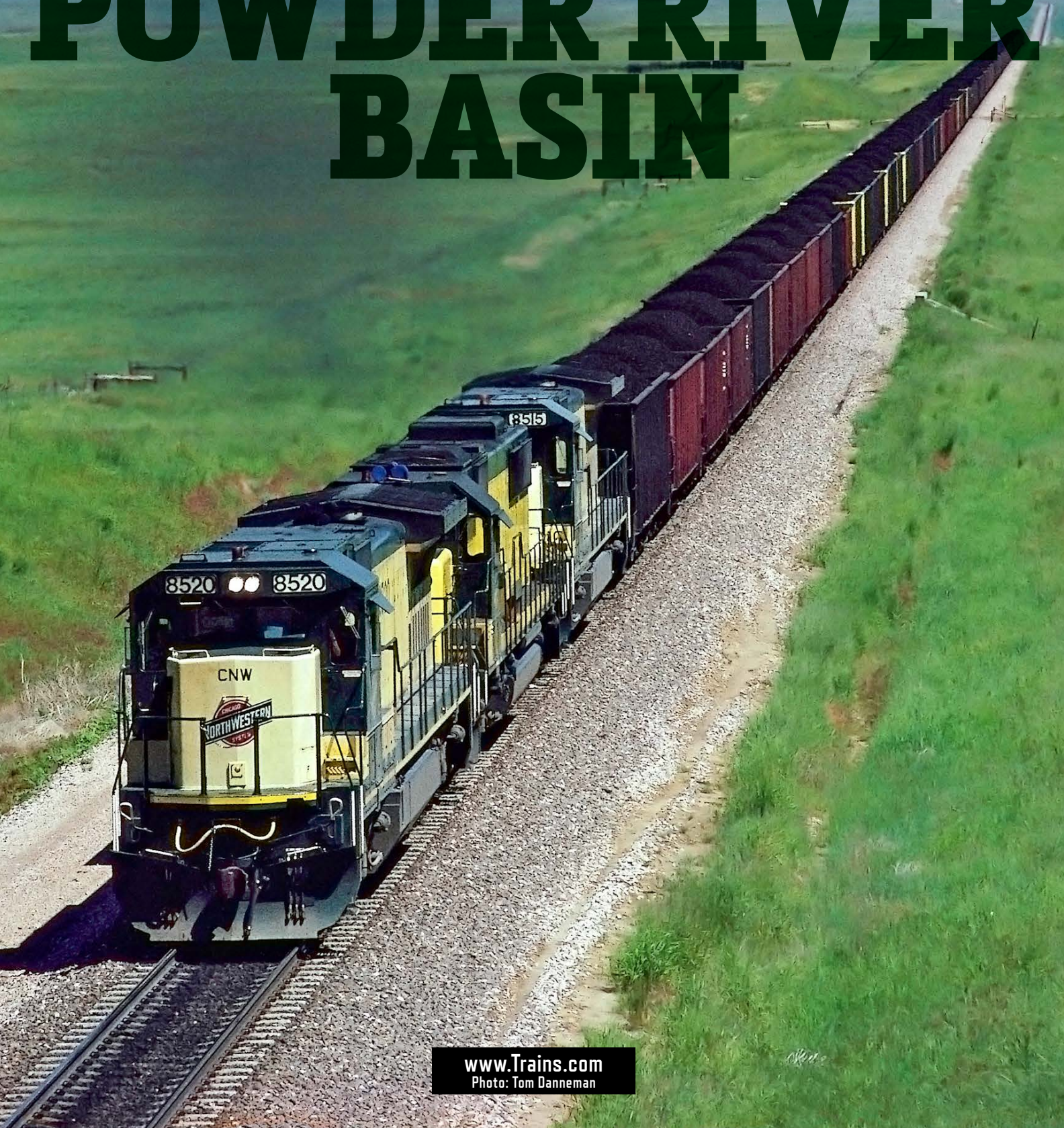


FRED FRAILEY'S POWDER RIVER BASIN

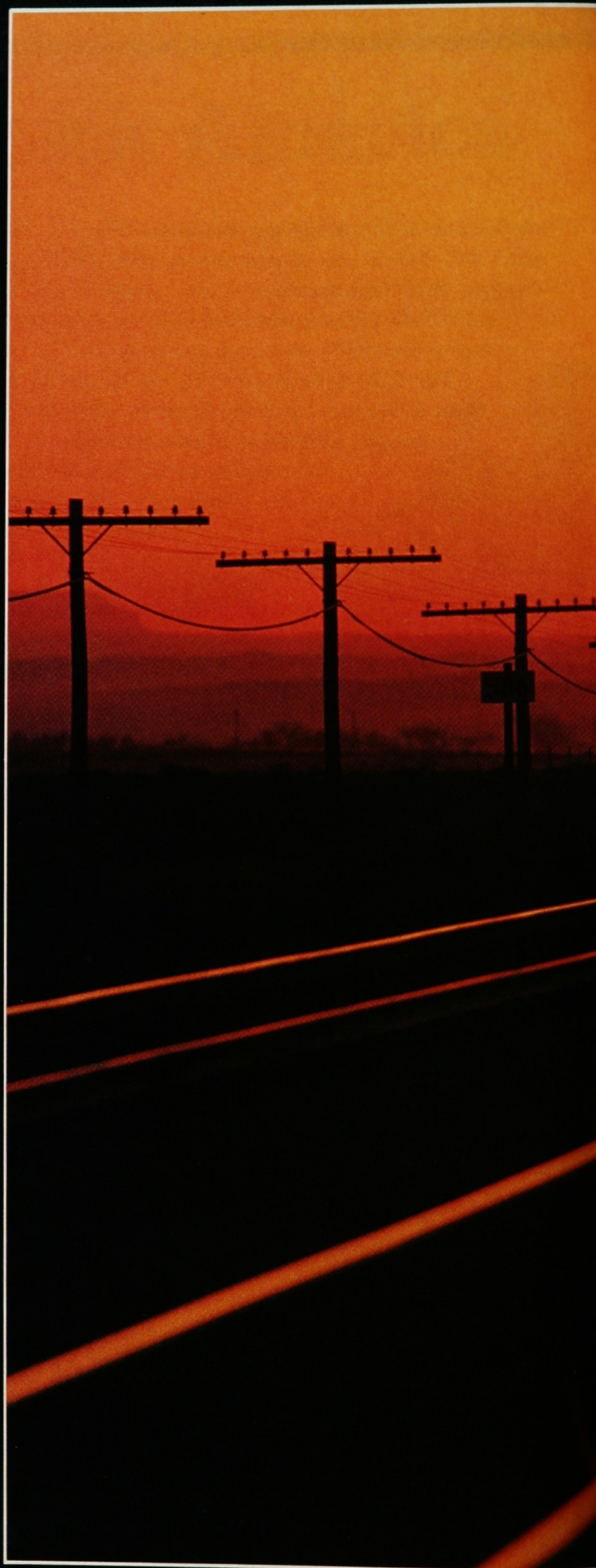


Where does all that coal come from?



POWDER RIVER COUNTRY

STORY / FRED W. FRAILEY
PHOTOS / GARY J. BENSON





A Niagara of



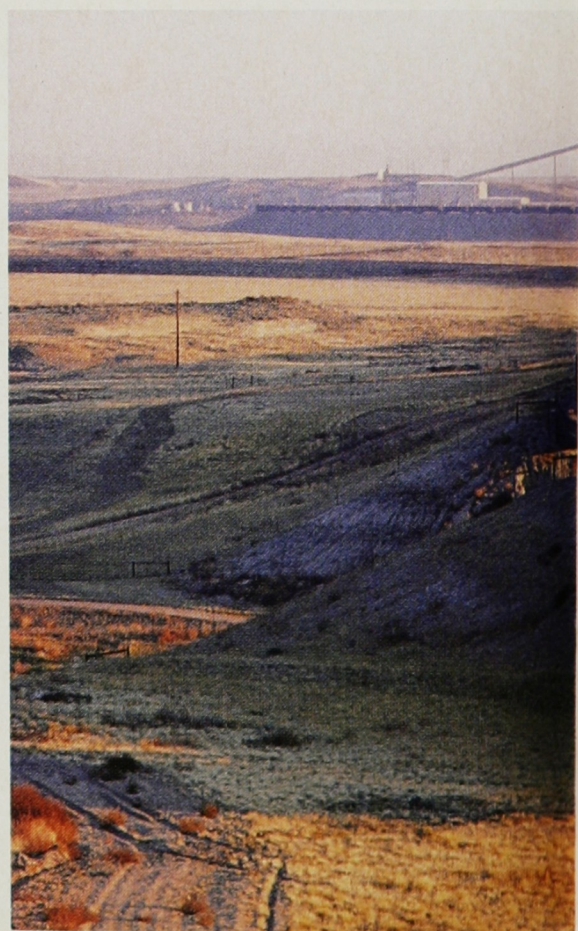
I A PAIR of green, black, and white SD40-2's, bracketing a fuel tender, glides by just as sunlight begins to skip across the shadows of an Indian Summer dawn. On the near horizon a hopper-car train that preceded the helper engines moves out of view toward Belle Ayr Mine. Almost 3 miles distant, beneath the towering 200-foot-high silos of Caballo Mine, a second train is faintly visible.

Here at Milepost 17, in the deer-and-antelope country of northeastern Wyoming, you can't help but mentally turn back the clock. Less than 20 years ago you'd have experienced a far different landscape, one straight from the pages of "Lonesome Dove"—just you and the antelopes and the wind . . . and nothing else, from here to the far horizon. But now you stand beside rails that are the conduit, over a year's time, for several billion dollars' worth of economic activity. Out of these grasslands each day are carved 600 million pounds of coal, from rich seams that measure up to 110 feet thick and which are close beneath the topsoil. The coal is blasted, shoveled, trucked, crushed, and tested, and then is put aboard 6200-foot-long trains that leave the region on each others' signal block. Right now you see only two of them. But 246 others, all



IN October 9, 1988, sequence beginning with northward view (top), SD40-2 helpers and fuel tender glide eastward from Belle Ayr Junction. Caballo Rojo Mine looms in background. In southward view, helpers stop at Rojo Junction to give westbound a push. Looking north again, five units lead departing train; helpers are cut in behind caboose.

PREVIOUS PAGES: Westbound empties and eastbound loads near Donkey Creek at dawn.



traffic from a Wyoming county the size of Connecticut

alike, are even now making their way toward this 50-mile-long patch of remote America from places as distant as Plaquemine Parish, La.

You're in Powder River country, America's newest railroad frontier, and perhaps its last. Beginning in the early 1970's, two railroads fought for a decade for access to the 40 billion tons of sub-bituminous coal buried beneath the soil of Campbell County. Their surveyors labored within sight of each other. Their platoons of lawyers skirmished before regulators and judges. Ultimately both railroads penetrated Powder River. Their construction crews laid 226 miles of new railroad, and rebuilt from the sub-ballast up several thousand additional miles.

And what, after spending between them \$2.5 billion, did the Burlington Northern and the Chicago & North Western achieve? In a sense, they made a down payment for the prosperity of the entire railroad industry west of the Ohio River for the next half century. Coal from the Powder River Basin finds its way onto the account ledgers of practically every railroad in the West. (Note: The basin extends north into central Montana, but 14 of the 24 mines, including all the biggest producers, are in Campbell County, Wyo.)

Powder River coal helped prop up the Missouri-Kansas-Texas until it found a buyer in mid-1988. It lifted Kansas City Southern back on its feet. It finds its way to Southern Pacific and Union Pacific, to Santa Fe and Chicago, Central & Pacific, to Elgin, Joliet & Eastern and Peoria & Pekin Union, to Soo Line and Chicago & Illinois Midland. It makes BN to a degree recession-proof, and provides C&NW with the profits it sorely needs to survive.

