



A New Transcontinental Railway

By William Thornton Prosser

FOR years the Pacific Northwest called for transportation facilities adequate to meet its constantly expanding needs. Each harvest season the transportation problem faced the lumberman and the farmer, the merchant and the consumer, while the occasional and unavoidable congestion of traffic on the other lines delayed commerce, impeded business, and deprived the Pacific Northwest of dollars it had earned. All the continent needed the products of Oregon, Washington, Idaho, and their neighbors, but transportation did not keep pace with development. Well might the empire of the Northwest call for more rails and for more cars.

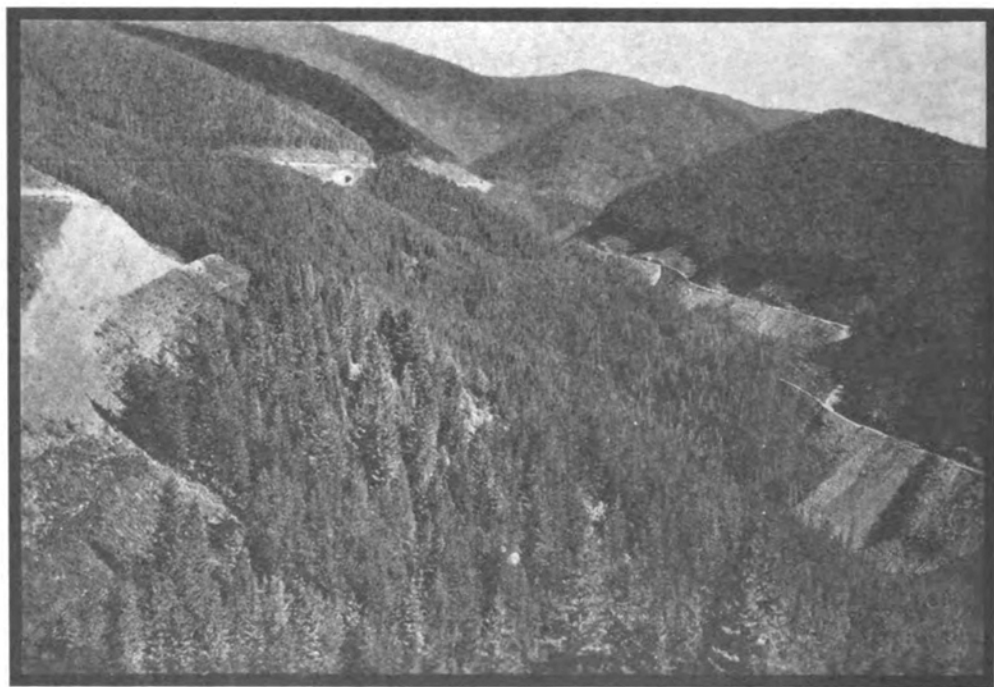
Answering this cry came the Chicago, Milwaukee & St. Paul Railway. With a speed unique in engineering annals it extended its lines over broad plains and jagged mountain ranges, through tunnels and across great rivers, until in three years it reached its goal, with almost fifteen hundred miles of new line, and the expenditure of close to \$90,000,000. Fourth among the great transcontinental railways to penetrate the Ameri-

can Northwest, the Milwaukee opens a new era in the linking of the East to the Pacific Coast.

But while the completion of the three earlier arrivals was marked with imposing ceremonies that were watched by all America, the new line saw its last rail laid on March 29, without any golden spike and without any brass band.

A. J. Earling, president of the Chicago, Milwaukee & St. Paul system, had long been looking into the Pacific Northwest, for the marvelous development of the region was the wonder of the entire country. Knowledge of world commerce, too, made clear the necessity for the Milwaukee's great network of rails, spreading over a dozen and more Middle States, to have an outlet upon the Pacific. A decade had seen the trade across the largest ocean grow with leaps, while the same ten years had witnessed the production of \$100,000,000 in Klondike and Alaskan gold, and the development of a great coastwise business. With its connections east of Chicago, and a Pacific Coast extension, the Milwaukee would virtually span the continent.

While the Milwaukee system had been circumscribed through its lack of a gateway to the Pacific Ocean, other lines



NEAR THE WEST PORTAL OF ST. PAUL PASS TUNNEL.

were developing great trade through Puget Sound, Portland, and San Francisco. This trade promised to increase in volume with each succeeding year.

