

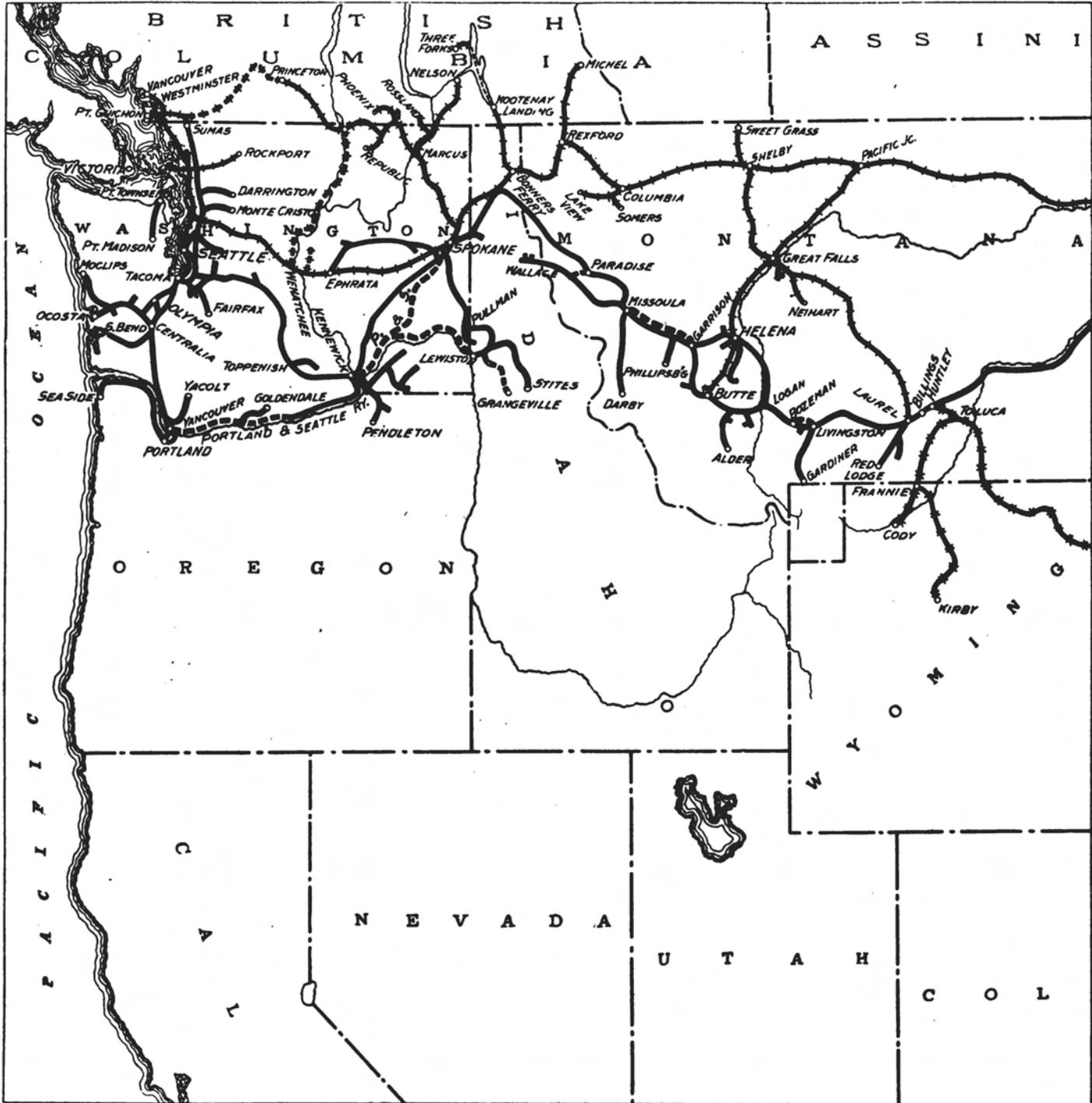
Great Northern.

the improvement in smoke conditions obtained in this way will also mean an improvement in the efficiency of the locomotive and in the condition of the firebox and flues. In fact, some roads have found it advisable to enforce some such rules as these throughout their lines merely as a matter of economical firing. Until such time as some suitable mechanical apparatus shall have been devised for this purpose, reliance will have to be placed on the means just outlined.

The question of the use of smokeless fuels is to a large extent a local one. The use of either Pocahontas coal or coke involves certain changes in the firebox and grates which make it decidedly inconvenient to change from the use of these fuels inside the city

The Great Northern is the railroad which J. J. Hill created and which he himself has managed. Therefore it reflects both the high standard of railroad construction originally carried out and the operating methods continuously applied over many years which made this railroad builder again famous long after his road was put through to the Pacific coast.

To the Great Northern, the past year has brought many changes. The annual report for 1906 was reviewed in the *Railroad Gazette* of November 16, 1906. On that day Great Northern stock sold at 330. In December, 1906, each shareholder was given as many certificates of beneficial interest in the company's ore prop-



The Hill Railroads—Western Section.

