

The Moffat



Coal Road

The unfinished product of a rail baron's bold vision still makes for dramatic railroading in the Colorado Rockies

BY MARK W. HEMPHILL

PHOTOS BY THE AUTHOR

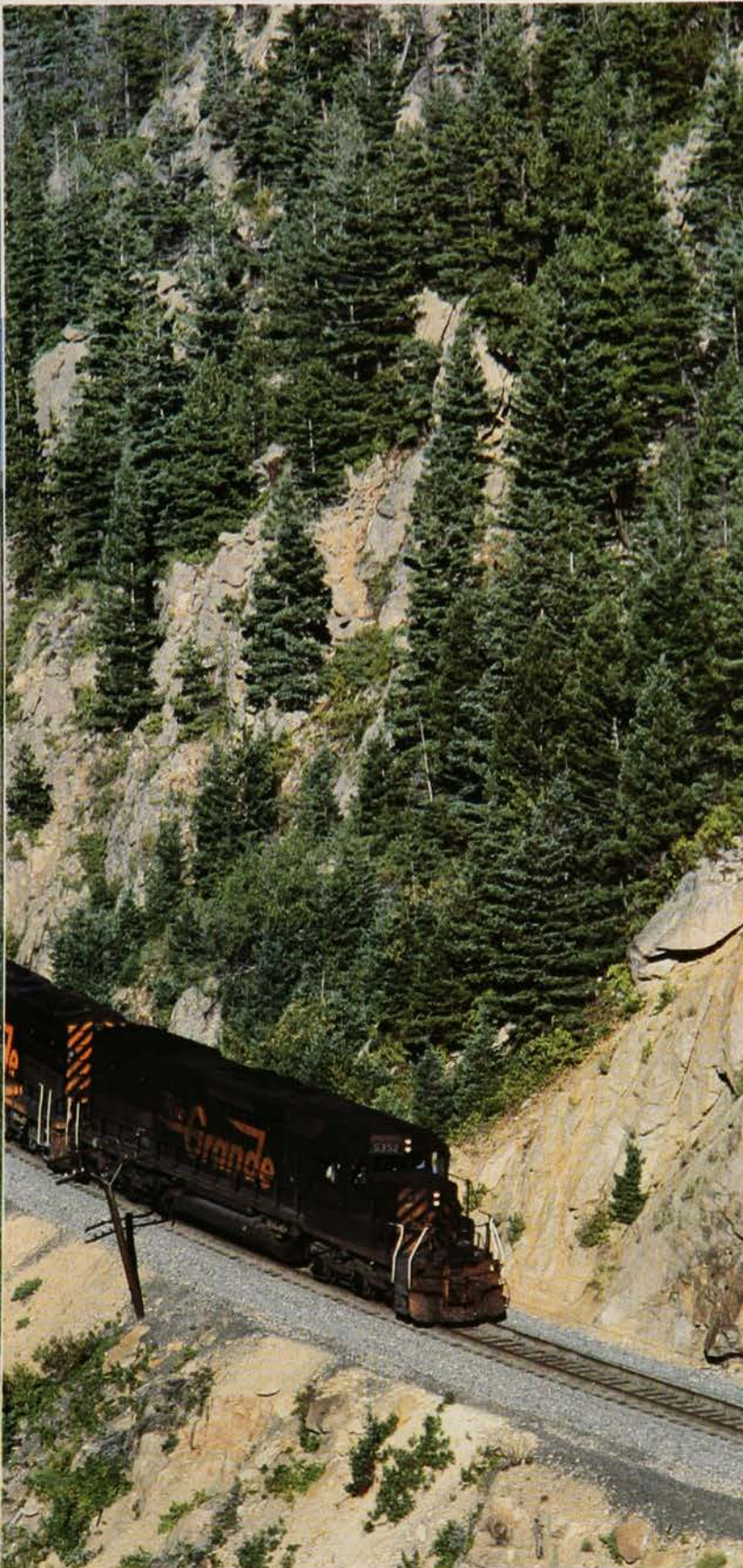
IN 1909, David Halliday Moffat Jr.—mining magnate, bank president, railroad builder—was tired and ill. He had dissipated his fortune pursuing his dream of a direct rail connection from Denver through the Rocky Mountains to Salt Lake City. On this, his ultimate gamble, he had underestimated the odds. The Denver & Salt Lake—“the Moffat Road”—had stuttered to a dead end in Colorado’s empty northwestern quarter. It would seem the mountains had won.

A look at a map of the United States circa 1909 reveals the loneliness of the Moffat Road. Everywhere in Colorado there was a maze of railroads, everywhere! Except where the Moffat Road went. To all intents—and it surely must have seemed such to Wall Street investors—the Denver & Salt Lake Railway looked like a mistake. If it was a main line, it didn’t go anywhere. If it was a branch line, what towns were these? Tolland? Steamboat Springs? What gold strikes had been made there? Cripple Creek, Leadville, Telluride—these Colorado mining towns were familiar to investors caught up in the excitement of instant wealth. But Yampa? Toponas? Kremmling? They might as well have been outposts in Abyssinia. And had the sages of Wall Street traveled the D&SL, and seen with their own eyes its appalling canyons, its ferocious winters that swept away trains like toys, its terminus in a muddy town in the back of beyond, they would have unhesitatingly written it off as scrap.