Mr. Earling had prevailed upon his somewhat skeptical directors that the extension to the Pacific Coast was not only justified by the immediate business such an extension would gain, but that strategically the Milwaukee could place itself in an impregnable position among railways. He showed that the territory which the Milwaukee's proposed line would serve produces more than a third of a billion dollars annually from the soil, the forest and the sea, and he outlined branch lines as feeders for the main line that would bring the richest portions of this rich territory within easy access. He dwelt with especial stress upon the great timber wealth of the Northwest. "It's the last great storehouse of the continent's trees," insisted the president.

"If we can be assured of four trainloads of timber products a day from the forests of Washington, Oregon, Idaho

and Montana, that business alone will pay the operating expenses of our Pacific Coast branch"—and that was before the railways were allowed an advance in lumber rates by the Interstate Commerce Commission.

Washington is the greatest lumber-producing State in the Union, while Oregon and Idaho combined equal Washington's output. These three States have an annual timber production of more than \$150,000,000, while an army of 200,000 men is dependent upon this greatest Northwest resource. Annually Washington sends out of the State 110,000 carloads of lumber and shingles, while the water trade is of equal proportions.

Before construction of the 1,400 odd miles was authorized, Milwaukee engineers had tramped over and mapped every foot of the territory through which such a line would pass, and had selected a route, remarkable for directness, from Mobridge, S. D., the furthest western point in the old system, to Puget Sound. Estimates made on the cost were so ac-

curate that later there was no call for deficiency appropriations; in fact, actual construction served to reduce, slightly, the original figures.

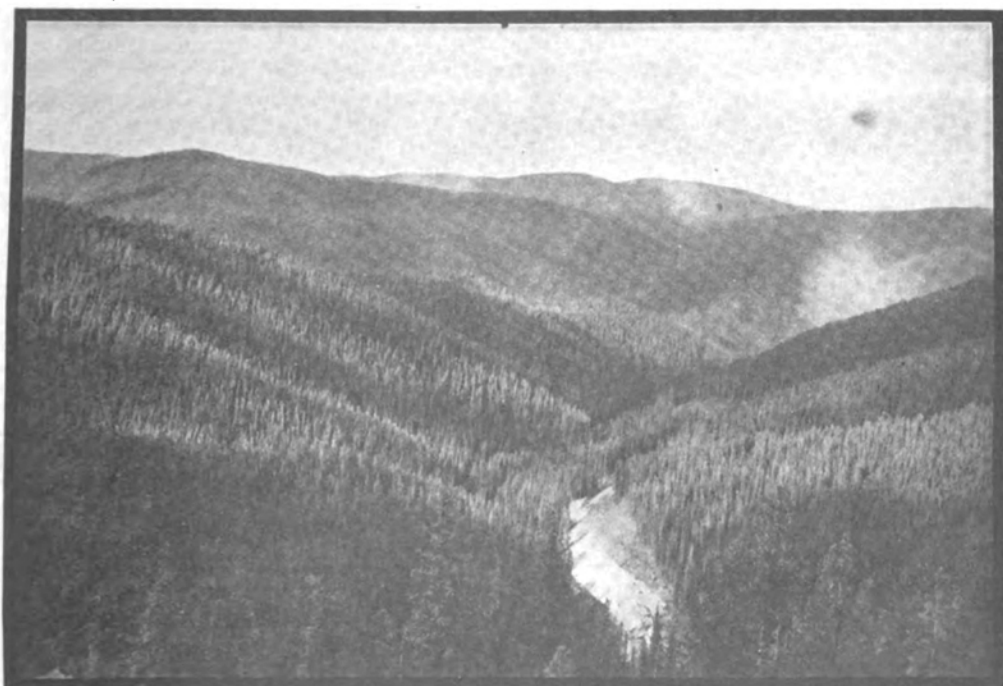
With accumulated experience in trans-continental-railway building, the Milwaukee was enabled to work out its problems in engineering with greater facility than its predecessors, while the advance in mechanical appliances served to condense into thirty-six months a task that a few years before would have required the greater part of a decade. Also, the officials of the Chicago, Milwaukee & St. Paul financed their enterprise at exactly the right time, for their work of supplying the millions needed for the undertaking was not much more than completed when the panic of 1907 shook confidence in railway securities and delayed many enterprises that otherwise would have been carried to early completion.