Limits to the use of soft coal on the lines. In many cases, however, fuels of this kind can be used for switching service with good results, and it may be possible to change engines at the yard limits and employ smokeless fuel within the confines of the city. Without doubt, the electric locomotive will take every year a more prominent place for interurban service and for most of the work in the neighborhood of large cities. The ordinary soft coal-burning engine is, however, destined to be with us for a considerable period, and the importance to the community at large and the railroads themselves of reducing the consequent smoke cannot be stated too strongly.

erties as he held shares of stock. These ore certificates sold for about 85 at the time of their issue and are selling at about 40 to-day. On December 11, 1906, an increase of \$60,000,000 in the capital stock was authorized and offered to stockholders at par, with payments in instalments running up to May 1, 1908. The rights to this new issue were quoted at about 35 when it was announced. The high price at which Great Northern stock was selling last fall was due in large degree to the expectation of these valuable distributions to stockholders. Furthermore, the road had just had the largest earnings and most prosperous year in its history. Now Great Northern stock sells around 110.

This tremendous decline in price is due to a number of different

influences. In the first place there is no expectation now of valuable rights in the near future; in the second place, there has been a tremendous drop in the prices of all securities; in the third place, though gross earnings have again increased, the Great Northern has been very hard hit by increases in operating expenses. With gross earnings about \$4,000,000 larger than in 1906, net earnings last year were nearly \$3,000,000 less.

Like all other roads the Great Northern suffered from increases in wages and in the cost of material and supplies. There were two other special influences which reduced its net earnings, from which it suffered more than most other roads. These were a large number of rate reductions, voluntary and forced, and a very severe winter during which the depth of snow in northern Minnesota and North

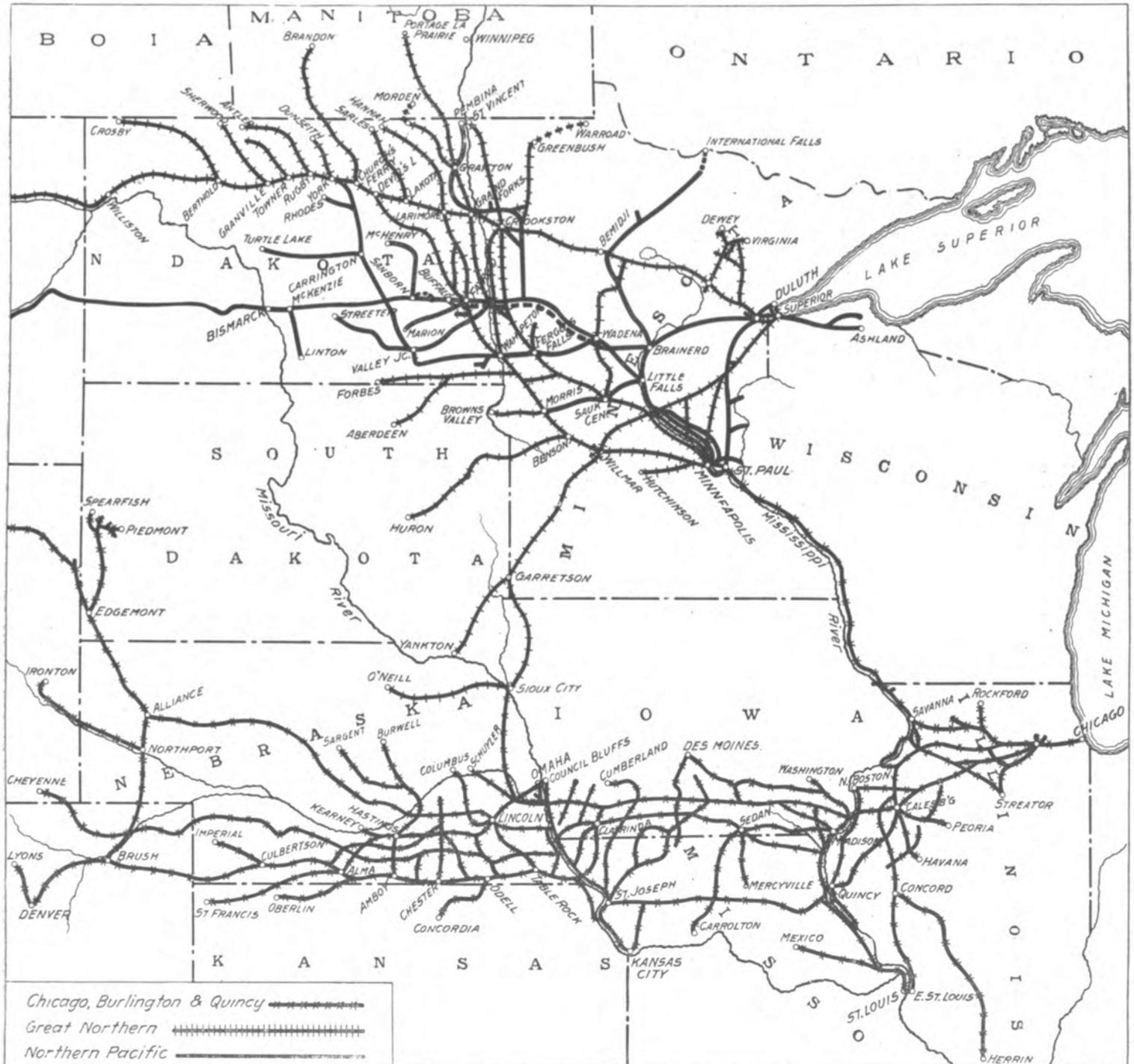
South Dakota, Iowa and Nebraska were reduced, causing a loss of revenue for the ten months of \$400,000.