Eighty years later, the Moffat Road is a main line, part of Denver’s direct connection to the west. The railroad is laid with 136-lb. welded rail and signaled with Centralized Traffic Control all the way from Denver to Craig. It is the territory of 14,000-ton coal trains, as well as overnight hotshots to Salt Lake City via the 1934 link from Orestod (Bond) to Dotsero built by D&SL’s 1947 successor Denver & Rio Grande Western. The Moffat Road has confounded the odds-makers, defied the competitors who would have seen it scrapped, and mocked the experts. David Moffat, you see, had hedged his bet. His hole card was the Yampa Coal Field.

Today, when three or four 105-car coal trains roll down the 2 per cent into Denver every 24 hours, there is no question that Moffat built wisely.

Empties climb through Tunnel 27 east of Cliff on their way back to the Craig Branch for more power-plant coal.



"I am not satisfied to do nothing"

"By God, the road will be built, if I have to go and drive spikes myself."—David Moffat

David H. Moffat Jr., a young man of 21 from rural New York, saw Colorado Territory in 1860 as a land of opportunity. He established a book and stationery store in Denver and soon landed a bank-cashier job. He made some propitious investments in silver mines, and by age 40 was a millionaire.

Moffat was soon involved in Colorado's railroads. He was elected to the board of the Denver & Rio Grande at age 45, and became president two years later. At this post, he seized opportunities when others were timid. When the D&RG refused to build a short extension to the silver camp of Creede, he financed it himself, and reaped the wealth of Creede's glory days. At news of gold at Cripple Creek, Moffat built the Florence & Cripple Creek, again harvesting a huge profit.

But David Moffat had his eye on something grander: a new main line for the Rio Grande, one that pierced the Rocky Mountains directly west of Denver. It must have

seemed a consummate idiocy to Moffat that his trains leaving Denver went 120 miles south to Pueblo before turning west.

Moffat and the D&RG parted in 1891 after the board censured him for spending \$200,000 of the railroad's money on surveys for a new main line. For a time, he considered building a narrow-gauge line west of Denver. This wasn't the solution, but, "I am not satisfied to do nothing," he said.

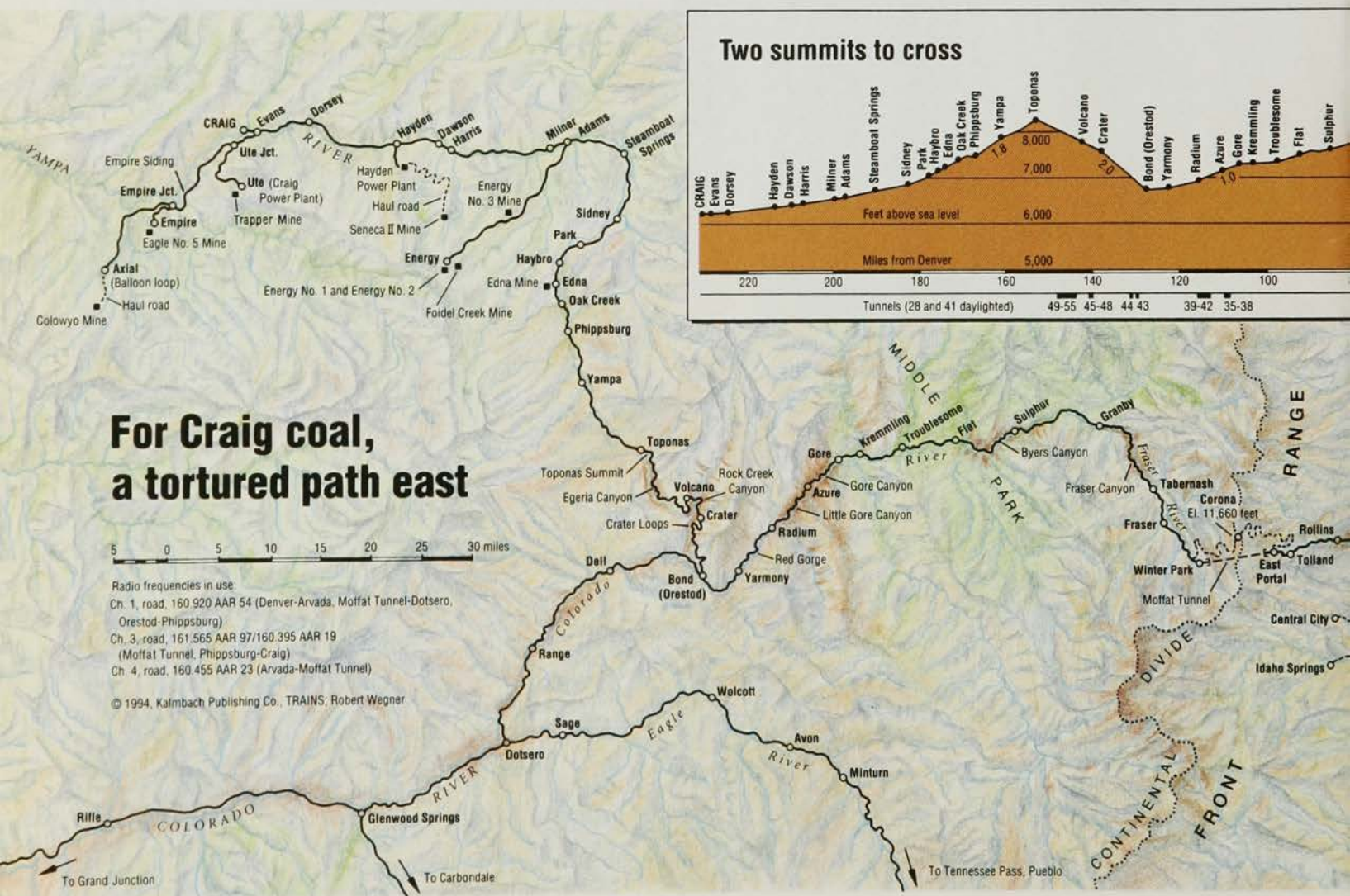
In 1902, Moffat announced he would build a first-class, standard-gauge line into the Rockies. It would pass through northwestern Colorado, over Utah's Wasatch Range, and descend into Salt Lake City to connect with the abuilding San Pedro, Los Angeles & Salt Lake. Moffat's railroad was called the Denver, Northwestern & Pacific Railway—the "Moffat Road."