Awesome, profitable

You begin to sense the enormity of what's happening in Powder River at odd moments, as when you come upon trains lined up behind one another for 5 solid miles in the middle of nowhere, just like cars at a stoplight. "I thought, 'My god, what have I gotten myself into?'" says David Hibbard of the August night in 1984 when he arrived in Nebraska from Galesburg, Ill., to become chief dispatcher of BN's Alliance (now Denver) Division. Fresh off the airplane, he walked into the division office at the foot of Alliance's main drag to look over his new turf. Display panels at the five dispatching desks glittered with electronic indications of trains headed into or away from the coalfields—an immense amount of ac-

tivity within a small area. "I was flabbergasted," says Hibbard. "I figured I was a crackerjack dispatcher, having worked the suburban trains in Chicago. But that was like playing with toys."

Awesome, indeed. Incredibly profitable, too, for both railroads. Coal, virtually all from Powder River, accounts for \$1.5 billion of Burlington Northern revenues, more than 35 percent of receipts on the 28,937-mile system (largest in the U.S.) and probably a greater proportion of its profits. Similarly, railroad analyst John Kawa of Dean Witter Reynolds figures that for every \$1 in revenues Chicago & North Western books from Powder River this year, 35 cents will drop down as net profit. That \$50 million could represent two-thirds of C&NW's earnings, Kawa says.

This business simply didn't exist two decades ago. Back then, Wyoming was the woebegone extremity of the North Western's westward expansion. Its trains meandered across Nebraska's Sand Hills atop half-century-old rail, and both the right of way and the traffic (such as existed) shriveled beyond Chadron, Nebr., the railroad's westernmost terminal of any consequence. A triweekly local went west 135 miles from Chadron to Douglas, Wyo., and once a week bravely ventured the final



180 miles through Casper to end of track in Lander (later trimmed back to Riverton, and then Casper—see pages 24-25, April 1989 TRAINS).

BN's former Chicago, Burlington & Quincy lines through Wyoming also were thin on traffic, the happy hunting grounds of SD9's on once-a-day trains of box cars that moved with no particular urgency. The principal route comes out of Lincoln, Nebr., and passes through Ravenna and Alliance, Nebr., and then Edgemont, S. Dak., before cutting across the northeastern corner of Wyoming via Gillette and Sheridan (all six towns being crew-change points) and connecting with the former Northern Pacific main at Huntley, Mont., just east of Billings. A secondary, more hilly route runs north from Denver through Cheyenne to Wendover, Wyo., on the Q's old Colorado & Southern subsidiary, and then northwest through Casper to Laurel, Mont., just west of Billings on the old NP. BN also could tap Denver on a CB&Q route heading southeast from Wendover through Guernsey, Wyo., to Northport, Nebr., where it joins one from Alliance, and then strikes south through Sterling, Colo., to a junction with the Chicago-Denver main line at Brush (map on following two pages).

Twenty years ago you could have napped beside any of these tracks without much fear of being awakened by a train. It's not that the coal went unnoticed. The earliest scouts spotted the black dust beside the region's principal river, and seeing its resemblance to gunpowder called this stream the Powder. On the largely treeless Wyoming plains, coal heated ranchers' houses for decades, and both railroads mined the coal for their steam locomotives. "We have some old, old mines around here, where people started digging in the sides of hills," remarks Kevin Doll, managing editor of the *Gillette News-Record*. As early as 1956—in the embryonic stage of the 14-year struggle to merge the CB&Q, NP, Great Northern, and Spokane, Portland & Seattle into today's Burlington Northern—Robert Downing heard of the enormous coal deposits in these parts while aboard an inspection train through Wyoming. "It was talked about as a sometime-in-the-future sort of thing," says Downing, then with GN and later Burlington Northern's vice chairman. And Dallas Carlisle, then division engineer and now manager of C&NW's Western Division, recalls driving his top officers from Chicago into coal country in 1966 for their first look-see. "But I didn't know," admits Carlisle, "just how much more lay to the north of us."

A lot would have to happen to create a market for Powder River coal: An efficient way to get it out of the ground. A higher price for oil, coal's competitive

fuel, which sold for a mere \$3 a barrel in the late 1960's. A reasonable rail rate for hauling it to generating plants hundreds or thousands of miles away—the ubiquitous, low-cost unit train of 1989 was just beyond being a figment of TRAINS columnist John G. Kneiling's imagination back then.

So when Minnesota Power & Light

approached GN and NP in 1967 about supplying a new power plant in Cohasset, Minn., from a mothballed mine in Colstrip, Mont., nobody imagined that the genie was about to pop out of the bottle. "There had been so many disappointments over the years in developing coal traffic," says Downing. But mark this date: May 1, 1969. The first



TOPPING Crawford Hill at Belmont are SD40-2 7182 (above) and a pair each of BN and UP units with an eastbound coal train. Notch at right leads to abandoned tunnel, only railroad bore in Nebraska. Tiger-stripe GP50 on train 224 (below) leaves Gillette, Wyo., in its wake.



unit train left Peabody Coal's Big Sky Mine in Colstrip on the Northern Pacific, to be handled by the Great Northern from Fargo, N. Dak., to Cohasset. Retired BN Chairman Louis Menk recollects that a clamshell shovel loaded the hoppers. No matter—the genie's bottle had been uncorked.

Getting its feet wet

Immediately after the March 1970 creation of Burlington Northern, events gathered momentum. Oil and coal companies busily signed coal-rights leases in the Gillette area—the heart of the southern Powder River coalfields. The energy firms were positioning themselves to take advantage of the Clean Air Act, whose enactment by Congress that year would require utilities burning high-sulfur coal to clean up their acts. Powder River coal, with a sulfur content one-third to one-fifth that of Illinois and West Virginia deposits, was a one-stop solution. "But again," says Downing, "the view was that these people were buying insurance for the future."

Then the bombshells:

□ Amax, the giant minerals company, informed BN it was ready to build a mine south of Gillette. To be called Belle Ayr, the mine would require a 15-mile spur to reach.

□ Decker Coal, a joint venture of Peter Kiewit & Sons and Pacific Power & Light, made known its intention to begin recovering 200 million tons of coal just across the Montana border from Sheridan. It, too, asked BN to lay rail.

Still, concedes Downing today, the enormity of what lay ahead wasn't comprehended by the railroad, which reacted cautiously to the events of 1970. Explains Downing, "If you start from zero, 5 or 10 million tons is an enormous increase. At first we didn't set our sights much higher than that." By comparison, BN alone in 1988 moved 129 million tons of coal from the Powder River Basin.

The big concern of BN brass was exposing the railroad to excessive risk. Talk is cheap by prospective shippers. Was this a bubble that would burst? Downing: "We were talking real money in preparing for this traffic." Back then, the railroad was short on cash but long on capital projects needed to blend together the four newly merged railroads. Those projects didn't include speculative spending in Powder River country.

So BN hedged bets. It deferred rebuilding main lines; the track, in reasonably good shape, could stand a few extra trains a day. It told mining companies needing branch lines for their yet-to-be-built mines to finance the construction themselves; BN would repay them, with interest, on the basis of usage. BN made a similar offer to electric

utilities: If you'll buy the coal cars, we'll make rates that much sweeter.

Thus did Burlington Northern get its feet wet. From a point called Donkey Creek, 10.6 miles east of the Gillette depot on the Alliance-Billings line, BN in 1972 supervised the Amax-financed construction of the Belle Ayr line. The ruling grade on White Tail Hill that crested midway along this 14.8-mile spur—1.4 percent southbound for empties, 1.25 percent northbound for loads—would have been milder had the line started 5 miles to the east and followed Caballo Creek toward Belle Ayr. After all, this little "spur" ultimately became part of what may be the most heavily used single-track, common-carrier main line on earth.

By then, says Downing, "I was convinced that we'd eventually build to meet the Casper line," referring to the secondary Billings-Wendover route. In fact, he and Menk that autumn got approval of BN's board of directors to do just that. Finally the railroad sensed that conditions had fundamentally changed—that big markets for Wyoming coal would indeed open up. A southern entrance to the coalfields linked to the Belle Ayr spur, directors were told, would pay back many times its \$30 million cost. (The 113-mile extension ultimately would cost \$113 million.) Trains bound for Colorado and Texas would avoid a circuitous routing via Donkey Creek. They'd also avoid the biggest physical barrier in the region, Crawford Hill, a 1.55 percent, 14-mile grade up Pine Ridge in northwestern Nebraska 45 miles northwest of Alliance. There still remained the question of timing. BN people thought their

new route—called the Orin Line because of the settlement (population 15) at its southern end—would materialize in easy stages over a number of years as mines along the way opened.

Burlington Northern now realized the incredible amount of capital necessary to make this all work just right. "We never said one morning, 'Let's invest \$2 billion or \$3 billion in the coal business,'" Menk recounts. "It was a business judgment. There were times our directors asked a lot of pointed questions—our capital budget was running \$600 million a year. But everyone knew we needed to upgrade secondary main lines to total mainline status, and this involved massive tie programs, substantial new rail, hundreds of locomotives, shop facilities, and signal systems." Not just trackage in Wyoming would need attention. Every BN artery radiating from Powder River—to destinations as far away as Minneapolis-St. Paul, Kansas City, Southern Illinois, and South Texas—required upgrading to support the weight of 15,000-ton unit trains.

On October 10, 1972, precisely one year before an Arab-Israeli war set the stage for \$13-a-barrel oil, Burlington Northern attorneys walked into the Interstate Commerce Commission Building on Constitution Avenue in Washington, D.C., and filed papers seeking authority to build the Orin Line.

But another railroad's surveyors had been busy in southern Powder River country as well. Seven months and 17 days behind BN, Chicago & North Western's lawyers arrived with a competing application.

Competition

In 1973, C&NW was hardly in a position to lay rail. For a decade the North Western would vacillate between euphoria and despair trying to bridge the chasm between its ambitions and its purse. Yes, C&NW's railway was as close to some of the coal deposits as BN's. But that's like equating a Yugo with a BMW. Between Fremont, Nebr., where C&NW exchanges Chicago-West Coast traffic with Union Pacific, and the south end of the Powder River Basin, North Western's trains crept 519 miles over the largely unballasted 90- and 100-lb. jointed rail of the old Fremont, Elkhorn & Missouri Valley, and across 417 bridges, few of which could support 125-ton axle loads. North Western could not merely rehabilitate; it would have to literally build a new railroad in place of the old. The realistic cost: \$1 million a mile—an impossible sum for a railroad marginal in the best of times.

BN's Orin Line application passed almost unnoticed at 400 West Madison Street, C&NW's Chicago headquarters.



NO bills in Crawford waybill box today, so crewman swings aboard departing CACDA.

That changed abruptly in early 1973 when Texas Eastern approached the North Western about delivering coal to a gasification plant it wanted to build near Douglas, Wyo. Nothing ever came of this, but on April 4, 1973, civil engineer Eugene M. Lewis was sent to Wyoming to eyeball the terrain north of Douglas, to collect maps of that area, and to develop traffic projections.

