do it again and others like them don't do it again." EPA regulations require major air pollution sources to apply for permits before construction. L-P built its Olathe and Kremmling waferboard plants with permits only for minor source pollution, with an estimated 25 tons per year of particulates. EPA stack tests in 1985, however, revealed that the L-P mills are actually major pollution sources that emit over 500 tons each per year of particulates, carbon monoxide and volatile chemicals. The EPA suit could cost L-P as much as \$25,000 for each day of operation in violation. The agency also comparable in harassment to re-permit, which would require the best available control technologies to be installed at the two plants.

Tit for tat at Glacier

A member of the Earth First! Grizzly Bear Task Force is threatening to "dive-bomb" bald eagles and tourists in Glacier National Park unless a park researcher stops using helicopters to count grizzly bears. Dave Smith of Missoula, Montana, told Glacier Superintendent H. Gilbert Lusk by letter that unless the research flights are stopped, he intends to fly over lower McDonald Creek in Glacier every weekend for a month, beginning Oct. 25. Park officials say Smith's flights would disturb the hundreds of bald eagles that gather each fall to feed on salmon spawning in the creek. Smith says it will be equally threatening to the many tourists that watch the eagles from the McDonald Creek bridge. In his letter, Smith wrote, "Would you please advise them to clear the bridge when they hear the helicopter approaching? We're going to be flying at tree-top level and the helicopter's roto-wash might push people off the bridge." Smith says his flights will be comparable in harassment to research biologist Kate Kendall's aerial census and pilot Jim Kruger's scenic tours of the many grizzlies and black bears that feed in Glacier's Apgar Mountains each fall.

LETTERS

THE GRAZING ISSUE

Dear HCN,

I am no longer contributing to HCN's funds though I will continue to subscribe. I think you do a good job covering many issues but I don't appreciate the continual references to the quaint but parasitic and all-powerful ranching community. I enjoy reading opinions of all kinds but not opinion presented as fact or the negative connotations behind your words.

I do not think that grazing on the public lands is a subsidy. One reason that the Forest Service states that grazing fees do not begin to cover their costs is because they are a huge, inefficient bureaucracy that hires many people to do many jobs of varying worth; all of which are costly. This is not the ranchers' fault.

Also, you cannot compare grazing on the public lands to grazing on private land. They are two very different things. Most private grazing is on prime land. It is fenced, salted, and often irrigated by the landowner. The cattle gain better and are not disturbed by people traffic.

The public land is not of the same quality. The permittee pays a seemingly low fee to the government, but that is just the beginning of his costs. On many ranges the permittee is then required to hire a rider to look after the cattle. The Forest Service tells the permittee where to fence and when, and the permittee pays for the fencing. The dates are set by the Forest Service (or BLM). If bad weather or an early hunting season forces the rancher to get the cattle

down early, he/she still has to pay for the unused days.

When we have leased on both private and public land, the private land has turned out to be cheaper, the cattle do better and there is no hassle with the Forest Service. The subsidy just isn't there.

Lastly, I do not know a great deal about water, but I think HCN is wrong in stating that most ranchers get subsidized water. Like many people, we take our water out of the river and put it into a privately built and maintained ditch. There is no reservoir involved.

Many of the existing water projects and proposed ones are done in the name of agriculture. However, that is just a way of getting them passed, and a means of keeping the water in the state for future urban and industrial use. Every politician I hear on the radio is advocating protecting Colorado's water rights. This is not for a few ranchers in the state. It is for the future. For jobs and growth. I am not looking forward to the future and its accompanying urban sprawl. I would rather see the ranchers stay in business (without government subsidies) and the beauty of the land maintained.

Marj Perry
Carbondale, Colorado

P.S.

Ed Abbey is mistaken when he states that getting the cattle off the public range will increase the number of wildlife. In the mountains, elk and deer are not limited by the number of cows on the forest, but by the amount of winter range. The elk and deer winter habitat is most often private land. When ranchers are forced out of business, developers most often buy the land and crucial winter habitat is turned into tract houses and bluegrass.

If everyone who ate meat had to go to the woods and shoot an animal, the woods would be more crowded than ever. It would hardly be hunting. Many animals would be wounded, chased and harassed, which is hardly an improvement for them. More meat would be wasted, as many people have no way of storing great quantities at once.

Cattle and wildlife do not compete in the mountains, but people and wildlife do.



UTAH SKI COUNTRY, the second book in the Utah Geographic Series, will be available Nov. 1, 1986. This beautiful 128-page book by Brooke Williams includes more than 160 color photographs by Chris Noble and others, four full color maps, and 40,000 words of beautifully written text. Available in softcover (\$15.95) and hardcover (\$24.95). Orders received on or before Nov. 7, 1986 will receive a 15 percent pre-publication discount. Send \$13.55 plus \$1.00 for postage for softcover (\$14.55 per book) and \$21.25 plus \$1.00 for postage for hardcover (\$22.25 per book) to: Utah Geographic Series, Box 8325, Salt Lake City, Utah 84108. Money-back guarantee if not fully satisfied. (\$29-027)

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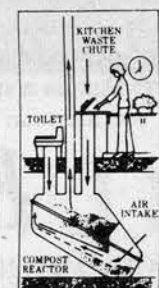
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CLASSIFIED ADS cost 20 cents per word, pre-paid, \$5 minimum. General rates for display are \$6/column inch camera-ready; \$8/column inch if we make up. For ad rate brochure, write HCN, Box 1090, Paonia, Colorado 81428 or call 303/527-4898.

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(Required by 39 U.S.C. 3685)

- Title of publication, *High Country News*
- Date of filing, September 25, 1986
- Frequency of issue, Biweekly
 - No. of issues published annually, 24
 - Annual subscription price, \$20.00/ \$28.00
- Location of known office of publication, 124 Grand Ave. (Box 1090), Paonia, Co. 81428
- Location of headquarters of general business offices of the publishers, same as 4.
- Names and address of publisher and managing editor, Edwin H. Marston, Box 1090 Paonia, Co 81428, Elizabeth A. Marston, Box 1090, Paonia, Co. 81428
- Owner: High Country Foundation, Box 1090, Paonia, Co 81428
- Known bondholders, mortgagees, and other security holders owning or holding 1 (one) percent or more of total amount of bonds, mortgages or other securities: None
- Extent and nature of circulation:

	Ave. No.	Actual No.
	Each Issue	This Issue
A. Total # copies printed --	5,487	12,200
B. Paid circulation, 1. Sales		
-dealers and counter sales--	52	102
2. Mail subscriptions --	4,562	4,978
C. Total paid circulation		
(B1 and B2) --	4,614	5,080
D. Free distribution-smples--	395	6,542
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G. Total (E&F) --	5,487	12,200

I certify that the statements made by me are correct and complete.

Edwin H. Marston, Publisher

WATER



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America can't keep its hands off its rivers. In the Columbia and Colorado basins, the damming and diverting has produced new economic bases, enormous amounts of irrigated desert lands and green cities in what was desert. But the transformation of the long, wide, muddy Missouri has had little effect on the region. The northern plains has been left with a series of large reservoirs; the humid states in the lower basin have been left with a channel in place of a river. The Missouri in those places has lost its natural values without gaining compensating economic uses. The Missouri has been developed, but it has not been put to use.

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THE MISSOURI RIVER BRANCH OF THE HATFIELD-MCCOY FEUD, by Marjane Ambler.

The aborted development of the Missouri River basin left the states within the region at each others' throats. Feuding is inevitable within a river system, but the Missouri basin has nothing to mediate that feuding -- no strong federal presence, no dominant economic use dependent on the river, no interstate compact. The result, as this story shows, is the use of litigation as a wrecking bar. If South Dakota were a sovereign nation, it would long ago have broken off diplomatic relations with Iowa and Missouri.

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THERE ARE NO BORING LANDSCAPES, by Peter Carrels.

Non-Dakotans often assume the prairies and plains of the Dakotas are flat, boring, and uncomfortable: too hot and humid in the summer, too cold and blizzardy in the winter. Not so, writes South Dakotan Peter Carrels. The Dakotas' landscape is flat only if you neglect its most spectacular feature -- the skies, with their towering cumulus clouds, their ominous thunderstorms and blizzards, their uninterrupted expanses. The land is boring only to those who do not understand how like the ocean its unpeopled vastness is. The prairies and plains are dull only to visitors who do not see the life supported by the incredibly fertile soil, the surviving prairie potholes and the harsh but nourishing climate.

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"THE MOST USELESS RIVER THERE IS," by Peter Carrels.

Thus spoke *Time* magazine when it hailed the drowning and channelization of the Missouri River

in 1952. Today, the Missouri River has been transformed, but residents of the northern plains still struggle with the question of how to use its water. That struggle goes back to the first white settlement of the region. Early settlers put their faith in a slogan: Rain follows the plow. Then they turned to science, in the form of rainmaking. In the end, most farmers decided to work with the region's rich soil and droughty climate and adopted the techniques of dry-land farming. But the idea of dependable moisture never died. So today North Dakota is still seeking to build projects to spread the Missouri's water over the land.

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HOW COULD ANYONE OPPOSE, OR FAVOR, THE GARRISON PROJECT? by Ed Marston.

North Dakota's Garrison Project, in its various manifestations, would irrigate 130,000 to 1,000,000 acres, cost about \$1 million per farm, devastate surviving wildlife habitat in this flat and intensively drained and cultivated land, add only a tiny fraction to the state's farmland, and produce crops already coming out of the nation's collective ears. But the billion-dollar-plus project would also reassure a remote, hurting and suspicious part of America -- a state filled with boomers and blamers. North Dakota is less than 100 years old, and it is the state's ill fortune to have sunk almost a century of national political capital into Garrison. In authorizing a scaled-down Garrison, Congress may have been acting on humanitarian grounds.

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THE LOW-TECH ART OF IRRIGATING, by Ed Marston.

Everything you ever wanted to know about seepy ditches, headgates, measuring water in a ditch, stealing water out of a ditch and washing away your low-lying neighbors' fields.

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THE REAL WATER LAWYERS, by Marjane Ambler.

An honest position-wanted ad for ditch riders would read: "The ideal candidate will have the diplomatic skills of Talleyrand, the patience of Job, the wisdom of Solomon, and a cast-iron gut." Ditch riders need those attributes because they are the people who actually distribute the West's irrigation water. Often, as here on Wyoming's Wind River Reservation, they are working with an aged, deteriorated system; very rough measuring means; and farmers who are quick to assume that they are being shorted.

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A BOOK FOR ALL RURAL HINTERLANDS.

A review of Carl Kraenzel's 1955 book, *The Great Plains in Transition*, by Ed Marston.

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A TALE OF TWO IRRIGATION DISTRICTS, by Marjane Ambler.

History and fate have placed two irrigation systems -- one white and one Indian -- on opposite sides of Wyoming's Wind-Bighorn River. One has been recently modernized with the help of federal reclamation dollars and is doing well. The other has been cut off from federal help, and is slowly deteriorating as headgates and valves rust, ditches deteriorate and land is taken out of production. As of now, the one hope for the Indian district is that a courtroom water rights victory can be translated into financial help.

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A MISSOURI RIVER BIBLIOGRAPHY, by Peter Carrels.

The writers

Ed Marston has been publisher of *High Country News* since 1983.

Marjane Ambler is a freelance writer who specializes in Indian issues. She lives in Yellowstone National Park.

Peter Carrels is an environmental activist and writer in Aberdeen, South Dakota.

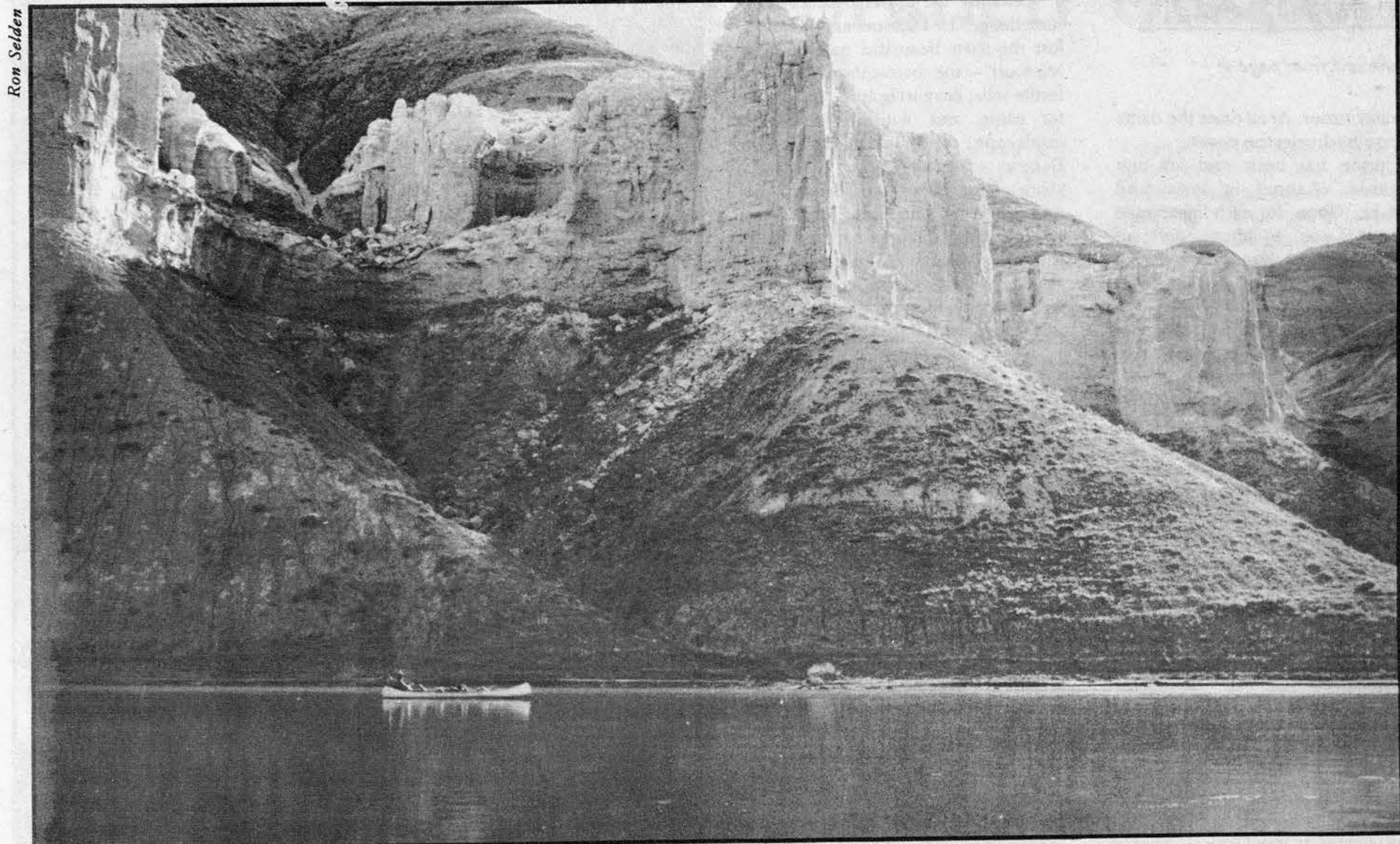
Thanks

High Country News gratefully acknowledges the support of the 777 Fund of the Tides Foundation in the development of these four special issues, and in the circulation of 28,000 sample copies to persons and institutions interested in Western water.

MISSOURI RIVER BASIN

RIVER LENGTH [miles]	2,315(1)
BASIN SIZE [square miles]	529,400(2) 530,000(1)
AVERAGE ANNUAL RUNOFF [acre-feet]	65 million (1) 58 million(3)
AVERAGE FLOW AT RIVER MOUTH [acre-feet]	49.4(1) 54.6(4)
IRRIGATED LAND [acres]	14.139 million [1985 projection](4)
RESERVOIR STORAGE CAPACITY [acre-feet]	75 million [active capacity](3) 75 million [mainstem, total capacity](1)
HYDROPOWER CAPACITY [megawatts]	3,300(1)

Sources noted are as follows: 1) *The Missouri River Basin Water Resources Plan*, 1977, Missouri River Basin Commission, Omaha, Nebraska; 2) *World Book Encyclopedia*, 1986 edition; 3) Bonneville Power Association; 4) *A Water Protection Strategy for Montana, Missouri River Basin*, 1982, Water Resources Division of the Montana Department of Natural Resources and Conservation, Helena, Montana.