Within months, nearly 4000 men were hacking out a right of way in South Boulder Canyon west of Denver. At great expense the line was built up the canyon through 29 tunnels to the base of the Front Range at Mammoth (later Tolland). From this point an

extraordinary temporary line was flung over the Continental Divide at Rollins Pass. Moffat planned to replace this line with a 2.6-mile tunnel once Salt Lake was reached. West of the pass the line followed the Fraser River, then the Colorado River to Yarmony.

There the track ended at an unlikely spot in the wilderness. Moffat had run out of cash, all his \$9 million fortune consumed. The construction had cost more than expected, and each year there was the expense of plowing snow on Rollins Pass. Moffat believed outside financiers would provide the capital to build the big tunnel. But investors were scared off by the line's high operating costs, lack of business, and the specter of ruthless Edward Harriman of the competing Union Pacific and Southern Pacific.

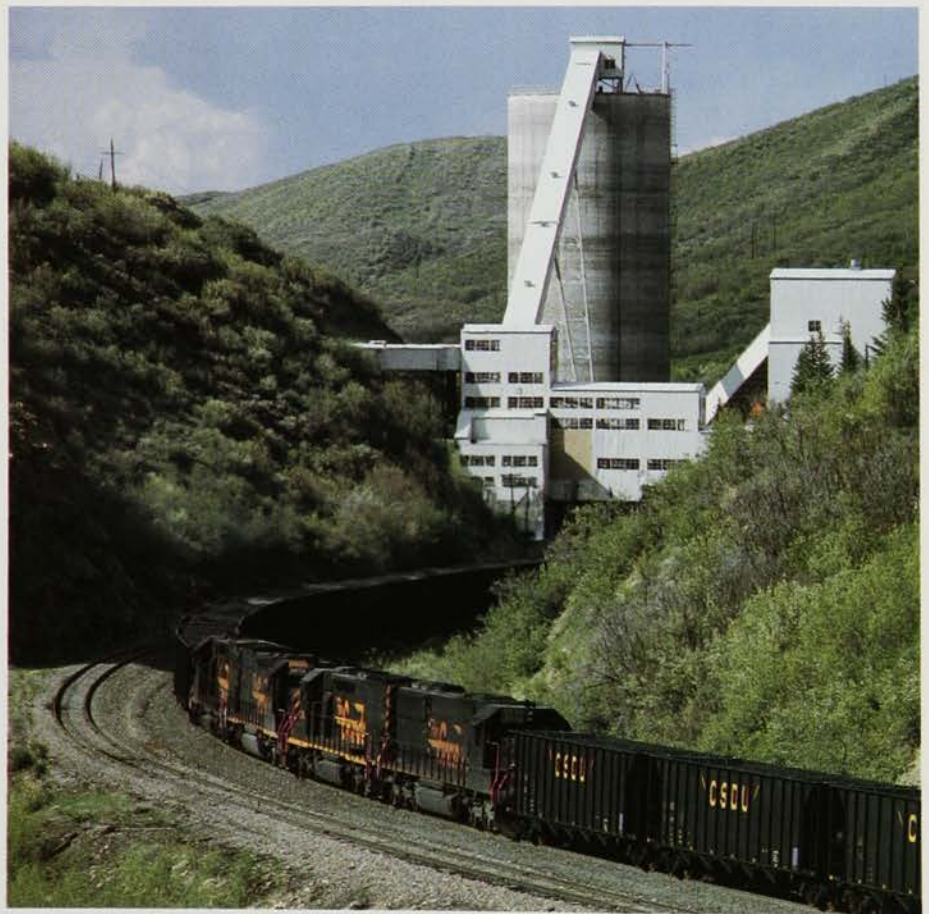
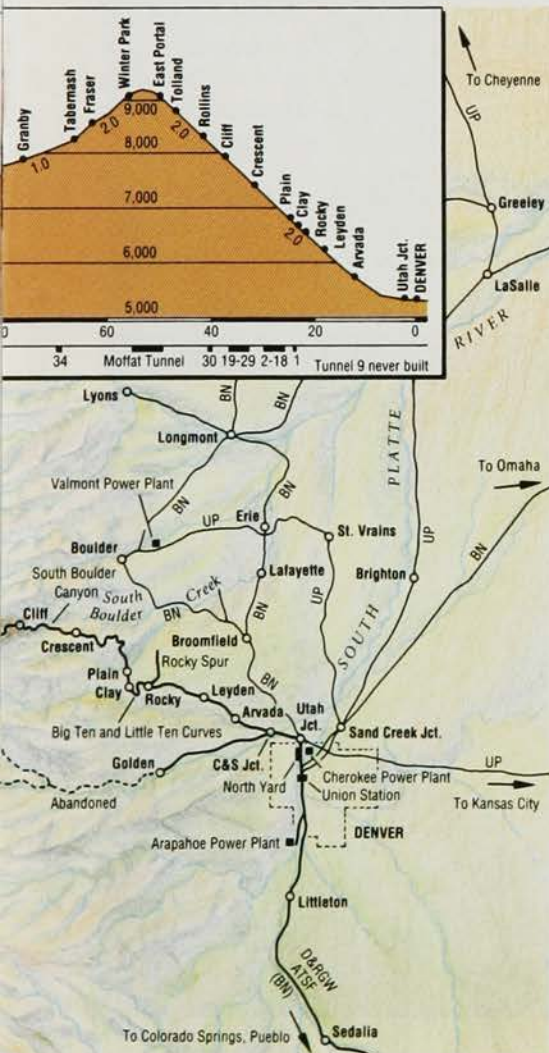
Moffat's friends, fellow Colorado railroad and mining investors, supplied \$1.5 million in 1908, just enough to extend the road to Steamboat Springs and the Yampa Coal Fields. In this broken terrain a million dollars didn't buy much; over \$500,000 was expended just in two miles of Rock Creek