On Sept. 10, 1906, a reduction of about 10 per cent. in class rates was made from far Western points to Montana points.

On Oct. 22, 1906, rates on coal from Duluth, St. Paul and Minneapolis, Minn., and Superior, Wis., to stations in Minnesota, North and South Dakota, Iowa and Nebraska were reduced, causing a loss up to June 30, 1907, of \$50,000.

On Nov. 15, 1906, reductions were ordered by the Minnesota Railroad and Warehouse Commission on merchandise shipped between local points in Minnesota. As a result, reductions had to be made in interstate rates so as to grade out the Minnesota rates in the bordering states. During the 7½ months in which these rates were in effect the Great Northern's revenue was reduced \$317,000, or at the rate of over \$500,000 a year.

On Dec. 12, 1906, a new distance tariff with rates about 10 per cent.



The Hill Railroads—Eastern Section.

Dakota was greater than ever known since the line was built. The severity of the weather increased the demand in these districts for fuel at the same time that it made it almost impossible to keep the railroad lines open. Some towns ran out of fuel altogether and for a week or two were in desperate straits. Fuel and supplies had to be moved to save lives whether other traffic moved or not. This caused a direct and unusual expenditure of over \$950,000, which does not include the loss of earnings due to delays and suspension of the movement of traffic.

The various rate reductions caused an actual loss in earnings of about \$1,000,000. They are important enough to be listed in detail, as follows:

On Sept. 1, 1906, grain rates from stations in Minnesota, North and

lower than before, went in effect between points in Washington and in Idaho, and between points in those states and stations east.

On March 11, 1907, on the opening of the line north to Portage la Prairie, Man. (the line to Brandon, Man., was opened April 4, 1907), the rates from Port Arthur to Manitoba points were applied to shipments from Duluth and eastern terminals to points in Manitoba reached over either of these new lines. This, however, was a rate reduction made necessary in order to compete with the Canadian Pacific and the Canadian Northern, which both use the Port Arthur gateway.

On March 18, 1907, new rates ordered by the South Dakota Railroad Commission went in effect. These reduced by about 10 per cent. the rates on live stock and traffic shipped on class rates.

On June 3, 1907, new rates ordered by the Minnesota Railroad and Warehouse Commission on various staples in carloads from Eastern terminals to 11

different jobbing centers became effective. The average reduction under this order amounted to about 14 per cent.

On June 1, 1907, maximum freight rates on grain, coal, lumber, live stock, and other commodities, were to have taken effect. The Great Northern prepared new tariffs in accordance with these rates, but on May 31, 1907, on the prayer of certain stockholders, the United States Circuit Court in Minnesota granted an injunction to remain in force until suit was decided, forbidding the company to adopt the rates on the ground that they were unreasonably low and confiscatory. This suit has not yet been decided.

These reductions, it will be observed, are all of freight rates. Freight earnings are a railroad's strong dependence, and thus far few railroads have had any serious reductions by law in their freight rates. The Great Northern has been peculiarly unfortunate in this respect.

Nor has it been free from passenger-rate reductions. By legislative act passenger rates were reduced from 3 to 2 cents a mile in Nebraska, effective March 6, 1907; in Minnesota, effective March 6, 1907; in Iowa, effective July 4, 1907, and in Wisconsin, effective August 15, 1907. Passenger rates were reduced from 3 to 2½ cents a mile in North Dakota, effective July 1, 1907, and in South Dakota, effective August 15, 1907. President L. W. Hill (James J. Hill being now Chairman of the Board) states that the minimum reduction in the Great Northern's revenue by reason of these passenger-rate reductions, based on the passenger business handled this year, will amount to \$1,180,000 a year. It is therefore evident that the Great Northern has been and will probably be in the year now passing a heavy sufferer from enforced rate reductions.

The increase in operating expenses was \$6,700,000, or 26 per cent. Maintenance of way increased 24 per cent., maintenance of equipment 17 per cent. and conducting transportation \$4,160,000, or 33 per cent. Of this last increase \$799,000 came from "station service," due to more stations, increase in station forces and higher rates of pay. In the past the Great Northern has been accused of maintaining stations only where it wished to do so, and the large increase in this item, especially as it was stated in the 1906 report that part of the increased expenses of that year came from the opening of additional stations, looks as though the road had been compelled to follow a more liberal policy in this respect. There was an increase of \$373,000 in "train service," due to additional train mileage and increased wages. "Engine service" increased \$1,745,000, due to 12 per cent. more engine mileage, an increase of \$550,000 in wages of enginemen, an increase of \$75,000 in cost of "other supplies," and an increase amounting to \$1,020,000 in the cost of coal, of which there were about 300,000 more tons used than in 1906.

