1926.

NEW ZEALAND.

RAILWAYS STATEMENT

BY THE MINISTER OF RAILWAYS, THE RIGHT HON. J. G. COATES.

MR. SPEAKER,—

In presenting my fourth annual Railways Statement I am pleased to be able to record a year of very satisfactory progress.

The net revenue amounted to £1,992,333, which is equal to 4·35 per cent. on the capital invested in lines open for traffic, including expenditure on railway-improvement works which have not yet reached the stage when they are revenue-producing.

Included in the revenue is £359,540 paid from the Consolidated Fund in terms of the Government Railways Amendment Act, 1925, in respect of services performed by the Department in working developmental lines.

The sum of £317,142 has been charged against expenditure and set aside as a Renewals and Insurance Fund. Excluding these two items, which have not hitherto appeared in the accounts, the net revenue amounted to £1,949,935, equal to 4·25 per cent. on the average capital invested, as compared with 3·55 per cent. for the previous year.

A Betterments Fund has also been established to provide for improved accommodation in passenger-carriages and the replacement of gas by electric-lighting therein, improvements in shunting-yards, the retirement of obsolete equipment and works not fully covered by the Renewals Fund, and minor improvements required to maintain the standard of service. The sum of £58,000 has been credited to this fund during the year.

After paying interest charges at the rate of £5·3s. 9d. per cent. on capital raised under the provisions of the Railways Improvement Authorization Act, 1914, and £4·2s. 6d. per cent. on all other capital moneys, there remains a surplus of £21,022.

The subsidy paid from the Working Railways Account to the Government Railways Superannuation Fund was increased during the year by £65,000 to £145,000, equivalent to 18s. 10d. in the pound on members' contributions.

The results of the year's working must on the whole be considered to be very satisfactory. Nearly all classes of traffic show an increase in both volume and revenue, due not only to the natural growth of business, but also in a large measure to the spirit of enterprise which has actuated all ranks of the staff in fostering traffic and catering for the requirements of the Department's customers.

RAILWAY FINANCES AND ACCOUNTING.

In accordance with the policy laid down in previous Statements, and under authority of the Government Railways Amendment Act, 1925, a separate Working Railways Account was established in the Treasury as from the 1st April, 1925, from which date full responsibility for the financial administration of the railway revenue

and expenditure devolved on the Department, within the limits prescribed by parliamentary control. The objects aimed at were, firstly, to set up an organization that would apply the test of financial results to the administration of the Department, and, secondly, to ensure that the accounts should record the results of the Department in the clearest possible form. The accounts have been subdivided to show separately the results of purely railway operation, and of subsidiary services such as refreshment-rooms, Advertising Branch, Lake Wakatipu steamers, and departmental dwellings.

Expenditure has been reclassified to furnish an accurate analysis and allocation of costs for the information and guidance of officers charged with the duty of controlling expenditure.

In order to make systematic provision for depreciation and to equalize the losses arising from fires, slips, floods, and accidents, regular monthly contributions have been levied against working-expenses and credited to special funds.

The accounts for the year under review are published in the revised form. In comparing results with previous years due allowance has to be made for the altered system of accounting. As far as possible the figures for the year 1924–25 have been adjusted to make the comparisons as clear and accurate as possible, but the details are in many cases necessarily only approximately correct.

DEVELOPMENTAL LINES.

In pursuance of the policy previously announced, an investigation has been made into the finances of branch lines and isolated sections of railway which were built in order to encourage settlement and to develop the resources of the country. Officers of the Treasury, Audit, Crown Law, and Railway Departments conferred in order to determine an equitable basis for arriving at the true position of such lines after assessing their value as feeders of the main lines.

The results are shown in detail in a table appended to this Statement. The outstanding facts disclosed by the figures are the low earning-capacity of these lines and the high ratio of fixed capital charges to revenue. At the present stage of development the earnings could not be materially increased even if the railway had a monopoly of the traffic. Since the investment in railways consists mainly of loan-moneys, the capital charges cannot be reduced, as even if the lines were closed the capital charges would still have to be met.

The only method by which any appreciable improvement can be effected is by the reduction of the working-expenses. In order to reduce traffic and locomotive charges experiments are now being made with light rail-cars of various types, while maintenance charges are also being reduced to the lowest point consistent with safe working. The best that can be expected of such means is, however, the reduction of the gap between operating revenue and expenditure. In very few cases is there any immediate prospect of obtaining any net revenue to meet capital charges.

The problem of providing adequate transport facilities in sparsely settled countries is not peculiar to New Zealand. Investigation shows that the practice in other countries is to pay the railway authority from the public funds for remunerative services involved in the working thereof, it being recognized that the benefits accruing to the State as a whole far outweigh the cost to the State.

In New Zealand the payment made to the railways has been confined to specified branches and to isolated sections of line not connected with the main system. The payment is so regulated that every improvement effected in the results on unassisted lines must automatically reduce the payments in aid of the branch lines, and in a lesser degree of the isolated sections.

There has been from time to time some criticism of the arrangement under which the specified branches and isolated sections of line are directly subsidised from the Consolidated Fund, such criticism being generally in the direction of suggesting that the payment involves practically giving the Railway administration a blank cheque on the Consolidated Fund wherewith to provide services at its discretion on branch lines, the inference being apparently that services wasteful in their nature or unjustified will be provided under such circumstances which would not otherwise have been established. Such a suggestion is quite wrong, and must

be based on a very superficial analysis of the arrangement. The truth is that the very opposite is the effect. Under the old system the accounts did not disclose what was being lost in the operation of these developmental lines. Under the new system this amount is known exactly, and exact information is also obtainable from the railway accounts as to the extent to which the Railway Department is reimbursed on account of that loss. This reimbursement again is based on the operating cost of the railways and is incapable of manipulation in any way. Instead, therefore, of the facilities for wasteful administration being extended, the arrangement provides a very efficient check thereon. It does, indeed, what the critics suggest it should do.

TARIFF.

After full discussion with representatives of the various industries affected, the revised tariff was brought into operation on the 31st August, 1925, and was therefore effective for seven months of the financial year under review.

The business community generally adopted a very reasonable attitude towards the Department in its endeavour to put the finances on a sounder footing by charging rates calculated to give a fair return for the service rendered, and by removing anomalies and concessions that had long outlived their usefulness. Every effort was made to avoid throwing any undue burden or hardship on any industry, and it is believed that this object has been substantially achieved.

The following figures show the effect of the tariff alterations on traffic for the seven months ended 31st March, 1926, as compared with the corresponding period of the previous year:—

	Increase or Decrease in Tonnage.	Fluctuations in Revenue		
		Due to Tariff Alterations.	Due to Traffic Variations.	Total Increase or Decrease.
		Increase. £	Increase. £	£
Grain and potatoes	15,350 dec.	4,329	1,527 dec.	2,802
Flour and meals	1,570	3,307	1,745	5,052
New Zealand fruit	3,053	9,687	926	10,613
Sheep	2,878 dec.	3,504	7,591	11,095
Frozen meat	3,905 dec.	1,904 dec.	738	1,166 dec.
Coal (brown)	10,396	36,696	11,577	48,273
Road-metal	7,050	11,885	..	11,885
Timber imported	12,458 dec.	6,611	14,378 dec.	7,767 dec.
Timber, New Zealand	4,305	59,752	9,722	69,474
Posts and firewood	7,378	2,327	2,682	5,009
Horses returning from race meetings	..	6,000 dec.	..	6,000 dec.
	839 dec.	130,194	19,076	149,270 inc.

The increased charges imposed in order to place wheat on the same footing as other cereals resulted in an increase in the revenue from grain and potatoes of 0·12d. per ton per mile, or £4,329. Owing to the smaller yield the quantity handled decreased by 15,350 tons, but an increase in the average haul largely compensated for the loss. The net increase in revenue was £2,802.

The increase in the revenue from flour and meals was £5,052, of which £3,307 was due to the higher rates on flour and £1,745 to the greater quantity handled and an increase in the average distance the traffic was carried.

Locally grown fresh fruit shows an increase of 14·50 per cent. in tonnage and 52·99 per cent. in revenue, attributable to the record crop of apples and the increased charges. The freight on fresh fruit is still very low, averaging only 1·86d. per ton per mile. In view of the perishable nature of the traffic, necessitating the use of special trucks and rapid transit, and involving much empty haulage, light loading, and frequent handling, the rates are unprofitable to the Department. It is hoped that the development of the export trade will soon place the fruit industry in a position to bear a charge more in proportion to the value of the service rendered.

A decrease of 1·24 per cent. in the tonnage of sheep handled was set off by an increase in the average haul. The small increase in the rates resulted in an additional revenue of 0·05d. per ton per mile.

Owing to concessions given with a view to assisting the beef-export industry the average revenue from frozen meat declined by 0·29d. per ton per mile. The total tonnage carried decreased by 5·87 per cent., but a slight increase in the average distance the traffic was carried reduced the loss in revenue to £1,166.

The higher rates imposed on native brown coals resulted in an increase of 0·15d. per ton per mile in the revenue. The total quantity carried increased by 1·92 per cent., the average haul by 2·88 per cent., and the total revenue by 20·08 per cent.

The revenue derived from road-metal, which, prior to the adjustment of the tariff rates, was only 0·74d. per ton per mile, increased to 1·55d. per mile. The total tonnage carried increased by 3·50 per cent., but the average haul decreased by 35·42 per cent. The net gain in revenue was £11,885.

The rates on timber, which were only one-seventh above the pre-war level, were raised to place them on the same footing in this respect as the rates on other products. This has resulted in an increased revenue of 0·97d. per ton per mile from imported and 0·34d. per ton per mile from native timbers.

Owing to the falling-off in importations of power-line poles the total quantity of imported timbers decreased by 27·54 per cent., and the revenue by 19·41 per cent.

Native timbers show an increase of 1·08 per cent. in quantity, 2·91 per cent. in the average haul, and 24·46 per cent. in revenue.

An important matter in connection with the tariff which is now engaging my attention is that of adopting cheap rates to induce traffic in the "off" season. It must be borne in mind that the Railway Department requires to maintain a plant throughout the year which will be practically sufficient to meet the maximum demand at any time of the year. For instance, in connection with passenger traffic, the Department must be in a position to cope with the very heavy demand at such restricted periods as the Christmas and Easter holidays. The result is that a very large amount of plant is lying idle for a great part of the year. Any traffic, therefore, that can be induced during the periods when the plant is lying idle, and from which the revenue will be anything in excess of the additional net cost of working such traffic, will leave something to assist in meeting the overhead expenses, which practically remain constant whether the traffic be light or heavy. I feel, therefore, that if anything can be done to develop such traffic as I have mentioned it will go some distance towards improving the financial position of the Department. Included within this category, for instance, is such traffic as farmers' winter excursions. The facts I have outlined make possible the granting of exceptionally low fares during the winter season, and as it happens that this is also the period of least activity in the farming sphere, I feel confident that there is a field that might be explored here to the mutual advantage both of the farming community and of the Department.