Canyon. After seven years of subsisting upon summertime excursions and a daily mixed freight and passenger train, the line began to receive some real traffic from the coal fields, but it was too late for David Moffat and his railroad.

Moffat died in 1911. His railroad went bankrupt the next year. The firm was reorganized as the Denver & Salt Lake Railroad in 1913, and Moffat's friends managed to extend the road to Craig in 1914. Here the Moffat Road ended, 255 miles west of Denver, far short of its goal. Soon it was back in bankruptcy, where it remained for most of the next two decades until emerging as a chattel of the Rio Grande in the 1930's.

The citizens of Denver and Colorado's northwestern counties voted \$18 million to build the big tunnel. Finished in 1927, the 6.21-mile Moffat Tunnel eliminated the crossing of Rollins Pass. The Dotsero Cutoff put Denver on a direct transcontinental route. The Moffat Road was merged into D&RGW in 1947, the incomplete main line west of Orestod becoming the Craig Branch.



An eastbound with a four-unit helper passes the Edna Mine, now nearly mined out.

Coal: lifeblood of the Moffat

“Coal resources of Colorado total about 60 billion tons. Only one percent of this has been mined.”—Colorado Mining Association

Since World War II the fortunes of the Yampa Coal Field have been firmly linked to the price of oil. In the 1950's, coal shipments from the Yampa Field collapsed as homes and utilities in Denver switched from coal to cheap natural gas and oil. By the late 1950's, sometimes just one weekly train sufficed to haul northwestern Colorado's coal, cattle, and sheep to market in Denver.

In late 1973, though, oil quadrupled in price from \$2.90 to \$11.65 a barrel, prompting the U.S. to dust off its coal mines. A modern-day mining boom descended on northwestern Colorado. Welders, carpenters, dozer operators, and pipefitters poured in to open up three big new mines, and to build one of the West's largest power plants just outside of Craig.

Colorado's coal production peaked in 1981. Then the boom went bust. The Powder River Basin had come fully on line, and its low-cost mines took most of the market. Since 1987, Colorado's mines have slowly climbed back on the basis of their coal's high quality. Yampa coal averages over 10,500 BTU's per pound, much higher than Powder River coal, and has much lower ash and moisture content. It shares the same desirable low-sulfur content. Though Yampa coal is three times as expensive to mine, for many it's a better buy.

Currently there are six active mines in the Yampa Field, all but two of the open-pit

type. Two truck their entire production to nearby power plants: Peabody Coal Company's Seneca II Mine east of Hayden trucks about 1.5 million tons a year to the Hayden Generating Station, and Trapper Mining Inc.'s Trapper Mine digs 2.1 million tons annually for the big Craig Generating Station at Ute. Trapper, however, is too small to meet the demand of the Craig Station, so the Rio Grande runs the 73-car “Seven-Day Shuttle” from either the Empire or Colowyo Mine (and occasionally the Edna Mine) to the Craig Station once or twice daily.

The other four mines load out all of their coal on the Rio Grande. Pittsburgh & Midway Coal Mining Company's Edna Mine, just west of Oak Creek, is the oldest but smallest, shipping about 400,000 tons a year. Cyprus Twentymile Coal Company's underground Foidel Creek Mine at Energy produces over 3 million tons annually. The earlier Yampa Valley Mine at the same location was worked out several years ago and now is being reclaimed. The 12-mile long Energy Spur was built to serve this mine in 1962.

Cyprus Empire Corporation's underground Eagle No. 5 Mine 9 miles west of Craig at Empire ships about 3 million tons annually. W.R. Grace Co. subsidiary Colowyo Coal Company operates the largest mine in the field at Axial. Colowyo shipped 4.65 million tons in 1992, making it the largest coal mine in the state. The 16-mile long Axial Spur and the tributary Empire and Ute Spurs were built in 1978 to access these two mines and the Craig Station.