The Missouri River in the White Cliffs area near Big Sandy, Montana

The Missouri River: Developed, but for what?

America can't keep its hands off its rivers. In the Columbia and Colorado basins, the damming and diverting has produced new economic bases, enormous amounts of irrigated desert lands and green cities in what was desert. But the transformation of the long, wide, muddy Missouri has had little effect on the region. The northern plains has been left with a series of large reservoirs; the humid states in the lower basin have been left with a channel in place of a river. The Missouri in those places has lost its natural values without gaining compensating economic uses. The Missouri has been developed, but it has not been put to use.

by Ed Marston

The Missouri is America's longest river, and one of its widest and muddiest. It starts in Montana's Rockies as hundreds of mountain streams of the kind made familiar by beer commercials. These streams come together to form the Gallatin, Jefferson and Madison rivers, and they join to create the Missouri at Three Forks, between Butte and Bozeman. (See map on pages 12-13.)

From there the Missouri gropes its way north out of the mountains, emerging onto the plains near the city of Great Falls, and then carves a path for itself east across Montana -- a state so wide it could easily be divided into two still very generous states. At the North Dakota line, the Missouri is joined by the Yellowstone, and the strengthened river then slants east and south down across the Dakotas and on into the lower basin states of Nebraska, Iowa, Kansas and Missouri.

Like the mountain and plains land that it drains, the Missouri's scale is

hard to grasp. There is nothing puny about the Columbia or the Colorado, but the Missouri is almost as long as the two put together; the land mass the Missouri drains is larger than the Columbia and Colorado basins together.

The Missouri basin's runoff is dwarfed by that of the moist Columbia, but its annual flow is four times greater than that of the Colorado. As its Big Muddy nickname implies, the Missouri carries enormous amounts of silt. In the river's natural state, the silt caused the Missouri to wander back and forth across a broad flood-plain. The silt, when it settled out, created islands and built up channel beds, and the river would unpredictably relocate itself.

The Missouri also wanders on a larger scale. Unlike the other two major Western rivers, it is no stay-at-home. It moves eastward and southward across the continent to empty, via the Mississippi, into the Atlantic.

Physically, the Missouri is a mature river. It has fought its wars

with glaciers, which pushed it south; it has worked its way through soft and hard rock; it has created characteristic landscapes; and it has carried enormous volumes of mountain and plains soil toward its juncture with the Mississippi.

But politically and legally, and in terms of what the West calls "water development," the Missouri is decades behind the Columbia and Colorado. The use of its waters is not governed by a multistate treaty, or compact. There are few institutional arrangements among the states that share the river. Litigation over control and use of the river's water is just beginning. And although the Missouri would cause even a race of beavers to wonder if there is anything left to dam, relatively little of its water is diverted out of the riverbed.

Major economies have been built on the damming of the Columbia and on the diversion of Colorado River water to irrigate farmland and water cities. Now, other economies -- the salmon, rafting, mountain wildlife and fish -- are challenging the single-minded pursuit of further damming and diversion that had dominated the Columbia and Colorado before. In both basins, the choices between development and conservation are clear. Making those choices and compromises will be controversial and difficult, but the nature of the choices is plain.

The Missouri is different. The development of that river has physically changed both its upper and lower basins. But the resulting economies -- hydropower out of the upper basin dams and barge traffic in the lower basin channels -- have not been nearly as transforming as the hydropower, irrigation and the

building of desert cities that flow from the Columbia and Colorado. The upper Missouri dams have prevented some flood damage to downstream cities, but navigation benefits have been small. An Iowa professor calculated that transforming the Missouri through Iowa into a rock channel now yields that state only \$5 million a year from barge traffic.

So the half-completed Pick-Sloan plan of the 1940s, which was to transform the Missouri River into the region's economic engine, did not create strong, new economies. But neither is the Army Corps of Engineers' dammed and channelized river being strongly challenged by conservation alternatives, as is occurring in the other basins.

Long dams block the Missouri's shallow valleys in eastern Montana and the Dakotas. Then, as if to compensate for the sprawling upper basin reservoirs, on the lower Missouri, especially on the Iowa-Nebraska part of the river, the once muddy, wandering, flooding river has been put in a straitjacket. Every inch is confined by rock or log walls to a narrow, swift-flowing barge channel.

Before the massive Pick-Sloan dams were built in the upper basin, the Big Muddy was a terror. It flooded the lower basin cities in high-runoff years, and left boats and barges in the river stranded during the low-flow summer. Today the large Pick-Sloan dams in Montana and the Dakotas hold back water at flood times and release enough water to float barges at

(Continued on page 10)

Developed...

(Continued from page 9)

low-water times. At all times the dams generate hydroelectric power.

A price has been paid for that navigable channel in Iowa and Nebraska. Gone, for each linear mile of channel, is a square mile of wetlands, oxbow lakes, meandering river, islands and mudflats. Gone with them are most of the wildlife -- the catfish, the ducks, the muskrats, the deer -- that once occupied that undisciplined environment.

Altogether, Iowa has lost 500,000 acres of wildlife habitat to channelization. A river that surged back and forth across a wide swath of land now stays obediently in a narrow channel. The Missouri has been tidied, constrained. All through Iowa and Nebraska, the channel is bordered by farmland that occupies what had once been mud flats, marshes, islands and riverbed.

Some lakes or marshes were left undrained and unfilled as the Army Corps of Engineers went about its riprapping, concrete-pouring and wall-building. Now many of those lakes are drying up, losing their water to a dropping groundwater table.

The drying would be funny -- a massive joke on the Corps -- were it not doing so much damage to the surviving natural lands along the lower Missouri. The joke is that although the Corps locked the river in horizontally, it didn't pave the bottom of the channel.

The Missouri, as it emerges from the string of Pick-Sloan dams swift and free of the silt it once carried, is a hungry, down-cutting river. It runs down that straight, neat channel the Corps built like a power shovel, first dredging the channel (as the Corps planned) and then digging itself ever deeper into the ground. As the channel deepens (the phrase is "channel degradation"), the river drops. That, in turn, causes the groundwater level in the surrounding land to also drop, drying up surviving lakes and marshes.

It has been suggested that the lower Missouri be re-reclaimed in places. One Iowa state official interviewed in the 1982 TV documentary, *There Once Was a River Called Missouri*, suggested that the Corps stop maintaining the channel for barge traffic, and free the river to once again wander in its floodplain. The upper dams would still control floods in Iowa and Nebraska and generate electricity, but some of the river's natural values would be reclaimed in its lower stretches. The economic benefits could be large. A stretch of unchannelized Mississippi yields \$1 billion a year from recreation and wildlife. If a freed Missouri yielded even a fraction of that, its value would be far greater than the barge traffic that now lightly plies the Missouri channel between Sioux City and Omaha.

The abandonment of barge traffic through Iowa and Nebraska might ease relations with the upper basin states. If there was no longer a need to use water out of the dams to float barges, the lower basin might be less quick to go to court when North or South Dakota tried to divert water out of their string of reservoirs.

Certainly the upper basin is owed something. The Dakotas and Montana lost the most beautiful part of their Missouri -- the bottomland, with its fertile soils, easy irrigation, tree cover for cattle and wildlife, a varied landscape, and large fish. The Dakotas especially never got their share of the Pick-Sloan bargain. As originally envisioned, the project was to provide the Dakotas with extensive irrigation projects to replace the land flooded by dams whose major purpose was to stop flooding in the lower basin and to give them water to float barges.

In an age of surplus Btus and kilowatts, of Gramm-Rudman-Hollings, of massive farm surplus, of national hostility to irrigation projects that cost \$1 million a farm, traditional irrigation and hydropower approaches to the development of the upper Missouri River seem antique. The West has entered an era of reform -- the trailing away of Reclamation and the beginning of water marketing. But since the Dakotas never went through an era of development, it is not clear how, or if, they will adapt to the new reality.

As mentioned, the aborted development in the upper Missouri is balanced by a lack of definition on the conservation side. The natural and recreation alternatives to dams, irrigation and hydropower that exist in the Columbia and Colorado basins are not as visible in the Missouri.

So this Special Issue on the Missouri River basin emphasizes basin over river. The arid plains of the Dakotas are a neglected, little-known part of America. Outsiders see them as flat, frigid, humid, blizzardy and boring. Unlike the mountains and the Western deserts, the Great Plains have not attracted preservationists and environmentalists, who inevitably act as promoters and publicizers of a region or area. The former Great American Desert is little known and little appreciated.

This issue is an attempt to correct that. Peter Carrels, a South Dakotan, writes about the region's physical and historic landscapes. The stories may not convince you to move to the Dakotas. They may not even get you to spend a spring or fall there. But you will understand that the land has a beauty, a history and a life unique to itself.

As a result of the incomplete deal, the entire basin became thin-skinned, and quick to quarrel and litigate.

Mike McClure



When, in the midst of the last energy boom, South Dakota tried to sell a dab of water to a coal slurry pipeline company whose acronym was ETSI, the downstream states sued to stop the sale. Long-standing attempts to build massive irrigation projects in the Dakotas to replace the flooded lands have also been fought and stopped or scaled back. In large part, the projects were stopped or scaled back because the Bureau of Reclamation couldn't figure out how to build projects that wouldn't do more damage than good to Dakota farming.

The Missouri is not all main stem. The Platte River comes out of Colorado and Wyoming to cross Nebraska (another candidate for

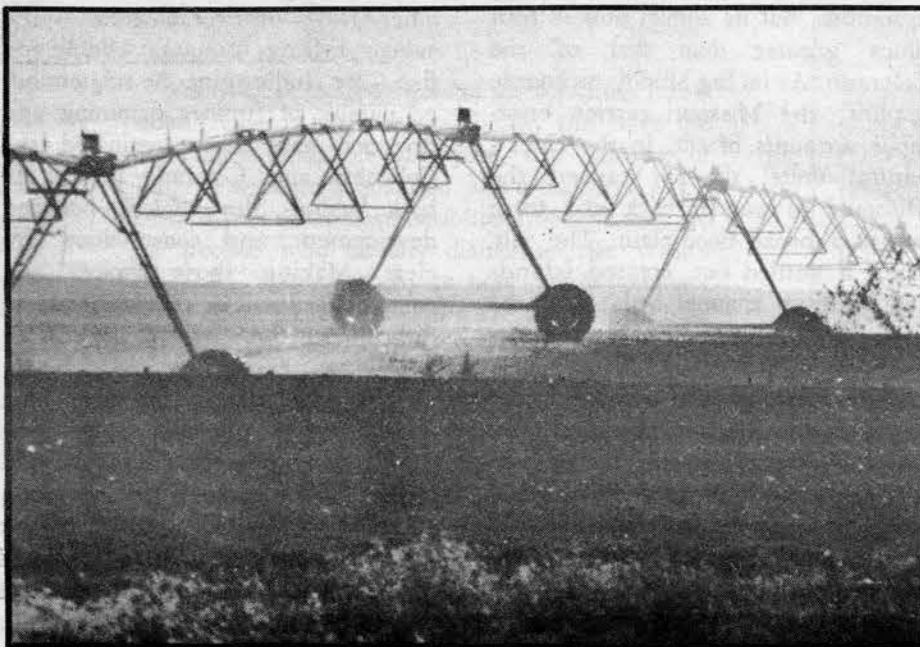
division in two) and join the Missouri just below Omaha. The Yellowstone River flows northward out of the corner of Wyoming, through Montana, and into the Missouri on the Montana-North Dakota boundary.

One of the tributaries to the Yellowstone is Wyoming's Wind-Bighorn River. We could have used any small basin in the region to illustrate how they become worlds unto themselves, binding those who live in the basin together in cooperation or conflict. Along the Wind-Bighorn River, the story is of the struggle between Indians and white men over the control of the land and water.

The Indians had been steady losers in this struggle. But just as treaties give Indian tribes in the Columbia a right to a large share of the salmon, so do treaties in the Missouri and Colorado basins give reservation tribes a large share in the region's scarce water.

Where these so-called Winters Rights apply, they grant the tribes enough water to irrigate their reservation lands. The legal principle is the same everywhere, but it plays itself out in different ways in different basins. In the Wind River basin, as Marjane Ambler reports, a Winters Rights victory by two Wyoming tribes has given them a bargaining position. Some of that strength may be used to get funds to rebuild and expand the Indians' deteriorating irrigation system described in her articles.

Carlotta Collette



The Missouri River branch of the Hatfield-McCoy feud

The aborted development of the Missouri River basin left the states within the region at each others' throats. Feuding is inevitable within a river system, but the Missouri basin has nothing to mediate that feuding -- no strong federal presence, no dominant economic use dependent on the river, no interstate compact. The result, as this story shows, is the use of litigation as a wrecking bar. If South Dakota were a sovereign nation, it would long ago have broken off diplomatic relations with Iowa and Missouri.

by Marjane Ambler

BILLINGS, Mont. -- Speakers at a Missouri River basin water symposium here Oct. 8-9 said they believe the time is ripe for states and tribes to join together to better manage the river. Northern Lights, a research and education institute based in Missoula, Montana, sponsored the symposium, which attracted about 100 people to the Northern Hotel.

Several speakers pointed out that both tribes and states seem more willing to talk with one another than they were even four or five years ago. However, a speech by South Dakota Gov. William Janklow (R) and a spirited debate between an upper basin and a lower basin attorney made it clear that compromise and consensus will not come easily.

Janklow accused the lower basin states of succumbing to pressure from the railroads when they challenged South Dakota's sale of water in 1982 to Energy Transportation Systems, Inc. for use in a slurry pipeline. William Crews, an attorney for the state of Iowa, denied the charge.

Janklow pointed out the difficulty in states understanding one another when their situations are so different. "Missouri gets 40 to 60 inches of water a year. Where I come from, that's a monsoon," he said.

Crews said, "We have a long way to go" to agree upon a management compact for the whole basin. His state of Iowa, plus Missouri and Nebraska, sued to stop the ETSI sale. "We need help to resolve our differences. We don't even listen to each other," he said.

As retribution for the ETSI suit, Janklow vowed to use lawsuits to harass lower Missouri River basin states that challenge his state's water use. "Anybody can wreck anything in America," he said in his keynote speech to the Missouri Headwaters Symposium.

South Dakota and other upper Missouri basin states said they believed the 1982 lawsuit challenged their rights to use Missouri River water. Wyoming sided with South Dakota when it filed a petition to sue the lower basin states. The U.S. Supreme Court dismissed the petition earlier this year, but left the door open for a re-filing of the suit.

On Sept. 30, South Dakota filed a new petition, asking the Supreme Court to consolidate the 1982 case and the recently dismissed case. Meanwhile, South Dakota is jumping into local water issues in the lower basin states. "Two can play that sort of game," Janklow said, referring to stopping progress in neighboring states.

When the state of Iowa asked the Army Corps of Engineers for water from the Missouri to fill a small recreational lake, South Dakota protested. Janklow also threatened to interfere in Nebraska's process for granting individual water permits.

Janklow admitted that his fight against the lower basin states was reaching "ludicrous proportion... our

intent should never be to stop other people from developing." But he said the amount of water he planned to sell ETSI was also small -- 50,000 acre-feet, or just one-tenth of the water that evaporates off Oahe Reservoir each year.

Janklow said his state lacks the fossil fuels that neighboring states enjoy, and that South Dakota never got the irrigation development promised by the federal Pick-Sloan water plan of the 1940s. He said money from the ETSI water sale would have been used for irrigation development. Janklow accused all the plaintiffs in the ETSI case, including the Sierra Club and Nebraska Farmers Union, of bringing suits because of railroad lobbying.

Janklow was in sharp contrast to Charles Wilkinson, a noted water-law expert who opened the meeting. He called for the creation of a multistate

compact and an organization of the basin states. The new organization could provide an ethical standard for resolving conflicts and a method for dealing with disputes, he said.

Wilkinson hoped that the basin states could end their impasse on the ETSI lawsuit and countersuit by South Dakota before the end of the year, when five of the basin governors leave office. The states have been negotiating since last spring at the instigation of the Missouri Basin States Association.

Wilkinson and former Montana legislator Daniel Kemmis set lofty goals for the participants. Wilkinson called upon them to adopt an "ethic of place" that includes not only respect for the land but also for people's economic needs. Kemmis hoped that years from now people would see themselves as part of one large bioregion, with their political boundaries forgotten.