In the past there has been from time to time a demand from various representative bodies of farmers for facilities of this nature, and I have therefore had no hesitation in concluding that an experiment along these lines would be amply warranted. After the close of the year such an excursion was run, and the results were distinctly encouraging. I propose during the coming year to pursue this matter further not only in connection with farmers' excursions, but in all other ways, both as regards passenger and goods traffic, that will enable our facilities to be made revenue-earning during as great a portion of the year as possible.

WORKSHOPS REORGANIZATION.

Since last year's report considerable progress has been made in the direction of bringing the workshops of the New Zealand Railways up to date.

New Workshops.

In the North Island a site has been procured at Otahuhu, near Auckland, for the new car and wagon shops. All heavy repairs to cars and wagons in the North Island will be performed at these shops when completed, and all new car and wagon stock will be built there. The complete plans for these shops have been completed, and tenders for the erection of all buildings close on the 30th September, 1926.

At Petone, in the new industrial area close to the Waiwetu Stream, a site has been procured for the centralized locomotive-repair shops for heavy repairs for the North Island. Complete plans have been made, and tenders for the erection of these shops close on the 31st August, 1926.

In the South Island the plans have also been completed for the remodelled car and wagon shops at Addington, and for the locomotive shops at Dunedin. Tenders for these shops have been called, and close on the 1st November, 1926.

The complete erection will take, it is estimated, about fourteen months from the date tenders are accepted, after which the installation of machinery and equipment will be proceeded with. Since it is recognized that the economies on which the scheme of improvement is based will not be obtained in their fullest measure till the works are completed, every effort is being made to complete them in the three years as planned.

Further investigation into the maintenance of wagon stock has shown that the existing workshops have been handling a considerable volume of work on minor breakdown jobs, which logically should be done at the terminals themselves, as is the general railway practice. In order to do this and other light work, such as Westinghouse-brake cleaning, the facilities at Auckland, Christchurch, and Dunedin yards are being increased so that vehicles requiring these light repairs may be repaired and put into service with the utmost possible despatch. The increased efficiency in this connection will reduce the " out of service " problem so far as rolling-stock is concerned, and assist the Traffic Branch when the demand for wagons is heavy.

East Town Workshops.

It has been decided that the manufacture of points and crossings shall be transferred from Addington to East Town.

Examination shows that the major requirements for this product are in the North Island, and the existing shop at East Town is well suited for the purposes. It has also been arranged to concentrate all tarpaulin work for the North Island at East Town. Car work hitherto done at East Town will be transferred to Newmarket, and the tarpaulin department from Newmarket transferred to East Town. Light repairs to engines and wagon stock will be continued at East Town; the heavy work to locomotives will later on be transferred to the new workshops at Petone.

Copies of the plans of the lay-outs at Otahuhu, Petone, Addington, and Hillside are appended hereto.

Workshops Machinery.

Considerable progress has been made towards the modernizing of the workshops machinery. The state of obsolescence reported on last year has been dealt with by a three-year programme of replacement. The machinery being ordered during the first and second year consists only of that which can be profitably utilized in existing workshops pending the erection of the new workshops; that included in the third year will be the heavier machinery which will be placed directly into the new workshops.

In order to facilitate repairs to locomotives, plans for grouping machinery according to the organization of the work have been made and put into execution at each of the four main workshops. The new layouts provide better access around the shop, and lessen the amount of material-handling. Provision was made in these new layouts for the new machinery and for the electrification of drives.

One hundred and three machinery specifications were drawn up and issued, covering the replacement and additional machinery required to modernize our shops, this being the first year's quota. A Machinery Committee was set up to make a

final selection from the tenders received, and decisions are all complete for the first year's programme. During the coming financial year the second year's programme will be handled.

On receipt of the new machinery the best of the existing machinery will be selected to augment the facilities at running-sheds and small terminal repair shops of all kinds.

Workshops Electrification.

Work is proceeding satisfactorily with regard to the electrification of existing workshops at Petone, Addington, and Hillside. Petone and Addington have been gas-engine driven, and Hillside steam-engine driven, in the past. Complete plans for electrically driving all machinery in these shops have been made. Motors and electrical gear have already arrived and are being installed at Petone and Addington, and the motors for Hillside are expected in a few months. Ultimately all these motors will be transferred to the new workshops. Not only will this relieve the smoke and gas annoyance to the men and to the neighbourhood, but it will be a distinct step in advancement towards economy and efficiency in working.

Workshop-lighting is also being modernized, and conditions made much more comfortable for the employees in this and other directions.

Reorganization of Existing Workshops Management.

Good progress can be reported in the reorganization of existing workshops management, methods, and services, some of which may be mentioned as follows :—

The official staff of our four main workshops in the past consisted of a Workshop Manager and six Foremen, one over every major trade—namely, fitters, blacksmiths, moulders, carpenters, painters, and boilermakers. These Foremen supervised all their respective craftsmen wherever they were located in the workshop area. Analysis showed that each Foreman had men all over each workshop, and that efficient supervision was impossible because of the number of duties involved and the area to be covered. This organization has been changed, and now consists of a Workshop Manager and two General Foremen, one over car and wagon work and one over locomotive work. These General Foremen have Foremen in each shop, supported by Assistant Foremen where the number of men warrants it. In addition, a Production Office division has been set up to route work through the shops, dovetailing the work of one department with another, and to trace material that is required, so that the Foremen are not employed doing work that clerical men can do better. The new organization is better balanced, provides means of production through a progressive route, and is producing economic results.

Cost-keeping methods have been established in the four main workshops as part of the Production Division, and the system of recording labour distribution has been changed. A daily time-card replaces the old fortnightly book, so that by a process of keeping the supervisory staff informed of the cost of the work in progress, each Department separately, they will be able to assist in introducing cost-reducing methods. A proper knowledge of detail costs is essential in all businesses, and the methods now introduced cannot fail to have good results.

A new system of costing material has been instituted in all four main workshops, so that the supervisory staff will be acquainted with the values of the material they are using. Stock-lists of slow-moving stores are now issued monthly to all departments, as also are lists of stocks of special materials, such as tires, tubes, and plates, so that purchasing may be kept down to a minimum.

A matter in connection with the administration of the workshops to which I have devoted considerable attention during the past year is that of relating the earnings of the employees in some way to their output. This is, of course, no new problem in industrial affairs, and various schemes have from time to time been applied to its solution. That, however, which appeals to me as having the greatest possibilities is the premium bonus system. The basic principle of this system is that the profits arising from increased output per unit of labour shall be divided between the worker and employer. This system is now in operation in many parts of the world, and although it has in many cases been opposed at the outset by labour organizations (more, I believe, as a matter of tradition or sentiment than

founded on any sound argument), this opposition has generally disappeared when the benefits of the system to the workers have become manifest in practice. I hope during the coming year to be able to finalize proposals on this question, and these will be discussed with the employees with a view to enlisting their co-operation in regard thereto. I believe that the advantages will be recognized immediately the employees obtain a proper understanding of the system, and that no great difficulty will be experienced in bringing the system into operation at our workshops, and carrying it on so as to get the maximum benefit to both the Department and the employee.

STORES.

A branch in which substantial progress has been made in the work of reorganization during the year is that relating to stores.

I am fully sensible of the fact that in no branch is there greater necessity for an efficient organization and a strict adherence thereto than in this branch. It must not be forgotten that stores are money's worth, and there is no difference between a leakage therefrom and a leakage from the cash-drawer in a booking-office; nor is there any substantial difference in the loss incurred through maintaining unnecessarily large stocks of stores than there is in keeping a large amount of money locked up and unused. The object, therefore, of the organization that is being developed is both to safeguard leakages and waste of stores and also to ensure that while there shall always be sufficient there shall never be a surplus. The greatest vigilance requires to be exercised in the care and purchase of stores in order to ensure that stocks shall not become out of date, and especially does this apply to slow-moving lines. Proper distribution to jobs and accurate accounting in connection therewith are essential to secure proper costing figures.

All these things require a specialized knowledge to get the maximum of efficiency, and in order to achieve the best results along these lines a system has been adopted under which the Stores Branch will have the custody and responsibility for stores right up to the moment of their issue for consumption.

This has been a work of considerable magnitude, involving a large amount of organizing, together with erection of suitable stores accommodation. It is gratifying to find that substantial progress has been made in connection with this work, and during the coming year we should find the whole system of stores-control within the Department on a thoroughly sound footing.

WORKSHOPS OUTPUT.

SUMMARIZED RESULTS OF THE OUTPUT FROM THE FOUR MAIN WORKSHOPS FOR THE YEAR ENDED 31ST MARCH, 1926, COMPARED WITH PREVIOUS YEAR ENDED 31ST MARCH, 1925.

Locomotives.

Overhauled	23 more	.. ..	13·6 per cent. increase.
Light repairs	41 less	.. ..	12·0 per cent. decrease.
Painted	43 more	.. ..	30·7 per cent. increase.

The decrease in the number of light repairs is an important feature, inasmuch as an endeavour is being made to reach the stage when the question as to when engines shall be shopped for overhaul will be regulated by the mileage run.

In addition to the extra repair work done, six new tender engines were built and thirty-five imported engines erected, whereas in the previous year only two tank engines were built and four engines re-erected.

	Number of Days under Repair. Average, 1924–25.	Average, 1925–26.	
Complete overhaul	55 days	44 days	.. 20 per cent. decrease.
Heavy repairs	36 days	41 days	.. 14 per cent. increase.
Light repairs	14 days	11 days	.. 21 per cent. decrease.

The increase in heavy repairs is due to the difference in classification. Whereas in 1924–25 these repairs were classed on a cost basis, those for 1925–26 are on the amount of work done and the mileage run by engines.

On the basis of the number of days in shops the above represents—

1924–25 average :—	Average.	Days.
154 complete overhauls	55 days	8,470
38 heavy repairs	36 days	1,368
298 light repairs	14 days	4,172
		14,010

1925–26 average :—	Average.	Days.
154 complete overhauls	44 days	6,776
38 heavy repairs	41 days	1,558
298 light repairs	11 days	3,278
		11,612

Showing a saving of 2,398 engine-days, or additional days engines were revenue-earning.

Cars and Vans.

Built	20 more.	
Rebuilt or heavy repairs	124 more ..	10·2 per cent. increase.
Light repairs	113 more ..	37·2 per cent. increase.
Painted	81 more ..	13·7 per cent. increase.

Wagons.