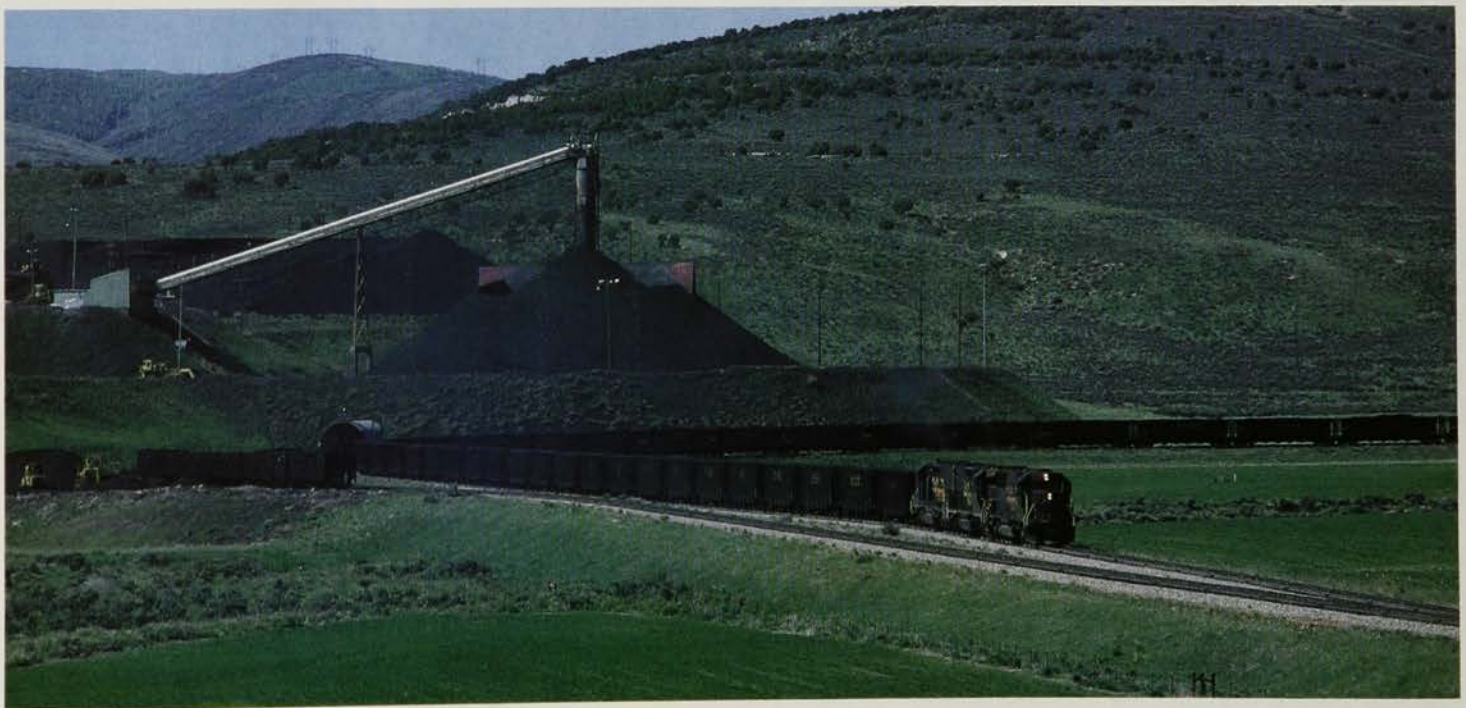
Most of the coal from these mines goes

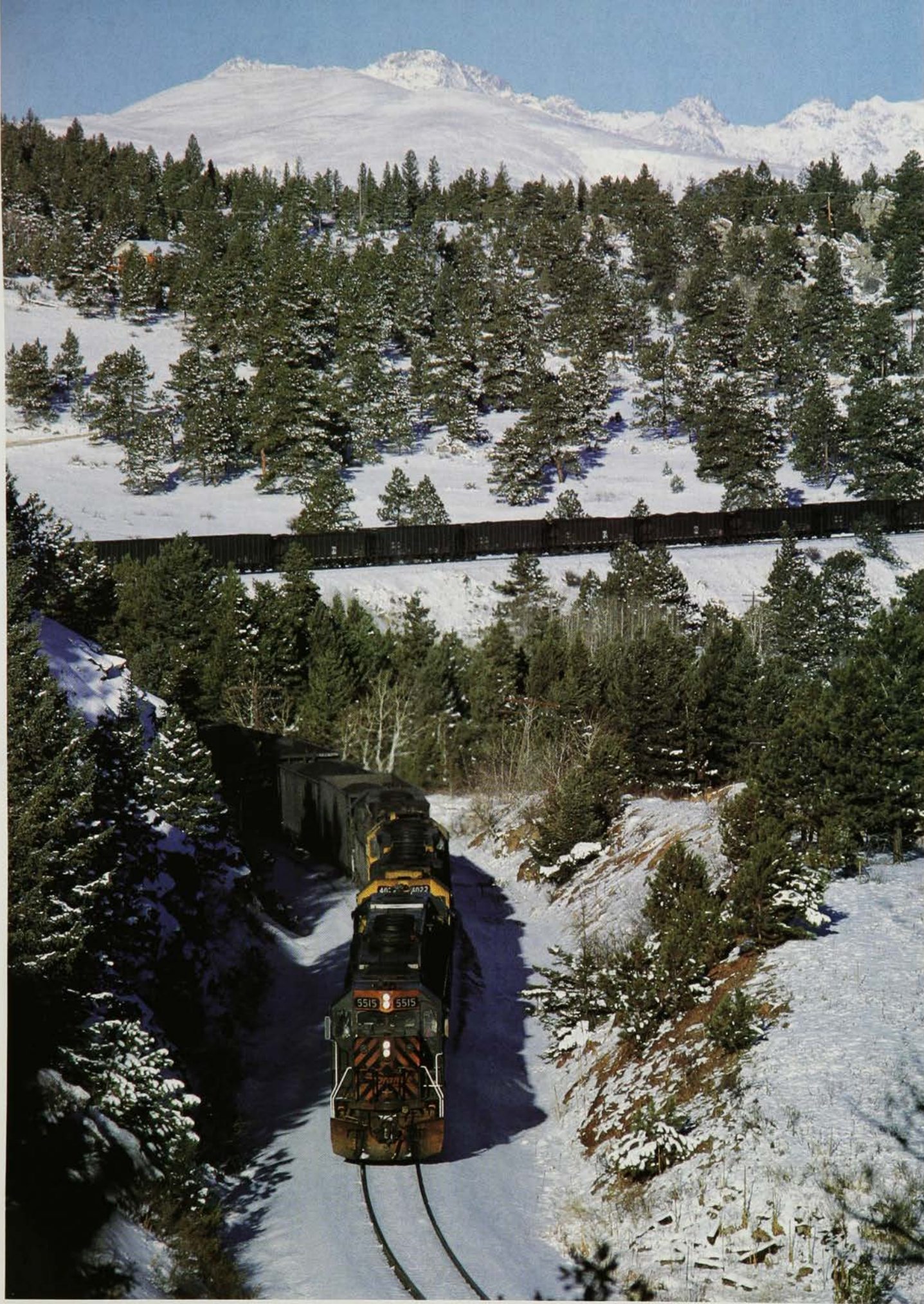
to power plants in Denver and Colorado Springs. The largest customer is Public Service of Colorado (PSCO). Its Cherokee and Arapahoe plants in Denver get at least four trainloads per week, and about one trainload a week goes to PSCO's Valmont plant near Boulder. The Colorado Springs Department of Utilities runs one unit train three times weekly between Craig Branch mines and either its Martin Drake plant in Colorado Springs, or its Ray Nixon plant about 15 miles to the south.