Mary Moran



Irrigation canal and outlet gate

12-High Country News -- October 27, 1986



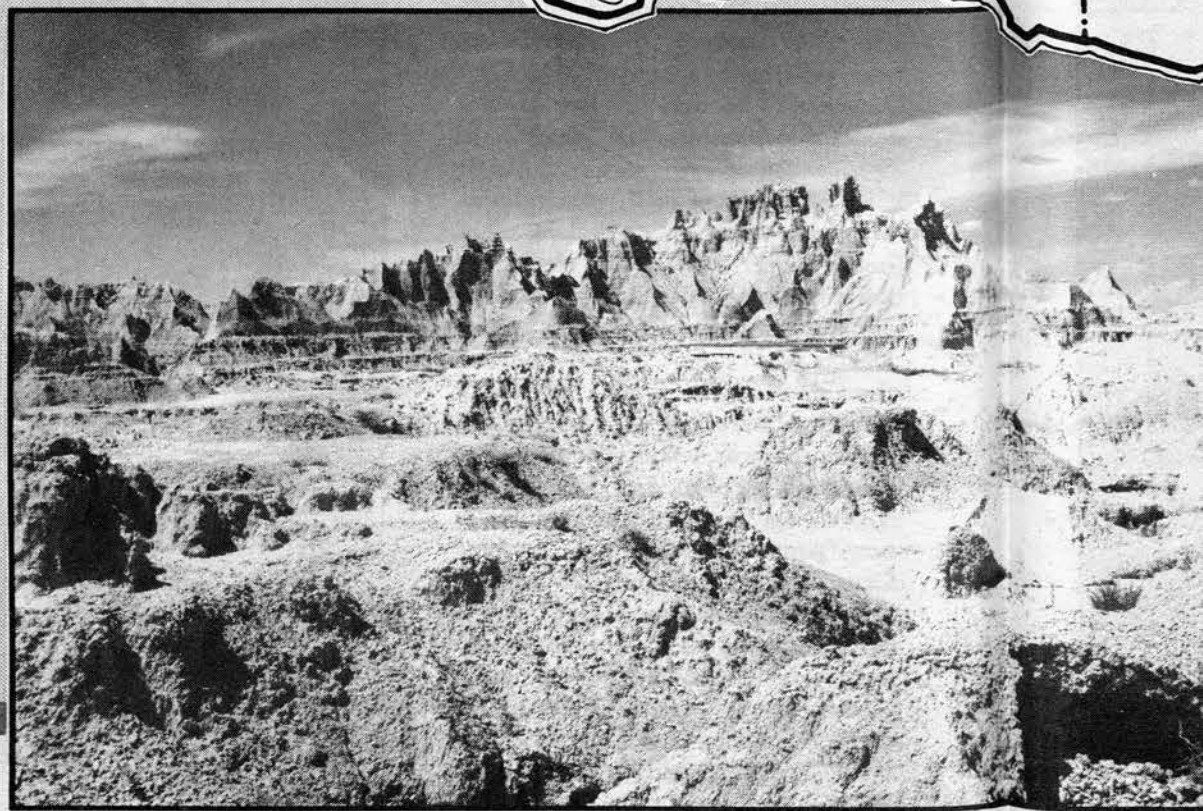
Jack Richard

Clarks Fork of the Yellowstone River,
northwestern Wyoming



Kansas wheatfield

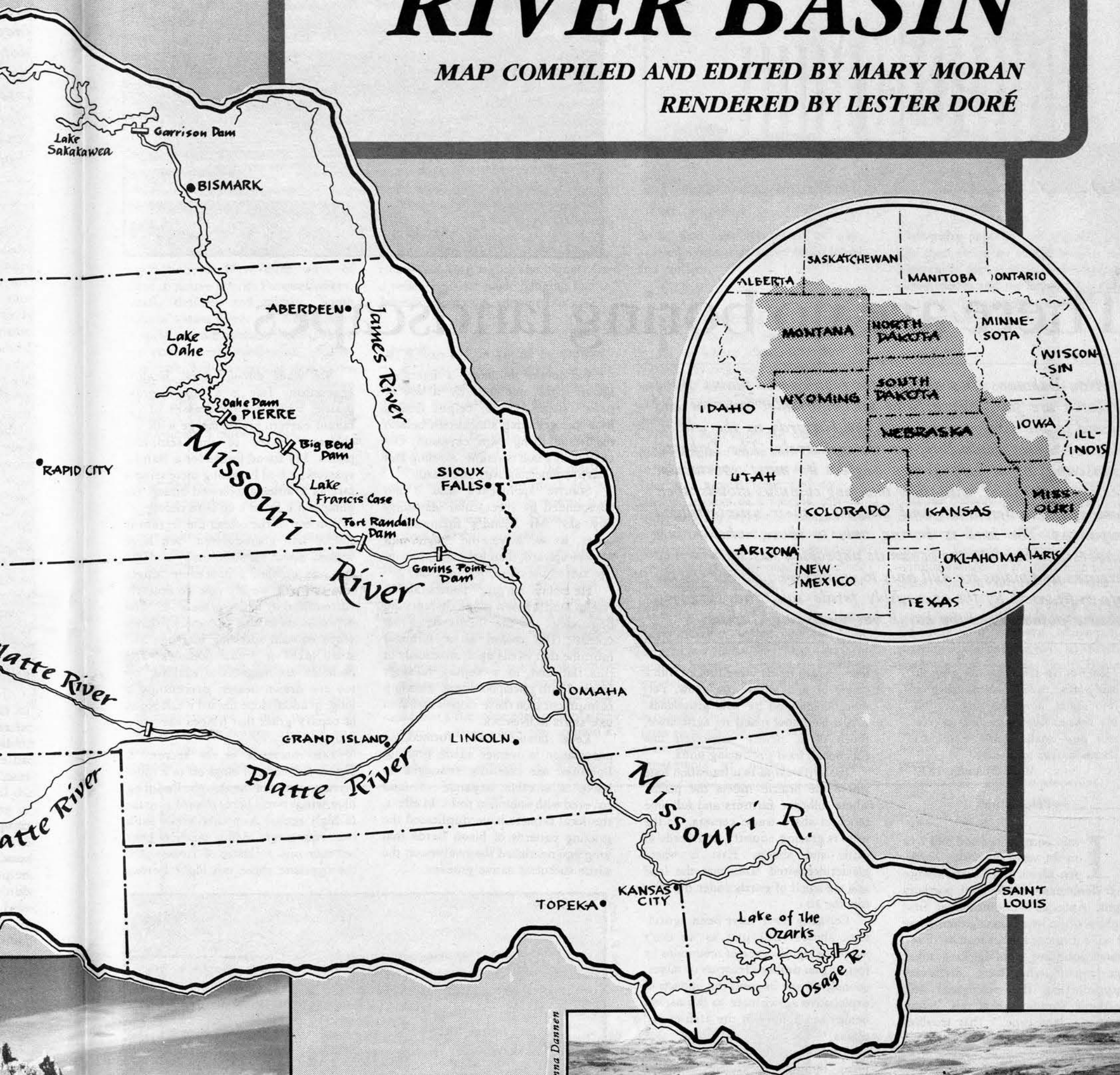
Kent and Donna Danner



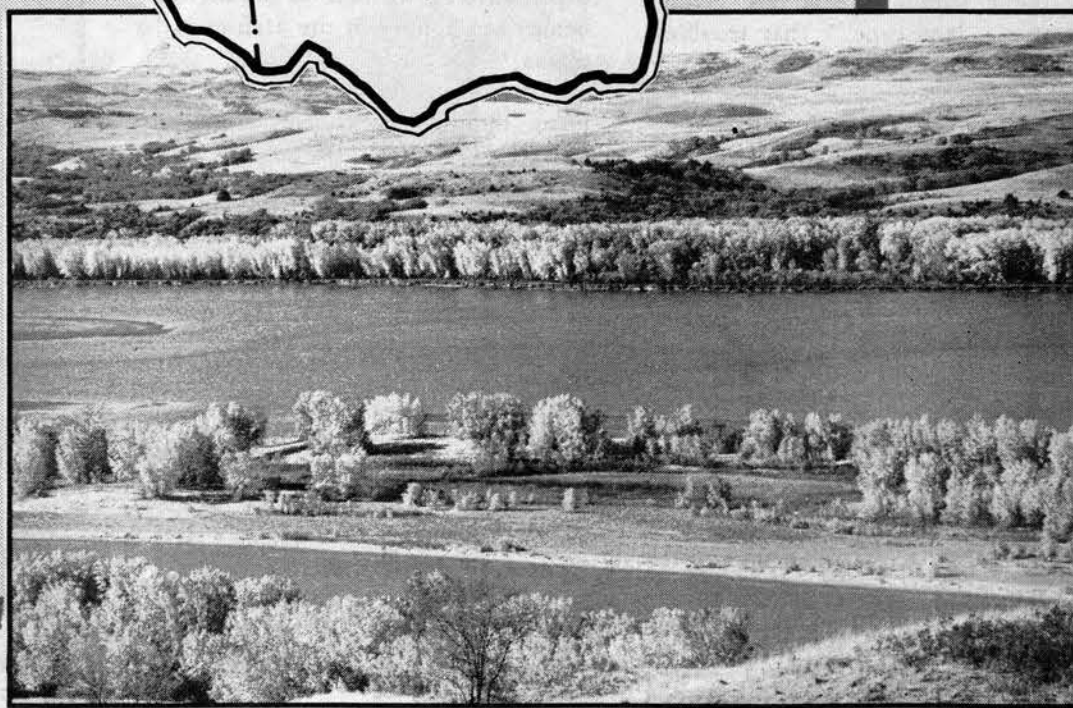
Badlands National Monument, South Dakota

THE MISSOURI RIVER BASIN

MAP COMPILED AND EDITED BY MARY MORAN
RENDERED BY LESTER DORÉ



Kent and Donna Danner



The Missouri River below Fort Randall Dam, on the South Dakota-Nebraska border

Peter Carrels



There are no boring landscapes

Non-Dakotans often assume the prairies and plains of the Dakotas are flat, boring, and uncomfortable: too hot and humid in the summer, too cold and blizzardy in the winter. Not so, writes South Dakotan Peter Carrels. The Dakotas' landscape is flat only if you neglect its most spectacular feature -- the skies, with their towering cumulus clouds, their ominous thunderstorms and blizzards, their uninterrupted expanses. The land is boring only to those who do not understand how like the ocean its unpeopled vastness is. The prairies and plains are dull only to visitors who do not see the life supported by the incredibly fertile soil, the surviving prairie potholes and the harsh but nourishing climate.

I am not so sure that the prairies and plains, while less stunning at first sight, don't last longer, fill the senses fuller, preclude all the rest and make North America's characteristic landscape.

Walt Whitman, 1879

by Peter Carrels

I was born, raised and still live on the western prairie - northern plains and I acknowledge that Whitman was at least partially right. America's midsection at first sight is often less stunning than some of our continent's other regions. Even after a good long bit of watching, there are many who have difficulty appreciating the ecological and aesthetic significance of this "characteristic landscape." That troubles me for, like Whitman, I find the prairie and plains fill my senses fuller than other landscapes anywhere.

I suppose many form their opinions of our nation's grasslands as they chase vacations in their automobiles, an experience blighted by glass, speed and stereo tape-decks. There is a non-intimate experience, part of a beeline to the mountains or coast.

Also altering impressions of my homeland is the constant manipulation of so much of the landscape. The business of food production has relentlessly tamed the prairie and plains, forever altering this chunk of America.

My part of the world has been easily subdued by man's simplest technologies. Access posed few prob-

lems. Virgin fields were broken with a single ox and a one-row plow. Formerly dominated by wild grasslands, it is a land now ruled by agriculture, much of it neatly organized into functional, food-producing units.

Eastern Dakota is a transition zone where the prairie meets the plains, where full-time farmers and full-time ranchers share trade centers. To the west is grazing country and herds of cattle and sheep. East is where glacier-deposited soils mat the land and the smell of earth under the plow fills the air.

Certainly there have been agricultural abuses. But just as we don't judge the significance of mountains by focusing on timber clearcuts or mines, so must we see beyond the impacts of exploitative agriculture to the natural beauty and bounty of the prairies and plains.

That beauty is easiest to see on hikes through surviving tracts of native grasses, vestiges of the grassland wilderness that once blanketed nearly a third of the United States. Last July a friend invited me to accompany him to such a place -- one I had never visited before.

We reach the remnant prairie by crossing countryside that is flat and fertile, the bottom of what was a large inland sea formed when the ice of our region's last Pleistocene glacier melted and pooled in a wide, gentle bowl. Farmsteads are sprinkled about, their yard lights twinkling in early morning's violet darkness.

Far to the southeast a lightning storm rages, obscured by a veil of heavy clouds. Quick, bright flashes look like gesturing silhouettes behind nighttime living-room curtains. Occasionally a bolt is visible, sizzling and sharp, connecting with the earth.

Sunrise approaches and I am surrounded by spectacular dawning-day sky. My friend's farmyard is quiet. As we leave, the bright ball sneaks upward, then hovers, tubby on the sides, just above the horizon.

He points out our destination, a rise of land a dozen miles distant, the beginnings of the Missouri River coteau. The coteau is a terminal moraine that swells up dramatically in this flat land, its sweeping hillsides littered with glacial boulders. Farming is impractical on these slopes and land use shifts to livestock.

Local families have formed an association to oversee cattle grazing. Pastures are carefully managed to leave a sizeable expanse of land covered with unbroken soils. In effect, the local farmers have duplicated the grazing patterns of bison herds that long ago nourished themselves on the same succulent native grasses.

We wade through thick, healthy vegetation. This is a mixed grass prairie, where the tall grasses of the humid eastern prairie merge with the shorter grasses of the semi-arid plains. My friend listens for a Baird's sparrow, a bird becoming increasingly rare as prairies are plowed under. He glimpsed a Baird's up here before.

On top of the coteau the terrain is rolling and grass-covered. We have walked about for some time, and the sun has climbed a noticeable length into the sky; we are now completely surrounded by native grasslands. The depressions in this hummocky landscape contain sparkling marshes and small lakes or prairie potholes. The potholes are magnets to wildlife; we too are drawn nearer, descending a long, gradual slope toward a tall stand of canary grass that fringes the open water.

Our presence is no secret. A bittern flushes and wings off to a more private corner of the slough. Paddling blue-winged teal hurry toward a maze of high reeds. A mother grebe with two youngsters riding on her back retreats into a cluster of rushes. On the opposite shore two night herons

John P. George



Western grebe

stand motionless, and a couple of great blues drop from graceful flight, lighting in the shallows. A killdeer cries out its name.

Although agriculture has destroyed many prairie potholes in recent years, these wildlife meccas still pocket the northern plains. Wildlife scientists call the prairie pothole region "America's duck factory," for nearly 90 percent of all ducks that breed in the continental United States do so in these small bodies of water nestled among the grasslands.

Above the wetlands are the varied grasses: the bluestems, needle-grasses, wheatgrass, wild rye, Indian grass, buffalo grass and a dozen others, in myriad shades of green. Winds sway the grasses, creating patterns that make the hillsides and coteau pulse with life. Children in wooded areas sometimes think trees make wind; here they think it is made by the grasses.

There are more wildflowers than you'd believe. Wave after wave of them in native prairie. Pasqueflowers, small, delicate and purple, South Dakota's state flower, are a harbinger of spring on the northern plains. There are coneflowers, sunflowers, thistle, anemone, red blazing star and many more. The prodigious growth is based on the rich soils of the prairies and plains. A square meter of prairie sod may contain 5 miles of roots.

The prairie and plains are a sprawling, mostly people-less place. To some this open space is disconcerting and uncomfortable. I love the dome of sky and floor of land stretching forever, without landmarks, without scale. It is a landscape for dreaming and contemplation. It encourages looking inward as well as outward, not unlike the sea, with a smooth surface that soothes those weary from looking at too much.

The weather of the plains is robust and unpredictable. In this country, all eyes turn to the sky countless times a day. Though there are practical reasons for vigilance, sky-watching is

also one of the region's great pleasures. The sky here provides magnificent theater, with color, calm and power performing in the round. A massive weather-front laden with swirling, swelling black thunderheads, stretching to opposite horizons, is at once menacing and exhilarating.