Built	21 more.	
Rebuilt or heavy repairs	268 more ..	2·9 per cent. increase.
Light repairs	269 less ..	5·2 per cent. decrease.
Painted	640 more ..	20·6 per cent. increase.

Tarpaulins.

New and replacements	175 more.
Repaired	1,731 more.

The output figures for the four main shops show an increase in the number of engines completely overhauled, and this has been achieved with a reduction in labour costs. Comparing cost of repairing locomotives this year with last, the position is as follows :—

	£
Wages	10,586 decrease.
Material used	9,665 increase.
Overhead	12,693 increase.

The reason for the increase (£9,665) in material expenditure is due to the greater number of engines completely overhauled during the year.

The increase (£12,693) in overhead charges is due to the reorganization of the Railways accounting system, whereby the cost of such items as insurance, interest, depreciation on buildings, machinery, &c., has been distributed over all working-accounts. In previous years these were not debited directly to working accounts.

Briefly put, the reduction in labour costs (£10,586) more than pays for the extra material (£9,665) used in obtaining a greater output.

The workshops reorganization scheme was introduced to reduce working-costs, and the reduction in labour costs discloses the fact that it is already achieving this purpose.

LOCOMOTIVE SUPPLY AND TRACTIVE FORCE.

A committee of Railway officers is now going into the matter of engine-power generally with a view to evolving types most suitable for the varying duties to be performed, such as shunting, working branch lines, heavy grades, &c.

Diagrams showing gradients and curves on the Main Trunk line were recently forwarded to Messrs. Beyer and Peacock, makers of the Garratt locomotive, with all necessary details to enable the firm to quote a Garratt type locomotive suitable to New Zealand conditions and draw-gear, the firm being asked to quote for two

Garratt locomotives of the two-cylinder and three-cylinder type respectively, and also for these locomotives in lots of six. On receipt of this information the committee will be in a position to come to a conclusion regarding the feasibility of adopting this type of locomotive for our heavy grade working. Of the 184 miles of line between Te Kuiti and Marton a large-sized Garratt locomotive would be restricted to the ninety-one-mile length from Taumarunui to Taihape, the position north of Taumarunui hingeing on the strengthening of the Waitete Viaduct near Te Kuiti. New girders for this viaduct are, however, now being manufactured. Between Taihape and Marton (forty-four miles) an extensive programme of bridge-strengthening will be necessary to enable Garratt engines to be run. The whole question is necessarily wrapped up with the other questions of draw-gear and length of trains. The present car and wagon draw-gear is a combined buffer and draw-bar with only a 2 in. shank. A Garratt engine of greater tractive effort than 40,000 lb. or 45,000 lb. is not practicable with this draw-gear. The present crossing accommodation at stations, governing the length of trains that can be crossed, is another factor.

The modified Fairlie type, being completely rigid, is not considered so suitable as the Garratt type for the short-radius curves experienced on our lines. Another advantage of the Garratt engine is that it can run at high speeds, and can therefore be used almost as well on passenger-trains as on goods-trains, thus fitting in freely on engine-run linking.

Arising out of the matter of tractive capacity of locomotives and the strengthening of draw-gear, inquiries are being prosecuted by the Transportation Branch regarding the actual need of strengthening draw-gear in connection with train-loads, having regard to yard accommodation and crossing-loops.

TRAIN SERVICES AND GENERAL OPERATING.

The reorganization of train services was continued during the year, and the general rearrangement of services was incorporated in the summer time-table which came into operation in November last. This also synchronized with the opening of the New Zealand and South Seas Exhibition, for which additional train services were necessary.

The Wellington–Auckland, Auckland–Whangarei–Opua, Auckland–Rotorua, and Auckland–Thames expresses were re-scheduled, and in each case considerable reductions were made in the time required for the journey. The Napier–New Plymouth and Christchurch–Dunedin–Invercargill expresses were adjusted on somewhat similar lines before the close of the last financial year.

A daylight express was given a trial between Wellington and Auckland during the summer months. The approach of winter, however, made it quite evident that the running of three express trains between Auckland and Wellington during the slack season of the year would not be justified, and that a reduction in the number of trains was inevitable. As the ordinary express and the night limited were each receiving greater patronage than the daylight limited the running of the last-mentioned train was discontinued from the 5th June.

Considerable attention was given to mixed and goods train services. When circumstances permitted additional goods trains were provided with the object of relieving the mixed trains—more especially those connecting the near-by country districts with main centres—so making it possible to accelerate the latter trains and giving better access to the business centres. The matter of providing for later starting-times in the morning and earlier arrival times in the evening also received attention, and improvements in this direction were made wherever possible.

The reorganization of the railway time-tables has given general satisfaction to the travelling public in whose interests the alterations were made.

Fast through goods trains were inaugurated between Christchurch, Dunedin, and Invercargill, and between Wellington and Auckland, Wellington and New Plymouth, Wellington and Napier, and Auckland and Okaihau. These trains enable goods to be conveyed between the terminals in either Island with a period of only one working-day in transit. They also afford fast transit for perishable and urgent

traffic which cannot be accommodated on express trains. Close and constant touch will be kept on country and town requirements, and I have expressed a wish that every effort be made to study the convenience and requirements of the Department's clients.

RAIL-MOTORS.

Experiments with self-propelled rail-cars have been continued during the year, and although a certain measure of success has been attained a thoroughly satisfactory vehicle has not yet been produced.

A project to develop a suitable vehicle by fitting a motor-car engine into an ordinary railway carriage has been abandoned.

The Sentinel steam-car has been tried during the year on the Wellington–Melling line. Its construction does not admit of a speed in keeping with the requirements of suburban traffic, and its usefulness is in consequence limited. Arrangements are being made to place the car on the Frankton–Thames section at an early date.

The Clayton steam-car has been under observation, and after various modifications it shows some prospect of developing into a fairly satisfactory service vehicle. On a recent trial run, after the fitting of a larger boiler, this car gave promising results. Further extended tests have since been made, and the car still gives satisfaction. It is proposed to try this car in regular service on the Kurow Branch, and arrangements are being made accordingly.

Experiments are also in progress with four-wheeled road-vehicles converted to run on rails. These cars seat eleven passengers, and have been sent for trial on selected branch lines in the South Island where the passenger traffic is light. Their working-expenses are low, as they can be operated by one man, and their fuel cost is small compared with that of a steam-engine or any other power unit required to deal with the same number of passengers.

The Edison electric storage-battery carriage has been prepared for trial between Christchurch and Lyttelton. The necessity for recharging the batteries at regular intervals limits the scope of a car of this type. The question of extending the limits of the car by the provision of an extra set of batteries is being gone into. The vehicle should provide comfortable riding and, being smokeless, should prove popular on the tunnel journey.

ORGANIZATION.

During the year I have been giving considerable thought and attention to the question of the organization of the Department, particularly in relation to the system of divisional control which was outlined in my Statement of last year. During the course of the year we have had some experience of this form of control, with results that have confirmed the conclusion then arrived at—namely, that this was an improvement on the organization under which the Department had been previously worked.

Much railway literature has been written in recent times on the question of divisional *versus* departmental control, and the subject has been one of keen discussion among railway authorities. Generally speaking, it may be said that divisional control was most favoured, and was earliest developed in America, while departmental control has had the longest survival in Great Britain.

Viewing the question in the light of our experience and of these discussions, I feel forced to the conclusion that we must pay very careful regard to local conditions before deciding that any particular system that might be in operation elsewhere should be applied *in toto* to our system. Undoubtedly any decision on this question must be affected by factors that may vary considerably in different systems, such as the size of the system, the extent of territory covered, geographical features, &c. For instance, the division of our system into two main portions separated by sea at once suggests that divisional control founded on that separation might be advantageous. At the same time the fact that the most distant controlling officers in our system can be reached from Headquarters practically within twenty-four hours suggests that the organization does not require to meet that degree of what might be called "isolation" that exists on such far-flung systems

as are operated in some parts of America, South Africa, and other countries. In those countries we have what might more properly be called the "regional" system, where—in South Africa, for instance—the regions are controlled by Assistant General Managers. These officers are what their name implies, really sub General Managers, and the whole question that has to be decided in framing organization to meet our needs is whether the conditions that have called for the establishment of such officers on the South African and American systems have a parallel in this country.

Leaving this question open for the moment, however, we may safely say that the decentralization of detail that is one of the marked characteristics of divisional control amply justifies the measure of divisional organization which we have already adopted. The essential desirability of co-ordinating the efforts of those who are directly concerned with operation undoubtedly makes for efficient and economical working, and certainly reduces to a minimum that friction which is apt to arise within the organization under a strictly departmental system. I have, therefore, during the course of the year pursued the policy of devolving from the central authority on to the divisional Superintendents practically the whole work of control of operation within their respective divisions, and also as much of the detail work as could be disposed of in that way. This policy has essentially for its object the removal from the sphere of the general management of all but the major questions of policy and finance, and such other questions (for example, rating) as owing to the absolute necessity for uniformity throughout the system must be kept within the province of the central authority. The divisional Superintendents are now able to decide matters in connection with time-tables themselves, they, of course, being held responsible for the results achieved. By this means we have aimed at making our time-tables and other operating arrangements more responsive to the needs of the people, the desirability of this action resting on the basis that the nearer we can bring the authority with which the final decision must rest to the customers of the Department the sounder will be the decisions arrived at and the more speedy will be the satisfaction to our customers.

I believe that, as the question of the method of organization so far as general principles are concerned is still one of some debate, we might find it necessary from time to time to make alterations in the system, but I feel satisfied that the lines along which we are now working—namely, that the development of the best points in the divisional system as experience shows them to be adaptable to our requirements—are the only sound ones, and during the coming year their application in practice will be closely watched and changes made as necessity arises with a view to securing the best possible results.

APPOINTMENT OF ASSISTANT CHIEF MECHANICAL ENGINEER.

Owing to the resignation of Mr. R. P. Sims, Assistant Chief Mechanical Engineer, applications were invited to fill this position. A large number of applications have been received, and I hope to be in a position to make an announcement shortly.

APPOINTMENT OF STATISTICAL OFFICER.

Reference was made in my last Statement to the compilation of certain statistics. A good deal of preliminary work in this connection has been done during the past year. In order that the best results may be obtained applications were recently called for the appointment of a Statistical Officer. Before coming to a final decision I am anxious to ascertain whether a suitable appointment cannot be made from within the Department, and this aspect is now engaging my attention.

TRAIN-CONTROL.

This matter has been the subject of special inquiry by officers who have been abroad recently. As a result of their investigations it is apparent that "train-control" has become the recognized method of dealing with the movements of trains and the control of rolling-stock.