Lewis, assigned to a North Western office that provided consulting services to the railroad, came back to Chi-

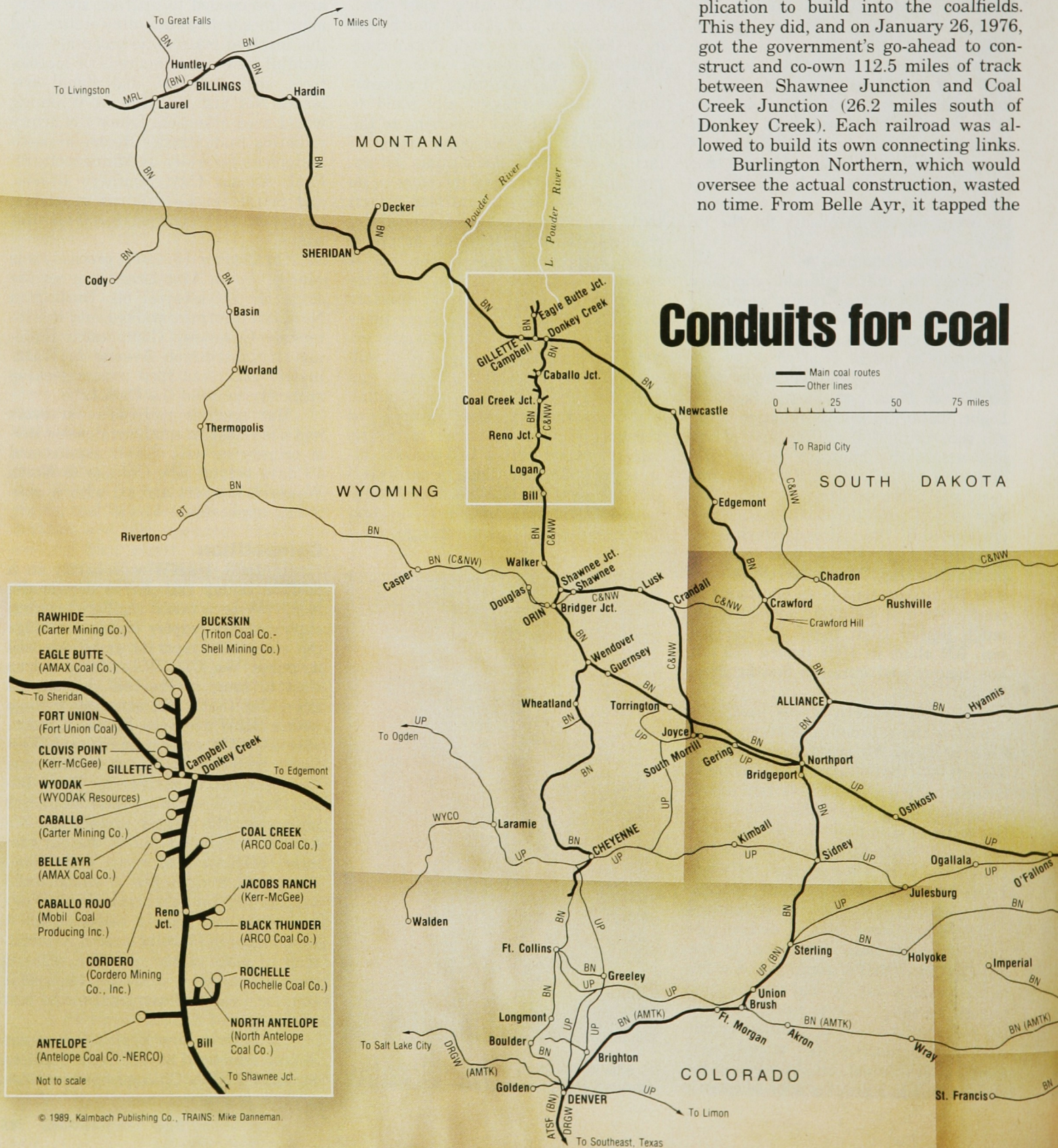
cago a changed man, a true believer. The potential, he told President Larry S. Provo on April 16, was "unbelievable." Largely on the basis of that presentation, Provo gave his assent to a construction application covering essentially the same line BN sought to build.

"Management intensity at first was —on a scale of 1 to 10—about a 4," says Lewis. On July 13, 1973, Provo met with BN's Downing—the first attempt to negotiate a joint arrangement. "Well, Larry," Downing said at the end of this

inconclusive meeting, "how do you expect to pay for all this?" Replied Provo: "With cash." Of course he was bluffing. Leaving the session, Provo remarked to other C&NW people: "Where in hell is the Powder River?"

The ICC took C&NW's bid more seriously than perhaps the railroad did at first. Wise public policy dictated that competition be encouraged. But competition needn't mean parallel railroads into the mines when one route used by both railroads would do just as well. The commission suggested that BN and C&NW try again to agree on a joint application to build into the coalfields. This they did, and on January 26, 1976, got the government's go-ahead to construct and co-own 112.5 miles of track between Shawnee Junction and Coal Creek Junction (26.2 miles south of Donkey Creek). Each railroad was allowed to build its own connecting links.

Burlington Northern, which would oversee the actual construction, wasted no time. From Belle Ayr, it tapped the





CHALLENGE of BN's Crawford Hill is evident in this March 15, 1989, view of westbound train of empties easing into Horseshoe Curve.

new Cordero Mine 5.7 miles to the south in 1976. The next year the rail-head was extended 23.1 miles past Coal Creek Junction to unpopulated Reno, Wyo. Then there was a two-year pause, caused in part by such environmental concerns as bald eagles nesting their young alongside the already graded right of way. Finally, on May 1, 1979, rail-laying began northward from Bridger Junction, on the Casper line just

east of Orin, and on July 15 southward from Reno. The actual meeting point, at Milepost 71.26, was determined in part by a nearby family of eagles, which ultimately (to BN's relief) relocated its nest, allowing the two rail gangs to converge. A ceremonial spike was driven home on October 6, 1979.

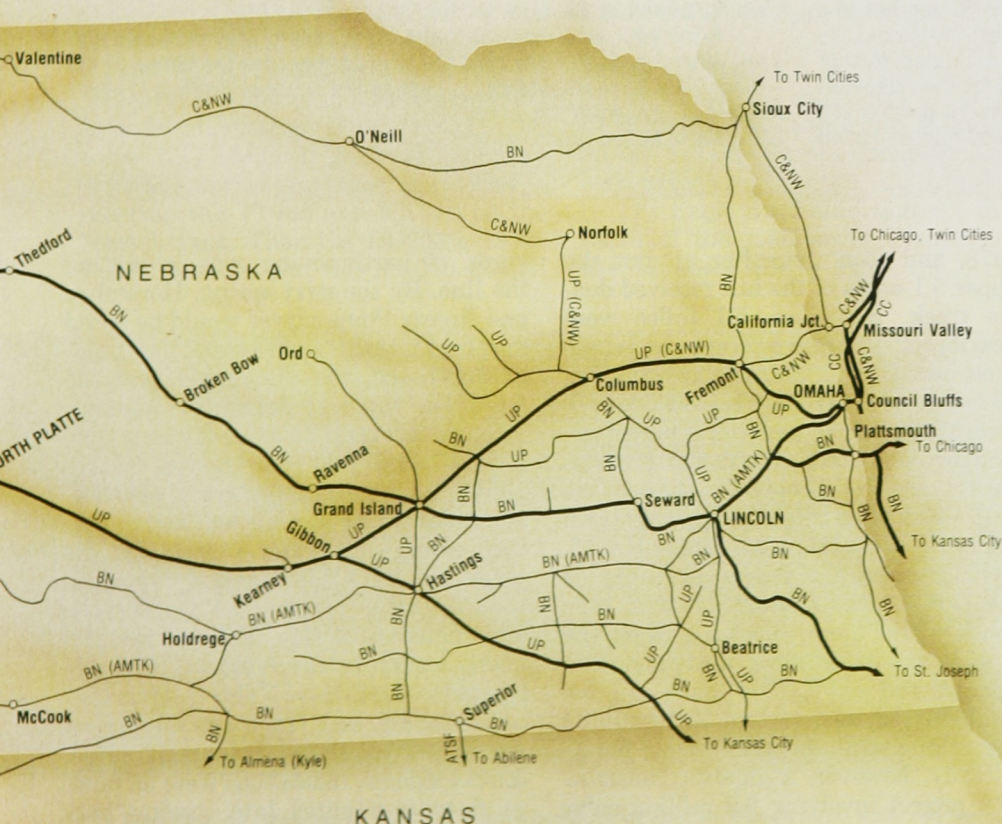
Two important BN feeder lines also appeared. In 1976 came a 14-mile spur northward from Campbell, just west of

Donkey Creek on the Gillette-Alliance main line, to Eagle Butte, along which five new mines were under construction. And from Dutch, just east of Sheridan, a 22.6-mile spur crossed into Montana to reach the West Decker, East Decker, and Spring Creek mines.

A new age

Imagine, if you can, this nascent rail frontier at the dawn of the 1980's. It revealed lots of rough edges. BN was new at this sort of thing and was struggling to rise to the challenge. "Back then we hired anyone with a heartbeat," remarks Read Fay, until recently the assistant superintendent in Gillette. "The standing joke here was, 'Yesterday I couldn't spell "conductor," and now I am one.'" Behind the quip lay an element of truth. Adds Fay: "It wasn't uncommon for an entire crew to have less than a year's seniority among them."

The Orin Line bore a fresh, brand-new look. Train-order operation reigned until 1981 from Reno south, with mobile trailers used as depots at Reno, Bill, and Bridger Junction. This route, combining new territory with new railroaders, concerned BN management. Sidings at Logan, Bill, and Walker were each 5 miles long with double crossovers between the extremities. In anticipation of centralized traffic control that would permit remotely controlled dispatching, multiple location signs had been erected—such as EAST BILL at one end, BILL at the crossovers, and WEST BILL at the other end. Fearing crews might go beyond the first switch



Meanest mountain in Nebraska



LED by a pair of pounding Oakways, a Rawhide Mine-Omaha train roars around Breezy Point. In the distant valley, another train follows.

I "HELPER moving!" crackles over the VHF scanner at 6:50.

You have just reached Breezy Point, at the high end of spectacular Horseshoe Curve 3 miles short of the summit of Nebraska's meanest ridge, Crawford Hill. The eastbound coal train is leaving the small town of Crawford, 11 miles away, having just attached a trio of SD40-2's ahead of its caboose.

Minutes pass, with nothing but the calls of birds and occasional grunts of grazing cattle interrupting the silence of an autumn morning on Pine Ridge. Susan Benson hands you the binoculars, and finally you locate the train—a tiny, almost stationary black line far down in the valley below. Soon it slips from sight. More silence.

Were it not for Crawford Hill, Burlington Northern coal trains would waltz from Powder River country. The ruling grade from Gillette to Alliance otherwise is 0.8 percent, and a mere 0.5 percent from Alliance to Ravenna. Obviously this 1.55 percent climb presents a challenge. BN attacked the problem in stages between 1976 and 1982—CTC first, then successive segments of double track and finally massive track relocation to reduce curvature at Horseshoe and adjacent Breezy Point curves (from 10 degrees to a maximum of 8) and to daylight Nebraska's only railroad tunnel. To actually get its heavy trains to the summit, BN instituted pusher service. Three sets of three-unit SD40-2's, favored for their dependability, are based in Crawford. Pit stops—the helpers gobble 200 gallons of diesel fuel each time they make the 100-minute round

trip—are minimized by fuel tenders sandwiched into each set. These are converted tank cars which are also familiar sights on BN TOFC and double-stack trains on the Chicago-Seattle route.

Now it's 7:28 a.m., and the train pops into view at the bottom of the horseshoe—directly across from you but still 12 minutes away. The noise builds, too, reverberating across the hillsides from the three C30-7's and two U30C's on the front—the violent *chugga-chugga-chugga* so characteristic of General Electric locomotives, each of which shoots black exhaust into the lonejack pines. Eight minutes later the helpers appear, adding to this outdoor symphony the high-pitched whine of Electro-Motive turbochargers. Protesting that 8-degree curve, the coal cars chime in with ear-rending squeals. You're witnessing industrial might as surely as if you were inside a steel mill.