These are the only detailed figures given in regard to any of the three great operating expense accounts. As a consequence, no unit maintenance of equipment figures can be worked out. Maintenance of way, however, cost \$1,342 a mile, against \$1,093 in 1906 and \$973 in 1905. The 1907 increase in this figure is an important one and raises the standard of the road in maintenance of way per mile to a figure which, if the road has been so well maintained on so much less during previous years, ought to be more than adequate for keeping up the condition of the property.

There was more traffic throughout the year than could be conveniently handled, an underlying factor which counted for a great deal in increasing the operating cost. The trainload was increased, but at the expense of the helping mileage. The Great Northern, with its nearly 6,000 miles of line and its many branches and feeders, carries an average revenue trainload of 549 tons. This is an increase of 3½ per cent. over 1906, when the revenue trainload was 530 tons. Including company freight the trainload was 625 tons, against 590 tons in 1906. As remarked in the review of the 1906 report, Mr. Hill's average trainload on his pet property has long been, and still continues to be, the marvel and the despair of other railroad managers. The increase in total trainload was 6 per cent.; the increase in freight and mixed train mileage 5 per cent. Against these the mileage of locomotives employed in helping freight and mixed trains increased 30 per cent., following an increase of 32 per cent. in 1906. Furthermore, the mileage of locomotives helping passenger trains increased 45½ per cent., following an increase of 113 per cent. in 1906.

These figures in themselves are enough to justify the new stock issue of December 11, 1906. Traffic has grown so great that the existing line, strikingly efficient as it always has been, is outgrown. Grades must be reduced, curves straightened and double track laid or each new increase of traffic will return a smaller proportion of net earnings than the one before. It is true that one result of the new stock issue has been to depress the market value of Great Northern stock, but the road now has funds assured for carrying out these necessary improvements. Such expenditures are not doubtful investments, but outlays necessary to maintain operating profits.

Construction advances during the year to various companies amounted to \$23,314,945. For new equipment \$6,000,000 was paid. Out of earnings \$3,000,000 was credited to "fund for replacement of equipment" on account of depreciation of equipment caused by its use during the year. At the same time there was \$2,000,000 appropriated out of income to "fund for permanent improvements and renewals" to provide for future contingencies and the cost of such

additions and improvements as cannot properly be included in operating expenses, but which on the other hand should not be capitalized. There was charged against this fund during the year \$4,000,000. These several expenditures suggest the large increase in equipment during the year (there were 943 locomotives on June 30, 1907, against 786 a year earlier, an increase of 20 per cent.), the various improvements to the property, and the construction of new lines to develop new territory and facilitate operation. Of the lines built for the last purpose there are two most important: The connecting line from a point near Great Falls, Mont., southeast to Laurel, on the Northern Pacific, which is to be a short connection between the Burlington through line to Huntley, Mont., and the Great Northern; and the Portland & Seattle, which is described in the Northern Pacific review, below. The most important construction work done during the year is listed in this week's Railroad Construction column.

The following figures of mileage, earnings and operating expenses cover the Great Northern system, not including the Spokane Falls & Northern lines, 390 miles, which are operated separately. The figures for net income, improvement appropriations and final surplus are those of the Great Northern Railway proper:

	1907.	1906.
Mileage worked	5,982	5,906
Passenger earnings	\$10,005,598	\$9,460,659
Freight earnings	41,270,192	39,044,732
Gross earnings	55,144,402	51,276,280
Maint. way and structures	8,024,889	6,453,240
Maint. of equipment	5,622,513	4,820,650
Conducting transportation	16,833,854	12,678,737
Operating expenses	32,562,776	25,852,923
Net earnings	22,581,626	25,423,357
Net income	17,897,824	19,464,000
Improvement appropriations	4,934,978	5,130,910
Year's surplus	2,155,703	5,184,569

Northern Pacific.

The Northern Pacific came formally into the Hill system as a result of the famous Northern Pacific corner. When the Northern Securities Company was broken up by the government, control of the Northern Pacific was handed over to the Hill party, while the Union Pacific in return for almost a majority of Northern Pacific stock which it turned over to the Northern Securities Company, was given merely its pro rata share of the Northern Pacific stock held by the Northern Securities Company, which amounted to much less than a majority. The difference in value was made up by receiving its pro rata share of the Great Northern stock held by the Northern Securities Company.