The principal objects of control are,—

(1.) To maintain the punctual running of booked trains, and to see that special trains are run at suitable times.
(2.) To ensure the expeditious movement of traffic.
(3.) To regulate the flow of traffic from point to point, according to the capacity of the yards to receive, and the running-lines to carry it.
(4.) To obtain the maximum service from the available locomotive power by—
    (*a.*) Using the least possible number of locomotives:
    (*b.*) Incurring a minimum of unproductive mileage:
    (*c.*) Securing the greatest workable loads.
(5.) To adjust, between the various depots, the power available to ensure that a shortage at one depot is, wherever possible, met by a surplus at another.
(6.) To regulate the hours of trainmen to ensure the fullest possible use being made of the men available, and that the hours of duty of the men are kept within reasonable limits.
(7.) To distribute the available rolling-stock promptly and to the best advantage.
(8.) To make all necessary arrangements in any case of emergency, advising all concerned as to what has occurred and what emergency arrangements must be effected.

The matter is, however, vitally dependent on improvements in our system of communication, and steps are being taken in this connection as outlined hereunder.

TELEPHONE AND TELEGRAPH FACILITIES.

For some time past the Department's telephonic and telegraphic facilities have been inadequate to meet the steady growth of traffic. With the view of bringing these services into line with modern requirements a special committee of experts was set up to investigate and make recommendations. Their report has now been received, and the following points are given prominence:—

(1.) Morse telegraph-lines, both local and through circuits, in the North Island are in many cases inadequate to cope with the business to be handled.
(2.) The telephone circuits, almost without exception, are inadequate.
(3.) The inadequacy of both methods of communication causes considerable congestion in working, this being most detrimental to the satisfactory handling of transport work, for which rapid and efficient communication is most essential.

The telephone circuits were all originally earth-working, but with the advent of hydro-electric reticulation generally throughout the country it has become necessary to convert them to the metallic system, which necessitates the provision of an additional wire in all cases.

Reference is made to this in the D.–2A statement for 1924, the sum set aside for this particular purpose being £65,000. At the present rate of progress it is estimated that two years will elapse before the metallicing of all earth circuits is completed.

The committee makes it quite clear that an immediate increase in the facilities available, combined with a reorganization of those at present existing, is urgently necessary to relieve congestion and delays and to promote the safe and economic handling of railway transport.

The best solution of the problem appears to be the construction of suitable copper-wire circuits with selective telephones and the institution of train-control from central offices. This matter has already been gone into, and it is estimated that the provision of a train-control selective system for all the main lines will cost approximately £140,000.

In accordance with the committee's recommendation, in which the Board of Management concurs, I have decided that this system should be installed as a trial over a selected section in each Island—namely, Wellington to Marton in the North Island and Christchurch to Oamaru in the South Island. The cost of these portions will be respectively £10,500 and £13,000, a total of £23,500.

PUBLIC RELATIONS.

A cardinal feature of the policy in the development of the railway business has been the promotion of a closer relationship between the Department and the public: in other words, the creation of a good-will in favour of the Department. In the case of a monopoly business, of course, good-will figures very little, but as competition grows this factor becomes increasingly important, and to-day the stage has been reached through the advent of competitive forms of transport that necessitates those responsible for the administration of the Railway Department fostering public good-will to the maximum possible extent. With the rapid improvement in motors as a mechanical form of transit, together with the steady improvement in our roads, the sphere of motor competition will become more and more extended, and as this occurs the matter of good-will will assume proportionately greater importance. In the days when the railways had a virtual monopoly of the transport business the necessity for fostering public good-will did not press itself on railway administrators, and — perhaps unconsciously—the development of this aspect of the Department's activities did not receive the attention at their hands that the present altered circumstances imperatively demand.

The problem of improving the public relations may be said to present itself in two aspects—(1) improved service; (2) co-operation of the public. As to the first, a close survey of the situation discloses the necessity for substantial improvements in the facilities at the Department's disposal to enable it to give better service. This has necessitated our embarking upon an extensive programme of improvements involving the expenditure of considerable sums of money, but in every case the proposals have been based on a rigid adherence to the principles of economy and efficiency. Without exception we have required to be demonstrated before any proposal was adopted that it was amply justified on one or both of these grounds, and we are already beginning to feel the benefit of the steps that we have taken in this direction.

Unquestionably with the increased spending-power of the people there has been a greater demand for service. As to passenger traffic, the maximum degree of comfort and speed that can be obtained consistently with safety is demanded, while similarly with goods traffic the demand is for promptness in transit. This has required extensive revision of time-tables, providing for faster train services. The changes that have been achieved in this direction during the past year have, I believe, met with the general approval of our customers and have brought to the Department a large measure of good-will. A further aspect of the problem of better facilities is to be found in the greater measure of contentment among the staff, which has its direct reflection in better personal service given by the staff to the public. It is a fact that a staff working in comfortable and congenial surroundings with efficient machines will work with an enthusiasm and a will for service to a much more pronounced degree than under other conditions. The attitude of the staff generally towards the public, I am assured, has been a considerable factor in promoting the success of the past year's operations. This, however, is a matter on which I shall have further to say hereunder in dealing with the question of staff. Let it be sufficient to record at the present point that our object is not only to devote attention to the improvement of facilities, but also to recognize and continually keep in view the other essential to success—namely, a staff 100 per cent. efficient and with the will to give service.

Dealing with the problem of public relations under the second aspect—and one which from many points of view is the more important—namely, that of securing the co-operation of the public, I am happy to be able to say that in this direction very considerable progress has been made. Realizing at the outset the necessity for setting up a closer personal relationship between the Department and its

customers I had established a Commercial Branch, which has now become a very important branch of the Department. The work of this branch is twofold in its nature. It requires in the first place that the commercial officers shall go out among the public, establish personal contact with the Department's customers or potential customers, and advocate the cause of the railway, pointing out that the Department has both the will and the means to give good service, that the service is economical as well as efficient, and, more particularly, that the constant care of the Department is the client's interest. The other aspect is that, within the Department itself, it must plead the public point of view. Necessarily its ideas will generally be in advance of the ideas of the transportation side and it will be constantly urging the public demand for extended service. The Commercial Branch must be extraneous to and independent of the transportation side though working constantly in the closest co-operation therewith. The Commercial Branch places itself in the position to value services, and so also provides the foundation for confident and sound decisions in the Rating Department. More particularly, however, does it constantly concern itself with maintaining a point of contact between the Railway staff and the public, ever directing the viewpoint of both so as to ensure an entire harmony between them in all the Department's transactions. I feel satisfied that there has been no more strongly operating factor in bringing about the closer *rapprochement* between the Department and its customers than the operations of the Commercial Branch, and I am equally convinced that there is still much room for good work in this direction, resulting not only in prosperity to the Department, but also satisfaction to its customers.

Good work has been performed during the past twelve months, and much of the business previously lost by competition has been recovered, and a good deal of new business has been secured. In this respect it has been ascertained that revenue to the extent of £133,000 has been directly due to the activities of the Commercial Branch, together with the co-operation of the station staffs. This is very gratifying, and I hope with the keenness displayed by all ranks of the service that even better results will be shown next year.

A further channel through which it is considered that public co-operation might be secured in an active way is by the establishment of District Advisory Boards. These Boards will be representative of the various interests using the railways, as incorporated in Chambers of Commerce, Farmers' Unions, &c., and will operate within defined districts. At the meetings of these Boards discussions will take place on the various problems that will be remitted to them affecting public relations with the Department, and there can be no doubt that the clearer understanding that will arise from these discussions and from the operations of these Boards generally will lead to a closer co-operation between the public and the Railways that will be for the material benefit of both. These Boards will, as their name implies, be advisory in their nature, as must necessarily be the case when as in State-owned railways the final responsibility to Parliament must rest with the Minister. This, however, need not in any way restrict the usefulness of the Boards, for there is undoubtedly a field for their operation which will be ample to justify their constitution. They will act as a means for bringing together the views of the Railway Department and its customers, and will be a step towards ensuring that the Department's decisions shall before being finally settled have at their foundation a proper knowledge of the point of view of the customers. The Boards will work out the solution of the various problems in a way that will be possible under no other method, but, above all, there will be the fact that the decisions when come to will have behind them the weight of opinion of the representatives of the Department's customers. By that method we are not only better assured of the correctness of the decisions arrived at, but we are also assured in advance of the help of the committees and the bodies they represent in bringing about the desired results. The operations of these Boards will be founded on a basis of fair and open dealing, frank discussion, and constructive criticism, all combining together in a healthy co-operation. As this report is being written the constitution of the Boards is being settled, and it is hoped that before next year's Statement is presented we will be in a position to report that they have developed a full measure of activity.

Let me emphasize, in conclusion, that we aim at not only a passive acquiescence on the part of the public in our doings, but their active co-operation and assistance to make our services better and better, and I am satisfied that it is only by taking our customers fully into our confidence and placing all the cards face up on the table that we can hope to arouse the fullest measure of active co-operation in them. In that way will we secure the public good-will, and only along that way lies the path of progress.

An excellent example of the practical application of the principle underlying this proposal is to be found in the policy which was adopted last year of referring the Department's proposals in regard to the new tariff to the various interests affected before the tariff was finally adopted. These proposals were fully and frankly discussed with all those who desired to make representations concerning them, and in the light of the fuller knowledge thus gained various modifications were found desirab'e, and were incorporated in the tariff. The result was that when the tariff was brought into operation it was accepted practically without question.

ROAD COMPETITION.

A problem which has engaged my attention during the year and which is, of course, likely to be the prime problem of our railway system for some years to come is that of road competition with the railways. The efforts of the Commerical Branch have undoubtedly tended to keep this competition within limits, but we still find that at various points road carriers are maintaining their business. The whole question, of course, resolves itself into one of economics, and if transport can be carried on more economically by road, then undoubtedly the business will go by road; but it is necessary in considering this matter from the point of view of a Government policy affecting the railways to regard it, not as the road carriers and their customers almost invariably do—namely, from the point of view of individual interest—but rather from the point of view of what is best for the community as a whole. The difference between these two points of view is very material in deciding the policy, because the community owns the railways, and regard must therefore be had by the community to the capital that has been sunk in the railways. It must not be forgotten that, generally speaking, the railway rolling-stock is available to do the work that is being performed by road and is lying idle when that work is diverted to road transport. A community must, therefore, make due allowance for this capital and for the plant that has been provided in making comparisons of relative costs as between road and railway transport. But if, after making these allowances, it is still found that transport by road is the more economical, then there can be no justification for doing other than utilizing the road transport for such traffic. In other words, even if the traffic is available for the Railway Department, it seems to me that if it can be dealt with more cheaply by road transport the proper course is to deal with it by that method. The question then arises as to whether the Railway Department should hand over the traffic to a competitor by road or should itself undertake the transport of the goods by means of road-vehicles. Cases have already come under my notice, and particularly in connection with the casual traffic between the peak loads in the morning and evening on short runs, when undoubtedly the work now being performed by the Railway Department could be more cheaply performed by road-vehicles, and I therefore desire to state as a declaration of my personal policy that whenever this can be done I propose that the Railway Department shall undertake the work, either itself or by arrangement with private enterprise. In doing so I recognize that it may be said that the Railway Department is trenching on the field of private enterprise, but a careful analysis of the situation seems to me to show clearly the fallacy of this argument. The traffic, in the first place, was railway traffic, and in keeping the traffic to itself the Railway Department is but holding what has always been its own and is not taking the traffic that originally belonged to private carriers. The advantages of large-scale work have up to the present lain with the railways because of the extent of their field of operation, and I think the same considerations, though possibly in a less degree, might be held to justify the Railway Department in endeavouring to undertake at least such road transport work as will enable it to reduce its working-costs.