The tension is such that you're almost relieved when the head end growls by. Breezy Point, just behind you, sets the 125-ton cars to new heights of piercing protest. The helpers howl past at 7:45, and almost at once the noise begins to recede. Ten minutes later it abruptly stops. "7202 helpers to the west dispatcher. We need the siding switch at Belmont to drop the caboose."

Soon your ears readjust to the quiet calls of the birds and cattle. What a beautiful day, you think, gazing across the valley to the Black Hills 80 miles distant . . . just as the scanner emits a "Helper moving!" cry from the valley.

Here we go again.—F.W.F.

to head in for meets, BN authorized a special form of train order. Instead of the usual EXTRA 7072 WEST TAKE SIDING AND MEET EXTRA 5051 EAST AT BILL, these orders would read EXTRA 7072 WEST TAKE SIDING AT EAST BILL AND MEET EXTRA 5051 EAST AT WEST BILL. A BN officer assigned at that time to Alliance admits this reeked of excessive caution. But he added in a letter then to friends: "The crews were pretty green when the line opened, and after dispatchers answered such questions from crews as this, nothing may have been too much: 'Spatch, I've got an order to meet Extra 5803 West at Bill and another order to meet Extra 7203 West at Bill. Which one do I wait for?'"

Crawford Hill couldn't be leveled, but could it be tamed? CTC came by

1978, and soon thereafter all but the upper 5.1 miles of the hill received double track. But those 5.1 miles were heartbreak—10-degree curves at Horseshoe and Breezy Point, a constricting 73-foot tunnel (the only railroad bore in Nebraska), and of course the punishing 1.55 percent grade. "Something wrong back there?" an engineer radioed the helpers shoving his loaded coal train around Breezy Point on September 19, 1981. Replied the helper engineer: "I see cars on the ground." Indeed they were—19 of them, having pushed the outside rail aside, stood upright and in line off the track. The scene, all too common, meant Crawford Hill wouldn't see another train for the next 26 hours. Already, however, a gigantic construction project involving 2.2 million cubic

yards of earthmoving was relocating the line. By the next spring, Horseshoe and Breezy Point curves would be eased to 8 degrees, the single-track gap finally eliminated, and the tunnel near the top of the climb at Belmont bypassed.

The 238-mile Ravenna-Alliance subdivision until mid-1981 gasped from a 1951 CTC installation—spring switches and take-siding signals at one end of each siding and power switches at the other. By 1980 this corridor was being used by an average of 24 trains (coal and manifest) a day. Relates one frequent visitor to the Alliance dispatching office back then: "The old machine could hardly keep up with the trains. As the relays clicked away sending out control signals, indications were as much as 6 to 8 minutes late coming back



AT dispatcher's office in Alliance, relief Chief Dispatcher Bill DeLett works at the board that keeps track of locomotive assignments.



ARRAY of screens helps Orin Line Dispatcher Jerry B. Johnson monitor Cordero Junction-Guernsey, plus Bridger Junction-Casper.

when traffic was heavy. A new dispatcher could get lost very quickly." Out on the subdivision, some scenes were as timeless as that CTC machine—every so often dispatchers would set signals to red to allow Sand Hills ranchers to herd their cattle across the tracks.

Congestion? It's 7 p.m. on a September evening in 1981—busy, busy. Another Alliance Division coal-loading record has been set this day—25 trains. Now six trains are being swallowed in the "Bermuda Triangle," as the wye outside Northport is called. Two trains arrive from each of the three directions: from the south (Sterling), two VV093 "hopper trains" for Guernsey (hopper is the label, despite the cars being gondolas); from the north (Alliance), a DD008 loaded train for Sterling and a TT067 hopper train for Guernsey; and from the west (Guernsey), waiting at the end of double track next to the wye, a TT066 and a KK010, both with coal for Alliance and Ravenna. There's only one way for dispatcher Lynn Davis to resolve this Mexican standoff: The two VV093 empties veer west to Guernsey, meeting the TT066 and KK010 on the second track. Then the DD008 goes toward Sterling, and the KK010 behind

it follows the VV093 trains to Guernsey. That frees the two Alliance-bound trains. It all happens in about the time it takes to read this account.

Rough edges or not, by 1980 the cards were rapidly falling into place for BN. The Orin and Eagle Butte lines were finished. Existing routes were being whipped into shape. A new locomotive and car shop in Alliance enclosed six acres under one roof to service the coal fleet. Hundreds of passing tracks, from Wisconsin to Montana to Texas, were being extended. New CTC installations would soon enable dispatchers to control switches and signals on virtually every foot of coal-hauling main line in Wyoming, Nebraska, and Missouri. Its orgy of capital spending winding down, Burlington Northern could finally, in the words of ex-Vice Chairman Downing, "begin to make some money" hauling coal. And make money it did.

Mine by mine

Let's tour the southern Powder River Basin coalfields, starting at the top, on BN's Eagle Butte extension north-east of Gillette.

At Eagle Butte Junction, 9.5 miles north of the junction of Campbell on the Alliance-Gillette main, the branch

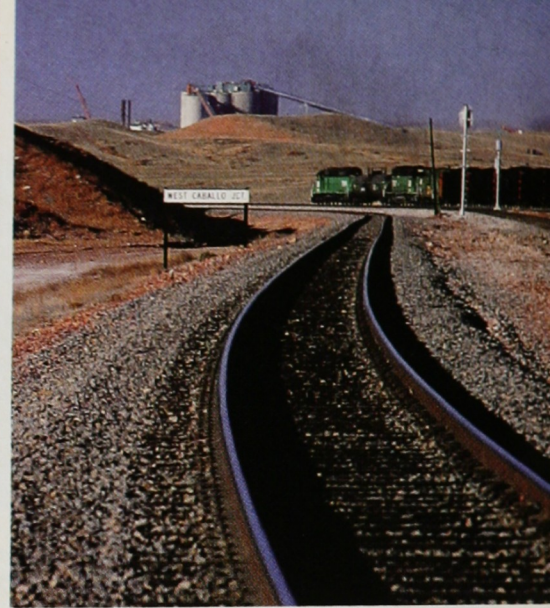
line splits three ways. To the north another 4.5 miles sits **Eagle Butte Mine**, an Amax facility opened in 1978 that's the third-biggest producer (and therefore the third-biggest originator of trains) in the Basin. Just a mile or so away from Eagle Butte Junction on separate spurs are **Buckskin** (opened in 1981), owned by Shell, and **Rawhide** (1977), run by Carter Mining, an Exxon subsidiary. Leaving Eagle Butte Junction southward, loaded trains pull almost 5 miles on a 1 percent grade, then it's downhill to Campbell. Near the top of the grade is a spur to **Fort Union Mine** (1981), and just over the crest is the line to **Clovis Point** (1979), a mine that Kerr-McGee idled in 1987. All five mines are reached exclusively by BN.

So is **Wyodak Mine**, whose property 3 miles east of Gillette is literally bisected by BN's main line and U.S. Highway 14-16. The oldest mine in Powder River, Wyodak opened early in this century. It isn't much of a factor for BN, though; now owned by Black Hills Power & Light, its output goes almost entirely to an adjacent electric power plant.

East of Campbell is Donkey Creek, the northernmost point of the Orin Line. The junction sits in far more pro-



IT'S 8:30 a.m. on October 8, 1988, as empty hoppers of Jacobs Ranch Mine train roll through West Caballo Junction. Silos are Belle Ayr Mine.



WITH fresh loads out of Belle Ayr Mine, engineer applies throttle and sand to five GE's growling eastward onto main through "Absolute Alley" . . .

saic surroundings than its name implies—merely switches of a wye, obscured by a highway overpass in a flat, barren valley. From Donkey Creek south on the Orin Line, it's uphill on double track all the way to Milepost 8 on a 1.4 percent grade. This presents no problem to the minebound empty trains—as a rule of thumb, a train needs almost the same horsepower per ton as the percentage gradient to make a sustained climb, and hopper trains hit this hill with 4.5 hp/t. But then it's downhill to Milepost 16.4 on a 1.25 percent ruling grade that does present a problem to loaded northbound trains, which have only about 1 hp/t. Therefore, BN stations two SD40-2's in the vicinity to give northbound loaded trains a shove to the top (plus the occasional southbound loaded train entering the Orin Line from mines north of Donkey Creek).

Between West Caballo Junction (MP 14.7) and the north siding switch at Haire (MP 17.8) are a tangle of junctions and absolute signals that would bring to grief any engineer who didn't come off the hills on either side with his train under tight control. Some of the absolute signals (remotely controlled and associated with a power switch) are only a couple hundred feet apart, earning this stretch the handle "Absolute Alley." Within those 3.1 miles come—in order, from north to south—a crossover, West Caballo Junction, an entrance to Belle Ayr, East Caballo Junction (the north limit of joint track with C&NW), the end of double track, East Belle Ayr Junction, the north and south legs of the wye at Rojo Junction, and the north switch at Haire. Note: We say north-south in this description, because that's how the Orin Line runs; to operating people it's west (north) and east (south).

Three very active strip mines are visible within those 3.1 miles, too. **Caballo** (1978) is another Carter Mining

property whose balloon track veers west at the junctions bearing its name. Southward trains bound for Amax's **Belle Ayr**, the second-biggest producer in Powder River, can exit the main line either 100 feet south of West Caballo or at East Caballo a mile to the south, while northbound empties go in at East Belle Ayr almost 2 miles down the pike from West Caballo.

Caballo Rojo Mine (1982), run by Mobil, is the last of the trio, reached from the wye at Rojo Junction, which is just a few feet from the north switch of 3-mile-long Haire siding. But we're not finished: Just beyond Haire, at Milepost 22, juts the 2.7-mile spur to Sun Company's **Cordero Mine** (1976). And at Milepost 26 comes Coal Creek Junction, from which a 2.1-mile line heads east to Arco's **Coal Creek Mine** (1982).

Meanwhile, we've begun a hill-and-dale ride through the Wyoming outback, highlights of which are a 1 percent upgrade from Milepost 16.3 to MP 19.2, 1 percent descending to about MP 21.5, 1 percent up from MP 24 to MP 28 and again from MP 32.6 to MP 34, followed by a 1 percent drop from MP 37 to 39. You can easily imagine what this means to the engineer of a loaded 15,000-ton train. The momentum pushes you downhill almost as hard as it retards your way up. It's full dynamic braking and 6 pounds of air one minute, and the last notch on the throttle the next as you try to make the crest at maybe 9 mph—a cycle repeated day without end, amen. Running trains on the Orin Line, remarks BN engineer Richard Gilkey, "is not so much hard as tiring—you're either going up or down, and trying to control your speed."

Reno Junction, at Milepost 44 in the middle of a 7-mile stretch of double track, is jumping-off point for two huge mines. To the east goes a 5-mile spur that first visits **Black Thunder Mine**

(1977) and then terminates at Kerr-McGee's **Jacobs Ranch Mine** (1978). Black Thunder is worthy of its name; in 1986 this Arco property became the biggest coal producer in the U.S. (output of 22 million tons, which means 2000 trainloads a year). Its silos load two trains simultaneously.

Two more 1 percent grades and 21.5 miles south of Reno comes Nacco Junction. From here a spur heads east to Peabody's **Rochelle Mine** (1986) and **North Antelope** (1983). And finally, 3 miles south of Nacco, at Milepost 65 on a new 10-mile stretch of double main, juts the lead to **Antelope Mine** (1985), owned by NERCO Coal.