The largest non-Colorado power customer is Central Power & Light's Coletto Creek plant near Corpus Christi, Texas. Three 105-car trains cycle between Coletto Creek and the Colowyo or Empire Mines (as well as two mines east of Grand Junction on Rio Grande's North Fork Branch) on a seven-day turnaround schedule, via BN at Pueblo. Other customers are Northern Indiana Public Service at Wheatfield, Ind., via CP Rail System's Soo Line at Kansas City, and Central Illinois Public Service at Lis, Ill., via Illinois Central at St. Louis.

Industrial customers for Craig Branch coal include Celanese Corporation at Kingsmill, Texas, whose single train loads about once weekly at Energy. More industrial coal moves in a 60- to 80-car triweekly train whose loads are broken up at North Yard in Denver for delivery to customers including the Coors Brewery at Golden, Colo.

After loading at Colowyo, a train leaves the Axial loop (below). In fall, a Craig train descends the snowy Front Range at Crescent.





Four by two by two

“Runs on the road were characterized by a special and resolute chunkiness of motive power designed for slow ascents over staggering grades.”—Lucius Beebe

Between Craig and Denver a coal train must climb 4726 feet and descend 5686 feet. To lift 14,000 tons of coal and steel a mile into the air takes power, the power of wheels gripping the rail with such force that if they hesitate for an instant the steel surface of the rail begins to flow like lava. Run your finger downhill on a Moffat rail, and it feels as slick as greased glass. Uphill, your finger catches every quarter inch on a tiny sliver of steel dished out by the torque of a locomotive driver.

The power for Moffat coal trains comes from Rio Grande's big six-motor EMD's: 71 SD40T-2's and 17 SD50's, of which about one-third are engaged on the Moffat at any given time. The SD40T-2's, popularly called tunnel motors but simply "SD's" to the Rio Grande, are specially designed for slow-speed service through the Moffat's 10.7 miles of tunnels without overheating. They are equipped with PTC (Positive Traction Control), an electronic wheel adhesion system, making them equal in tractive effort to the more advanced SD50.

Foreign-road units are discounted in Rio Grande's ledger, both because they lack PTC and because they often aren't up to the strain of several hours of Run-8, full-ampere operation. After Southern Pacific took over locomotive management for its new parent/partner Rio Grande, SP assumed that a six-axle unit was a six-axle unit was a six-axle unit. The Moffat soon disabused SP people of such fantasies.