The magnitude of the task that was accomplished in these three years is

shown by the final figures. More earth was excavated, in preparing for the road-bed, than the United States Government moved in the Panama Canal zone in the years 1904, 1905, 1906, 1907 and 1908—a total of 60,000,000 cubic yards. In those years the aggregate excavation from the canal was about 55,000,000 cubic yards. Without stir or excitement this American railway company moved in three years more than one-third as much earth as will be required in the grand total at Panama, including the locks and basis on each side of the entrance.

Twenty miles of bridges have been built. The bridge across the Missouri River cost close to \$2,000,000, while that across the Columbia cost \$1,000,000. Tunnels exceeding a third of a million cubic yards were driven. Two hundred thousand tons of eighty-five-pound steel rails were laid.

Mobridge, from which the extension started, is about midway between the



LOOKING EAST FROM SUMMIT OF ST. PAUL PASS; MONTANA AND IDAHO STATE LINE.
Camp and Embankment in Foreground Are at the East Portal of St. Paul Pass Tunnel.

eastern and the western boundary of South Dakota. The first big task for the engineering department was the crossing of the Missouri. Approaches to this structure, built of solid steel and concrete, were particularly long and costly, but the spans were not as long as those later put in place across the Columbia. Each bridge affords trains a passage about fifty feet above the river's high-water mark.

The Milwaukee has sought to secure low grades, and for the most part has succeeded.

When it comes to operating trains the "ruling grade" on any one division is the most important factor. The ruling grade is the maximum, in ordinary parlance, but it means much; if there is a stretch of say half a mile with a two per cent grade (two feet upward in every hundred) that half-mile determines the size of the train, even though the remaining 200 miles of the division are absolutely level. The ruling grade is like the weakest link in a chain. Curvature is another problem in economical operation, for abrupt curves waste the engine's power just as grades do. The Milwaukee spared no expense to make the new line as straight as possible, considering the mountainous nature of much of the territory through which it passed.

Until the line begins the ascent of the great continental divide, in Montana, the grade is slight indeed, and going up the Rockies the ruling figure is 1.66 per cent, comparatively low. From Butte, into the Bitter Root Mountains, following the Deer Lodge, Hell Gate and Missoula Rivers, again there is little incline, while the Bitter Root range is negotiated at 1.7 as a maximum, the same figure reached in the ascent of the Cascades, while the downward grade on the western slope of the Cascades is only eight-tenths of one per cent.

The Milwaukee performs a somewhat unusual feat among transcontinental railways, in crossing and recrossing one of its rivals. Near Terry, Montana, it goes to the northward of the Northern Pacific, making the crossing on an overhead bridge. At Piedmont, just east of Butte, it passes back to the southward

again. While the Milwaukee parallels the Northern Pacific in many places, the vast extent of the country through which it passes gives it a territory all of its own, development of which is certain to follow even more rapidly than that opened by the older lines, because of the constantly increasing stream of immigration passing into the broad areas of the Northwest.

St. Paul Pass, in the Bitter Root range, is the highest altitude which Milwaukee trains attain. This pass had attracted little attention from railroad builders before the arrival of the Earling road, but a gradual ascent was found by the engineers, and the backbone of the continent is crossed at 4,160 feet, in the longest tunnel that the new line has opened. It is 8,750 feet in length. Through the beautiful Coeur d'Alene district in Northern Idaho the line passes, and down across the fertile plains of Eastern Washington to Beverly, where the second big bridge spans the Columbia.

In crossing the Cascades the Milwaukee found Snoqualmie Pass so easy to negotiate that the construction of a costly tunnel was unnecessary at first.

"We will be able to reduce our altitude in the Cascades by some 500 feet, with a tunnel underneath Snoqualmie Pass," said Chief Engineer E. J. Pearson, of the Chicago, Milwaukee & Puget Sound, as the extension was called upon its completion. "No determination has yet been reached regarding this tunnel, and our grades now are excellent, but this Cascade tunnel will be driven in time, for the economy in fuel and power will be great. It takes money to raise trains 500 feet in the air, and drop them back again. The tunnel as suggested would be approximately three miles in length, and would require as long to drill as it has taken to build the Pacific Coast line, for, working from both ends, progress of a mile a year is considered good.