Just before the Antelope switch, southbound trains dig in for a 5-mile, 1 percent climb that's punctuated by three long, train-retarding curves. Cresting Logan Hill you then begin a 5-mile, 1 percent drop. One more test of steel endurance awaits southbound loads on the Orin Line. From roughly Milepost 91 to MP 102 it's 1 percent to the crest of Walker Hill, with just one brief respite. After that, the run is mostly downgrade to Bridger Junction at Milepost 127.3.

This is what Burlington Northern wrought in less than a decade—a Niagara of traffic that spews from 4796-square-mile Campbell County almost as much coal as is mined in all of the 24,181-square-mile state of West Virginia (Campbell County itself is almost as large as Connecticut). And it all belonged to BN. In 1984 as many as 35 BN coal trains left the basin daily. At a time when oil seemed destined to reach \$90 a gallon and Powder River coal output increased at a 20 percent annual rate, the sky seemed the limit.

Short-lived prosperity

Good times for Burlington Northern lasted two years—maybe three



... but even with two-unit helper, the heavy train won't make much speed for the next 45 minutes as it climbs 1.25 percent toward Donkey Creek.

years and then came crashing down.

Perhaps the setback that stung the most had nothing to do with competition, operating costs, or train congestion, but with rates. Even a decade after stepping down as BN's CEO, Louis Menk is still rankled: "The utilities want to make all the money and cut out Burlington Northern. They have rates of return guaranteed by law. We don't. It has been a continuing fight."

Countless sons and daughters of attorneys had their college educations paid for by rate litigation against BN. Partly it was the railroad's fault. In the beginning, when you could count each week's coal trains out of Powder River on the fingers of two hands, BN priced the service on the basis of incremental

costs. It wasn't building new shops, buying hundreds of locomotives, or upgrading thousands of miles of track, so spending for crews and fuel was about all it worried about.

But soon BN was investing hundreds of millions a year in coal-hauling operations. Then rates seemed woefully inadequate. When it finally refigured costs to reflect its huge capital investments and then hiked rates by *force majeure*, the utilities went up in arms—and down to the ICC. Three major rate cases (in which at least 35 attorneys participated) wound their way through the commerce commission and courts. BN ultimately lost them all.

For sheer sound and fury, none surpassed that begun by the City of

San Antonio over rates to its Elmendorf (Tex.) power plant from Cordero Mine. The imbroglio lasted a dozen years. San Antonio, one of the first Powder River Basin customers, accused BN and Southern Pacific of price gouging—the rate per ton had gone from \$10.93 in 1976 to \$23.05 by the end of 1980. First, the ICC ruled that San Antonio had been undercharged by BN and SP in 1980-1981 to the tune of \$19 million, which the utility was told to pay. Then in 1986 the ICC ordered the railroads to pay twice that amount to San Antonio for overcharges between 1980 and 1984. Still later the two sides settled a complaint over rates during 1976-1980, resulting in a refund of about \$70 million to the city. In the interim, this political-



AFTER the long rate case, San Antonio coal now leaves Cordero Mine on C&NW, not BN. It's October 9, 1988, and train will load at 10:07 a.m.



WITH a pause in the action, BN helper engineer Richard Gilkey (above) takes a break in the pocket track at Belle Ayr Mine. In view from fireman's side later in the day (below), Gilkey's lead SD40-2 inches toward the rear end of a westbound loaded train at Rojo Caballo Mine.



ly charged dispute ended up in a U.S. district court, two courts of appeal, and the Supreme Court, and prompted Congress to insert "one-legged Hopi Indian" language into the 1980 Staggers Act deregulating rail rates to give the city special relief. (A Hopi provision is one that's artfully worded to apply to a single set of real-life circumstances.) For what it's worth, San Antonio signed with Chicago & North Western in 1985.

Arkansas Power & Light was next to put BN (and Missouri Pacific, now part of UP) on the rack. BN's initial rate to White Bluff, Ark., of \$12.78 was protested by AP&L two years before it even took effect in 1979. AP&L was paying \$18.75 by 1981, and \$22.62 the next year to a nearby plant in Newark, Ark. The utility unleashed its full litigious fury. In 1987 the ICC finally sorted out this incredibly complex affair: BN owed AP&L \$22 million. Long be-

fore, AP&L had become North Western's first Powder River client.

And Omaha Public Power went to the ICC in 1982 after BN raised by 53 percent its rates from Rawhide and Caballo mines to OPP's Arbor (Nebr.) generating plant. The shipper won—BN in early 1988 agreed to refund \$21.5 million. The important point here was that the ICC invoked a new policy for fixing maximum coal rates in the absence of competition: It said to imagine there were another railroad and to calculate what costs this efficiently run competitor would incur handling coal for several shippers. What rate, asked the ICC, would a competing railroad then offer? That, in essence, would be a fair price. By the time the ICC's decision came out there *was* competition, and to keep the business, BN cut its rate to OPP by 40 percent, according to reports. So maybe the ICC's tortuous reasoning made sense.

Enter the North Western

Where was Chicago & North Western all this time? Trying to find a way to buy into Powder River, and then banging on BN's door to be let in. C&NW spun its wheels seeking money to rebuild all 519 miles from Fremont west. In March 1974 Gene Lewis participated in a hi-rail inspection from Douglas to Fremont that lasted five days, and wrote in his diary: "A sobering experience. Now obvious that the present railroad cannot handle a single coal train. The line is literally a shambles. However, Chicago may not understand this."

Then in January 1975 a recession sent revenues in a tailspin—off 30 percent from year-earlier levels. Hundreds of employees were laid off, equipment was scrapped to raise cash, and capital projects were put on hold. The Powder River project seemed dead—an academic point, perhaps, since C&NW hadn't raised the first dime necessary to carry it out.

In September of that year of despair, however, Lewis was struck by inspiration: Don't rebuild to Fremont. Instead, build south from the east-west line along the Nebraska-Wyoming border to connect with Union Pacific. The topography was essentially flat, with only a bridge over the North Branch of the Platte to complicate matters. Lewis collected more maps, performed rough train simulations on C&NW's computer, and brought the results of what he dubbed "Project Yellow" to Larry Provo. While interested, the North Western president couldn't surrender his dream of hauling coal the entire distance east. Project Yellow lay dormant for nine months.

On June 2, 1976, just days after BN had given the North Western 18 months to pay its share of the joint line, Provo summoned Lewis. "Hey," he said, "refresh my mind on that idea of yours." Soon thereafter, Provo called his counterpart at Union Pacific, John C. Kenefick. "Larry said he was convinced that the North Western couldn't swing this deal on its own, and would UP be interested in participating?" relates Kenefick. "I said sure." Back west went Lewis to collect still more topo maps. On July 4th, as most Americans celebrated their nation's Bicentennial, North Western's assistant chief engineer-construction, James Brower, and his wife, Lee, compiled in their suburban Chicago kitchen an engineering profile of a North Western-Union Pacific connector line.

Just as things looked up, Larry Provo, 49 years old, entered a Chicago hospital on August 17, 1976, for diagnostic tests. Two months later he was dead of lung cancer. Again, the Powder River project languished. "You have to

More than one victim

I YOU first encountered Burlington Northern 323AA044 at 7:10 a.m. that day at Donkey Creek, bound from Belle Ayr Mine to Jeffery, Kans., via the Gillette-Alliance line. An hour later you watched it overtake a slower coal train at Kara, Wyo., and at 8:33 you photographed its meet with a train of empties on double track at Thornton. Then you headed back toward Gillette . . . until you heard the north dispatcher in Alliance calmly repeat over the radio at 9:09 a.m.: "You hit a truck, right? Over."

In succeeding minutes you eavesdrop on a human tragedy. You can hear only the dispatcher's end of the dialogue: Where did it occur? he asks, patiently gathering facts. Is the crew safe? Is the vehicle on fire? Have you found the occupants? Is an ambulance there now?

And finally, at 9:26 a.m.: "He's dead?"

The county road at Milepost 539.34 is adorned with sheriff's cars, ambulances, and fire trucks. The train's head end is three-fourths of a mile to the east, where it stopped. Around BN unit 5057 is wrapped the twisted remains of a truck tractor, its door thrown open to reveal an undisturbed red cooler and a lunchbox. The driver, a South Dakota man employed by a mine-reclamation company, had been thrown from the cab. He died instantly.

The young engineer of 323AA044 is distraught. "I never even saw the truck," he says, "on account of its coming from the left side. I had passed the whistle post, blown the whistle, and the first thing I know my brakeman on the left side is yelling, 'Oh s---!' And then the impact. I put the air in emergency right then and got on the radio [the reply to which you'd heard broadcast]. I remember being afraid we'd derail stopping this fast. Then I leaned out my window and could see the tractor being pushed in front of us. That's when I really saw what had happened."

Now BN mechanical forces are beginning to arrive. C30-7 5057 is a mess, the pilot crushed by the impact and handrails on



TRAGEDY at Milepost 539.34: Cooler is unscathed, driver is dead.

the left rear side tangled like spaghetti after being whiplashed by the trailer. Wood chips from the truck are everywhere. Several hours will pass before the tractor can be disengaged, the 5057 set out and exchanged for an operative locomotive, and the railroad returned to normal.

This is the side of railroading daddy never told you about. Someone is dead, but there's more than one victim. "When I hired out," says the engineer, his hands trembling, "the older fellows told me the odds were three out of four I'd kill someone someday." His trains had collided with vehicles twice before, with no worse effects than cuts and bruises. Now the awful percentages had caught up with him, and he'll never know why it happened.—F.W.F.

have heroes," says Lewis, "and for us it was Provo. This was his baby. He had guts, and the nerves of a card player."

Provo's successor, James R. Wolfe, put the budding deal with UP on hold. Says Kenefick: "He told me he wasn't sure he wanted to join up with us. He wanted to take a new look at going it alone." But UP, definitely wanting a piece of the action, set up its own task force to examine alternatives. (Historical footnote: About then, William S. Cook, executive vice president of UP's parent company, invited Kenefick to Manhattan to meet Richard Bressler, an Atlantic Richfield executive. Arco, of course, owned Black Thunder and Coal Creek mines, and ardently championed competitive access to Powder River. Says Kenefick: "Dick was making the pitch that we should put up money to help the North Western." Not a year later, Bressler went to BN as Menk's successor and began throwing darts at the UP-C&NW arrangement.)

By the time Wolfe was ready to negotiate in early 1977, Union Pacific had become fed up with the other railroad's waffling. UP proposed, says Lewis, that C&NW abandon from Chadron to Fremont and turn over its Wyoming tracks (including the joint line rights) to UP in exchange for a 2-cent-a-ton royalty (\$200 per loaded coal train) for 20 years. "Are you prepared to negotiate

this proposal?" asked C&NW's vice president-law, Richard M. Freeman, of UP people who came to Chicago. Told their offer was take-it-or-leave-it, Freeman slammed his portfolio shut, stood up, and announced: "The meeting is over. Good afternoon."

C&NW was on its own again. As the December 1977 deadline neared for C&NW's paying BN its half of the Orin Line's cost, Union Pacific informed the ICC that while it hoped C&NW would come up with financing, UP itself stood ready to step in "as an alternative, competitive carrier for Powder River Basin coal" if North Western dropped out. Hearing this, Menk at BN hit the roof. Says Menk now: "I told Kenefick I would consider a UP project into Powder River a total invasion of our territory, and that we'd fight it to the end." But the mere threat of direct entry by UP moved BN to give the North Western another two years' grace, to November 30, 1979.

North Western had a number of financing options left. It attempted to ask for help from the lender of last resort—the Federal Railroad Administration—for a loan of \$500 million to pay BN and do its 519-mile reconstruction. "But we all knew, deep down, that we'd never get it," says Lewis. "We needed more money than FRA could put into one project, and BN was having a cat-

fit in Washington over the proposal."