The coal-train cycle begins with the ar-

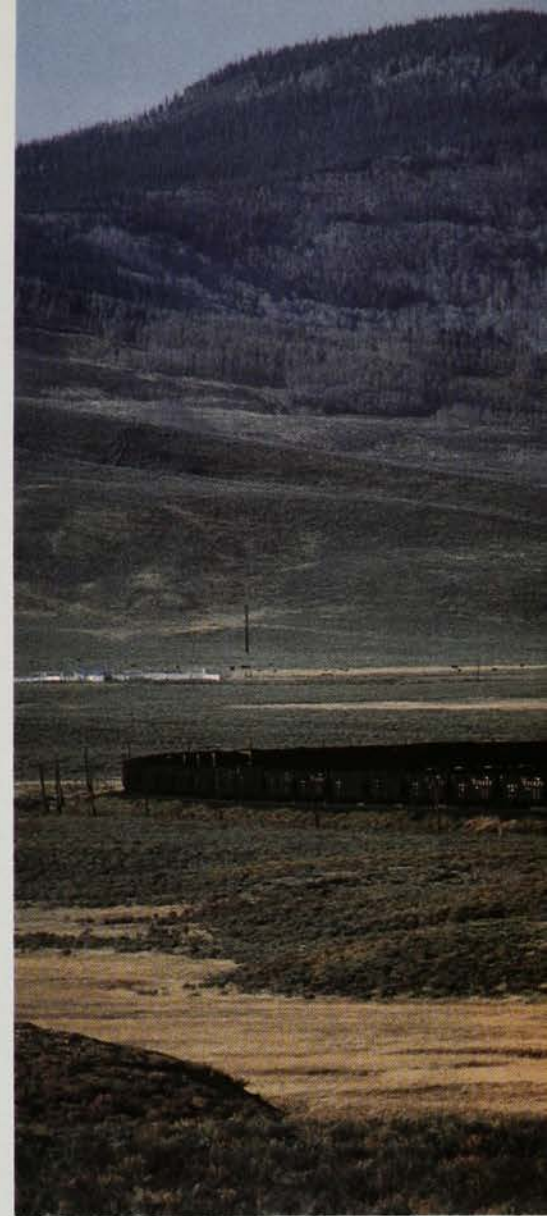
rival of an empty train at Denver's North Yard. The standard 105-car trains are given six serviced and fueled units, and two crews are called from the Moffat Pool to take the train west to Phippsburg ("P-burg"). The second crew is a two-man, deadhead engine crew, who will operate the swing helper when the train returns to Denver. The lighter, shorter DVPHC, the triweekly train serving a variety of Denver-area industries, doesn't need a swing helper, so it receives a four-unit consist and only one crew.

Upon arrival at Phippsburg, the two crews go to rest, and a Phippsburg-based crew takes the train west to its appropriate mine for loading. Two of the six units are left at Phippsburg. When the train leaves the mine, a helper crew heads west with the same two units. Usually the helper meets the loaded train at Sidney and cuts in behind the 70th car. About 45 minutes later the loads have clambered over Pallas Summit and roll to a stop in Phippsburg.

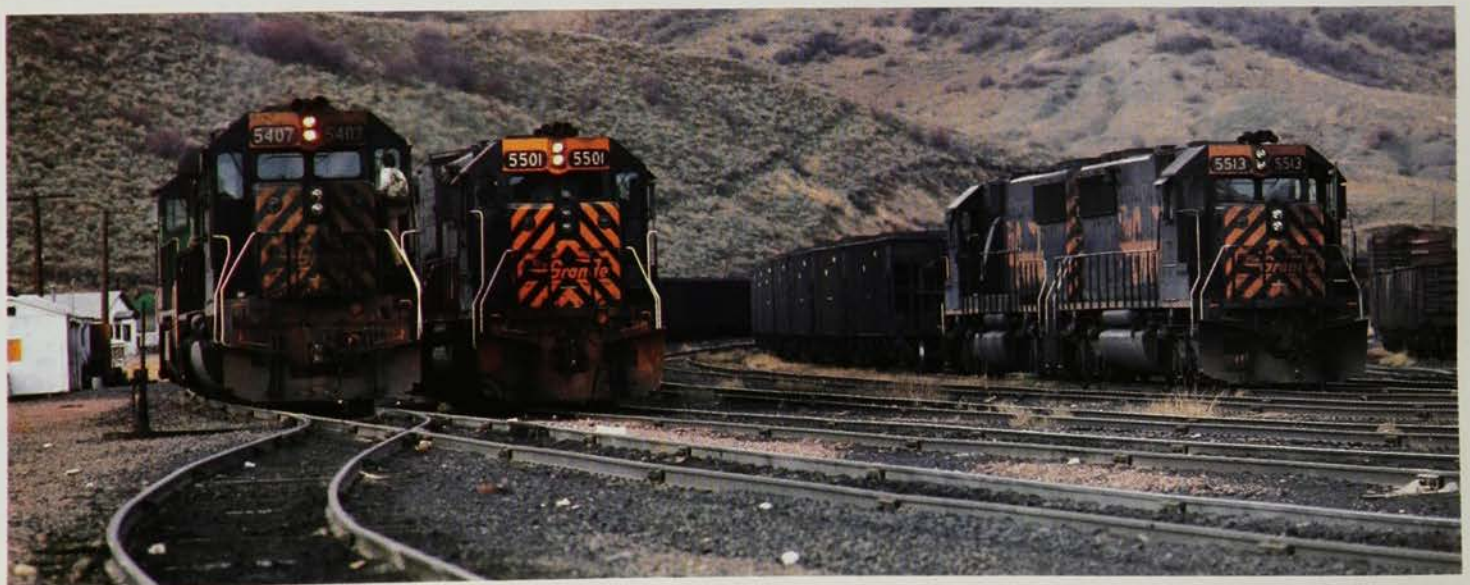
At Phippsburg, the Denver road crew takes over on the head end of the train from the Phippsburg crew, the extra engine crew steps aboard the cut-in helper (now called the swing helper) to relieve the Phippsburg helper crew, and the Phippsburg helper crew takes two SD's based at Phippsburg and couples on to the rear of the train.

Leaving Phippsburg with eight units, arranged four by two by two, a Moffat coal train has enough power to climb the 1.8 percent ruling grade to Toponas Summit in about 45 minutes.

At Toponas the Phippsburg Helper drops off. The swing helper remains cut in all the way to Denver, 152 miles away, both for power on the climbs and dynamic braking on the descents.