"Our St. Paul Pass tunnel has an easy grade, rising to a summit inside the mountain, but this slope is so slight that we can operate ordinary locomotives where a steeper grade would require electricity. A puffing locomotive fills

the tunnel with such a dense cloud of smoke that time must be allowed between trains for the smoke to clear."

Coming down the western slope of the Cascades the Puget Sound line made what is believed to be the deepest fill ever made in original railway construction. Topographer's Gulch was as deep as a twenty-story building. It required 630,000 cubic yards of earth to fill it from side to side, a distance of 850 feet. The hydraulic plant used to sluice in the earth required the expenditure of \$60,000 before a cubic yard was moved.

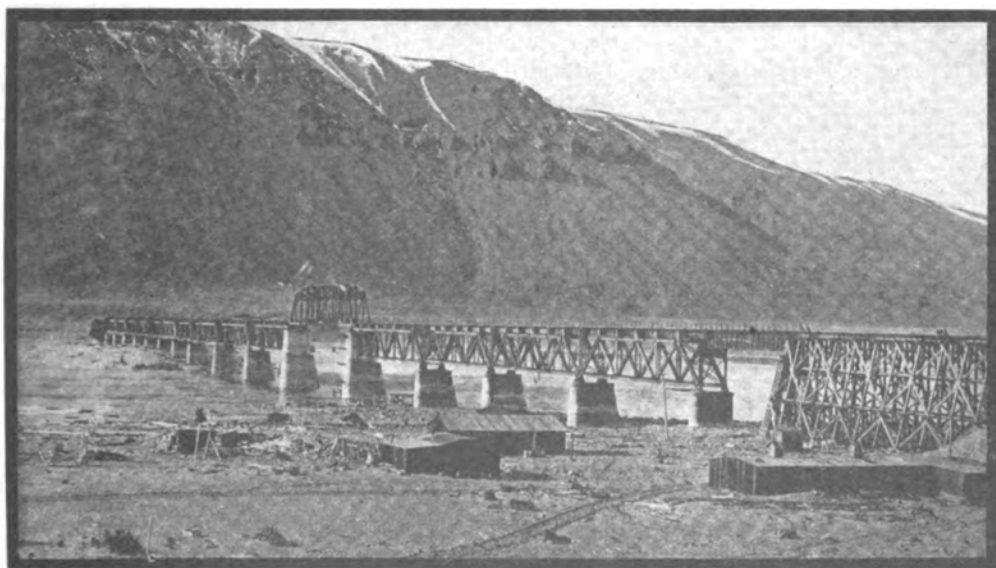
Construction of the extension was car-

ried forward in five sections. The eastern half of the work was supervised from Chicago, but from Butte westward the work was under the direction of H. R. Williams, who was made president of the Chicago, Milwaukee & Puget Sound as soon as the corporation was organized.

President Earling and a party of other officials of the system, including Mr. Williams, made the first trip of inspection over the new line, and expressed themselves as well pleased with its condition, but they deemed it best to delay the inauguration of through passenger

service for almost a year until the road-bed should be put in the best condition. Freight service, however, was inaugurated without delay.

One of the most difficult problems before Mr. Earling was to convince his directors of the immense requirements in the way of equipment for the extension, for the Eastern men on the board could not see the true situation through the eyes of the president. They thought him over-sanguine and too enthusiastic. It was necessary for him to bring several members to the Pacific Coast with him, including William Rockefeller, before he



THE MILWAUKEE BRIDGE OVER THE COLUMBIA, EASTERN WASHINGTON.

could have his way regarding the equipment. The original order was doubled, and then doubled again, and today the business confronting the road will make good use of all the cars and engines available.

The Milwaukee has already constructed a line from Seattle to Tacoma, which is to be used jointly with the Union Pacific, and the Union Pacific this year will complete its branch line to Grays Harbor, over which the Milwaukee will operate its trains. A shrewd stroke on the part of the Milwaukee was the acquisition of the Tacoma & Eastern,



THIS FILL (ON THE "MILWAUKEE," EIGHT MILES ABOVE NORTH BEND, WASH.) IS ONE OF THE LARGEST EVER UNDERTAKEN, AND WAS MADE BY HYDRAULIC SLUICING FROM ADJOINING CUTS.

a road originally built for logging purposes southeast from Tacoma, and later developed into a good property with perhaps sixty miles of track. This road, still operated independently, gives to the Milwaukee access to one of the finest timber belts in the Northwest, while the Milwaukee's main line through Snoqualmie Pass opens another fine district, and plans are developing for the construction of a line northward from Grays Harbor into the virgin Olympic Peninsula, containing timber worth scores of millions of dollars.