So back went North Western to negotiate again with UP. And it was this approach that finally bore fruit, in January 1980, in an agreement to build to the closest practical meeting point—Joyce, Nebr. Joyce is a siding on a Union Pacific wheat-gathering branch that turns north from UP's Overland Route transcontinental main at O'Fallons, just west of North Platte. UP had already rebuilt 115 miles of this branch to interchange some coal trains with BN at Northport. Its role now would be to improve the remaining 49 miles west to Joyce, and to provide \$60 million in interim financing to the North Western.

With well-heeled UP as a partner, C&NW in 1980 finally arranged a \$414 million line of credit from a consortium of banks. (A Manufacturers Hanover vice president told the Omaha *World-Herald*: "UP has terrific credit—very strong financially. I love to lend money to people that don't need it.") North Western's construction plan involved a new subsidiary, Western Railroad Properties Inc. (WRPI, or "Werpy" for short), and read like this:

- Build a new, 56-mile line along the Nebraska-Wyoming state line between Joyce and a meeting point with the Chadron-Casper route at Crandall, Wyo.—the same Project Yellow path laid out by C&NW engineer Brower in



HEADED for Oklahoma Gas & Electric in Fort Gibson, Okla., two each C&NW and UP SD60's take loads off the joint line and enter North Western territory at Shawnee Junction, Wyo.

1976. Crandall is named for Milton H. Crandall, C&NW motive power superintendent who died on the job in January 1979.

- "Rebuild" 45 miles of the Chadron-Casper line, westward from Crandall, to Shawnee, Wyo. In fact, this became 45 miles of new railroad—the only thing North Western didn't discard was the right of way.

- Construct the 6-mile Shawnee Cutoff between Shawnee and the BN at Shawnee Junction, 10 miles up the coal line from Orin.

BN, indignant, balked at reviving the joint-line accord, telling the ICC that it had risked its own money to build the Orin Line. North Western had agreed in writing to bow out if it couldn't hold up its end of the bargain by 1979. Now, with traffic booming and the risks lessened, C&NW wanted in. Hey, a deal's a deal!

A private, anti-competitive deal between two railroads is no deal at all, the ICC replied. The commission hadn't set a deadline for C&NW's entry into the basin. Nor had it sanctioned any pay-up-or-drop-out pledge by the North Western. The ICC reaffirmed C&NW's right to enter the Basin in 1981. There followed some 18 months of protracted negotiation over what North Western owed Burlington Northern to become half-owner of the Orin Line. Finally losing patience, the ICC set the price at \$76 million, a sum equal to half the original cost plus 14 percent interest and minus depreciation. Says C&NW's vice president-operations, Richard J. McDonald: "The commission never backed away from its commitment to competition. We got our reprieve."

The two railroads signed the documents in October 1983, but the North Western didn't wait on formalities. Al-

ready it had surmounted environmental challenges (involving threats to such species as the black-footed ferret and the blowout penstemon) and had begun the previous June to bridge the 107-mile gap between Joyce and the joint line at Shawnee Junction. And what a job it did. "Dollar for dollar and pound for pound, it's the best piece of railroad in the world," says Carlisle, Western Division manager for C&NW. "Give us superelevated curves, and I'd have no compunctions about running a passenger train over it at 150 mph."

North Western learned from Burlington Northern's experiences. BN had laid the Orin Line atop native soil, hastening the rise of dirt into the ballast. Once North Western finished grading, it replaced unstable soil with other material and packed this subgrade to maximum density. Then it rolled an eight-inch-thick mat—a combination of aggregates and crushed fines from ballast—onto the ground. When rains fell, the mat set like concrete, creating a thick barrier that prevents water from seeping into the subgrade and keeps dirt from percolating up.

As for steep grades, only one became unavoidable: Myles Hill, a 7-mile, 1 percent climb for loaded trains starting 10 miles south of Shawnee Junction and ending at Myles siding. (North Western spaced 3-mile-long sidings at approximately 20-mile intervals.)

Two new terminals supported the C&NW-UP effort. One, at South Morrill, Nebr., just east of Joyce on the UP, is the hand-off point between the two railroads; it holds four trains. Some 145 miles to the northwest, on the Orin Line itself at Bill, Wyo., C&NW erected a four-track yard capable of holding seven unit trains.

All this was accomplished in a 14-

month frenzy of construction. On August 15, 1984, unit train NANWC-001 left North Antelope Mine behind SD40-2 6935 and two UP C30-7's and tied up for the night at Braun, Wyo., 40 miles north of Joyce. At ceremonies nearby on the Wyoming-Nebraska state line the next morning, with cannons firing and marching bands blaring in the open countryside, NANWC-001 made it official—the first Chicago & North Western train had left Powder River Basin. Eugene Lewis, who had retired from C&NW in 1980 at age 54 to enter another business, was there as a guest of the UP, "snapping photos as fast as I could run the film through." But it was a modest beginning—North Western's train frequency was one every other day, from North Antelope to Newark, Ark., on the UP (MoPac). CTC wouldn't be added for another two years.

North Western no sooner entered the Orin Line than it went back to the ICC, seeking to extend its reach. Joint track was never envisioned all the way to Donkey Creek. Indeed, Provo had forsworn any right to go north of Coal Creek Junction (Milepost 26.2) in the joint-line accord of 1975—a provision the ICC had disallowed at the time as anti-competitive. Mines north of Coal Creek were upset at the lack of two-railroad access, and with half its \$414 million line of credit still unused, North Western was happy now to oblige them. (In the meantime, Sun Company had simply built its own 1.5-mile extension from the Cordero Mine lead to Coal Creek Junction to give C&NW entry.)

Again the Interstate Commerce Commission went against BN. In late 1985 it gave C&NW permission to build north 10.8 miles—from Coal Creek Junction to East Caballo Junction—to reach the four mines on the Orin Line still served exclusively by Burlington Northern. North Western had surveyed a route and was about to let contracts when BN in late 1986 agreed to extend half-ownership to East Caballo Junction, for \$27 million.

BN rebuilds

Bad enough that utilities dragged Burlington Northern's name through the mud in rate battles, and that upstart Chicago & North Western had succeeded against the odds in becoming now half-owner of one of the world's most lucrative railroad lines. By early 1984, BN awoke to the fact that its key coal-carrying corridors in Powder River country were in utter disrepair. The Orin Line, still almost brand-new, was not the problem. But BN's other main lines in the region were being beaten to shambles by the relentless blows from coal cars.

Case in point: the Alliance-Ravena subdivision. BN finished laying new



ALTHOUGH P811S No. 1 does the heavy work—laying rail, inserting ties, and tamping ballast—track fasteners still require the human touch.

Emergency surgery

I WHAT does Tamper Inc.'s P811S No. 1 do? Pull spikes? In style! Remove welded rail? Oh, yes. Take out the wooden crossties? Certainly. Install concrete ties? That much is clear. Put new rail in place? Well, yes. Adjust the gauge? Yup. If you asked it to, P811S No. 1 would probably plant daffodils along the way, while scrambling eggs and brewing coffee for the extra gang. It's one hell of a machine.

You're witnessing emergency surgery at Milepost 100 on the Orin Line, 15 miles south of Bill, Wyo. Ten years of almost unprecedented use has reduced this once-new right of way to a sad state. Rails are snapping. Filthy ballast pumps mud each time it rains. The approaching bitter winter would only worsen matters.

To the rescue comes P811S No. 1. Burlington Northern Roadmaster Lynn Terry explains what's happening, because unless you all but stick your head inside the machine it's not all that obvious.

The P811S is winching itself, a string of 16 flat cars with added upper decks, and two idling work-train locomotives along at a 1000-foot-per-hour pace. All the while, the spikes are removed, the old rail lifted away, the ballast plowed aside, and the tie plates picked up (the latter task performed by two men stationed in the bowels of the machine).

Here's where it gets tricky: An instant after one set of arms from the P811S plucks a 175-lb. wood tie off the roadbed, another pair of steel fingers descends from above with a 600-lb. concrete tie, laying it at four-inch-wider intervals. Just then human hands (these people are all but invisible) lay rubber pads on the new ties.

Seconds later the new welded rail is slid atop the pads and ties and mechanically aligned. You inspect the rail being taken out; it's from CF&I Steel, the old Colorado Fuel & Iron at Pueblo, Colo., a mere three years earlier.

Now step back and look at what else is going on: Those 16 bilevel flat cars are linked along the top by rails across which three gantry cranes continuously slide. The crane most removed from the P811S brings concrete ties forward and deposits them, retreating with a set of old wood ties it stacks farther back. The middle crane shuttles the old ties backward and the new ties forward. The third crane lays the concrete ties in front of the mechanical arms, then scoops a stack of wood ties to begin their journey toward the first crane. Confusing, yes, except that everyone seems to know exactly what they're supposed to do, even if you don't.

Immediately to the rear of this work train, one crew puts welded-rail fasteners in place, while another welds machines that tighten them into place. Behind all this comes an undercutting machine that lifts the new track, throws out the dirt and mud, and sets the ballast back in place, and behind that is a tamper machine to realign the ballast. *Enough!* you say. But that's not all. The whole process is being repeated a few miles north by still another P811S and its accompanying regalia. Together they are rebuilding the Orin Line at the rate of 20 miles a week, using a total of 110 people to do what several times that number used to take several times as long to accomplish, and (all hope) doing it better.

Chicago & North Western's V.P.-operations, Richard D. McDonald, came all the way from Chicago to watch this armada spend his railroad's money, and went home a happy man. Do you blame him? Weeks after its co-owners had decided the Orin Line was in danger of wearing out, they had practically replaced the old railroad with a new one.—F.W.F.



FRESHLY rolled welded rail rests atop new concrete tie east of Bill.



C&NW'S McDonald (left) and Western Division chief Dallas Carlisle.



welded rail across this 238-mile stretch in 1979. "But the track wasn't maintained the way, in retrospect, it was supposed to be," says Ron Bacon, the Alliance-based assistant superintendent for maintenance. "We took out 112-pound rail that had seen more than 1 billion gross ton-miles, and thought we had solved the problem. We hadn't." Dolomite, a limestone-like rock used as ballast, was dissolving from effects of water and the weight of traffic. In 1984 the track was down in the mud again—everywhere. The process of restoring this one subdivision to higher standards would last five years, into 1989.

To a greater or lesser extent, most of the old Alliance Division (bounded by Ravenna on the east, Sterling on the south, Casper on the west, and Gillette on the north) was in similar straits. In just January and February of 1984, no fewer than 1669 crews ran afoul of the 12-hour "hog law"—the government's

maximum Hours of Service Act—and had to be rescued on line. BN paid taxi drivers \$1 million-plus that year just to recrew stranded trains in the Alliance area. Remarks Al W. Ricket, now superintendent of operations in Gillette: "We had more crews on the highways than on the trains."

But that was only a fraction of the extra costs BN paid. Two crews or even three did the work that should have required just one in an efficient operation. Plus, when the hog law waylaid trains willy-nilly across the division, all semblance of efficient use of manpower dissolved; during that same January and February in 1984, BN paid 7500 hours of "alimony" compensation to crews for failing to call them at their away-from-home terminals within 16 hours of their arrival—perhaps five to six times an acceptable occurrence.

BN installed a new set of managers in Alliance in 1984 to bring order

from this chaos. Much-needed track work was begun, too. From an operating viewpoint, the critical task was to reduce the number of trainsets needed to deliver coal. "BN has 168 trainsets operating now," says ex-dispatcher Hibbard, "but it was up to 250 in August of 1984." That was no badge of honor. "Utilities determine the number of sets that run. Imagine that each utility has one big stockpile of coal with two dotted lines running across the center of it. When the coal pile goes below the bottom dotted line, they put more sets of trains into service; when it gets above the top line, they take sets out. The more trainsets you have, the more locomotives you need. Nobody has enough locomotives to keep 250 trainsets moving, so then you underpower trains and get even more congestion, more delays, and still more trainsets in service."