I stand in an open field and watch the clouds approach. Bright flashes of lightning suddenly thrust from the darkening blue-charcoal sky, followed by exploding, cracking thunder that makes me flinch and shiver. I continue to survey the storm, looking closely for funnel clouds. Never mind that there appear to be none in this particular system, it is still time to retreat before driving rain or stinging hail arrive.

In winter we observe approaching blizzards. Like thunderstorms, blizzards roll in from the west, producing turbulent, chaotic rumblings, whining winds and a shrouding mass of whiteness.

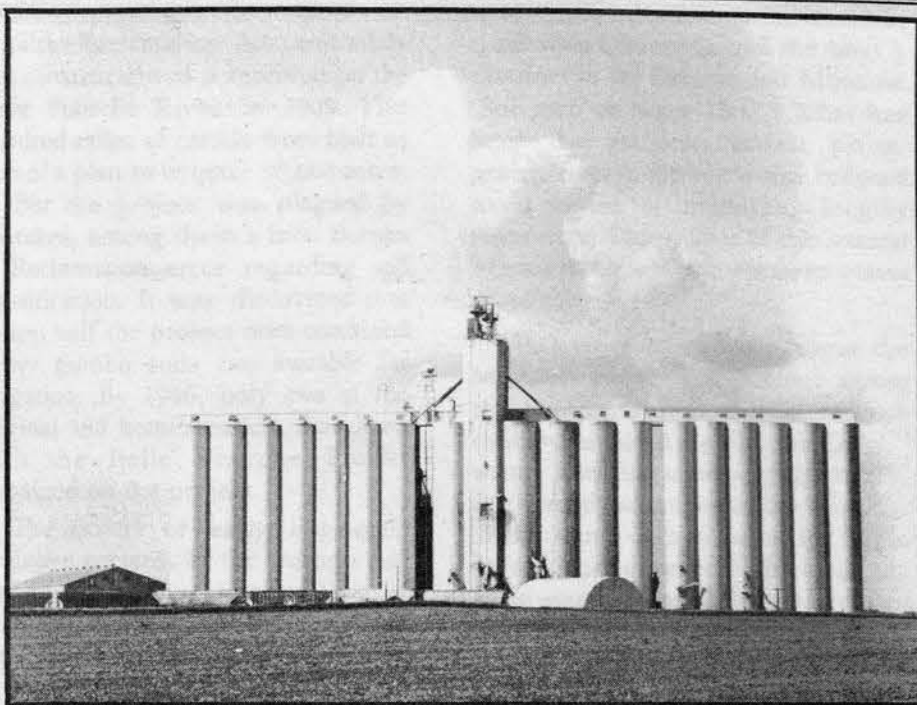
Or I watch billowing cumulus clouds building higher and higher. Or a yellow harvest moon hanging like a lantern in a large, empty room.

The sky is graced by raptors, constantly scanning the terrain for gophers, squirrels and rabbits. A meadowlark's melodic song rises sweetly above the breeze. Ring-necked pheasants hustle across a gravel road bound for uncut cover. Prairie chickens celebrate the mating season with flamboyant ritual. Males gather at display grounds to strut and 'boom,' hoping their bravado will impress a female audience.

On the high plains, pronghorn antelope race over the grasslands at breakneck speeds. They are America's fastest mammal. But gone are the legendary bison herds that once shared the range with the antelope. Only remnant herds roam the confines of national parks. Toward dusk comes a song-dog chorus. Coyotes, long common on the wild plains, are now denizens of the more populated prairie as well. They are the region's symbolic survivor.

Man also survives on scattered

Peter Carrels



Grain elevator

farms and ranches, and in tiny, isolated towns that serve those farms and ranches.

The skylines of America's towns gives you an indication of where that community is located. What would a New England town be without a white church steeple towering above the rest of the buildings?

Travel west from the wooded hills of New England more than 1,000 miles to the immense, semi-arid plains. Look at a typical town and note its skyline. Instead of a steeple, a water tower or grain elevators dominate the view. And in churches below, topics that sustain most of Sunday's conversations are moisture -- whether too much or too little -- livestock or crop prices.

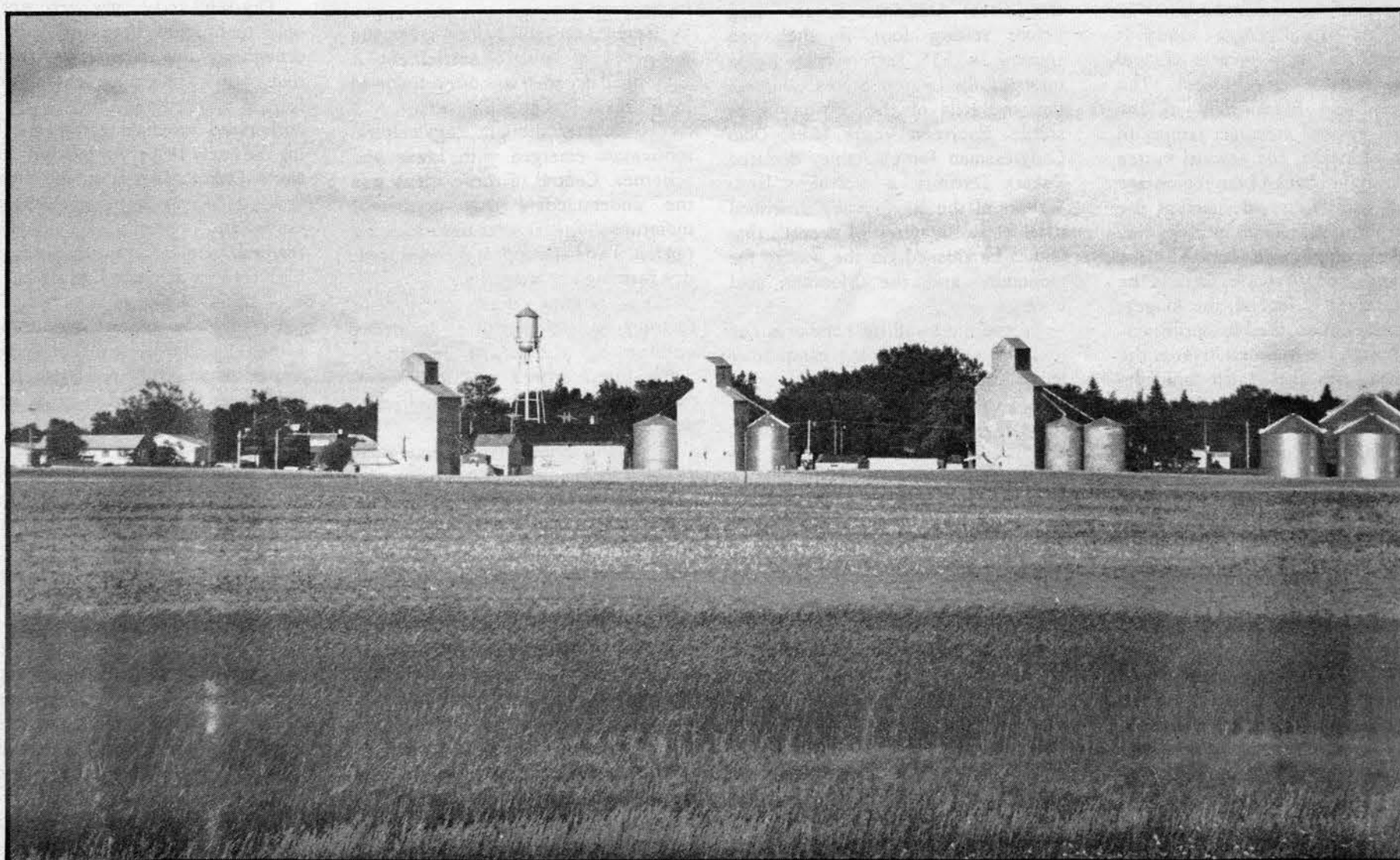
In this region, it is man's quest for more reliable water supplies and larger crop yields that fuels efforts to subdue nature. Irrigation interests promote river modification projects. Prairie potholes are drained to accommodate more cropland. Non-farm corporations and farmers alike point powerful tractors pulling huge implements at native grasslands.

Vulnerable topsoils are abused and are then stolen by strong winds and hard rains. Stewardship is overlooked, sidestepped, and the natural heritage of this "characteristic landscape" is disregarded.

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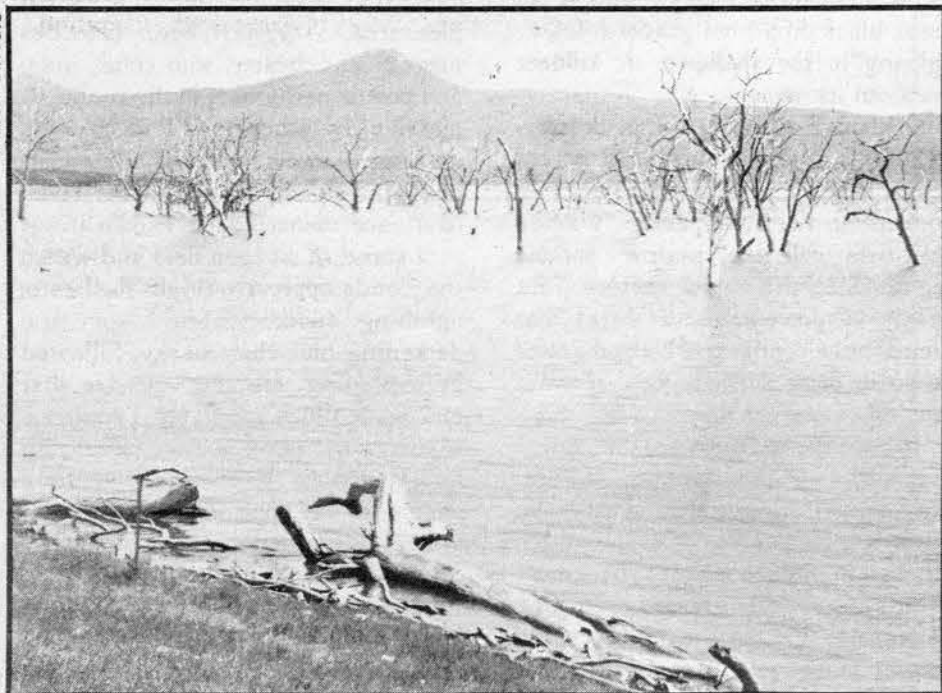
To find out more about northern plains - western prairie native grasslands, contact the Nature Conservancy at 1800 N. Kent St., Arlington, VA 22209. The national nonprofit organization has been active in purchasing and preserving tracts of grasslands, and the Ordway Prairie, for example, located in north-central South Dakota, preserves almost 8,000 acres of native prairie. National parks and national wildlife refuges on the northern plains also contain impressive natural grasslands. Wildlife refuges and state preserves and parks in the eastern Dakotas and western Minnesota provide excellent access to prairie potholes and wetlands. North Dakota is especially blessed with federal wildlife refuges, with over 60 preserve locations. Nebraska's sand hills area also contains excellent examples of native grasslands and lakes and ponds.

Peter Carrels



The skyline of Roslyn, South Dakota, on mixed grass prairie 50 miles east of Aberdeen

Peter Carrels



Trees inundated by Lake Oahe, South Dakota

'The most useless river there is'

Thus spoke Time magazine when it hailed the drowning and channelizing of the Missouri River in 1952. Today, the Missouri River has been transformed, but residents of the northern plains still struggle with the question of how to use its water. That struggle goes back to the first white settlement of the region. Early settlers put their faith in a slogan: Rain follows the plow. Then they turned to science, in the form of rainmaking. In the end, most farmers decided to work with the region's rich soil and droughty climate and adopted the techniques of dry-land farming. But the idea of dependable moisture never died. So today North Dakota is still seeking to build projects to spread the Missouri's water over the land.

by Peter Carrels

The northern plains is this nation's region of last resort. It was the region most recently settled, and it is the least appreciated, least understood section of the country.

America's northern plains occupy central and eastern Montana and most of both Dakotas, representing about 13 percent of the land in the lower 48 states. This is rural, remote country. It is agricultural, with pockets of coal mining and oil development. The Badlands and Black Hills in the Dakotas, several mountain ranges in eastern Montana, and sentinel buttes in the middle chunk of the region are the only land forms to interrupt the flat or rolling grasslands or croplands that everywhere else dominate the landscape. And, of course, there is the region's river of legend, the longest river in the nation, the Missouri River.

Although the Missouri River is the seam that ties the region together, hardship and hard times bind the residents of this land. Natural conditions have long been seen as obstacles to the region's progress in traditional white-American terms. So, many of the region's political powers look to man-made water projects, using the massive upper Missouri River reservoir chain, as one way to overcome nature and break through to economic prosperity.

To the earliest white settlers journeying westward, the northern plains was a bleak, intimidating land. They had come from heavily timbered states east of the Mississippi River to find themselves surrounded by endless, treeless, semi-arid grasslands, often lacking even the comfort of a distant promontory landmark. Snarling blizzards made for a

miserable winter in a cramped, poorly heated settler's shanty.

In the eastern states, moisture came as needed and crops rarely withered in the field. For a settler accustomed to broadleaf trees and rainfall, the northern plains held no promise, no topographical or climatic lure. So they hurried through, to the bounty beyond.

The settlers had been warned of the "Great American Desert" long before setting foot in the open country. In 1855, Jefferson Davis had informed the United States Congress that the soils of the territory were sterile. Fourteen years later, Ohio Congressman James Ashley declared Dakota Territory a worthless land. Writers of the day vividly described the lifeless "leagues of desert" that had to be crossed on the way to the mountains and the Montana gold mines.

It was the swelling populations of mid-19th century mining camps that led to efforts at permanent settlement. During the first years of mining, food came from Mormon fields in Utah. The difficult winter of 1864-1865 saw the price of flour jump to \$120 and more for a 100-pound sack -- a sudden \$100 increase. Violence erupted between merchants and miners. Local sources of food were needed and some prospectors turned to farming. They applied their knowledge of sluice construction to agriculture, and simple irrigation systems soon fed the crops. They followed tillage methods used by the Mormons.

By the 1890s, the notion of the northern plains as a sterile desert was being proven wrong. Interest in the northern plains and in the West generally was buoyed by the census of 1890, which concluded that the "frontier" no longer existed. The

nation had reached the coast, and now it turned its attention back to the vast 'pocket' it had skipped. Land prices rose and speculators went to work.

In what is now southeastern South Dakota, rail connections to Eastern markets opened the door to farm development; thanks to fertile soils and greater precipitation than the rest of the region, settlement quickly expanded.

From east to west the character of the northern plains changes greatly. The east is where the tallgrass prairie meets the plains, and where crop-growing conditions are best. Nearing the Missouri River and west to the Rockies, most of the land is better suited for grazing livestock, with crop-raising concentrated in valleys.

Early promoters of the northern plains saw that the region's future hinged on its capacity to support agriculture. Just what sort of agriculture should be pursued was and remains a pressing and controversial issue.

Regular droughts ruined crops and tempered the influx of settlement. A prolonged dry spell was often followed by a drastic loss of population.

To counter drought, agricultural innovators emerged with ideas and schemes. Central to these ideas was the understanding that occasional moisture shortages were natural in the region. Two basic approaches evolved: dry farming and irrigation.

Dry farming does not mean farming without moisture. It means conserving the scant moisture. Agricultural experts say an annual minimum of 10 inches is required to dry farm.

Dry-land farming techniques gained fame by the turn of the century and rode a wave of popularity into the 1920s. Much of its success is attributed to Hardy Webster Campbell, called the greatest evangelist of dry farming by Plains historian Walter Prescott Webb. Campbell was a New Englander who moved to what is now eastern South Dakota in 1879. He had a distinct advantage over many of his northern plains farming counterparts: He had never farmed, and had no preconceptions. Also he didn't hold to the foolish adage plains settlers brought with them that 'rains would follow the plow.'

Campbell believed farmers must adjust to their environment. "Don't

try to change nature's laws to fit your notions and habits," he advised. "Change your notions and habits to conform with nature's ways." To Campbell, the lack of moisture on the plains need not be fatal. "It is a matter of common knowledge that the soil of this region is of a texture admirably adapted to the best farming. The fact of the small precipitation has been the sole reason for the failure to develop the region," he said.