Whether the Milwaukee will build its own line to Portland, or make a traffic agreement with the Northern and Union Pacific for use of their tracks and bridge across the Columbia, remains to be seen, but it is the announced intention of the new road to reach all the important centers of the upper Pacific Coast.

"We have been so busy completing the line to the Coast, and preparing it for traffic," Mr. Williams said recently, "that we have not had time to complete details of other extensions. Our plans are announced for entrance into Spokane, and a branch line is being built into the Cascade timber, while work is progressing at a most satisfactory rate on the Gray's Harbor line, which the Union Pacific is building for our joint use. There is business enough for all the roads now entering the Northwest, and we believe that we are going to get

our share. We have made traffic arrangements with the *Osaka Shosen Kaisha* Japanese Steamship Company to handle our business with the Orient. Six steamships are to be constructed for this line, two of which, the *Tacoma Maru* and the *Seattle Maru*, are in the service, and the third, the *Chicago Maru*, is to follow soon. The fleet is to be increased as rapidly as the traffic justifies."

It has been reported from the first that the Milwaukee would make use of the abundant waterpower along its line, for the operation of its trains, at least through the mountain divisions. Eventually it is more than likely that electricity will be the motive force for many hundreds of miles, but these plans are not matured, according to Mr. Williams.

"We are carefully investigating this feature, mapping the water courses, and measuring the available power, but further than that we have not gone," said the president of the western line. "It is true, beyond a doubt, that much waterpower is going to waste in the Western streams, and in time it will be utilized."

The policy of the Milwaukee, through a land department, has been to acquire large holdings of Western timber lands. Timber lands are looked upon by investors as better than Government bonds. While the extent of the holdings of the new line have never been made public, it is stated that not less than \$10,000,000 has been invested in timber in the vicinity

of St. Maries, Idaho; in Snoqualmie Pass; along the Tacoma & Eastern; in the Olympic Peninsula, and in other districts.

To all shippers, but especially to the lumbermen of the Northwest, the coming of the Milwaukee was looked forward to as a boon, and the course of the new line, so far, has justified such optimism. Eagerly the lumber industry awaited the rate schedules which the new road would promulgate, and it has found that, after the great struggle on rates between the industry and the old lines, the Milwaukee had made reductions without precipitating a rate war that might have proved disastrous. The Milwaukee declined in the beginning to enter a rate agreement with the other lines, stating it preferred to be independent. On Puget Sound the Milwaukee has instituted a car-ferry system, transferring loaded cars from the mills of the Puget Sound district by water to the Seattle or Tacoma terminals. It is probable that passenger traffic out of Seattle is to be handled through the Union Pacific station, which is to stand opposite Fourth avenue from the Hill station, and which is under construction at a cost of \$500,000.

The growth of the Chicago, Milwau-

kee & St. Paul system in the last few years has caused remark in the railway world. The beginnings of the system go back to the Minnesota Central, in 1865, completed to St. Paul two years later. In 1884 its mileage reached 4,721. With the Pacific Coast extension the total is over 9,000 miles.

The Chicago, Milwaukee & St. Paul Railway is a strong booster for the development of the territory it serves. It has helped to spread broadcast over the country a knowledge of the resources and opportunities offered to settlers and capitalists by the Northwest, especially Montana. Farm papers, magazines, daily and weekly newspapers everywhere have carried advertising of the St. Paul extension and of the regions it crosses. The effect has been marked in the great number of new people that are coming to settle along the line of the road. New towns, new enterprises, new institutions are daily springing into being, where three years ago was nothing but the stock range. The publicity campaign of the St. Paul has had the effect, also, of stimulating the other roads to follow the same system, with the result that the whole Northwest is profiting by these great agents of publicity and of public service.



LOG STATION AT MUSSELSHELL, MONTANA.