I do not regard road and rail transport as necessarily antagonistic. Undoubtedly road transport has come in as a new factor and has its rightful place in our economic life. That place must be conceded it in any policy that has regard to the true economic interests of the community, but equally in such policy must road transport be kept within its proper sphere. If this is done the position is not one of antagonism, but one of co-operation and co-ordination. I can conceive no better medium for co-ordinating the transport work of the community than that organization which has already been charged with that work or the greater portion of it—namely, the railways. There will still under this policy be a large field for private enterprise in those portions of the country where it would be no great saving to the railways to undertake transport work by road. Such occasions occur to me as transport on roads that are feeders to the railway. There is, I believe, sufficient outlet for the energies of those who desire to adopt that class of business for many years to come. The railways are ever willing to co-operate in the fullest measure with any such persons to facilitate their business as far as the Department may do so and generally to co-ordinate their efforts so as to reduce working-costs and give better service.

Summing the position up in this connection, I desire to say that my policy will be for the Department to utilize road transport either itself or by arrangement with others wherever it can effect economies in its work by so doing, or can increase the potentialities for service of its present operations.

In this connection I may say that the financial aspect of many of our branch lines has for some time been the cause of much concern, and consideration is now being given by the operating officers to the question of establishing definitely whether it would not be more economical and make for greater efficiency to run services by road, either in addition to or in substitution for services by rail.

SHUNTING ACCIDENTS.

Owing to the number of shunting accidents which were occurring during the past year it was decided to set up a Railway Shunting Inquiry Board for the purpose of inquiring into the conditions of work of shunters as affecting the hazard involved in the performance of their duties, having regard more particularly to the following factors: (1) The length of the shifts which shunters are required to work; (2) the numbers of the employees composing shunting gangs; (3) the time that is allowed for the work of making up trains; (4) the supervision that is afforded on shunters' work; (5) the general control of the work in shunting-yards; (6) the lighting of shunting-yards; (7) the layouts and proposed layouts of shunting-yards; (8) drainage of yards; (9) the matter of employees inexperienced in the shunting-work being employed thereon; (10) and generally any other matters which, in the opinion of the Board, affect the conditions of work of shunters as bearing on the risks involved in their employment.

The Board consisted of a District Traffic Manager, an Engineer, and two shunters, and commenced sitting on the 16th July, 1925. It conducted a thorough examination into all matters coming within the scope of the order of reference, and inspected shunting yards and facilities at various stations throughout the Dominion, besides taking evidence at all the important stations. The report of the Board is appended to this Statement.

All matters reported upon have either been adjusted or are in the course of further investigation.

LEVEL-CROSSING PROBLEM.

The policy in regard to the level-crossing problem was clearly set out in the Railways Statement presented to Parliament last session as being one for the "elimination of the more dangerous level crossings and provision of warning-appliances at others." That policy has been, and is being, carried out.

Information from other countries where level crossings constitute an even more formidable problem than in New Zealand goes to show that the tendency is to do away with gates and gate-keepers and to depend on warning notices, visible or audible signals, and the good sense of vehicle-drivers for securing safety

at the crossings. This applies to such countries as Italy, where on the State railways there are 13,000 public level crossings; Holland, nearly 3,000; France, 30,000; and the United States, 256,000 on first-class lines.

The expenditure of several million pounds on unremunerative works, which a programme for the complete elimination of the level crossings in New Zealand would call for, could not be justified to the taxpayers. If the rail-users were called upon to pay interest on this expenditure all railway charges would have to be raised, making it still more difficult for the railways to compete for traffic with the road-users, and throwing an additional burden on the taxpayer through losses on account of railway operations.

The Railway Department is now working as a business concern, and must be given an opportunity to carry on its operations under fair competitive conditions. It would not have this opportunity were its present disadvantages of track-cost and upkeep increased by heavy unremunerative expenditure entirely for the benefit of road-users.

It must be borne in mind that the roads and the railways of New Zealand were built by the State to meet its transport needs. In nearly all countries where level-crossing problems exist it is recognized that, no matter whether the lines are privately or State owned, the cost of eliminating any crossing should be apportioned between the Railways and the public authorities representative of the road-users. Each should share the burden of the expense incurred for public well-being at the crossing-places of road and rail. In this regard the Railway Department has always willingly borne its share of the cost of eliminating level crossings at those points where local bodies have agreed to pay their fair proportion of such cost.

Since the institution of the Main Highways Board the Railway Department has also been working in conjunction with that body in carrying out proposals for improvements at road and railway intersections.

The principle of making each level crossing as safe as possible for careful road-users is incorporated in the existing policy of the Railway administration, and is being put into effect as finances permit and other interested bodies are willing to co-operate.

USE OF NEW ZEALAND COALS ON RAILWAYS.

The matter of making more extended use of New Zealand coals on the railways was fully referred to in my last Statement. The Board of Inquiry therein mentioned has concluded its investigations, after taking a great deal of evidence and carrying out a large number of trials, under ordinary working conditions, of various mixtures of New Zealand coals.

The Board finds that generally most of the types of New Zealand coals the use of which was advocated are not by themselves suitable for present-day conditions, but that various mixtures of New Zealand coals could be obtained which would satisfactorily meet requirements.

It is obvious, as the Board of Inquiry points out, that the utilization of New Zealand coal in place of imported coal would result in a general improvement of the labour and financial situation within the Dominion. This is the objective in view, provided it can be attained without a compensating loss on the operation of the railways.

In accordance with the recommendation made that a Fuel Engineer be appointed, applications were called for the position. This officer will require to be technically trained and qualified in the use of fuel on locomotives, and will be responsible for the purchase and economic use of all coal necessary.

It will be the policy to utilize New Zealand coals and restrict the use of imported coals to a minimum, and arrangements are already in hand with this object in view. The success of the utilization of New Zealand coals will depend largely upon the co-operation of the mine-owners and miners with the Department, directed towards maintaining regular and adequate supplies of suitable classes of coal at economic prices, and it must be understood that if at any future time it is found that adequate supplies of New Zealand coal are not available as required a reconsideration of this policy will be necessary.

The report of the Board of Inquiry is appended to this Statement.

HOUSING.

As mentioned in my last Statement, special consideration has been given to the matter of placing the Railway Department's House-factory at Frankton Junction on a satisfactory financial basis. In this connection it has been necessary to review the question of rentals paid by the employees. Having regard to the expenditure involved in providing the houses the rentals have been quite inadequate, and it will be absolutely necessary to make a slight increase if the Department is not to continue to make a substantial loss on its houses. At the same time it is recognized that it is extremely desirable to have the staff well housed at a minimum of expense to them, and it is not expected or intended to make any profit out of the housing of the employees.

Three hundred five-roomed houses were cut at Frankton Junction Factory during the year, and of these 251 have been erected.

It has been recognized for some time that the Department's housing and sawmilling operations are on too large a scale for the requirements of the Department, having regard to financial exigencies, and that on present rent basis the completion of the house-building programme would relatively increase losses. The Government accordingly placed the Department's facilities at the disposal of local bodies to relieve the general shortage of houses, and the first consignment of fifty ready-cut houses has been sent to Lower Hutt for erection on the Hutt Valley settlement land known as Mandel's Block. Tenders for the erection of an additional 100 houses on this block have been called, and the Railway Department was given an opportunity of submitting a tender.

Arrangements have also been made to dispose of surplus timber at the factory at very reasonable prices, and up to the present very satisfactory progress is being made in this respect.

STAFF RELATIONS.

Relations with the staff during the year under review have been of the happiest, and there has been realized to a greater and greater extent the spirit of co-operation which is the foundation of my policy. I aim at greater efficiency in the Department, not only by providing the staff with better facilities to be used by them in connection with their work, but also by providing for them the means of becoming more efficient railwaymen in themselves. In this latter connection I have in course of development a scheme of staff training under which I hope to give every member of the Department the opportunity to make manifest his abilities in their fullest extent, and also to give him facilities for qualifying himself for the highest positions in the Department.

The application of these modern methods to staff matters will have far-reaching effects of a beneficial nature upon the working of the whole service, and, in particular, will assist the administration in keeping each member employed at such work as by training and ability he is best fitted to perform.

As a commencement there have been established correspondence classes in elementary traffic-working, and the ready response that has already been made by the staff shows that there was a widespread demand for facilities of this nature. Under this arrangement opportunity is afforded of receiving a special course of training by thoroughly qualified instructors in such subjects as tariff charges and regulations, station accounts, and the elements of train-working. There are also included special talks on business-getting, courtesy, behaviour, health, habits, self-reliance, and ambition, the purpose in this connection being more particularly directed to moulding the minds of the young beginners in such a way as will induce in them a proper attitude towards the public, to make them useful citizens and capable business men, with sustained interest in and enthusiasm for the welfare of the service.

During the coming year I intend to develop this policy still further, the operations being carried on up to a certain point within the Department itself, but ultimately stretching beyond that limit into our universities. It has within recent times been more and more realized that transportation is a science requiring careful and systematic study, no less than the other sciences which now form a

portion of the curriculum in our higher educational system. My policy aims to raise the standard of attainment right throughout the service. Only by effort and careful study properly directed can the principles of transportation science be thoroughly mastered; and the scheme which I have in view is designed to afford not only the means of study but the necessary direction towards the proper end.

Already in the older countries the Railway authorities are working in the closest co-operation with the universities to raise the status of railwaymen, so far as the same may be done along the line of educational attainment, while in Great Britain there has been established an Institute of Transport along the lines of the Institutions of Civil and Mechanical Engineers, with the same object in view. The result is that the work of Railway executives is being more and more regarded as professional in its nature, the object being to place the railways in a position to rank with the professions in attracting the best brains of the community.