Soil stewardship was the cornerstone of Campbell's dry-land farming system, with croplands managed to retain fertility and moisture. When his yields dramatically outpaced those of his neighbors, Campbell's reputation grew, and soon he was publishing books and managing experimental farms for the railroads.

The success of dry farming was seized on by the railroads and other commercial interests to convince reluctant settlers that the plains could be homesteaded. And though permanent lessons were learned from dry farming, the movement became, more than anything else, a promotional tool.

Dry-land techniques were not the only techniques used to settle the droughty plains. When it was realized that rain would not automatically follow the plow, the Congress authorized rainmaking research during the early 1890s. An 1891 bill in the North Dakota Legislature proposed a reward to anyone devising a rainmaking system. So 'rainmakers' roamed the countryside, charging high fees to detonate explosives. The explosives, of course, created nothing but noise, and interest in rainmaking waned. But the desire to find a reliable source of moisture persisted. Inevitably, attention turned to irrigation.

John Wesley Powell had begun the clamoring for irrigation projects in the region in 1878. Powell believed irrigation was absolutely necessary, though he viewed it as a way to supplement agriculture, not dominate it. In an early proposal he advocated granting 2,500-acre homesteads west of the 100th meridian, with 20-acre irrigated plots for each homestead. The large acreage would be dry-land farmed. The irrigated plots would provide animal food and seed to carry through periods of drought.

Eastern politicians had trouble understanding the need for such immense homesteads. But Powell knew that the risks of plains

agriculture necessitated large individual farm unit acreages. He also understood the need to create surface water storage reservoirs to facilitate irrigation development.

The first push toward irrigation development in the region came from a severe drought. The year 1890 delivered a brutally dry spring and summer. By 1892 Montanans were pressing their state government for irrigation development aid. Eight years later, federal aid for reservoir construction was aggressively sought.

The early debates regarding large-scale irrigation development and government assistance for these projects were as bitter and divisive as those today. And they had some of the same causes as today, for simultaneous with the interest in federal irrigation projects came wheat overproduction. Crop prices tumbled, and Eastern politicians complained that federally subsidized projects in the West would hurt farmers in the older states. They also contended it was unconstitutional to apply federal funds to serve sectional interests. And some northern plains leaders, particularly in the Dakotas, were reluctant to seek irrigation help for fear their localities would be perceived as 'dry' by the rest of the nation.

But overproduction was overtaken by the prospect of future food shortages, and Western leaders began touting the idea that reclamation by irrigation was in the national interest. Eventually, both major political parties endorsed national aid for Western irrigation. In June 1902, Congress passed the Newlands Reclamation Act, a law that expressed the nation's twin beliefs that agricultural expansion was necessary, and that the semi-arid lands were capable of consistently producing

crops only if large-scale irrigation projects were built.

President Theodore Roosevelt was given much credit for passage of the Reclamation Act. He was the country's first president with any experience in the West, having ranched in western North Dakota and hunted in the Rocky Mountains. In a 1901 speech to Congress, Roosevelt said, "It is as right for the national government to make the streams and rivers of the arid region useful by engineering works for water storage as to make useful the rivers and harbors of the humid region by engineering works of another kind."

But northern plains farmers were not so pleased by the new law. Many farmers were happy with dry-land techniques or with small irrigation projects. Businessmen and politicians, however, heartily promoted large-scale irrigation. In 1903, an enthusiastic three-day conference of Minneapolis, St. Paul and Duluth business interests was held to support irrigation development on the northern plains. They welcomed the promise of a construction boom to be followed by drought-proof agriculture.

A 1904 plan to irrigate 20,000 acres in western North Dakota was promoted by bankers, commercial clubs and area newspapers, and two years later, a large proportion of area landowners had been persuaded to sign irrigation contracts. But when the project was built and the water delivered, it proved so expensive farmers refused to use it.

Early irrigation interest in South Dakota was largely confined to the bottomlands along creeks and rivers in the extreme western part of the state.

With the Reclamation Act came study and construction of a reservoir on the Belle Fourche River in 1908. Five hundred miles of canals were built as part of a plan to irrigate 90,000 acres.

But the project was plagued by mistakes, among them a fatal Bureau of Reclamation error regarding soil classification. It was discovered that almost half the project area contained heavy gumbo soils not suitable for irrigation. By 1946, only two of the original 580 homesteaders associated with the Belle Fourche Project remained on the project.

The failure of early large-scale irrigation projects in the Dakotas and the isolated, oasis-like pockets of irrigation agriculture that survived kept interest in irrigation mild. Between 1920 and 1930, irrigated acreage diminished throughout the entire region. There was no noteworthy public support for large-scale irrigation projects until smothering dust storms and drought ravaged the region in the 1930s. The hot winds of the 1930s blew farmers off the land and set the stage for the 1944 adoption of the Pick-Sloan Plan, an ambitious scheme to harness the entire Missouri River basin.

Pick-Sloan's planners had the best of intentions. Their hopes were to stop destructive flooding in downriver cities such as Omaha, Kansas City and St. Louis, allow barge navigation as far north as Sioux City, Iowa, and enrich the northern plains with irrigation agriculture and hydroelectricity.

Under the U.S. Army Corps of Engineers and the Bureau of Reclamation, the Pick-Sloan Plan did bring predictability to the Missouri River. By 1967, six massive,

earth-rolled dams plugged the river's channel in the Dakotas and Montana. (See map on pages 12-13.) What had been the grandest, wildest plains-prairie river in the world was reduced to a series of mundane, lengthy reservoirs. Today, little of the natural Missouri River on the northern plains remains.

Pick-Sloan efforts to harness the Missouri River were extolled across the nation. "A technological triumph that overshadows the Panama Canal," wrote one magazine correspondent. But tragedy accompanied the triumph. Well over a million acres of fertile bottomlands drowned beneath the big main-stem reservoirs. Lush, verdant coulees and draws running up the river's valley walls were buried. A winding channel with gravel bars and chutes, lined with great groves of cottonwoods, was gone forever. What had been the most diverse ecological community on the northern plains was swallowed up.

Those who settled the river's valley also lost. Homestead farms disappeared. Thousands of Native Americans were forced to relocate to modern tract towns. Entire communities had to be abandoned.

What is amazing was the lack of organized opposition to Pick-Sloan's Missouri River dams. It was a quiet tragedy. No major environmental group fought the dams. Some Dakota farmers protested, claiming irrigation from Missouri River waters would damage the region's fragile soils. But the protests were not heard. Nationwide, Pick-Sloan was praised. A September, 1952, *Time* magazine story covering the Missouri River and Pick-Sloan's accomplishments described the Missouri River as "the most useless river there is."

(Continued on page 18)

Lyle Axthelm, BuRec



Oahe Dam, South Dakota

18-High Country News -- October 27, 1986

Useless...

(Continued from page 17)

Most residents of the region also applauded Pick-Sloan. They eagerly awaited the fruits of the reservoirs: irrigation projects. And downriver, city dwellers in floodplains breathed easier. No more would Big Muddy have its way with them.

Powell's dream of irrigating the northern plains from reservoirs was now possible on a large scale. The Bureau of Reclamation was prepared to undertake construction of two major irrigation diversion projects. Numerous smaller projects, utilizing stored water behind dams on tributaries, were planned as well. Over five million acres were to be irrigated, more than replacing the one million drowned acres.

The Missouri-Souris Diversion Unit was initially proposed to irrigate 1 million acres in the northwestern corner of North Dakota but soil surveys revealed that dense, poorly drained glacial subsoils dominated the area. So the Bureau found another million acres in eastern North Dakota and renamed the project Garrison Diversion.

Behind South Dakota's Oahe (pronounced a-WA-he) Dam sits a burly reservoir called Lake Oahe. The Oahe Diversion Unit, the second of the two major Bureau irrigation projects in Pick-Sloan, was to take water from Lake Oahe by canal 100 miles east to the James River Valley. A 1200-mile network of smaller canals would then water 495,000 acres.

This time there was opposition, and the controversy, starting in the early 1970s, commanded headlines in the state's newspapers for over a decade. Most of the state's politicians, including two different governors and the congressional delegation in Washington, supported Oahe. Opposition came mainly from farmers in the path of the canals and other project features; from environmentalists wary that the James River would be channelized; and from landowners who were actually scheduled to have Oahe waters irrigate their lands.

This last group's opposition surprised many people, including congressmen, who had trouble comprehending feverish opposition from the very people who were supposedly to benefit most from the project. But the farmers feared Oahe's irrigation would salt up their already productive croplands. And they had no desire to help pay for a project they viewed as wasteful and destructive.

Opponents to Oahe formed the United Family Farmers and gained control of the local, elected board overseeing development and promotion of the project. After a series of heated public hearings, the board asked Congress to deauthorize Oahe. With only the project's pumphouse and a short length of the main canal built, Oahe was deauthorized in 1982.

Landowners and environmentalists rejoiced, but the celebration was brief. To the north, North Dakota's Garrison Project was slowly being built, and new Garrison plans called for the drainage of the project's return flows down the James River into South Dakota. The threat to the James and its bottomlands remained.

These efforts by the Bureau of Reclamation to develop irrigation

projects east of the Missouri River represented a dramatic shift in thinking from those who advocated irrigation before the Pick-Sloan era. Both Garrison and Oahe proposed to irrigate productive lands with far less likelihood of drought than lands west of the 100th meridian. Early projects had been located in the drier portions of the northern plains.

Success had thus far eluded the Bureau in the northern plains. Its earliest attempts failed because the lands it chose did not respond well to irrigation and suffered alkaline buildup from poor drainage. High costs also handicapped the projects. The Bureau didn't seem to learn from its early mistakes. Farmers in Oahe's irrigation districts distrusted the Bureau's soil classifications and conducted their tests that contradicted Bureau reports.

With the demise of Oahe, Garrison became the premier symbol of Pick-Sloan irrigation development in the region. But Garrison, too, was assailed by disgruntled landowners and environmentalists. The Audubon Society, disturbed by Garrison's threat to prairie wetlands and national wildlife refuges, spearheaded efforts to derail the project. Canadians grew edgy at the prospect of polluted irrigation return flows from Garrison entering the Hudson Bay watershed and harming Manitoba fisheries. They also feared the introduction of Missouri River species. Further worsening the project's reputation was the questionable cost-benefit ratio. Under steady lobbying, Congress reacted and Garrison's funding slowed to a trickle.

But in 1984, Garrison was resurrected. The Audubon Society helped formulate a commission approach to settling the Garrison debate, and the commission eventually decided on a new direction for the project. Irrigation for lands draining into Canada were dropped, settling the international dispute. To compensate, new tracts were proposed that drain into the James River. Last May, the commission's compromise plan became law.

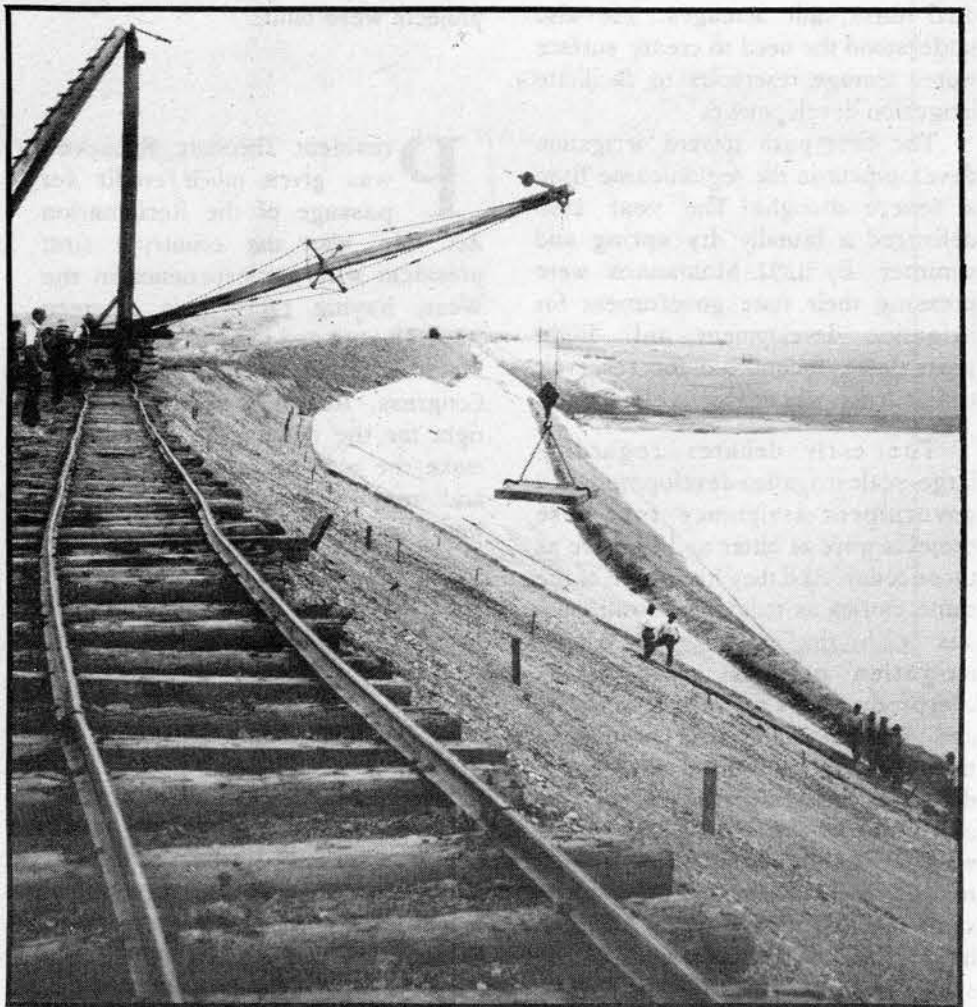
To handle the increased flows, channelization of the James in North Dakota is planned. South Dakotans are unsure what to expect, but those who fought Oahe's James River channelization fear the worst.

Jay Davis, executive director of the United Family Farmers, says, "With nearly all Garrison's polluted return-flows redirected to the James River, rich farmland and wildlife habitat in South Dakota may be turned into a sterile salt marsh from fluctuating flows flooding the valley." Davis adds that the tragedy is harder to take because South Dakotans had little input into the commission plan.

North Dakota Audubon Society members say they are angry at the organization's national leadership and view the commission compromise as a sellout. One Audubon chapter, based in eastern North Dakota, sent a brochure to Audubon chapters and other conservation groups nationwide. The headline reads: "For over a decade, Audubon members throughout the nation have worked to save this river (the James River). Today, Audubon's leadership is encouraging the river's destruction."

In an April 1986 memorandum to Audubon chapter leaders, National Audubon President Peter Berle admits

W.J.L., BuRec



Workers build the Belle Fourche Dam, South Dakota, 1910

the compromise is not perfect and that "some environmental damage will occur as a result of it." Berle also stresses "the compromise is a far better deal for the environment than the alternative project configuration."

That may be true in an overall sense. But Garrison threatens to the James ecosystem, serious under the original Garrison plan and made more serious by the commission plan, could one day claim the river as a sacrifice for water development. The irony of the threat to the James River and its valley is that Garrison promoters cite the loss of the natural Missouri River and its many thousands of acres of bottomlands as the reason North Dakota is owed Garrison.

In November 1980, South Dakota Gov. William Janklow proposed that the Garrison Diversion Unit be extended into his state. As the idea was studied and expanded, it became known as Garrison Extension. Water provided by Garrison would be utilized for irrigation, industrial and municipal uses. Attracting the same type of support as the Oahe Project, Garrison Extension focuses unprecedented attention on the James River in South Dakota. Plans to alter the channel to increase its water-carrying capacity gained support in the state's water development community and forged a revived enthusiasm for Garrison as the feeder supply for Garrison Extension. With the South Dakota Department of Water and Natural Resources coordinating efforts to promote Garrison Extension, river modification was soon underway.

In northern South Dakota, on one of the James' most scenic stretches, a dredging operation is deepening and trenching the river. Prohibitive costs and mismanagement may halt the dredging, but appropriations in the water omnibus bill now under consideration by Congress could continue river alteration.