In 1896 the Northern Pacific was in the hands of a receiver. Its career since the formation of the new company, with J. P. Morgan as the leading spirit, has been a brilliant one. It has profited from the tremendous prosperity of the Northwest in a remarkable degree. At the same time it has been improved not only on capital account, but out of income. Up to June 30, 1906, there had been spent out of income for additions and betterments \$18,162,598. A new policy was last year adopted in regard to these improvement expenditures. This sum was transferred to capital account and at the same time added to the profit and loss credit balance. This is improving on the Chicago & North-Western's example of stopping appropriations for additions and betterments out of current income. The Northern Pacific has not only stopped making these appropriations out of earnings but has capitalized all such expenditures which have been made in the past. Probably the reason for this is that the company, believing that the value of its property is at least as great as the total amount charged to capital account and spent out of income, wishes to put itself in a better light for a possible valuation by the states or the national government. This change is really one of accounting rather than of general policy. The present management has made improvement appropriations out of income in every previous year in which it has been in control of the road. It is certain that the improvements will go on, though charged in a different way.

The Northern Pacific had the same difficulties to contend with last year as the Great Northern, but judging by results did not suffer so severely. It shows a small increase in net earnings instead of a large decrease. More detailed facts are given in regard to the severity of the winter. From November 18, 1906, to March 18, 1907, four months, the movement of all business both on the main line and branches in Minnesota, North Dakota and Montana was seriously affected by snow and cold weather. Train movement was greatly interfered with for about 100 days during this period; for over 60 days in North Dakota there was scarcely any freight moved, except fuel and supplies sent through behind snow plows. In Washington during part of the same period, that is between November 13, 1906, and February 23, 1907, the Northern Pacific suffered from serious washouts which stopped through train service between Spokane and Puget Sound and Portland for a total of 25 days. Besides this, during much of the winter the snow and bad track on this part of the railroad made the movement of trains very difficult.

The capacity of the road was overtaxed by the volume of busi-

ness at various points. The Northern Pacific had literally more traffic than it could carry, and much more than it could carry economically and expeditiously. It shows this in the same way as the Great Northern. The revenue trainload increased slightly, from 400 to 407 tons, the total trainload more, from 468 to 492 tons, and the empty freight-car mileage decreased by over 26 per cent. With an increase of 5 per cent. in revenue ton mileage, the mileage of revenue freight and mixed trains increased 3 per cent. But there are other results which spell congestion of traffic rather than economy in operation. The mileage of locomotives employed in helping mixed and freight trains increased 35½ per cent., following an increase of 33 per cent. in 1906. With an increase of 11 per cent. in mileage of revenue passenger trains the passenger locomotive helping mileage increased 31 per cent., following an increase of 59 per cent. in 1906. Within two years the passenger helping mileage has increased from 2 per cent. to 5 per cent. of the total revenue passenger train mileage, and the freight helping mileage from 13 per cent. to 21 per cent. of the total revenue freight train mileage. Here is convincing proof that the road's traffic has outgrown its economical capacity. Here also is good reason for the new stock issue authorized January 7, 1907.

Of the authorized issue of \$95,000,000, \$93,000,000 was subscribed for by stockholders at par, payments to be made in instalments up to January, 1909. A year ago to-day Northern Pacific was selling at 225. This month it has been down almost to par. Of course, the new stock issue is responsible for much of this decline but, nevertheless, the stockholders of the Northern Pacific are fortunate that their company for the next few years will have funds at its command to make the improvements which are vitally necessary to maintaining the maximum rate of profit on its fast growing business.

Already during the past year there have been large expenditures for improving the property. There appear to have been more improvements to the line than on the Great Northern, but this is no proof that the Great Northern is falling behind its southern neighbor and ally in the condition of its railroad. The Northern Pacific was built as most other railroads were built, by speculative methods. It has been said, perhaps unfairly, "The Great Northern was built to carry freight; the Northern Pacific, to carry bonds." At any rate, the Northern Pacific needs grade revisions and line changes where the Great Northern does not and never has needed them. There are listed in the Northern Pacific report 20 distinct pieces of double tracking, grade revisions and line changes; two in Wisconsin, four each in Minnesota and North Dakota, eight in Montana and two in Washington. The most important of these are in Montana, where work is now under way on a total of 157 miles. Besides this, one grade revision in that state, 1.75 miles long, has lately been finished. The most important of these improvements were listed in the *Railroad Gazette* of November 1, 1907, in the Railroad Construction column. How much work they really represent can be judged from the fact that on the important pieces of work under construction during the 1907 year there were 10,900,000 cu. yds. of material moved, of which 8,000,000 cu. yds. were earth, 1,200,000 hard pan and 1,700,000 rock.

The same figures are given for the work done on the Portland & Seattle, the low-grade line along the north bank of the Columbia river from Pasco, Wash., to Portland, Ore. In contrast they are mute testimony of the difficulty of the work on the new low-grade connection. During the year there were 12,500,000 cu. yds. of material moved on the Portland & Seattle, of which 3,200,000 were earth, 4,000,000 hard pan and 5,300,000 rock. On the Northern Pacific construction work there were over twice as many cubic yards of earth moved as of the two harder materials. On the Portland & Seattle there was nearly twice as much rock alone moved as earth, and rock and hard pan together made up more than three times as many yards as the earth moved.