This proverbial vicious circle caused transit times on the Alliance Division



IN panorama looking north from atop 200-foot silo at Caballo Mine, BN train slowly loads coal at 8 a.m. on October 13, 1988. Destination: Nearman, Kan., on UP's former Missouri Pacific.

the route that summer and agreed that work scheduled for 1989 and beyond couldn't wait. The rate of defective rail—six failures per mile per year—was two to three times the acceptable level, and getting worse. "Had this rail totally failed the next winter, we'd have been up the creek," says Carlisle.

Here's a route built from scratch to the finest standards BN knew to employ in the late 1970's. Imagine, then, that the track structure would literally be worn out in less than a decade. You can figure that 136-lb. (weight per yard) tangent rail is good for 1 billion tons of hammering from above. The southerly 60 miles of the Orin Line, south of Reno, see that much traffic in seven years. Rail on curves, no matter how head-hardened, succumbs in two or three years. Also, consider the impact of this traffic volume on roadbed. Weight pushes the track structure down, and rain pushes the dirt up. Presto—mud in the ballast. Sums up BN's Bacon: "Rail degradation and subgrade decomposition occurs so fast that what happens everywhere else over five years of pounding happens here in one."

In late 1988 BN and C&NW employed the best technology they could find to reverse this process on the Orin Line. Rail rolled as recently as 1985 was taken out. Twenty miles of concrete ties went into place, and 40 more were scheduled for 1989. Behind the rail gangs came the undercutting machines to clean dirt out of the ballast, and behind them moved ballast trains to spread granite more than a foot deep.

A choice of exits

Because of the way its lines encircle the basin, Burlington Northern is blessed with enormous operating flexibility. Its coal trains radiate in two major ways from the southern Powder River. One is the "central corridor," from Alliance through Ravenna to Lincoln, thence choices to Kansas City, Iowa, and Illinois. The "southern corridor" extends from Alliance, or Guernsey, to Northport, thence Sterling, Brush, Denver, and down the Santa Fe-Rio Grande Joint Line to Pueblo, Colo., and on to Texas. (The "northern corridor," eastward along the former Northern Pacific main line, is fed by mines in the Montana portion of the Powder River Basin.)

But traffic reaches those corridors in more ways than one. For instance, trains bound from Black Thunder and Jacobs Ranch mines, halfway down the Orin Line, usually exit the basin south via Bridger Junction and Guernsey, then at Northport either turn north to Alliance and thence southeast to Ra-

venna, or south toward Sterling and Denver. But if circumstances require, they can as easily go by way of Donkey Creek. From mines north of Reno, trains for Ravenna go to Donkey Creek, then turn toward Alliance; those headed for Colorado and Texas go south by way of Bridger Junction. Yet, it could almost as easily be the other way around.

This flexibility paid off handsomely in 1988, a year that saw coal loadings on BN almost return to the pre-competition levels of 1984. When rail-laying gangs closed the Orin Line south of Reno for 8 and 10 hours at a time in autumn 1988, BN simply rerouted all the empty trains from Texas via Alliance and Donkey Creek, then south for loading. That night, with the track open, these trains, loaded, left the Basin through Guernsey. All the while Chicago & North Western traffic, with no such options for rerouting, simply sat and waited. Were the Gillette-Alliance line to be shut, no problem—everything would go via Guernsey.

You'd think BN could save a lot of time aiming coal traffic for the southern corridor straight south from Wendover to Denver on the old Colorado & Southern—it's 86 miles shorter than through Northport and Sterling. But this scenic line skirts the east slope of the Rockies. There's a knuckle-busting, 1.6 percent grade at Altus, 40 miles north of Cheyenne, and others in Colorado. The old C&S also bisects Colorado State University's campus in Fort Collins and has mid-street running there and in Longmont, Colo. "We'd have tied up that town 20 hours a day," says retired Chairman Menk of Fort Collins. Downing once had ordered a feasibility study of running on the C&S. "You could reduce Altus Hill to 1.25 percent by relocating and working in more distance, and south of Fort Collins there are two or three options," he says today. "But doing this would have cost hundreds of millions, and so long as you can handle everything on the lower-grade line, why bother?" There's a power plant just south of the state line, but otherwise Wendover-Denver remains a non-player in BN's coal trade.

In round numbers, by late 1988 Burlington Northern delivered 25 empty trains a day to Campbell County mines and left with a like number of loaded trains. Roughly 15 coal trains headed down the central corridor to Lincoln each day, and the other 10 went by way of Denver. Mines from the Decker area contributed another daily train or two to both corridors.

Alliance, 12 hours by coal train from the nearest mine, and now a city

to soar to as much as 180 percent of schedule. Hibbard: "Our big task was to improve performance so that utilities would take trainsets out."

Within two years, all the key indicators of efficiency were back on track. From 943 hog-lawed crews in February 1984, the number fell to 64 in the same month of 1986, and to a mere 3 crews in February 1987—a mind-boggling accomplishment in view of the long history of train congestion. By late 1986, coal trains could make up rather than lose time on the Alliance Division. All this occurred around a rebuilding program that entailed untold numbers of work trains and extra gangs, and the spreading of more than 10,000 tons of granite ballast beneath rails of this division *each week*.

The same toll of wear and tear became visible on the Orin Line by 1988. C&NW Division Manager Carlisle and BN's maintenance chief Bacon surveyed



ON a typical day, underground fuel tanks at Alliance diesel facility (above) will dispense 200,000 gallons. BN's Seattle-Houston intermodal train 92 (below), one of only two non-coal Orin Line trains, slips through curve near Haire siding.



of almost 10,000, is the pivot for most of this business. Imagine Alliance terminal as a Y lying on its side. The stem points southeast, toward Ravenna and Lincoln. Along that stem is North Yard, a 30-track affair that surrounds the shop. Loaded trains headed east to Ravenna hang around only a few minutes to an hour at most.

Empty trains spend more time, however. They bypass North Yard on a dog-leg track and turn south to tie up in the 10-track South Yard, which points toward Northport and Sterling. Locomotives are changed, the equipment is inspected, and each trainset is brought up

to ideal size (110 to 115 cars, depending on the customer). Spare cars for each trainset—roughly two-thirds are owned by utilities, the rest are part of BN's coal-car pool—are kept on hand in an eight-track pocket yard at the north end of South Yard for this purpose. Then fresh power comes from the shop, and off the train goes (its equipment now heading the opposite direction if the train runs north toward Edgemont and Donkey Creek). All this usually consumes three to four hours.

Thrown into this mix is BN's expanding conventional traffic running the Ravenna-Alliance-Gillette corridor

—intermodal trains 20, 21/22 and 24, priority freights 120/121 and 122, and cleanup trains 223/224. You'll also see a unit grain train going northwest every few days. The only noncoal trains scheduled on the Orin Line are 91/92, Seattle-Houston TOFC runs routed Laurel-Donkey Creek-Bridger Junction-Wendover-Cheyenne-Denver.

A madhouse? you ask Dave Clifton, Alliance terminal superintendent. "A controlled madhouse," he replies. "It's so systematic around here, and these people are so good at what they do and so used to it, that it all becomes routine. We're running between 37 and 50

Pick a number

1 199TT084 and BTRRC-199 are two ways of saying you're hauling the 199th trainload of coal in 1989 from Black Thunder Mine toward Oklahoma Gas & Electric in Red Rock, Okla., on the Santa Fe. The only difference is who does the hauling—BN in the first instance, C&NW in the second.

Burlington Northern's eight-digit symbol for coal trains is deciphered like this:

First three digits: How many trains up until now this year from a particular mine to a particular destination; returning empty, the train will retain that number.

Fourth and fifth digits: The two-letter code for the mine (see the table at right).

Last three digits: The location taking delivery. Even numbers are loaded trains, odd numbers empty. OG&E at Red Rock in this example would be 084/085. Other examples: Basin Electric Power Coop in Moba (Wheatland), Wyo., on the Wendover-Denver line, is 070/071; Southwestern Electric Power in Welch, Tex., on the Kansas City Southern is 014/015; and Commonwealth Edison in

Powerton, Ill. (Pekin), on the Chicago & Illinois Midland is 016/017.

Now for the North Western:

First two digits: The two-letter origin symbol (see table).

Third and fourth digits: The two-letter destination symbol.

Fifth digit: "C" for loaded (coal), "X" for empty.

Last three digits (preceded by a hyphen): The number of such cycles this year up until this one.

C&NW's 17 (as of early 1989) utility destinations include Arkansas Power & Light in White Bluff (WB) and Newark (NW), Ark.; Louisiana Gasification in Plaquemine, La. (PQ), City Public Service in San Antonio (SA) and Wisconsin Power & Light in Columbus, Wis. (CP)—and of course, Red Rock.

Below are Powder River Basin mines in Wyoming and the letter designations they carry on each railroad:

	BN	C&NW		BN	C&NW
Antelope	AT	AT	Cordero	VV	CD
Belle Ayr	AA	BM	Eagle Butte	HH	—
Black Thunder	TT	BT	Fort Union	FF	—
Buckskin	JJ	—	Jacobs Ranch	KK	JR
Caballo	QQ	EC	North Antelope	NA	NA
Caballo Rojo	MR	RO	Rawhide	RR	—
Coal Creek	CK	CK	Rochelle	RC	RM

trains a day counting manifest and TOFC traffic [piggyback trailers and containers]. Other spots on this railroad may be just as busy, but hardly anything passes here untouched."

Guernsey, a far smaller terminal than Alliance, serves the same function for southern corridor coal trains that miss Alliance. Out of both Guernsey

and Alliance, empty trains are fully powered—15,000 h.p. (i.e., five units)—for the grades they'll confront when loaded.

Powder River's iron ponies

Burlington Northern assigns 590 six-axle (C-C) high-horsepower locomotives to its 168 (as of late 1988) Powder

River trainsets. They are augmented by 125 or so units of connecting railroads that are on BN tracks at any one time (including Santa Fe, Southern Pacific, Kansas City Southern, Union Pacific, Soo Line, and even North Western). Star performers are 100 blue-and-white 3800 h.p. SD60's, the 9000-series "Oakways," owned by an invest-



ROLLING toward Rojo Caballo Mine from Kansas City Power & Light, 84RC109 leaves Guernsey and crosses North Branch of the Platte River.



WYOMING'S "most curious crew-change point": Bill, where brand new complex of offices, 46-room hotel, and beanery, to the right of SD60 8049, overlooks C&NW's four-track yard.

ment group of that name and leased to BN on an unusual basis: The railroad pays not by the day or by the mile, but by the kilowatt hours racked up on a meter inside each unit. So the harder these 3-year-old engines work, the more it costs.

The rest of the Powder River pool, all rated at 3000 h.p. each: 100 SD40-2's, built by GM's Electro-Motive Division in 1976-1979; 240 General Electric C30-7's, circa 1976-1980, and 150 GE U30C's that date back to 1972 and are due for replacement with SD60's.

All but the Oakways, now based at North Kansas City, Mo., after an initial stint at Trinidad, Colo., are maintained inside the giant Alliance shop. This is the province of Ken Hofacker, who was a supervisor at the old 12-stall Alliance roundhouse in the mid-1970's and returned in 1984 to run the new complex. "We do more under one roof than many Class 1 railroads do everywhere," says Hofacker, who proceeds to reel off the vital statistics. Each month, 200 power assemblies are changed out, 75 traction motors replaced, and eight entire prime movers switched . . . not to mention performing running repairs on 12,000 coal cars and servicing perhaps 250 locomotives each day.