Not only do I aim to raise the standard of knowledge and to develop the latent abilities of railwaymen, but I desire to give every employee in the Department equality of opportunity. Much has been heard in the past of a so-called "division barrier." Much of this may have been quite unjustified; but it is undeniable that among the Second Division at least there has been a good deal of belief in its existence as a factor tending to hinder their advancement. Anything that can be done to eradicate this feeling is, I believe, a step in the right direction, and I am hopeful that in the development of my proposals for staff education the members of the Second Division in particular will understand my desire in this direction and take the fullest advantage of the opportunities that may be afforded them.

A further section of my policy in relation to the staff is that which takes the direction of utilizing the combined knowledge of the staff in the solution of every problem that arises within the Department. I found my conclusions in this respect on the principle that the man who takes an interest in his job should be able to make a valuable contribution—especially in the practical aspect—to any discussion about that job. To attain the end I have indicated I have encouraged the convening of conferences of Business Agents, for instance, and others, with a view to having "round-the-table" discussions in the freest and frankest manner possible of all the problems that touch the daily work of those concerned. At these conferences there is an exchange of ideas and an analysis and synthesis of knowledge which must lead to sounder decisions than would otherwise be the case. Moreover, such a procedure, through giving a better understanding of the reasons underlying decisions, must make those decisions more acceptable to those whose work it will be to carry them into effect. It is plain also that exchange of ideas among many must result in a greater richness of ideas among all, and this, I believe, is the surest road to the removal of misunderstandings.

I have found as I have moved about the system that the Railway staff in general adopt a thoughtful attitude towards their work, and evolve ideas which appear to them to represent improvements on the present practice. The difficulty up to the present, however, seems to have been one of communicating their ideas to those who would have authority to order their adoption, and it is with the object of overcoming this difficulty that I have made it a part of my policy to encourage the controlling officers to confer freely with those under their control.

Suggestions and Inventions Committee.

Another means which was designed to the same end was the establishment of a Suggestions and Inventions Committee. The intention to establish this committee was mentioned in my Statement of last year, and a review of the particulars given hereunder will indicate that the staff are taking a keen interest in the welfare of the Department, and that the committee is meeting the need for which it was established. Since the inception of the committee on the 15th June, 1925, up to the 31st March, 1926, there have been received a total of 858 suggestions and inventions for consideration. Of these sixty-two were recommended for adoption, six are on trial, 165 are still under investigation, and 625 were not adopted.

The suggestions and inventions dealt with cover an extremely wide range, and include suggestions advanced by members of the general public in addition to those forwarded by railway employees. Matters referred to the committee have embraced suggested alterations to books and forms, improved workshop facilities, labour-aiding devices, safe working-appliances, improved mechanical and electrical apparatus for power-house and overhead gear, alterations to the lay out of station premises and yards, improved signal apparatus, devices for prevention of accidents at level crossings and accidents due to slips, improved traffic-working, reclamation of scrap material, improved methods in connection with refreshment services, and many other matters.

The majority of the suggestions and inventions have emanated from employees associated with the branches concerned in the respective remits; and, although no considerable financial advantage has yet resulted, it is pleasing to record that the setting-up of the committee has encouraged a spirit of co-operation and interest in the Department's affairs.

STATEMENT OF THE SUGGESTIONS AND INVENTIONS RECEIVED FROM THE STAFF AND THE GENERAL PUBLIC FOR CONSIDERATION BY THE SUGGESTIONS AND INVENTIONS COMMITTEE SINCE IT COMMENCED OPERATIONS ON THE 15TH JUNE, 1925, UP TO THE 31ST MARCH, 1926.

The suggestions and inventions are classified according to the nature of the suggestion or invention and not according to the branch of the service to which the person who submitted the proposal belongs.

The term "General" applies to items which are of miscellaneous character or which refer to more than one branch.

Branch.	Number of Suggestions received.	Recommended for Adoption.	Number on Trial.	Number in Course of Investigation.	Not recommended for Adoption.
Rolling-stock (including engines)	189	14	3	46	126
Locomotive shops	111	12	1	29	69
Way and works	78	1	1	3	73
Signal and telegraph* ..	86	1	..	33	52
Electrical	18	2	..	1	15
Transportation	22	..	..	2	20
Traffic	143	18	1	19	105
Stores	20	1	..	5	14
Audit	2	..	..	..	2
Commercial and advertising ..	56	1	..	3	52
Refreshment	8	..	..	..	8
Accounting	51	9	..	13	29
General	74	3	..	11	60
Total	858	62	6	165	625

* Including devices for prevention of accidents at level crossings and accidents due to slips on line.

Letters of thanks to those who submitted suggestions	634
Commendations noted on official record	39
Monetary awards granted	14
Still under trial or investigation	171
	858
Aggregate amount of awards granted	£92

TRAINING APPRENTICES.

In addition to the arrangements above outlined for the improvement of the qualifications of our railwaymen, careful attention is being given to the training of our apprentices. The policy in this connection is not only to make the apprentices first-class tradesmen so far as craftsmanship is concerned, but also to develop in them those qualifications of leadership which will fit them to take controlling positions. I think it must be admitted that our tradesmen are as efficient from the point of view of manual skill as any tradesmen who have served their apprenticeship outside the railway workshops. But in training our young men in our organization

regard must be had to more than manual skill. We have to provide the future controlling officers for our workshops, and so must educate them in the work of controlling men, laying out work, and generally bring to them a knowledge of the requirements of the position of a leader of men. Up to the present there has been no systematic activity along these lines, and we have therefore had to rely on our men gaining the necessary qualifications *after* they have been appointed to the higher positions. This does not make for efficiency, nor is it altogether fair to the men. That we have come through as well as we have is probably more of a tribute to our men than most of us realize. I think, however, that this blemish on our system should be removed, and definite steps are being taken in that direction. Arrangements are already in course of completion for the establishment of a permanent schoolroom for apprentices at each of our main workshops, and instructors have been appointed.

It is intended at the outset to give each apprentice, during the first three years of his apprenticeship, three hours' class-work per week for the purpose of teaching him to read and understand working drawings, instructing him in the various branches of locomotive maintenance, and tending generally to make him a better and more efficient tradesman by the time he completes his apprenticeship. A higher standard of attendance at regular technical schools will also be demanded, and inducements in the form of scholarships will be awarded.

STAFF DISCIPLINE.

In my last Statement I referred to the intention to adopt a new system of staff discipline, the essential features of which would be the abolition of monetary fines for irregularities, misconduct, &c., confining the suspension of members to cases where it is fairly certain that the offence would result in dismissal, and providing a system of merit and demerit marks in which a member would, in consideration of disciplinary measures for misconduct, have placed against his delinquency the record of his previous meritorious conduct. It is believed that the new system will be much more equitable in its operation, and remove much cause of discontent that has been engendered by the methods of discipline adopted in the past. This, we hope, will be instituted without any loss of disciplinary effect in our system—and indeed we look for an even greater measure of meritorious conduct by reason of the fact that due credit will be given to employees therefor. The proposals were submitted to the respective organizations and representatives of the Railway staff, and have, generally speaking, been approved of by them. The regulations to give effect thereto are now being finally drafted, and it is hoped to bring this system into operation in the very near future.

ACQUISITION OF INFORMATION FROM ABROAD.

A matter that has impressed itself on me during the course of my connection with the Department is the tendency that we have to become insular in our ideas, this no doubt being the natural result of our comparative isolation from other railway systems. The effect of such insularity must result in a poverty of ideas, and I am just afraid that we have been under some handicap in this respect in the past. I think it very necessary that we should keep in closest touch with modern thought in the railway world, in order that we may know the practices that are being found desirable elsewhere, and that we may know also the conditions under which such practices exist. I have found that in the organization of the Department there has not been any officer whose duty it was to obtain information from abroad, collate it, and compare it with the information obtained within the system itself, with a view to seeing whether we are getting the best that we can get from the efforts of all concerned in the railway world, and particularly from beyond the confines of our own system. It must be obviously to our advantage to have a free exchange of information with Railway executives in other countries, but, of course, this work cannot be undertaken by the heads of the Department in any systematic way owing to the pressure of their immediate duties. I feel that there should be some officer who should obtain all information concerning railway developments both here and elsewhere, who should sift all the matter received by him,

summarize the essential points, examine them in relation to our conditions, and make the points thus made clear available for immediate use by our Railway administration. To that end I propose to constitute an information bureau, where I am convinced much useful work can be done along these lines. Insularity always makes for narrowness of vision, represses imagination, and stops initiative. These considerations seem to me to call for definite action on the lines I have indicated, and during the coming year my policy will be to make a definite step forward in that direction.

Another line along which action has been taken with a view to overcoming the difficulties I have mentioned is that the administration has become associated with the Railway administrations of Australia in annual conference on subjects of mutual interest. During the course of the year under review I arranged for the Chairman of the Board to proceed to Australia to attend the Conference of Commissioners, and much valuable information was obtained. Steps have also been taken to send a number of younger officers to Australia to attend conferences of officers from the Railway systems in the Commonwealth, and these officers have also returned with a large amount of valuable information which must be helpful in bringing our railways to a still higher state of efficiency. It is proposed to continue our representation at the Australian Conferences as part of the policy to keep our administration right up to date.

Another aspect of the policy of keeping abreast of the times in the railway world is the sending of officers abroad. Since my last Statement a number of senior officers have been sent overseas, and have returned with a good deal of valuable information, proving the advantage of the scheme and the diligence of the officers concerned. I propose to continue this policy, which I am convinced is on sound lines. I think that the head of the Department should make a periodical first-hand acquaintance with men and methods in other parts of the world, and it is, in my opinion, beyond question that this would be a sound investment. More particularly, however, do I think that we can obtain very considerable benefit from the exchange with other Railway organizations for definite periods of promising young officers. These officers would require to make an intensive study of conditions on the systems to which they would become temporarily attached; and, as they will be actually engaged in the practical work, they will have an opportunity of seeing "behind the scenes" in a more thorough-going way than could otherwise be possible. My intention is that this arrangement should apply to every branch of the service. There can be little doubt that, for instance, a leading hand from the workshops, an engine-driver, or a shunter could obtain from such an experience a knowledge of methods tending to greater efficiency, economy, and safety, that would not only amply repay the Department for its expenditure, but would make for greater satisfaction among the staff in their daily work by the educative influence of these men.

RAILWAY MAGAZINE.

With the object of facilitating the interchange and dissemination of railway knowledge amongst the employees of the Department, and of making the rail-using public better acquainted with the aims of the management and with the services available, I have recently arranged for the issue of a monthly magazine. This is being distributed free to all employees of the Department, members of Parliament, business people, and shippers trading with the railway, and to the public libraries, &c.

Staff and "house" magazines are now quite an ordinary feature of all progressive businesses, and most of the Railways issue their own journal, so that the innovation is not really a venture into a new field, but a recognition of the necessity of providing a channel for the dissemination of information regarding railway matters and for a free exchange of ideas thereon.