Naturally the amounts spent during the year on the Portland & Seattle have been large. On June 30, 1906, the Northern Pacific had advanced \$5,600,000 to that road for construction. During last year it made additional advances amounting to \$11,400,000. Up to June 30, 1907, the Great Northern had made advances on account of the Portland & Seattle amounting to \$9,200,000, making a total expenditure by both roads up to June 30, 1907, of \$26,200,000. The Portland & Seattle line between Kennewick, Wash., and Vancouver, 221 miles, is rapidly approaching completion, and track should be laid by 1908. The large bridges over the Columbia and the Willamette rivers between Vancouver and Portland are well under way and to be finished by June, 1908. Then the through low-grade connection for the Northern Pacific from Pasco, Wash., to Portland, Ore., will be finished. The Portland & Seattle is also building a line from Pasco northeast to Spokane, 145 miles, which will connect it with the Great Northern. This is to be finished next summer. It is also building a branch from a connection with this Spokane line east to Texas Ferry, 41 miles, which also is to be finished in the summer of 1908. The Portland & Seattle lines are shown on the accompanying map.

This is to connect the joint lines which are being built by the Northern Pacific and the Union Pacific together between Texas Ferry

and Lewiston, Idaho, 72 miles, and between Culdusac, Idaho, and Grangeville, 55 miles. The Lewiston line is being built by the Union Pacific and is mostly finished, but the bridge over the Snake river at Lewiston will not be finished until next month or later. The line to Grangeville, which is an extension of an existing Northern Pacific branch, is being built by the Northern Pacific. On June 30, 1907, when 80 per cent. of the construction work was finished, the Northern Pacific had advanced for construction of this road \$2,234,379. It is expected that this extension will be finished by January 1, 1908.

The new projects and revisions of line already mentioned do not include all the improvement activities of the Northern Pacific during the past year. There were 480 miles of track laid or relaid with new 85-lb. rail, against 168 miles in 1906. On the main line 1,162,753 ties were renewed, against 946,087 in 1906. There were five miles of timber bridges replaced by permanent structures and embankments, against two miles in 1906, and 340 timber culverts replaced by stone, iron or tile, against 177 in 1906. On June 30, 1907, the company owned 250 more locomotives than a year earlier, 85 more passenger-train cars and 6,223 more freight cars. In addition there were to be received between June 30 and December 31, 1907, 52 new locomotives, 28 new passenger-train cars and 1,537 new freight cars. The increase during the last fiscal year in locomotives amounts to 25 per cent. in number and 34 per cent. in total weight on drivers, and in freight cars to 17 per cent. in number and 26 per cent. in capacity.

Gross earnings were \$68,500,000, an increase of \$7,300,000, or 12 per cent. over 1906. Operating expenses were \$6,600,000, or 21 per cent. larger, leaving net earnings of \$30,900,000, against \$30,100,000 in 1906, an increase of \$740,000, or 2 per cent.. The operating ratio was 55 per cent., against 50.8 per cent. in 1906. From the net income \$5,926,753 was appropriated for depreciation of equipment and written off from the capital account "equipment." This charge, which compares with an appropriation of \$2,000,000 in 1906, was arrived at by computing the depreciation to June 30, 1907, of all equipment owned on September 1, 1896, and purchased and built since then. The equipment account of the company is stated to represent the fair value of all equipment owned on June 30, 1907, after making full allowance for depreciation according to the principles laid down by the Interstate Commerce Commission. As already mentioned, no appropriation was made out of income for additions and betterments. The extra amount shown in the table at the end of this review, as appropriated in 1906, was \$1,081,980 for the insurance fund. The surplus of the year was \$6,700,000, against \$8,600,000 in 1906.

Freight earnings increased 10 per cent., while the revenue ton miles increased only 5 per cent. The gain in earnings was due to a larger rate per ton-mile which resulted from a greater proportion of high-class tonnage and a shorter average haul, and not to an increase in rates. The same thing was true in the passenger department, where the rate per passenger-mile increased 8 per cent. The lower rate for 1906 was due to the large amount of low-rate traffic to the Portland Exposition; there has been no actual increase in passenger rates. It is a striking indication of the prosperity of the Northwest that, compared with 1906, the year of the Portland Exposition travel, passenger earnings of the Northern Pacific increased 18 per cent.

The great increase in operating expenses was in conducting transportation, which rose 33½ per cent. Maintenance of way increased 18 per cent., while maintenance of equipment decreased 7 per cent. As in the case of the Great Northern, no detailed figures of operating expenses are given, so that the increases in the conducting transportation accounts cannot be located nor the unit maintenance of equipment charges discovered. Per mile of road, maintenance of way cost \$1,680, against \$1,387 in 1906, and \$1,382 in 1905, a distinctly higher standard of maintenance expenditure and one which represents more than necessary requirements.