Talk to BN engineers and you'll hear pretty much the same stories about the coal-pulling locomotives: The SD40-2's are great runners but so noisy under full load that bats eventually enter your belfry. The U30C's that pioneered the Powder River coal business are tired old belchers—you can see them coming 10 and even 15 miles away by their black smoke signals. The C30-7's can really dig down and lug. The almost-new Oakway SD60's do about everything well.

Hofacker agrees with his engineers.

"The U30C's have been around so long I gave one to a museum in Gillette," he says. "They've got about 1.2 million chassis miles, and the railroad is in a decision process on their leases, which are coming due. The C30-7's are mostly at 1 million miles, and we're giving them major overhauls; they come out close to new and will be good for another 10 years." The SD40-2's, averaging 750,000 miles, are still going strong; another 100 such units, based in Glendive, Mont., comprise the northern corridor fleet.

Assembling 15,000-h.p. sets is quite often a mix-and-match affair. The Oakways are first choice. They can be matched two-and-two or three-and-one with SD40-2's or GE's. Why not four Oakways (15,200 h.p.) on the point? "A little bit on the wasteful side," replies Hofacker, "though we've made it to the mines and back with just three SD60's."

If Oakways aren't available, trains will depart Alliance and Guernsey for the mines with every conceivable consist of five GE and SD40-2 units. Engineers aren't always happy with the results. Engineer Lee Gillespie: "I like the newer GE's [C30-7's] best—they really pull. When you get older GE's [U30C's] in your train, right away they start slipping." And engineer Gilkey: "Put the EMD's together with older GE's, and the EMD's end up doing all the work."

Once back to Alliance, loaded trains shed 6000 h.p. and head toward Ravenna with 9000 horses. For a time in the power-short days of 1982-1984, BN tried sending trains east with two units. It worked, to a degree. Recalls Operations Superintendent Ricket: "Well, two locomotives will get a loaded train to Ravenna. But if you lose one, you're dead. And if all the trains behind you and the

empties going the other way have just two units, too, nobody can give you a unit. Soon the whole subdivision is tied up over one bad-ordered locomotive." BN reverted to three units, Ricket says, and the subdivision became fluid immediately. Southern corridor trains keep five units all the way through Colorado, and get helpers on the Joint Line.

Burlington Northern made some other cost-saving changes. Until mid-1985, crews out of Edgemont and Guernsey brought empty trains to the mines and stepped off, to be replaced by Gillette-based "loading" crews, who in turn handed loaded trains over to outbound crews upon leaving the mines. Says Hibbard: "Somebody—I never did find out who, but it wasn't me, unfortunately—had the idea for the crew on the empty train to load it, too. This wasn't popular with the troops, since it increased their time on duty while not significantly increasing their pay." But it eliminated most loading crews. If a loading crew is called these days, it will usually handle two or three trains before tying up. Today a single Edgemont crew often makes the complete round trip within its 12 hours.

But rarely can the same railroaders out of Guernsey reach a mine, load, and return without hogging. Their trains have both a long one-way haul—Guernsey to the closest large mine at Black Thunder is 146 miles—and Chicago & North Western to contend with. From a standing start just five years ago, C&NW now runs roughly 11 loaded trains a day out of Powder River to any one of 17 destinations. Add these to the dozen or more daily BN round trips via Guernsey and you have the makings of real turtle soup on the south half of the Orin Line.

North Western's standard operating procedure is simplicity itself. Fifteen minutes after Union Pacific delivers an empty, caboosless train at South Morrill (about 15 percent of BN coal trains employ cabooses), C&NW people already have it past Joyce 3.5 miles to the west. Some three hours and 107 miles later, they're going through the turnout at Shawnee Junction and entering the joint line (which is dispatched by BN).

Another 35 miles north from Shawnee Junction brings the empties to Bill, surely Wyoming's most curious crew-change point. All of six people call Bill their home. Before North Western arrived you'd have seen just a small general store, plus BN's temporary depot while it lasted. Now look at it: a railroad yard, a large PLM Co. facility that repairs utility-owned coal cars, and a spanking-new C&NW building containing offices, a 46-room hotel, and a beanery.

South Morrill-based crews lay over



FILLED to the brim, eastbound loads hold at East Walker for westbound empties, which are in a shuttle between Caballo Rojo Mine and Basin Electric Power Co-op in Wheatland, Wyo.

in Bill, replaced by 1 of 15 crews assigned to run to the mines and back. Then a rested South Morrill-based crew brings the loads back to UP—a 20- to 22-hour cycle when all goes well.

"This is not labor intensive—you see damn few people," says Dallas Carlisle. "That's the nice thing about starting up a new operation. We were able to get gobs of new technology. We have only one clerk each shift in Bill." About 90 percent of the crews themselves transferred from C&NW jobs back east, mostly on the St. Louis line.

Like BN, North Western messed around with horsepower levels and locomotive combinations. It began with four-unit combinations of SD40-2's, all freshly painted in C&NW's current "lime

yellow" (and described, off the record, in less-flattering terms) with large numerals. Then came 30 new SD60's for exclusive use on Powder River trains. "We went to three SD60's," says Mike Wirtz, the trainmaster at Bill, "but this put us right at the limit of rail adhesion. And going up those 1 percent grades in summer, traction motors would heat up, causing the locomotives to automatically reduce power to save the motors. Then we'd stall."

Solution: C&NW settled on two SD60's on the point, followed by two SD40-2's (usually UP units)—a 13,600-h.p. combination. The two trailing units are kept in idle from South Morrill until the loaded train leaves the mine. And when their train tops Myles Hill

18 miles after re-entering North Western track, they're isolated again because the rest of the run is primarily downhill.

Co-existing in the trenches

Throw two fiercely competitive railroads together in Wyoming, and what happens? At the corporate level, what you'd expect—aggressive solicitation of business. Far removed from the trenches, you won't find many BN people bestowing compliments on North Western's behavior, or vice versa. But close to the ground it's a different story. "We got together a long time ago and said, 'Let's make this thing work,'" says Carlisle. "You can't play games, because the mine knows your train is coming and puts your coal in its silos. My crews may say they're being screwed to death by BN dispatchers, but I always find it's because we show up on the joint line or at the mine sooner than we'd said."

Coal trains do sit around and wait a lot, but that's mostly because of the nature of coal loading. One railroad or both may have two, three, four, or even five trains converging on the same mine at the same time. Few mines can load more than one train simultaneously, and the loading itself is subject to frequent delays because of malfunctions or coal-quality problems. Figure on a minimum of three hours getting a train in and out.

"You can't just park a train on the main line to await its turn," says BN's Hibbard. "Pretty soon you'd have half a dozen stopped behind it. You need foresight." To pace bunched-up traffic heading toward a mine, the starting times for crews of empty trains are adjusted in Edgemont, Guernsey, or Bill. But foresight works only to a point. There are so many variables—train-meet delays, engine failures, track-maintenance halts, silo breakdowns—that no amount of planning can anticipate everything.

You occasionally end up with fates such as befell North Western's HSECX-012 beginning October 12, 1988. Hauling empties from the Sheboygan (Wis.) plant of Wisconsin Power & Light, it reached South Morrill about noon, but was held six hours because of track work on the joint line. Caballo Mine, 212 miles to the north, was told to expect it at 6 a.m.—later changed to 7.

The mine crew departed Bill with HSECX-012 at 3:30 a.m., just about perfect for reaching Caballo at the appointed hour. There was only one problem: Caballo had agreed to take BN's 59RR029 first, and the BN train (from a Kansas City Board of Public Utilities power plant in Kansas) reached the mine almost three hours after its anticipated 4 a.m. arrival.

Good intentions went by the boards.



C&NW-UP six-motors bring a soon-to-be-very-tardy HSECX-012 of October 13, 1988, off the main line and into Caballo Mine at 10:01 a.m.

The mine wasn't ready for BN's train, so 8 o'clock came before the first car was spotted in the headhouse. North Western's train, waiting in Haire siding within sight of Caballo's silos, did not begin moving to get in line behind 59RR029 on the Caballo loop until after 10 a.m., and by the time it was loaded in early afternoon the crew had about exhausted its 12 hours of on-duty time. So the outbound C&NW train, now symbolized ECSHC-015, tied up in Haire siding until a new crew could be taxied there in late afternoon. Taken to Bill and called for 12:20 a.m. on October 14, it got trapped waiting for a flurry of northbound C&NW and BN trains—trapped so long, in fact, that the crew was sent home. Then came a 10-hour curfew for the rail-laying gangs. ECSHC-015 finally arrived South Morrill at 2:30 a.m. on the 15th, more than 62 hours after it had left there empty.

A common occurrence? No, but an object lesson of the ways that a little miscalculation can magnify delays to a train. South of Reno on the joint line, where 45 trains a day and 145 million gross tons a year are the norm, domino effects of this sort can start with a pulled drawbar, an overheated traction motor, a broken rail, or a dispatcher's inattention. Or take Crawford Hill: BN keeps as many as three sets of three-

unit SD40-2 helpers on duty at the foot of this grade, but if Edgemont disgorges five loaded coal trains in a hour, you're guaranteed a backup.

Finally, remember this perverse law of modern railroading: The more tonnage you run, the more often you must close up shop for track repairs, and the less actual capacity you enjoy. Hibbard left the chief dispatcher's job in 1988 for

another assignment but won't soon forget his frustrations every April to November seeking track time for the maintenance-of-way gangs. "There's no natural break, when nothing is coming," he relates. "So you force matters, and end up holding dozens of trains to make a window for the maintenance people to do the work. You can even come in at 10 the night before, survey the traffic,



EAST of South Morrill, Union Pacific can keep a loaded 14,000-ton train moving with only one SD60, as wide-nose 6098 demonstrates leaving joint UP-North Western yard in March 1989.

and conclude a line will be clear by 8 the next morning. Then two hours later everything has gone to hell—mines can load quickly, or they can take forever.”

Such is the price of success. Any railroad's chief financial officer would gladly endure (and pay to correct) operating problems of this sort. On the Orin Line this year, yet another double-track segment may be built between Bill and Logan, to slash train-meet delays. BN may ultimately convert the entire Powder River region to double track, if only to cope with maintenance shutdowns. It has studied a more unusual option—running trains around the Powder River “circle” in one-way fashion, all empty trains going via Edgemont and Donkey Creek and all loaded trains via Bridger Junction and Guernsey. The advantage is that two crews could conceivably run the entire circle; the disadvantage is the huge cost of relocating Edgemont-based engineers and trainmen.

Meanwhile, North Western ordered 30 of General Electric's state-of-the-art 4000 h.p. C40-8's which should be on-line as you read this, replacing SD60's operating out of South Morrill. Having tested the GE units in 1988 with great success, the railroad planned to use three of them to do the work required of four SD60's or SD40-2's. BN gave EMD the go-ahead for as many as 200 SD60's, many of which will replace the aging U30C's on the point of Powder River coal trains. On UP's C&NW coal connections across Nebraska, you'll find a single new, wide-nose SD60.

And this is only the beginning. Analyst John Kawa at Dean Witter Reynolds contends that another surge in demand for coal to produce electricity is inevitable in the early 1990's. The last nuclear plants will come on line in 1991-1992, he points out. New hydro capacity isn't being built, nor is oil and gas expanding as boiler fuel. Meanwhile, electricity demand steadily climbs, and concerns mount about environmental effects of high-sulfur coal. Given these facts, you don't have to be a genius to conclude where utilities will turn for fuel. Even if Campbell County production doubled overnight, there's enough to last another century.

So this isn't the end of the Powder River country story—only its opening verse. **I**

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DAWN at Donkey Creek: Part of Burlington Northern's Powder River tidal wave rolls east.