The extension of the magazine's interests and distribution to include those chiefly concerned in utilizing the services of the Department will, I trust, be found agreeable and useful to those who receive the journal, and should tend to strengthen the bonds of interest between the commercial community and the Railway Department, so necessary for the general welfare of the country.

The development of good-will among the public and team-work among the staff is felt to be the best way to make the Department render the fullest measure of service to the community, and the issue of a magazine such as we have decided upon is, in my opinion, one of the best methods for achieving the purpose. Members of all grades have been invited to forward contributions, and have thereby been afforded an opportunity to show their grasp of problems coming within the range of their practical experience, while contributions from persons outside the Department will be particularly welcomed. I have already received much evidence that the establishment of the magazine has been appreciated by our staff and customers, and I confidently look forward in the coming year to a considerable extension of its influence for good in both our internal and external relationships.

DERAILMENT OF THE WELLINGTON–NAPIER EXPRESS NEAR OPAPA STATION, 22ND SEPTEMBER, 1925.

The regrettable accident which occurred near Opapa Station on the 22nd September, 1925, was the subject of a Board of Inquiry conducted by Mr. W. G. Riddell, S.M. (Chairman), and Messrs. J. Marchbanks, M.I.C.E., and W. D. Hunt.

After a thorough and exhaustive investigation the Commission report, *inter alia*, as follows: "We find that the derailment of the Wellington–Napier express train on the Opapa bank on 22nd September, 1925, was due to excessive speed, and that this was the result of the engine-driver failing to take precautions to reduce speed when approaching the curves near which the derailment took place, in accordance with the regulations which are issued to engine-drivers and others." And "We also find that the presence of a third person on the engine, and the taking of liquor on to the engine by that person during the journey, were factors which helped to bring about the derailment."

It is therefore satisfactory to note that in so far as the Department itself is concerned no blame attaches.

The Board of Inquiry made a number of suggestions which have already been adopted or are under action.

The report of the Commission is appended to this Statement.

PROGRAMME OF IMPROVEMENTS AND NEW WORKS, 1924.

The present position with regard to works commenced under the above programme is as follows:—

Auckland–Westfield Duplication.

This work is in charge of the Public Works Department, and good progress is being made. The embankment across Judge's Bay is completed, and the embankments across Orakei Basin and Hobson's Bay are being pushed ahead from both ends. Special equipment is being used to facilitate the dumping of spoil on the mud-flats where the unstable nature of the ground makes the work difficult.

The work on the 27 chains of double-track tunnel is well in hand, and enlargement to full section will be commenced shortly.

Auckland New Station and Yard.

This work is in charge of the Railway Department, and marked progress has been made since last report.

The embankment and formation work for the new passenger tracks and platforms have been completed, and a considerable portion of the sidings laid.

The work of remodelling the engine-depot to suit the new yard layout is well in hand.

The building of the abutments and piers of the Campbell Point overbridge have entailed the sinking of deep foundations, but the work will be completed early and the superstructure pushed on with so that the permanent siding approaches to the new station may be laid beneath the bridge.

The floor-plans for the new station building are approaching finality, and when these are ready arrangements will be made for obtaining a suitable architectural elevation.

Tenders will be called shortly for the erection of the large outward-goods shed on Breakwater Road.

Paeroa Rearrangement.

The reconstruction of the station-yard is practically completed, and the installation of the power-locking will be commenced at an early date.

The double-track plate-girder bridge over the Ohinemuri River has been completed.

Palmerston North Deviation.

The plans of this work have been completed. The necessary land has been proclaimed, and work will be commenced at an early date.

Wellington New Yard.

A second contract has been let covering the completion of the sea-wall to Kaiwarra, and excellent progress is being made by the contractor.

To accelerate the work of reclamation the services of the Wanganui Harbour Board's dredge "Kaione" have been obtained, and good work is being done.

Tawa Flat Deviation.

The plans for this work are complete. A quarry-site has been obtained in the Ngahauranga Gorge for the supply of stone necessary for the sea-wall north of Kaiwarra.

Ravensbourne–Burke's Duplication.

A start has been made with this work. The sea-walls necessary in the relocation of the line are being built.

Elmer Lane Depot.

The plans for the depot have now been finalized. It is intended to build the engine-shed as a round house.

The work of preparing the site is proceeding.

Middleton Marshalling-yard.

The location of the marshalling-yard for Christchurch at Middleton has been finally decided upon. This yard will work on the gravity principle, the natural formation of the site being suitable to this. The work is in hand, and will be pushed to a speedy conclusion, as the further rearrangements at Christchurch and Lyttelton are contingent upon the accommodation at Middleton.

Helensville Station.

The new lay-out for this station has been finally settled, and the work of construction will be put in hand immediately.

Frankton Station.

The extensive additions to this yard which have been necessitated by increased traffic are in hand.

Hutt Valley Railway.

Marked progress has been made with the construction of this railway, which is in the hands of the Public Works Department.

The overhead bridge on the Main Hutt Road is approaching completion, and other road-bridges over the new tracks are well in hand.

The station-sites have been prepared, and the erection of the station buildings is being arranged for.

Pile-driving for the Hutt River Bridge is proceeding satisfactorily.

Penrose–Papakura Duplication.

This work has been completed to Westfield, and will shortly reach Otahuhu, where the extensive rearrangement work involved is nearing completion.

Electric Lighting.

Steady progress has been made with the work of providing electric lighting in railway houses and on station premises where power is available in the vicinity.

Signals and Electrical Works.

Considerable additions have been made to fixed signals at officered stations.

Special locking arrangements have also been provided at a number of stations.

Double-line automatic signalling has been brought into use between Auckland and Westfield, and also between Dunedin and Ravensbourne.

The further installation of automatic signalling and power-interlocking is proceeding satisfactorily.

The electric tablet system has been installed at the stations between Whangarei and Kaukapakapa.

Substantial additions to telephone and telegraph facilities have been made, and metallic circuits have been completed on a number of sections.

Automatic alarms have been provided at a number of railway-crossings.

Electrification of Suburban Lines.

For many years past a great deal of discomfort has been felt by the travelling public using the railway between Lyttelton and Christchurch, principally because of the smoke nuisance when passing through the tunnel, and there has in consequence arisen an insistent demand for something to be done to improve existing conditions.

The Government has recognized that something ought to be done to overcome the disabilities complained of, and in 1914 provision was made in the Schedule of the Railways Improvement Authorization Act for the duplication of the tunnel. Owing to the outbreak of war this, with many other similar works, had to be postponed.

In my 1924 programme of improvements and new works it will be observed that the matter of duplicating the tunnel was referred to. It will be noted also in that report that both the General Manager and the Chief Engineer of Railways were of the opinion that there was no justification for the duplication of the Lyttelton Tunnel. That view was justified by a close investigation of the business done over a period of years.

There are, however, sound reasons from a national aspect and in the interests of reasonable conditions of travel for taking a more liberal view of this undertaking than is strictly warranted by a survey of traffic volume, and the Government considered itself more or less in duty bound to give effect to the spirit of the promise implied in the 1914 proposal.

In my 1924 Railways Statement I referred to the fact that the Government was obtaining a comprehensive report in connection with the suggested electrification of the suburban sections at the four main centres from Messrs. Merz and McLellan, consulting engineers, of London.

That report has since come to hand, and is appended to this Statement. The question arises as to whether the Lyttelton Tunnel should be duplicated or electrified.

Messrs. Merz and McLellan consider that in so far as track capacity is concerned there is no great difficulty in working, but that the discomfort of travelling in the tunnel under present conditions is a factor to which due consideration must be given. They report accordingly that if electrification is adopted duplication could be indefinitely postponed.

Messrs. Merz and McLellan contend that the electrification of the tunnel only with consequent changes of engines at Heathcote is not desirable, and that if electrification is adopted it should be for the whole section between Lyttelton and Christchurch.

Their estimate for the electrification of this section of line, including the equipment of tracks to Addington to allow locomotives to run to repair-shops, is £203,000.

The net capital outlay, after deducting credit for steam-locomotives, is £190,800, which is £74,200 less than the estimated cost of the duplication of the tunnel (£265,000).

It is to be noted also that duplication would not remove the smoke nuisance, which has been the principal cause of the public complaint.

The annual saving in working-costs due to electrification, according to Messrs. Merz and McLellan's report, would be £4,200—equivalent to a return of 2·2 per cent. on the net capital outlay.

As pointed out by Messrs. Merz and McLellan, the return on capital is small, and it is evident that, apart from the question of the tunnel, electrification in this area would not be financially justifiable even with the increased service that would be possible with an electrified railway.

I appointed Messrs. F. T. M. Kissel, of the Public Works Department, and R. P. Sims, of the Railway Department, both electrical engineers, to go into Messrs. Merz and McLellan's report thoroughly in so far as the Lyttelton–Christchurch Section was concerned. Their conclusion was that the Government would not be justified in deciding to electrify the section on the information supplied in the report.

As a result of their investigation the following views were expressed :—

(1.) That there is no doubt that the atmospheric conditions throughout the tunnel are extremely uncomfortable both for passengers and crew.

(2.) That they are of the opinion that duplication of the tunnel will not satisfactorily deal with the situation.

(3.) That the present tunnel is ample to deal with the present traffic and a very considerable increase in addition:

(4.) That with electrical operation traffic could be still further increased.

(5.) That the need for a second tunnel from a traffic point of view is not warranted.

(6.) That from a railway economic point of view electrification is not justified, yet from a broader or national point of view it may be fully justified.

(7.) That, compared with the duplication of the tunnel, electrification of the section means an annual saving of £5,804 and the removal of the discomfort of passengers.

On the 12th March last I convened a conference at Christchurch consisting of members of the Canterbury Chamber of Commerce and other business representatives, local members of Parliament, and others. The conference was called for the purpose of discussing three alternatives in so far as the Lyttelton Tunnel was concerned—namely, (1) Duplication ; (2) electrification ; (3) Diesel electric engines.

All the data at my disposal were placed before the conference, and after a general discussion it was agreed that electrification of the tunnel was the most desirable of the three proposals.

Since the conference was held arrangements have been made for a committee of experts, consisting of Messrs. F. T. M. Kissel, Chief Electrical Engineer, Public Works Department ; J. E. L. Cull, Designing Engineer, Public Works Department : A. S. Wansbrough, Designing Engineer, and G. W. Wyles, Assistant Signal and Electrical Engineer, both of the Railway Department, to be set up for the purpose of reporting on a scheme for the electrification of the tunnel, covering also a general scheme in respect to electrification, and the method by which the work should be carried out. Definite recommendations have been made by the committee, and the matter is under the consideration of the Government at the moment.

The committee's report is appended hereto.

CONCLUSION.