The income account for the last two years is shown below:

	1907.	1906.
Mileage worked	5,444	5,401
Passenger earnings	\$16,924,188	\$14,368,221
Freight earnings	48,395,878	44,041,467
Gross earnings	65,534,832	61,223,476
Maint. way and structures	9,145,547	7,492,729
Maint. of equipment	5,542,209	5,944,119
Conducting transportation	20,887,730	15,673,248
Operating expenses	37,664,317	31,095,432
Net earnings	30,870,516	30,128,043
Net income	28,473,929	22,487,740
Improvement appropriations ..	5,926,753	3,081,980*
Year's surplus	6,697,176	8,553,760

*There was an additional improvement appropriation of \$3,000,000 in 1906 for additions to and betterments of existing lines, but this has since been transferred to capital account and therefore is shown, not in this figure, but in the year's surplus.

Chicago, Burlington & Quincy.

Last and greatest of the Hill roads is the Chicago, Burlington & Quincy. It was in 1900 that Mr. Hill set out to buy a Chicago connection for the Great Northern, which he owned, and the Northern Pacific, in which he was interested. He tried in the open market to buy control of the Chicago, Milwaukee & St. Paul and failed. Nothing daunted, he took the Burlington, which connected with the Great Northern only at St. Paul and with the Northern Pacific

only at St. Paul and at one point in Montana, with most of its nearly 8,000 miles of line hundreds of miles away from either of the northern trans-continental roads. During 1900 Burlington stock fluctuated between 120 and 144. Mr. Hill paid \$200 a share for it. He was severely criticised for this purchase, both on account of the high price paid and because it was buying thousands of miles of railroad for the sake of a 500-mile connection. He said little, but began to send men trained in the Great Northern service to manage the Burlington. More and more Great Northern men came to the road as time went on and with them came Great Northern operating methods. The results which have been accomplished during the six years of Hill management are remarkable.

When the Burlington was taken over by the Great Northern and the Northern Pacific it was, like the Chicago, Milwaukee & St. Paul, essentially a local railroad, with the operating methods of a local railroad—small trainloads, light equipment and slow service. In the year ended June 30, 1902, the first year under Hill management (the Burlington was taken over April 1, 1901), the revenue trainload was 218 tons and the total trainload 251 tons. Last year the revenue trainload was 389 tons and the total trainload 444 tons. In 1902 there were 4,000,000,000 tons carried one mile with a freight train mileage of 18,300,000; last year, with a freight train mileage of 18,400,000, there were considerably over 7,000,000,000 tons carried one mile. Meanwhile the railroad lines have been greatly improved; old equipment of small capacity has been scrapped with what might seem like wasteful rapidity and replaced with new equipment, fast freight service has been established between Iowa, Nebraska and the Black Hills and Chicago, passenger service both through and local has been brought to a high standard of excellence and the road stands to-day strong, efficient and well equipped.

Since 1902 there has been an increase of 53 per cent. in gross earnings. Last year gross earnings were \$82,500,000, against \$74,100,000 in 1906 and \$66,000,000 in 1905. Net earnings have not increased so fast but this is because the Burlington includes large improvement expenditures in its regular operating expense accounts instead of making special appropriations out of earnings.

It is particularly unfortunate that where this is the case no detailed figures of operating expenses are given, for this makes it impossible to analyze the expenditures in detail and form an opinion as to the amount spent on betterments. The only unit maintenance figure which can be obtained is that for maintenance of way per mile of road which on all roads operated and controlled, including some narrow gage mileage, was \$1,584 last year, against \$1,272 in 1906. It is necessary to look at the map to realize how generous is this figure. The Burlington is essentially a granger road with most of its mileage in the level prairie country between Chicago and the eastern line of Colorado and with a great clustering network of branch and feeder lines. If the records of the other two leading granger roads count for anything, this type of railroad is the cheapest kind there is to maintain. The Chicago & North-Western and the Chicago, Milwaukee & St. Paul each have a large mileage of branches and feeders in the prairie country. Last year the North-Western spent \$1,185 for maintenance of way per mile, and the St. Paul \$827 per mile. There is no obvious reason why the Burlington should have to spend any more than these roads. Therefore it is clear that an expenditure of nearly \$1,600 a mile by the Burlington means that large improvements are being made directly out of earnings.

The same process of analysis cannot be applied to the maintenance of equipment accounts. But from indirect evidences it is likely that betterments are being charged to operating expenses almost as heavily in equipment. There were added to the equipment during the year 136 locomotives, 712 stock cars and 1,000 coal cars. This, however, probably does not by any means represent the value added to the equipment during the year. It appears that when an old wornout Burlington car of 30,000 or 40,000 lbs. capacity is broken up, it is replaced with a new and modern car of 60,000 or 80,000 lbs. capacity, and the whole cost of the new car charged to maintenance of equipment. This process is said to have been going on with especial rapidity of late.

With such limited figures at command, the most concise and accurate way to estimate the results of the money spent in operating expenses is to observe the proportion of gross earnings which was used on each of the separate accounts. Last year maintenance of equipment expenses amounted to 17.9 per cent. of gross earnings, against 18.4 in 1906 and 14.8 in 1905. Maintenance of way amounted to 17.5 per cent., against 15.2 per cent. in 1906 and 13.8 per cent. in 1905. These figures are clear proofs of the large and increasing amounts spent on improvements through the maintenance accounts.