A train drops down the east side of Toponas Summit (above). Four road engines and two sets of helpers urge coal towards Toponas (right). SD50 5501 rolls an eastbound into Phippsburg, where helpers will be added.





Slide fences announce the impact of boulders

"As the mountains rose they were of course attacked by the forces of erosion."—John and Halka Chronic

You are standing on the west rim of a canyon. Behind you the Craig Branch is a thin black line, drawn in the broad curves of a firm hand across Toponas Summit. Over the top and down Chimney Creek wends the track toward Yampa. To your right the gentle circumference of the mountaintop ends at a jagged edge. The aspen groves halt with the roots of the last peeking over the edge into the void below. The railroad, a twisting trace on a ledge halfway down the

canyon wall, is a progression of squiggles interrupted by six tunnels. This ragged wound is Egeria Canyon.

To your left, the railroad returns to view at a lower altitude. It brushes past the maroon cinders of a dead volcano and sweeps from one side of the blind valley to the other, in a big horseshoe. This windy place is called Volcano.

On the far side the valley wall is gashed by a narrow side canyon. The railroad enters the gash, disappears, then reappears on the far side, dark spots marking the portals of the four tunnels through the canyon's projecting ribs. Pinnacles of crumbling Precam-

brian granite lean at angles that contradict gravity. Inside and above the track are slide fences whose flimsy wires do not deflect boulders, just announce their impact. This crack writ large is Rock Creek Canyon.

Emerging from this detour, the railroad ducks behind another cinder cone, then extends across a grassy bench. Soon the land begins to fall faster than the railroad, so the track turns a 180-degree circle, retraces its steps, turns another half-circle, and returns to its original direction. By this strategem it has dropped another 130 feet toward Bond. These are the Crater Loops.

From your vantage point you look south.



At your feet the terrain descends in chaos to the Colorado River 2400 feet below. A small cluster of trees, a shiny water tank, and few roofs in the far distance at river's edge denote the hamlet of Bond. This is the destination of all this amazing track. This is the genius of locating engineer Horace A. Sumner, who afterwards wondered if he hadn't made a big mistake.

For the Moffat the future is as obscure as the roadname on a typical grimy Rio Grande SD40T-2. Though its coal mines are productive and profitable, and reserves are ample, the Powder River Basin's mines are more productive and profitable, have even

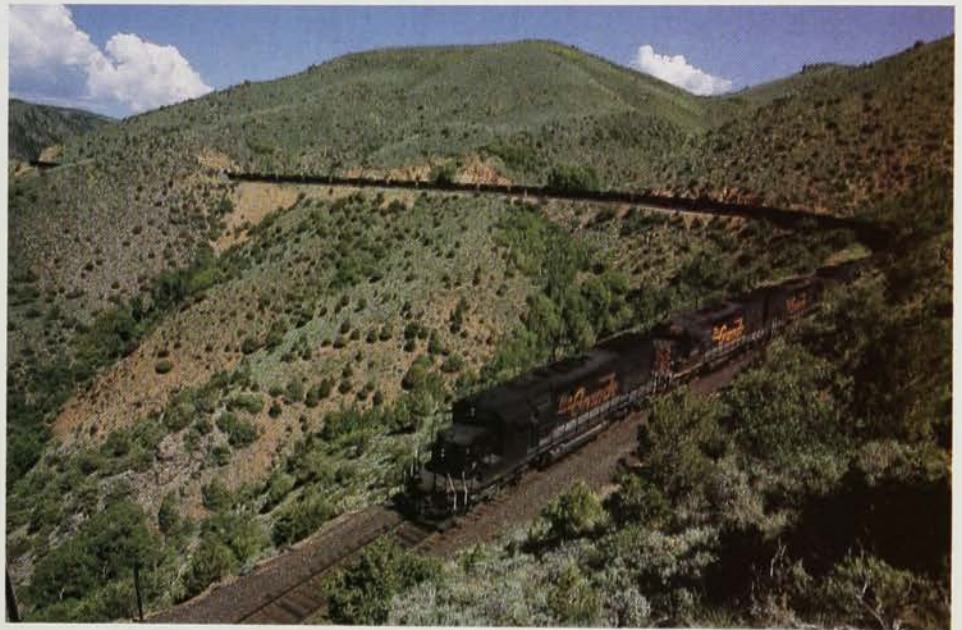
bigger reserves, and they, unlike the Yampa Field, don't lie on the wrong side of a mountain range. And coal's status as a fuel may be in jeopardy. Should the case be made that the greenhouse effect exists, and is caused by burning fossil fuels, coal may be an easy victim; people will probably find nuclear power preferable to giving up their automobiles.

As a through-freight route, the Moffat will forever be more expensive to operate than the Union Pacific to its north or the Santa Fe to its south, both of which are virtually mountainless railroads. While SP has echoed previous Rio Grande statements about the Moffat being superior to Rio

Grande's alternative route over Tennessee Pass, SP has also begun to wonder if the entire Central Corridor, including the Rio Grande, isn't superfluous to its system.

As long as eastern Colorado power plants want high-quality coal, the Moffat will haul it. Whether it remains a through route for freight is more difficult to predict. Coal, today as in the beginning, is the lifeblood of the Moffat. **I**

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A loaded train coils through the Crater Loops (left). In Egeria Canyon (top), loads are eased downward. Doubling back on itself in Rock Creek Canyon, a unit train heads for Denver.