In a land of few rivers, with the vast, open countryside filled with agricultural enterprise, the James and its valley are a narrow

corridor where nature survives. One hundred and fifty miles of the river in northern South Dakota is eligible for inclusion in the nation's wild and scenic rivers program. Three federal wildlife refuges straddle the river, attesting to the river system's role in the central flyway for migrating birds. Along the length of the river riparian woodlands and wetlands provide irreplaceable habitat for wild creatures and a haven for those who enjoy the outdoors.

The James is a river of significance, the longest tributary of the Missouri River, but it is also a river long targeted by water developers hoping to use it as a conduit for return flows or as a water delivery or water storage system for irrigation and industrial growth. The river's values as a natural system are largely unappreciated, and the attitude threatening the James is no different than the attitude that destroyed the Missouri.

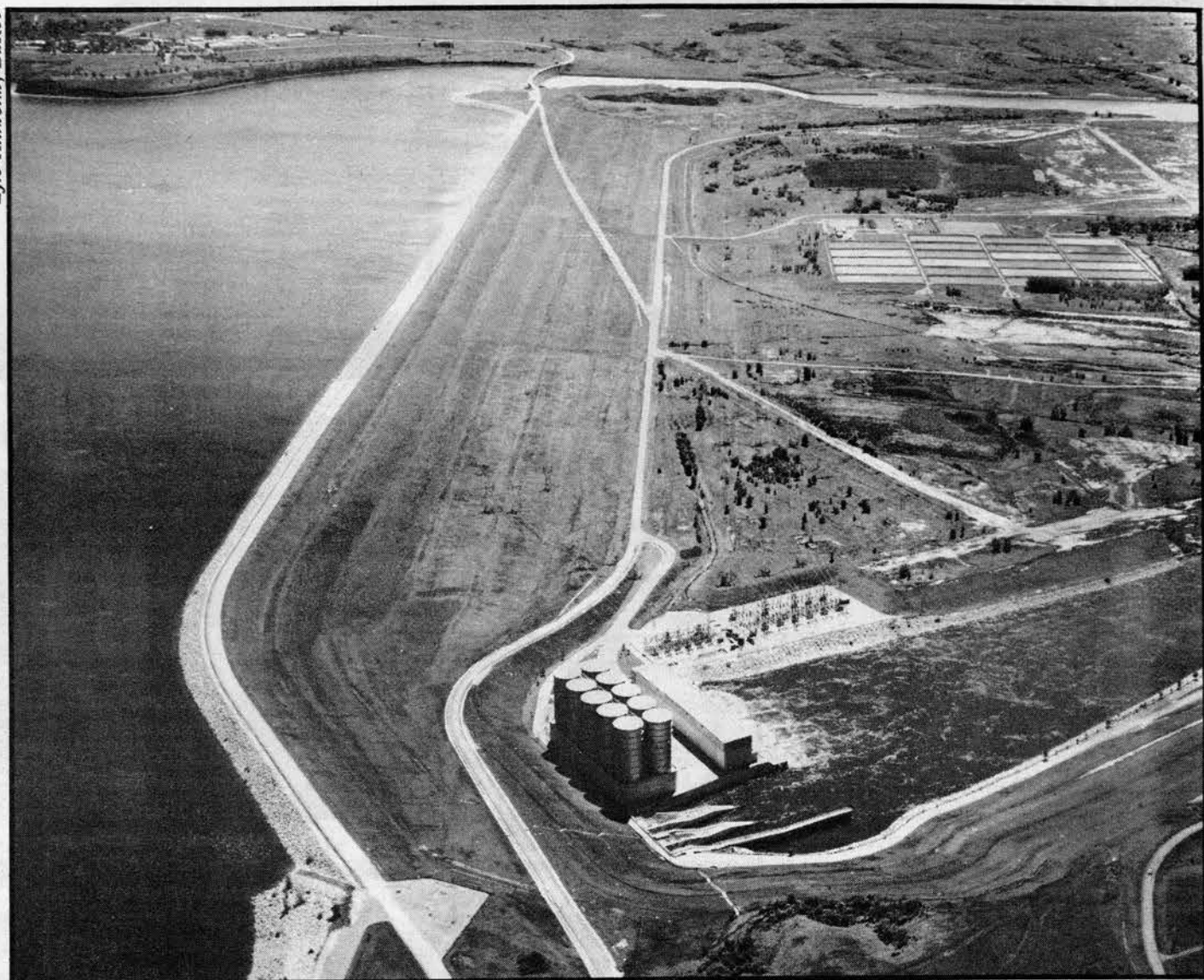
The northern plains is a region where, because so much depends on agricultural productivity, preservation of the landscape, rivers and wetlands has not come first. Current agricultural practices and the importance of stabilizing the region's farm-based economy puts relentless pressure on resources.

And that brings us back to Campbell and his dry-land approach to farming, versus rainmaking and irrigation. Should the region's agriculture conform to the environment of the region, or should the environment of the region be transformed?

In part, the answer will depend on economics. But it will also depend on people learning to appreciate the beauty and character of a difficult region. It is still too early to tell, but it appears that residents are slowly awakening to the importance of safeguarding the natural resources that remain in their heavily agricultural states. The environmental consciousness that began on the east and west coasts has found its way to the nation's most remote hinterland. It is difficult to fathom a river perishing without a tussle as did the Missouri.

How could anyone oppose, or favor, the Garrison Project?

Lyle Axthelm, BuRec



Garrison Dam, North Dakota

North Dakota's Garrison Project, in its various manifestations, would irrigate 130,000 to 1,000,000 acres, cost about \$1 million per farm, devastate surviving wildlife habitat in this flat and intensively drained and cultivated land, add only a tiny fraction to the state's farmland, and produce crops already coming out of the nation's collective ears. But the billion-dollar-plus project would also reassure a remote, hurting and suspicious part of America -- a state filled with boomers and blamers. North Dakota is less than 100 years old, and it is the state's ill fortune to have sunk almost a century of national political capital into Garrison. In authorizing a scaled-down Garrison, Congress may have been acting on humanitarian grounds.

How could anyone oppose the Garrison Diversion Project? North Dakota saw several hundred thousand acres of fertile Missouri River bottomland buried beneath the Army Corps' Pick-Sloan reservoirs for the benefit of downstream states. North Dakota is a young state -- its centennial is still several years away -- and it needs help from older states. Along with its youth, North Dakota is rural -- 25 percent of its 670,000 people live on farms. These farmers are asking the rest of America to help them be more stable and productive. Long droughts, such as hit in the 1930s, eroded land, wiped out mother herds of cows and pigs, and drove 10 percent of the people off their farms and out of the state. After the droughts, agriculture had to start over, renewing the land and rebuilding the herds. A large irrigation project could anchor the state.

How could anyone be for Garrison? Depending on the version of the project, Garrison would indeed put from 130,000 to one million acres into irrigation. But the mid-sized 250,000-acre version would simultaneously remove 230,000 acres from cultivation for canal right-of-way and wildlife mitigation. The newly irrigated land would produce crops already in surplus. The 250,000-acre project would create 1,300 farms at a cost to

taxpayers of about \$4,000 for each irrigated acre, or \$700,000 a farm. It would devastate 12 wildlife refuges, eliminate 180,000 ducks a year and 70,000 acres of waterfowl marsh, and send water polluted with pesticides and foreign organisms from the Missouri River basin into Canada's Hudson Bay. Canadians fear that would devastate their fisheries. Even with all the damage, Garrison would irrigate less than one percent of North Dakota's farmland and have a vanishingly small effect on the economy.

by Ed Marston

Those contradictory questions cannot be answered by economic or ecological reasoning. Resolution depends on seeing Garrison as symbol and history rather than concrete. It is a project that caught the imagination of America's coldest, most isolated state at birth, and it is a symbol that North Dakota is only now reluctantly releasing.

The letting go has taken the form of a compromise. The irrigation acreage for Garrison has been scaled back from the original one million acres in the project authorized by Congress in 1965 ("A sacred promise," project promoters call it) to 130,000 acres. And 17,000 acres of that will go to the three Fort Berthold

Reservation tribes that were criminally abused by the Army Corps of Engineers in the construction of Garrison Dam. (See map on pages 12-13.) The original proposal had no Indian lands in it.

None of the irrigated acreage will be in the Hudson Bay drainage, and the 12 wildlife preserves have been spared. Thus far, 85,000 acres have been identified for irrigation, including 36,000 acres now wetlands or other wildlife habitat. The Bureau of Reclamation says that lost habitat will be more than replaced -- the Bureau will provide 63,000 acres of wetlands, woodlands and pasture. The wetlands will be created by buying drained farmland, and then filling in the drainage ditches or turning off the pumps that keep the land dry and farmable.

Garrison, as approved by Congress this May, will cost \$1.2 billion. Originally, Garrison was all irrigation. But even North Dakota must shift away from total dependence on farming, so \$200 million will be spent to provide drinking water to North Dakota's towns and cities. The law also created a Wetlands Trust to save wetlands from draining and farming.

The 1986 law also appears to save the Lonetree Reservoir site. That site was craved by promoters of the big project because it could take water from the Missouri and distribute it to three river basins. One of those, the James River basin, is within the Missouri basin; the other two are to the northwest in the Hudson Bay drainage. The Bureau, once on the verge of building Lonetree, ends up owning a 33,000-acre site. The site will stay in wildlife, but the 1986 law says it may someday become a reservoir for an expanded project if it can satisfy Canadian and other concerns. The new law does spare fecund Kraft Slough near the South Dakota border, which was to be the site of the 2,680-acre Taayer Reservoir.

On the other side of the ecological scale is a heavyweight -- the James River. It is America's longest

non-navigable river -- a muddy, slow-moving body of water that is also fertile fish, bird and wildlife habitat. The compromise has set the James River up for destruction. Pending two years of experiments with 5,000 acres of irrigated ground and studies of the river, it may be channelized to carry the water that will flow off 130,000 acres of newly irrigated land. Channelization would physically destroy much wildlife habitat; the flow of irrigation drainage could poison surviving wildlife, as has happened at places such as Kesterson Wildlife Refuge in California.

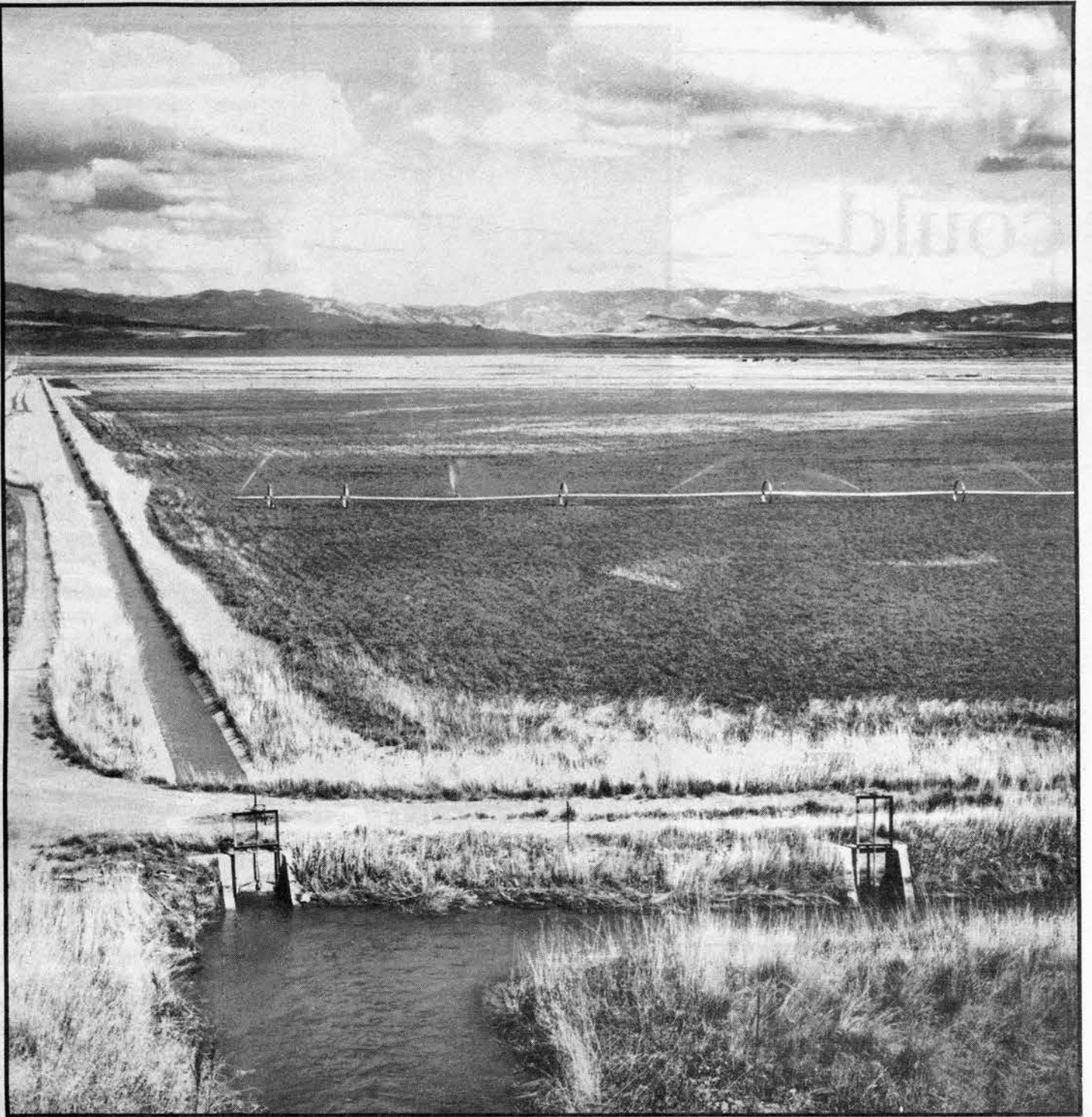
Politically, the compromise frees the National Audubon Society from what it has apparently come to see as an albatross. Environmental groups are creatures of the philanthropic and public interest marketplace. The organization fought Garrison with all its resources until three years ago; then, under new leadership, it decided its time and money could be better spent elsewhere.

North Dakota's national politicians (two senators and one congressman), by biting the Garrison bullet, will also be able to go on to other issues, if they survive the next few elections. The first test comes this November. If the action by Congress this May on Garrison is perceived as a victory for North Dakota, incumbent Sen. Mark Andrews will win in a walk. As of now, Andrews is in a very close race with Democrat Kent Conrad. It is so close that President Reagan made a flying visit there two weeks ago to help Andrews.

Some say the destruction of the James River accompanies the destruction of a North Dakota dream: that the treeless, flat, dry Missouri River basin part of the state could be made more eastern, more humid, more stable. Garrison, at its most extravagant, could confer that benefit on only a

(Continued on page 21)

Lyle Axthelm, BuRec



Water in the Helena Valley, Montana, flows from the delivery canal in the foreground through the gates to the small canal serving the field. Water is supplied to the moveable sprinkler by pumps.

The low-tech art of irrigating

Everything you ever wanted to know about seepy ditches, headgates, measuring water in a ditch, stealing water out of a ditch and washing away your low-lying neighbors' fields.

The Upper Missouri River basin lands of the western Dakotas and eastern Montana and Wyoming get enough rain for livestock grazing. But, as in much of the arid West, irrigation is often required to grow crops. Irrigation projects have made the region a mix of large stretches of dry country interrupted here and there by "patches" of green made all the more vivid by the surrounding brown land.

Some of the green patches are small, isolated fields on ranches located in flat places where it was possible to divert water directly out of rivers or streams. Other "patches," thousands to tens of thousands of acres in extent, are "projects": large storage dams on rivers, wide canals to deliver water from the dams to the project, and hundreds of miles of small, branching canals or pipes to give each acre access to water. How much water? Typically, irrigated crops in the dry West require three to five acre-feet of water each summer. (An acre-foot covers an acre of land to a depth of one foot.)

In theory, an irrigation system is simple. In practice, it is complex. The ditches are usually dirt, and may seep. They are 19th century technology in an

age of high-tech. Many canals were built in the late 19th or early 20th century, and are a part of the West's infrastructure that is most worn out.

The projects almost always depend on gravity to lead the water to the land. As a result, the main canals must follow gently sloping contours. This usually means the canals are both long and unstable, since they must hug miles of hillsides liable to slumping and sliding. The nightmare of every Western irrigator is a slide that wipes out a critical canal in the middle of August.