Similarly the conducting transportation ratio shows the operating efficiency of the year as nothing else can. In 1906 of the gross earnings 30.2 per cent. went for conducting transportation. Last year, with all the wage increases, higher prices of supplies and other influences tending to raise the costs of getting and moving the business, and with 869,000,000 more tons moved one mile and 98,000,000 more passengers carried per mile, only 30.6 per cent. of gross earn-

ings was required for conducting transportation. This small increase is a triumph of good management. General expenses, the other non-productive operating cost, was only 5.4 per cent. of gross, against 5.6 per cent. in 1906.

The few traffic statistics given show this operating efficiency. With an increase of 23,800,000 miles run by loaded freight cars, there was a decrease of 8,400,000 in the empty freight car mileage. The revenue trainload increased from 365 tons to 389 tons, and the total trainload from 420 tons to 444 tons. With a decrease in earnings per ton-mile, earnings per freight-train mile increased. An increase of 12 per cent. in passengers carried one mile was handled with an increase of 7 per cent. in mileage of passenger trains.

Neither the Great Northern, the Northern Pacific nor the Burlington give figures of tonnage carried by commodities. This would be particularly interesting in the case of the Burlington, because its mileage is so much more compact than that of either of the other roads. It is certain that one economy which has been gained during recent years—partly by the natural growth of the territory, partly by special efforts—is the development of a westbound back-haul. This would be indicated by the reduction in empty car mileage. The Burlington is a corn road rather than a wheat road, and is therefore likely to fare well during the next six months, for the corn crop is not only large, but the price is high. It also carries a great deal of live stock eastbound and merchandise westbound which it distributes to the various jobbing centers in Iowa, Missouri, Nebraska and Colorado. A description of its traffic by commodities would, in fact, be a summary of the products and business of the strip of territory between Chicago and Denver, which it so completely occupies.

In July, 1906, the line from Frannie, Wyo., south to Worland, 91 miles, was opened for traffic. An extension of this line from Worland south to Kirby, 20 miles, is now being finished. Since the close of the fiscal year the annual dividend rate on Chicago, Burlington & Quincy stock has been increased from 7 to 8 per cent., with an extra dividend of 6 per cent. This extra disbursement exactly refunds to the Great Northern and the Northern Pacific the amounts which they have paid during the last six years as the difference between the 7 per cent. received on the Burlington stock which they own and the 4 per cent. which they have paid on the joint Burlington bonds, which were issued at the rate of \$200 for each \$100 of Burlington stock.

The fifty-third annual report of the Burlington covers 36 printed pages. In proportion to its length it probably gives less real information than any other railroad report issued. The Great Northern and Northern Pacific reports are lacking enough, omitting as they do detailed figures of operating expenses, classification of tonnage by commodities and other important information, but the Burlington goes a step further. It is a pity that so great a railroad makes so incomplete an annual showing.

The following table shows the income results of all roads operated and controlled by the Chicago, Burlington & Quincy:

	1907.	1906.
Mileage worked	9,122	8,896
Passenger earnings	\$18,666,973	\$16,409,104
Freight earnings	56,516,689	51,168,339
Express earnings	2,000,140	1,456,990
Gross earnings	82,473,251	74,146,671
Maint. way and structures	14,445,867	11,312,712
Maint. of equipment	14,725,632	13,639,942
Conducting transportation	25,224,272	22,354,707
Operating expenses	58,904,988	51,463,642
Net earnings	23,568,263	22,683,029
Net income	13,155,207	12,742,430
Year's surplus	4,320,333	3,907,572

Detroit, Toledo & Ironton-Ann Arbor.

This is a combination of two small weak railroads. The combined lines run from the Ohio river to the northern part of Lake Michigan, from which there is connection by car ferry with a number of different ports on the western shore of the lake. The northern end of the line, from Frankfort, Mich., to Toledo, Ohio, is the Ann Arbor Railroad. The southern line, from Detroit, Mich., south to Ironton, Ohio, is the old Detroit Southern, now reorganized as the Detroit, Toledo & Ironton. The two roads were united in the hope of developing a larger aggregate of traffic by the alliance. This was successfully accomplished in 1906, the first year of combined operation, in which the combined net earnings were \$1,300,000, against \$739,000 in 1905 and the combined operating ratio 67 per cent., against 78 per cent. in the earlier year. The second annual report of the two roads shows that in 1907 there was only a slight increase in gross earnings, a decrease in net earnings and, owing to the application for the full year of the interest charges on new Detroit, Toledo & Ironton bonds, a large decrease in net income. The consolidated results for the last two years are shown in the table at the end of this review. In general the report takes up each of the two roads separately.

The Detroit, Toledo & Ironton, which showed great progress in 1906, went backward last year. Freight earnings decreased 4 per cent. and passenger earnings 3 per cent., while operating expenses increased 12 per cent. The reason gross earnings were larger than