There are problems once the water reaches the project. Water measurement is often rough. On many systems, it is measured by the height of the water as it flows through a narrowed section of canal, or by how many times a valve handle is turned in a large pipe leading to a section of fields, or by the width of an opening created by a board that slices water out of the main canal and puts it in a lateral ditch.

A single lateral ditch may serve several farmers, and if too many of the farmers want to irrigate at once, the ones at the end may be dry. So ditch riders (see accompanying story) must forever be roaming the area, shutting

off some farmers and sending water to others. Irrigation in the West is labor-intensive, and thus expensive.

Another complication is the way fields sit one above the other. If the fields are watered by sprinkler systems, that vertical distribution of land doesn't matter because little water will run off. But most Western irrigators simply dump water onto their fields, letting it run along furrows, or marks, from the high to the low end. About half the water is taken up by plants or evaporates. The other half sinks into the ground to appear downhill as seep or spring water, or flows off the field on the surface.

A careful farmer will collect his surface waste water in a ditch running along the low end of his field and deliver it, in one place, to the downhill neighbor. But a farmer who is sloppy or who wishes to bedevil his neighbor, can cause no end of misery by letting water run off uncontrolled. In such cases, crops can be washed out of the ground and fields eroded in a short time.

In the early years of the West's settlement, a family or group of families could, with shovels and horsedrawn scrapers, build an irrigation system. They could put in a headgate on a stream, and divert the stream into a canal for distribution to nearby flat fields. These direct-flow systems were fine so long as the creek ran all summer. Many creeks, however, slow to a trickle in August.

Then farmers even in these favored streamside locations were limited to one cutting of alfalfa in the early summer, followed by prayers for a late rain.

So, throughout the West, large federally built and subsidized irrigation projects became the order of the day. With the help of federal engineering expertise, federal capital, and often federal arm-twisting to force the area's farmers to pool their water rights, large reservoirs were built to catch spring runoff and hold it until river flows dropped. The projects included lengthy systems of canals to get the water to flat, fertile lands far from the river and main reservoir itself.

Many parts of the West have two kinds of such projects: one built by the Bureau of Reclamation for white settlers (often on former Indian land), and one built by the Bureau of Indian Affairs for its Indian clients.

Two examples of those projects sit literally facing each other along the Wind River/Big Horn River in central Wyoming; the BuRec's Midvale District and the BIA's Wind River Irrigation District. In addition to their physical proximity, their fates have been intertwined in the past and, after following parallel paths for decades, have again come together in the 1980s.

--Ed Marston

The real water lawyers

An honest position-wanted ad for ditch riders would read: "The ideal candidate will have the diplomatic skills of Talleyrand, the patience of Job, the wisdom of Solomon, and a cast-iron gut." Ditch riders need those attributes because they are the people who actually distribute the West's irrigation water. Often, as here on Wyoming's Wind River Reservation, they are working with an aged, deteriorated system, very rough measuring means, and farmers who are quick to assume that they are being shorted.

by Marjane Ambler

For nearly a decade, lawyers for the state of Wyoming have battled attorneys representing the Wind River Reservation for the waters of the Wind River - Big Horn River.

The state filed the lawsuit in 1977 as a pre-emptive strike against a possible Indian suit based on their Winters Doctrine water rights. If the state, which moved into the suit with secrecy and speed, had hoped for a quick victory over unprepared Indians, they miscalculated. The suit is now an institution involving 25,000 Wyoming water users, documents measured by the roomful, \$10 million in expenses to the state and millions to the Indians and federal government.

A decision by water-court referee and former Democratic Congressman Teno Roncalio and a subsequent Wyoming court has awarded the Indians a large amount of water and a very early priority date. The result has been near panic among non-Indian irrigators who share water with the Shoshone and Arapahoe tribes.

Now the case is before the Wyoming Supreme Court, with a decision expected in 1987. And, unless settled by negotiation, it will almost certainly reach the U.S. Supreme Court.

But here on the Wind River Reservation, where Indian and non-Indian farmers share the water in the Wind River Irrigation Project, no one can wait for the lawyers to turn the water onto the fields of its legal owners. Even if the lawyers were so inclined, it is doubtful they could get the water onto the right fields in the right amount. The physical operation of an irrigation system is as complex as the adjudication of water rights.

The physical "adjudication" of water from the Wind River Irrigation Project is done by seven ditch riders and two supervisors, the water masters. All are employed by the

Bureau of Indian Affairs, which is responsible for the project.

Each day they decide who gets how much water. The ditch riders use "turn-on cards," which are primitive water-measuring devices, arithmetic and above all, diplomacy. The nine are all Indians, and although 70 percent of the project land is owned by the tribe or by individual Indians, 70 percent of the land is farmed by non-Indians.

Pending resolution of the lawsuit, the ditch riders base their on-the-ground allocation on demand and on what amounts of water they know can be put to use. Crops in this dry climate need to have five acre-feet spread over them during a summer. Three of those acre-feet will seep into or flow over the ground and reappear elsewhere. Two

Who can oppose...

(Continued from page 19)

small part of the state and a few of its farmers. But that did not seem to matter, no more than it matters that the nation can send only a handful of people to the moon.

Garrison was symbolic in another way. North Dakota is not only a new state -- it is a foreign state, settled by people who came directly from farming villages in northern Europe to farming villages in North Dakota. Some third generation North Dakotans still speak with traces of accents. Unlike neighboring Wyoming, with its transplanted New England heritage and sense of ease in New York or Washington, North Dakota was cut off from the Eastern power centers by distance and culture.

The touchiness of North Dakota -- its quickness to embrace conspiracy theories and radical political parties, the ease with which it moves from boosting to blaming -- may come from a painful awareness of its welfare status. The state is dependent not only



William Wagon and irrigation measuring device on the Wind River Reservation

acre-feet will evaporate or be taken up by the crops.

The system is rough. Ditch riders lack devices to accurately allocate the water and must make decisions based on experience and common sense. The inaccuracy is not confined to reservations; sloppy allocation of irrigation water is typical in the West, where each acre of alfalfa or corn yearly consumes enough water to support 10 urban residents.

Were the water precisely measured out, the ditch rider's job would be simpler. But because he must make subjective judgments, he gets heat from farmers who think they've been shorted.

"Some people think I just get in my pickup and ride around all day. It looks easy but it's not," says William Wagon, a Shoshone Indian and a ditch rider for 16 years before he became a water master. With 400 miles of ditches, the water masters and ditch riders do a lot of riding. Each ditch rider is responsible for daily checking of headgates that serve about 5,000 acres of land. Wagon figures he covers 100 miles a day, mostly over dirt lanes that parallel the ditches. He can't

count how many times he gets out to open a wire gate in a day. Cattleguards, like precise water measuring devices, would make the ditchriders and farmers more productive, but the project can't afford them.

Wagon's year starts in the spring, when the water is turned into the ditch after the winter. His day then begins at 6 a.m. with the checking of the card boxes where farmers leave their daily requests for water, and the gauges. Then he clears rubble deposited by winter and spring runoff out of the lateral ditches -- ditches that run off the main canal to the farmers.

Early in the season, when the main canal and laterals are still seepy from the winter dryout and the various gates may not be working well, Wagon may work until 9 p.m. to make sure everyone is getting water. Then he may get called out at midnight by a farmer who is getting no water, or who is getting flooded.

In an ideal world, each farmer would get the water he wanted when he wanted it. But a single lateral serving 20 farmers may be only large enough to provide 10 of them with water at any one time. So when Wagon reads the cards left by the

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on farm programs, but also on defense, highways and the like. North Dakota is no different in this from other Western states, but lacks the psychological trick of burying that federal dependency under the image of a lean, independent man on horseback.

Garrison was going to eliminate its dependency with one last burst of federal generosity: a few billion dollars to help create a strong, drought-resistant agricultural economy.

That vision is vanishing, along with many small towns in arid western North Dakota -- towns populated by elderly people who have memories but no dreams. The wheat farmers in that region's droughty climate and marginal soils were kept in business by federal farm programs. Now the subsidy programs are being withdrawn. They have been replaced by a land withdrawal, or conservation, program that pays farmers to put wheatfields into grass.

None of the above explains or justifies even a scaled-down Garrison; not when farmers in southern California's fertile valleys can't make their irrigated land pay. But the U.S.

doesn't run by economic logic alone. The people of North Dakota have a huge political investment in Garrison. Their senators and congressmen for a century maneuvered onto committees that could move Garrison. In pursuit of Garrison, the state ignored or traded away other opportunities.

In the American system, something is owed the state for all those years. If a state has a collective personality, North Dakota's has a chip on its shoulder. The state fears it may not be as good as the rest of America, and it is ready to fight to prove itself wrong.

So the Gramm-Rudman-Hollings Congress, from exasperation, from log rolling, and perhaps from environmentalist miscalculation, has decided it is best to give way. The genius of American politics is to avoid fights to the death. It is expedient and pragmatic rather than principled and ideological.

No one will write a ballad about the Saga of Garrison, or even an heroic couplet. But this compromise, with its destruction of the James River, may allow everyone, especially North Dakotans, the freedom to think about what North Dakota is good for.

The real...

(Continued from page 21)

irrigators, and finds that 15 farmers want water on a lateral built for 10, he makes a decision that is going to irritate five people. If someone complains about the consequences of this daily juggling act, which includes making sure some water is left in the river for fish, Wagon tells him: "You have to do with what you got."

Wagon says it is the mental pressure from conflicting demands that usually gets to new ditch riders. "You have people jumping on you. Some farmers take what they get -- others don't."

Wagon's sense of humor and good nature probably account for his ability to withstand the stress. Swinging up the trail to check the Ray Canal gauge, he walks with the wide gait of a man who spends much of his time in irrigation boots. He says that farmers who fight all summer become friends again in the winter. "We're all like big children. That's what I've noticed."

Summer 1985 was particularly difficult because grasshoppers and a drought coincided. The acting project manager, Louis Twitchell, decided to rotate the irrigators -- 10 days with water and 10 days without. The water masters and ditch riders had to enforce the decision.

Allison Sage, an Arapahoe ditch rider, says a couple of disputes

erupted into fist fights. But he and his cohorts were usually able to explain the rotation and head off other disputes.

Sage and Wagon know first hand that in the West, fighting over water can be done in various ways. One farmer may flood a downhill neighbor's field on purpose, washing out his crop. Or he can pull a checkboard at night to increase the flow to his own field and decrease the flow to his neighbor's field. Or he may put rocks or sod in the ditch to divert water to his field and away from his neighbor's.

As a result of the games people play, Wagon says the favorite part of his job is winter. "I don't have to fight with nobody. I just keep busy, trying to get repairs done."



William Wagon

Sara Hunter-Wiles

Ditch rider Sage, 51, sees his job as a base from which to improve the reservation. He's a teacher, but the ditch riding allows him to live on his home reservation and be with his family on weekends. It also lets him serve on the school board, of which he's chairman.

A big man, husky and over six feet tall, Sage wants the children in his schools to one day develop a reservation economy, with agriculture a major part of the base. As a first step to that end, three years ago the Arapahoe people took over the local school from the BIA, and knocked the dropout rate way down, Sage says.

The potential for change is great. Non-Indians farm most of the land, and 8,000 acres within the irrigation project lie idle. Those lands don't produce crops or pay operation and maintenance fees to help support an aged, deteriorating project.

Sara Hunter-Wiles



Allison Sage

Sage hopes to see the idle land put back into production under the plows of Indian landowners. But there are obstacles. "A lot of kids don't know how to drive tractors or irrigate." Many of their parents are BIA boarding-school products and weren't taught such skills.

By the time the young people now in the reservation's schools are old enough to farm, the farmer's and ditch rider's world will be different. The settlement of the lawsuit will certainly require that today's eyeball approach to water allocation be replaced by a precise system. But for now, Twitchell and the men under him concentrate on getting water to the alfalfa and barley fields while cooling down farmers who need cooling down.

A book for all rural hinterlands

The Great Plains in Transition

Carl Frederick Kraenzel, University of Oklahoma Press, 1005 Asp Ave., Norman, Oklahoma 73019 (405/325-5111), 1955. 428 pages, index. \$22.50, cloth.

Review by Ed Marston

Carl Kraenzel's 1955 scholarly study, *The Great Plains in Transition*, is about the semi-arid region between the Rockies and the 98th meridian, from Montana to Texas. Under chapter titles such as "The adapted ways of the early cattlemen" and "The hinterland role of the Great Plains," Kraenzel mixes history, sociology and political science with lots of horse sense to describe a region that has never learned to control its own destiny.

Instead of adapting its economy and way of life to the semi-arid climate of the region, Kraenzel says, the Great Plains remained tied to the nation's humid areas -- to their ways of doing things, to their cities, and to their economies and institutions.

The dry region's attempt to ape the Midwest and East Coast was disastrous. Those humid areas, Kraenzel writes, are stable because of dependable precipitation and industry. By comparison, the Great Plains has just enough moisture to

encourage attempts at humid-area agriculture, it has little or no industry, and it lacks control over the agriculture and the natural resource economy it does have.

His most interesting point is the effect imported institutions have had on the Great Plains. Everything from fixed-payment mortgages to the economic expectations of the region's doctors and lawyers are products of humid areas. These ways of doing things assume a regularity and dependability that do not exist in a region always on the edge of drought. The need, he wrote, is for attitudes and habits designed to cope with the region's uncertainty: large savings in good years, much as Joseph recommended to the Egyptians; mortgages that are suspended at times of drought; a professional class that understands the chancy existence of those whom it lives off.

Kraenzel's treatment would be interesting for itself. It is compelling because, if you change the place names and other details, his logical framework applies to the Third World regions of the West. The Great Plains' instability comes from the climate; the instability in the rural Rockies comes from energy and mineral extraction.

However, the same results flow from the instability: inadequate schools, a lack of media to bind the

region together and a lack of local regional cities. But the most important failing, the failing at the root of all other problems, is what Kraenzel calls the effects of the "minority status of people." It is not good for a region to grow up with a chip on its shoulder, but that is exactly what has happened in the Great Plains and in the Rockies. Kraenzel writes:

"This situation in (economically weak and divided) communities, along with the great distances involved, makes the plainsman an individualist, one not highly social and not prone to act through groups. The people have fragmented personalities. There is a kind of anarchy of individualism. Faced with the prospect of no group solution to difficulties within the region, people attach their loyalty to special interests outside the region and destroy their own chances for solidarity among themselves. They develop personality traits which exhibit withdrawal behavior or extreme aggressiveness."

It would be good to say that Kraenzel's brilliant analysis of rural hinterlands was followed by a prescription for an equally brilliant cure. He does take a shot at describing a regional form of government, but it sounds academic and impractical. That failure doesn't detract from the book. His insights into the nature of the struggle the nation's hinterlands

The Great Plains in Transition



Carl Frederick Kraenzel

are involved in can help guide the Great Plains and the Rockies through these difficult times.

If Kraenzel is correct, a "rescue" from the current agricultural and natural resource bust by a new boom would be a disaster. If I read him correctly, the Great Plains people have not adapted to their environment because they have never had to. Each time they came close to such an adaptation, a new boom in demand for food, caused by war, gave them an easier way out.

A tale of two districts

History and fate have placed two irrigation systems -- one white and one Indian -- on opposite sides of Wyoming's Wind-Bighorn River. One has been recently modernized with the help of federal reclamation dollars and is doing well. The other has been cut off from federal help and is slowly deteriorating, as headgates and valves rust, ditches deteriorate and land is taken out of production. As of now, the one hope for the Indian district is that a courtroom water rights victory can be translated into financial help.

by Marjane Ambler

Shoshone and Arapahoe ditch riders who patrol the Bureau of Indian Affairs' Wind River Irrigation Project sometimes look longingly across the river. The modern, efficient Midvale project reminds them of the unrealized potential of their own project.

Midvale looks especially good because the U.S. Bureau of Reclamation recently put \$46 million into upgrading Midvale. But the Arapahoe-Shoshone project has not received federal construction money since 1979 and last year federal help for operating costs was withdrawn, too.

"Just look across the river, and you can see the tremendous job they're doing. We're just holding the line here," says Louis Twitchell, a Shoshone and acting manager of the Wind River Project. While his tribe and the Midvale irrigators have been battling in the courts for years, he leaves the fighting to the attorneys and politicians and expresses only envy when asked about Midvale.

Across the river, Midvale Manager Jack Long avoids any criticism of the Indian project. He attributes Midvale's better shape partly to its aggressiveness in raising the farmer's operation and maintenance fees. Midvale, which has 60,000 acres, charges water users \$560 for 40 acres, compared to the \$436 the BIA water users pay.

But without the recent federally funded improvements, Long says his project would be in trouble. BuRec lined canals and laterals, installed pipes to replace some ditches, buried 300 miles of pipe drains to draw water off saturated lands, and modified a diversion dam. Long says, "It would

be inoperable now without the improvements."

Long and other state political leaders convinced Congress in 1970 to spend \$12.1 million on Midvale. When the work was completed in 1986 it had cost \$45.6 million. Some of that money will be repaid by Midvale's water users at a rate of 50 cents to \$2.05 an acre for 50 years. Most of it will come out of hydroelectric revenues from urban users.

The Shoshone-Arapahoe irrigation project didn't get a federally financed upgrade, and it is not clear that the aging project will be able to keep operating as concrete drops and chutes deteriorate, ditch banks erode, steel gates rust and wood timbers rot. Twitchell says, "We try to keep it patched up, but reason dictates that it will catch up with us eventually."

As a result, the project's land-base is dropping. More than 10,000 acres can't be assessed operation fees because they are no longer usable. Twitchell says thousands of acres have become saturated because of inadequate drainage on lands above them. They could be reclaimed, he says, but there is no money to install drains.

In addition to the waterlogged land, 8,000 farmable acres of the 40,000-acre project lie idle. Most are idle because, through inheritance, small tracts of land have been split among 200 or 300 people, and leasing it to one farmer is impractical. The problem also complicates the collection of operations and maintenance fees.

The operations and maintenance budget is further eroded because the Shoshone and Arapahoe tribes refuse to pay fees for

tribally owned idle lands. That cut 11 percent, or \$40,000, from the project's hard-pressed budget last year. The dispute is said to be close to resolution, but even an extra \$40,000 a year won't solve the project's problems.

The existing farmers are unlikely to accept further fee hikes. When Idaho Republican Sen. James McClure's appropriations committee eliminated operating subsidies for all Category I Indian projects in 1984, farmers' fees increased 70 percent in two years, from \$6.40 to \$10.90 an acre. The jumps came amidst a terrible farm economy.

Bob Delk disagrees with the congressional decision to cut off supplemental aid to the project. The chief of BIA water services out of Billings, Montana, Delk says Indian projects in the Billings area cannot support themselves since none have been completed.

Technically, they have been completed. The BIA "completed" them by designating Wind River and four of the five BIA projects in Montana as Category I, or complete, projects. But Delk says, "We never reached the design level on any of them." Larger projects cost less to operate on a per-acre basis than incomplete projects, which means lower per-acre fees. The Catch 22 is that Wind River (and the other Indian projects) can't be completed because Congress has not supplied construction money since 1979.

Phil Corke has been fighting for Indian irrigation funding for close to 20 years within the BIA in Washington, D.C. He was hopeful in the late 1970s, for despite Jimmy Carter's opposition to most federal water projects, the president favored funding Indian projects. Corke says that momentum was lost when the administration changed.

Now Corke fights the attitude -- both within the BIA and the Office of Management and Budget -- that putting money into irrigation projects is like "pouring money down a rathole." He says people think Indians get unfair advantages because they don't repay construction costs. Since non-Indians repay only about 10 percent of the costs of their projects,

Corke finds little difference between Indian and non-Indian projects.

The problems facing Indian irrigation districts are rooted in history. With the creation at the turn of the century of the Reclamation Service, now the U.S. Bureau of Reclamation, and its placement in the Department of Interior with the Bureau of Indian Affairs, conflicts erupted. The government opened many riverside reservations to homesteading, including several in the upper Missouri basin.

Indians and Indian advocates began a continuing battle for rights to water and money for irrigation projects. They also had to hold onto their irrigable land, and keep it from being sold or leased, or inundated under BuRec reservoirs built to supply non-Indian irrigation projects with water.

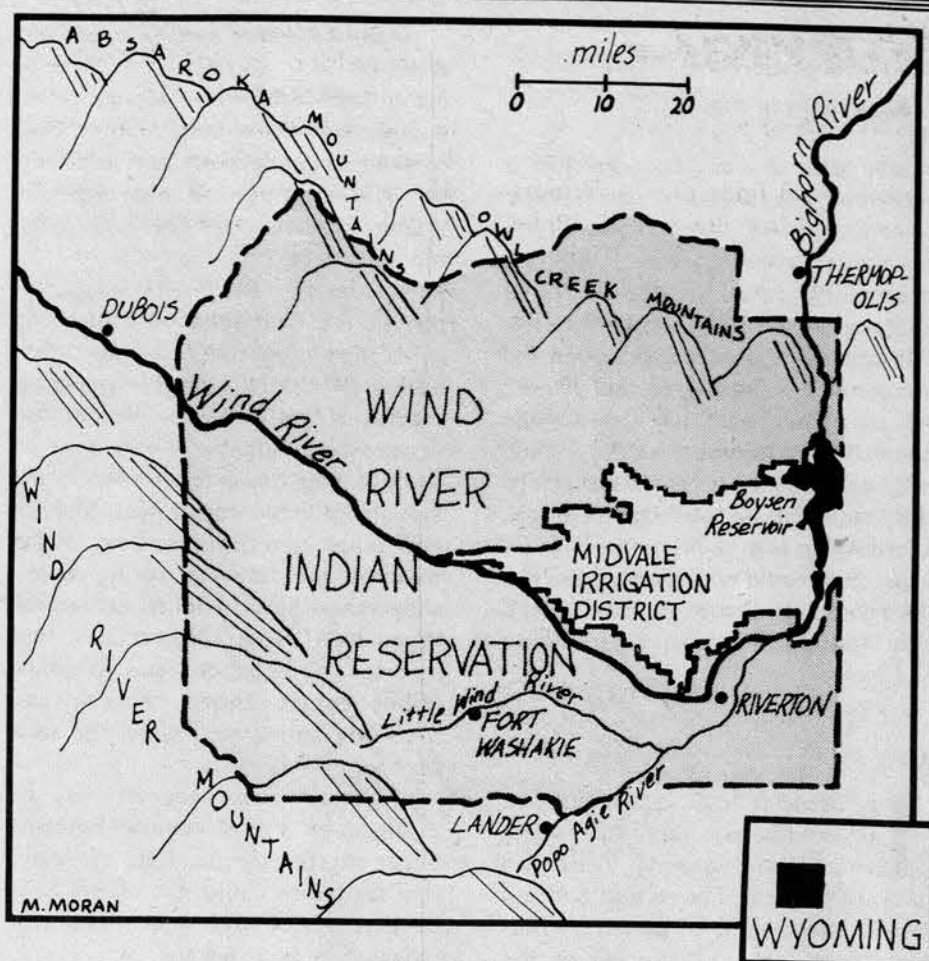
Often they lost those battles. Most of the Missouri basin's major Army Corps of Engineers and BuRec dams -- Boysen, Yellowtail, Fort Peck, Garrison, Oahe, Big Bend, Fort Randall and Gavins Point -- inundated Indian lands or backed water up over Indian lands.

On the other hand, Indian irrigation projects benefited from the reservation land sales; money for several major Indian projects -- including Wind River -- came directly from such sales.

In 1905, the Shoshone and Arapahoe tribes, under federal pressure, ceded 1.5 million acres of reservation land north of the Big Wind River to the government for homesteading.

Some of the remaining Indian land was already irrigated. Shoshone tribal members had started digging their own ditches in 1882. Historian Peter Iverson says the Indians' early success could be measured by an 1898 report that they supplied their own needs as well as sending 800,000 pounds of hay, 760,000 pounds of oats and 585,000 pounds of wheat to the federal Indian agency, Fort Washakie, and the school.

With the money from the 1.5 million acre land sale and tribal members' hard work, Wind River



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A tale...

(Continued from page 23)

became one of the better-developed reservations in the nation. Later, when the Indians were asked to pay \$1 an acre water charge, they objected vehemently. Tribal delegates went to Washington, D.C., to argue that the 1905 cession agreement provided for government financing of the project and that they had dug the ditches themselves. Moreover, by the 1920s, many tribal members could not afford food, much less the water charge, according to historian Loretta Fowler. When they could not pay the fees, the BIA encouraged them to lease or sell their land, further eroding the Indian land base.

In 1934, federal Indian policies reversed again, and the Roosevelt administration returned thousands of ceded acres that had not been homesteaded to Indian ownership, including 981,000 acres of the Wind River Reservation north of the river.

Midvale, however, was not returned, and settlers continued to claim land there as late as 1950, according to newspaper reports. Now Midvale is prosperous and efficient, but it is on land that was originally Indian and it is opposite a decaying Indian project.

Ironically, Midvale may now benefit the Arapahoe and Shoshone tribal members. Basically, the tribes hope to trade their smashing courtroom water-rights victory for development money.

Wyoming has been forced to the bargaining table to protect Midvale and other non-Indians from losing water to the Indians during water-short years. As mentioned earlier, the Wyoming District Court in 1984 awarded the Shoshone and Arapahoe tribes much more water than Wyoming anticipated when the state filed its 1977 lawsuit.

Although some aspects may be changed by the Wyoming Supreme Court on appeal, the state estimates that the tribes could cut off water to between 11,000 and 50,000 acres now irrigated by non-Indians.

"They could wipe out the Midvale Irrigation District," says R.T. Cox,

one of the attorneys representing Wyoming in the litigation.

Based upon a 1908 U.S. Supreme Court decision known as the Winters Doctrine, tribes have rights to the water necessary to make their reservations into permanent homelands. The priority date is based on when the reservation was established. The Wyoming District Court ruled that the Shoshone and Arapahoe tribes could divert 477,000 acre-feet, the amount it determined necessary for irrigation. With this, the tribes could put about 60,000 new acres under irrigation. With a priority date of 1868, the Indian rights predate everyone else.

However, the paper rights won't help the tribes without more storage and irrigation development. Therefore, the tribes are also interested in negotiating a settlement to determine how water will be developed and used.

Under the preliminary terms of the proposed settlement, Wyoming would provide about \$45 million in state funds as well as its clout in seeking another \$50 million from the federal government. The tribes would agree to defer using some of their water. By also providing for new storage and tribal rights to existing Boysen Reservoir storage, the agreement would protect the rights of non-Indians at Midvale and elsewhere in the Big Horn River drainage.

Funding for rehabilitating the existing Bureau of Indian Affairs Wind River Irrigation Project has been considered but is not an integral part of the negotiations at this time,

according to Tom Fredericks, an attorney who represents the Arapahoe Tribe.

Fredericks, who once served as assistant secretary for Indian affairs in Washington, D.C., believes the BIA should be providing money for upkeep of existing irrigation projects. He says the BIA is more concerned with social welfare than natural resources.

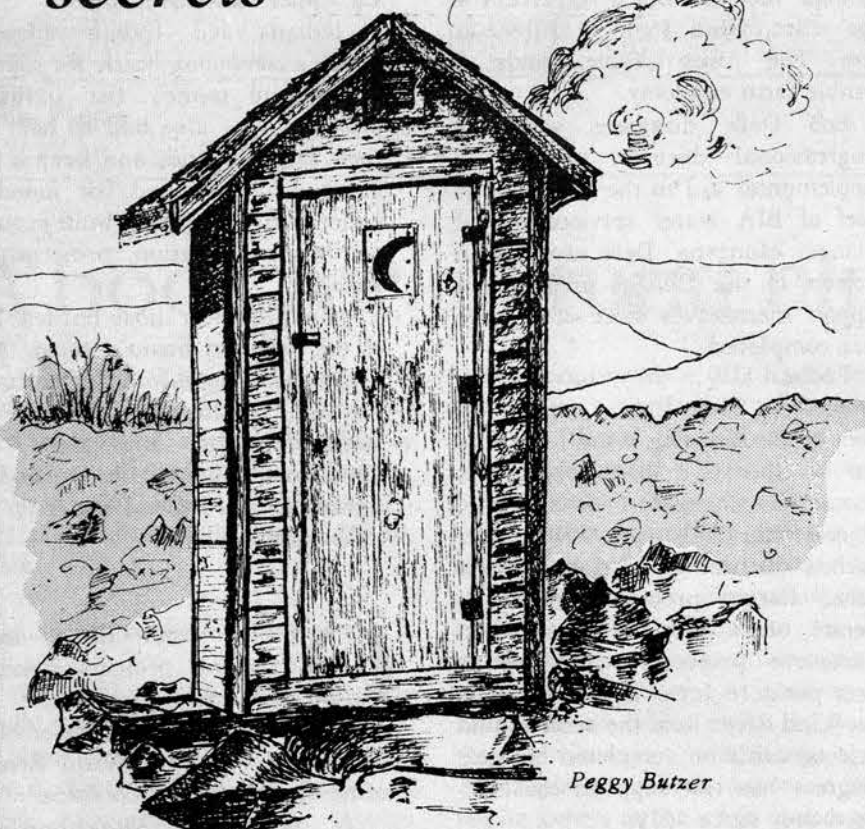
Tribes elsewhere in the West have met varying success in using water rights to bargain for water development. In Arizona, the tribes of the Ak-Chin and Papago reservations won water-development assistance under the Central Arizona Project after lengthy battles.

More recently, in the Missouri basin, the state of Montana reached a settlement in 1985 with the tribes of the Fort Peck Reservation that did not include money for water development. That historic agreement was the first reached by the Montana Reserved Water Rights Compact Commission, a board established by the Legislature to resolve Indian and federal water claims outside of the courts.

Fort Peck tribal leaders now hope to convince Congress to appropriate water development money as an incentive to other tribes to negotiate. The Northern Cheyenne Tribe, which has no BIA irrigation project on its lands, is seeking development funds as part of its compact with Montana.

Several water experts speculate, however, that Interior Secretary Donald Hodel enthusiastically endorses the Fort Peck Compact because the department hopes it will serve as a model for settlements without development dollars.

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A Missouri River bookshelf

by Peter Carrels

The Great Plains, by Walter Prescott Webb. Boston, Ginn Publishing; 1931, 1959. A popular, often-quoted book describing the plains and its climate, topography and settlement by Native Americans, Spanish and white Americans by a well-known plains historian.

Dry Farming in the Northern Great Plains, by Mary Hargreaves. Cambridge, Mass., Harvard U. Press; 1957. A comprehensive, scholarly history of the dry farming movement focusing on the late 19th century and first several decades of the 20th century.

History of North Dakota, by Elwyn Robinson. Lincoln, Neb., U. of Nebraska Publishing; 1966. *History of South Dakota*, by Herbert Schell. Lincoln, Neb., U. of Nebraska Publishing; 1968, 1975. *From Wilderness to Statehood: A History of Montana*, by James Hamilton. Portland, Ore., Binfords and Mort Publishing Co.; 1957. These three are basic texts. The North Dakota book in particular discusses water resources development issues.

The Dammed Missouri River Valley, by Richard Baumhoff. New York, New York, Knopf Publishing; 1951. Overview of Missouri River development. Baumhoff's skills as a newspaper reporter are evident in the amount of detail and information found in the book.

Dammed Indians: The Pick-Sloan Plan and the Missouri River Sioux, by Michael Lawson, Norman, Okla., U. of Oklahoma Press; 1982. A compelling account of Missouri River development impacts on Native Americans. A well-documented tragedy.

Oahe: A Question of Values, edited by William Bogard. Published by the South Dakota Committee on the Humanities; 1975. A no-frills inspection of the ecological and sociological ramifications of South Dakota's proposed Oahe Irrigation Project. It was produced to accompany a controversial film by the same name.

There Once Was a River Called Missouri, Iowa Public Television, 1981. A one-hour television documentary that gives an excellent sense of the changes wrought on the Missouri by damming and channelization. It is especially strong on the situation along the Iowa-Nebraska portion of the river. Those interested in a VCR copy of the documentary should contact the documentary's producer-writer: Thomas Moore, Iowa Public Television, 6450 Pioneer Parkway, Johnston, IA 50131-1553.

Boundaries Carved in Water, An Analysis of River and Water Management in the Upper Missouri Basin, Northern Lights Research and Education Institute, Inc., October 1986. This large format, 40-page primer and guide to the Missouri River is available for \$4 from: Northern Lights, Box 8084, Missoula, MT 59807-8084.