It was with much regret that I had to accept during the year the resignation of Mr. H. H. Sterling, member of the Board of Management, and I wish to record my appreciation of the excellent work he rendered to the service. His position on the Board was filled by the appointment of Mr. A. W. Mouat.

Another regrettable loss to the service, due to a fatal accident which occurred early in the year, was the late Mr. W. O. Ennis, who held the position of Staff Superintendent. Mr. Ennis's breadth of vision and foresight, enlarged by his long and distinguished service with the Forces during the late war, enabled him to fulfil the essential requirements of Staff Superintendent with the utmost satisfaction to the staff and to the Department.

I wish also to express to the Board of Management and to all ranks of the service my fullest appreciation of their devoted zeal and attention to the needs of the public and the requirements of the administration. Particularly do I wish to mention and at the same time to thank all concerned for the excellent manner in which they responded to the heavy demand made upon them during the period the recent Dunedin and South Seas Exhibition was open.

In conclusion, I wish to say that I have every reason to believe that the administration can look forward to the hearty co-operation of every member of the service in its efforts to cater for the convenience and comfort of its customers; and holding that view I see no cause for pessimism in the future.

RESULTS OF WORKING.

The following is a summary of the working for the year ended 31st March, 1926, as compared with 1925:—

Particulars.	Year ended 31st March, 1926.	Year ended 31st March, 1925.
Total miles open for traffic	3,138	3,085
Average miles open for year	3,103	3,067
Capital cost of opened and unopened lines	£53,716,455	£50,833,500
Capital cost of open lines	£47,608,676	£44,570,746
Capital cost per mile of open lines	£15,172	£14,448
Gross earnings	£8,460,762	£7,276,761
Working-expenses	£6,468,428	£5,709,652
NET EARNINGS	**£1,992,334**	**£1,567,109**
Interest charges	£1,913,311	£1,654,845
Appropriation for betterments	£58,000	...
Unappropriated surplus	£21,023	*Deficit* £87,736
PERCENTAGE OF TOTAL WORKING-EXPENSES TO GROSS EARNINGS ...	**76·45**	**78·46**
PERCENTAGE OF NET EARNINGS TO CAPITAL INVESTED	**4·35**	**3·55**
Railway operating earnings	£7,589,274	£7,014,649
Railway operating expenses	£6,164,570	£5,533,136
NET RAILWAY OPERATING EARNINGS	**£1,424,704**	**£1,481,513**
PERCENTAGE OF RAILWAY OPERATING EXPENSES TO EARNINGS	**81·23**	**78·88**
Operating earnings per average mile open	£2,446	£2,287
Operating expenses per average mile open	£1,987	£1,804
NET OPERATING EARNINGS PER AVERAGE MILE OPEN	**£459**	**£483**
	d.	d.
Operating earnings per train-mile	176·51	185·33
Operating expenses per train-mile	143·37	146·19
NET OPERATING EARNINGS PER TRAIN-MILE	**33·14**	**39·14**
Passengers, ordinary	11,813,480	12,424,012
Season tickets	600,292	537,554
Total passenger journeys...	27,653,414	26,106,859
Goods tonnage	6,808,603	6,602,607
Live-stock tonnage	447,539	430,852
Train-mileage	10,319,407	9,083,623
Engine-mileage	14,657,039	12,854,287

For the current year I anticipate the revenue will reach £8,250,000 and the expenditure £6,475,766.

Note.—The figures shown above for 1925 have, where necessary, been adjusted so as to make them comparable with the figures for 1926 as prepared under the new accounting system.

ANNUAL REPORT OF THE BOARD OF MANAGEMENT OF THE NEW ZEALAND GOVERNMENT RAILWAYS.

The Hon. the Minister of Railways. New Zealand Government Railways,
Head Office, Wellington, 31st July, 1926.

SIR,—

We have the honour to report on the working of the railways for the financial year ended 31st March, 1926.

The gross receipts for the year exclusive of the subsidy for branch lines amounted to £8,101,221 as against £7,276,761 for the previous year. It is interesting to note that since 1900 the revenue has increased fivefold, the figures at five year intervals being as follows:—

	£
1900	1,623,891
1901	1,727,236
1906	2,349,704
1911	3,494,182
1916	4,548,356
1921	6,908,531
1926	8,101,221

For the year just ended the financial results in round figures are as follows:—

Revenue—

	£
Actual revenue received	8,100,000
Subsidy for branch lines	360,000
	£8,460,000

Expenditure—

	£
Actual working expenditure (as spent)	6,151,000
Placed in renewals, betterments, and accidents reserves funds	375,000
Interest	1,913,000
Surplus	21,000
	£8,460,000

Capital Account.—The capital invested in the lines open for traffic, including the steamers and plant on Lake Wakatipu and other subsidiary services on the 31st March, 1926, was £47,608,676, as against £44,570,746 for the previous year, an increase of £3,037,930. This amount includes £1,631,089, construction charges on lines already taken over from the Public Works Department; £845,984 on new works charged against Capital Account under additions to open lines; and £560,857 expended under the Railways Improvement Authorization Act, 1914.

Receipts and Expenditure.—The gross receipts for the year amounted to £8,460,762, as against £7,276,761 for the previous year, an increase of £1,184,001.

The gross expenditure for the year amounted to £6,468,428, as against £5,709,652 for the previous year, an increase of £758,776.

The net earnings were £1,992,334, equal to 4·35 per cent. on the capital invested in the lines open for traffic and 3·84 per cent. on the capital invested in the opened and unopened lines.

The percentage earned during the last six years on the capital invested in the opened lines was—

1920–21	3·42 per cent.	1923–24	3·83 per cent.
1921–22	1·07 per cent.	1924–25	3·55 per cent.
1922–23	3·04 per cent.	1925–26	4·35 per cent.

Under the new financial policy outlined in the Board's report on the working of the railways for the year 1924–25 the rate of interest chargeable to the Railways in respect of capital raised under the provision of the Railways Improvement Authorization Act, 1914, was £5 3s. 9d. per cent. and on all other capital money £4 2s. 6d. per cent. Hitherto the Department was expected to meet a policy rate of £3 15s. per cent.

The total amount of interest paid during the year under the new arrangements was £1,913,311. After deducting this amount from the net earnings the year's working shows a surplus of £79,023. Of this sum £58,000 has been placed in the Betterments Fund, leaving a net surplus of £21,023. Interest charges represent a deduction of 4s. 6·27d. from every twenty shillings earned.

The subsidy paid to the Government Railways Superannuation Fund and charged against expenditure was £145,000, as compared with £80,000 the previous year, an increase of £65,000.

The sum of £317,143 has been charged against expenditure and set aside to provide for renewals, insurance, &c.

A short outline of the result of the year's operations as compared with those for the year 1924–25 is shown hereunder.

In comparing results with previous years allowance has to be made for the altered system of accounting. As far as possible the figures for the year 1924–25 have been adjusted to make comparisons, but the details are in many cases only approximately correct.

Revenue.

Gross Revenue.—The revenue from all sources for the year was £8,460,762, as against £7,276,761 for the year 1924–25, an increase of £1,184,001.

The particulars of the gross revenue are as follows :—

	1925–26.	1924–25.
	£	£
Train-operation	7,589,274	7,014,649
Subsidiary services	511,947	262,112
Branch lines and isolated sections subsidy	359,541*	..
	£8,460,762	£7,276,761

* Payable in respect of developmental lines in terms of the Government Railways Amendment Act, 1925.

Train-operating Revenue.—The total operating revenue for the year represented 89·7 per cent. of the gross revenue, and amounted to £7,589,274, of which the North Island system yielded £4,582,922 and the South Island system £3,006,352. The increase from the whole system was £574,625 on the earnings of the previous year.

The particulars of the operating revenue earned are as follows :—

——	1925–26.	Percentage of Operating Revenue.	1924–25.	Percentage of Operating Revenue.
	£		£	
Passengers, ordinary	2,271,498	29·93	2,073,456	29·56
Season tickets	265,549	3·50	210,742	3·00
Parcels, luggage, and mails	409,207	5·39	416,223	5·93
Goods and live-stock	4,499,160	59·28	4,117,746	58·70
Miscellaneous : Labour, demurrage, &c.	143,860	1·90	196,482	2·81
	7,589,274	..	7,014,649	..

The operating earnings per train-mile for all lines were 176·51d., as against 185·33d. for the preceding year—*i.e.*, a decrease of 8·82d. per train-mile.

The North Island main line and branches gave a return of 176·43d., and the South Island main line and branches 174·88d. per train-mile.

Subsidiary Services Revenue.—The revenue received from subsidiary services amounted to £511,947, as against £262,112 for the corresponding services last year.

The particulars of the revenue earned are :—

	1925–26.	1924–25.
	£	£
Lake Wakatipu steamers	10,625	10,096
Refreshment Service	133,658	104,797
Advertising Service	45,454	30,731
Departmental dwellings	68,661	52,572
Leases refreshment-rooms, bookstalls, &c.	19,062	13,347
Non-operating—Miscellaneous	234,487	50,569
	£511,947	£262,112

Expenditure.

Gross Expenditure.—The expenditure on all services during the year was £6,468,428, as against £5,709,652 for the year 1924–25, an increase of £758,776.

The particulars are—

	1925–26.	1924–25.
	£	£
Train operation	6,164,570	5,533,136
Subsidiary services	303,858	176,516
	£6,468,428	£5,709,652

£335,564 was expended in the Maintenance Branch and charged to Capital Account under the head "Additions to Open Lines." These comprise additions to station-buildings, extension of sidings, bridge-work, additional dwellings, workshops, purchase of land, and tablet-installations.

£519,604 was expended in the Locomotive Branch and charged to Capital Account in the provision of additional rolling-stock, tarpaulins, electric lighting for cars, and workshop machinery.

The rolling-stock in respect of which the charges were incurred comprised forty-five locomotives, forty-six cars, eighteen guards-vans, and sixty-eight bogie and 299 four-wheeled wagons completed on the 31st March, 1926, and twenty-two locomotives, two rail motor-cars, nineteen cars, four brake-vans, forty bogie, and 302 four-wheeled wagons incomplete but in hand on that date.

Train-operating Expenditure.—The total operating expenditure for the year amounted to £6,164,570, an increase of £631,434 over that for last year.

The particulars of the expenditure on train-operation are as follows :—

——	1925–26.	Percentage of Operating Revenue.	1924–25.	Percentage of Operating Revenue.
	£		£	
Maintenance—Ways and works	1,144,385	15·08	1,137,629	16·22
Maintenance—Signals	105,064	1·38	83,880	1·20
Maintenance—Rolling-stock	1,311,317	17·28	1,095,640	15·62
Examination, lubrication, and lighting of vehicles	59,447	0·78	58,500	0·83
Transportation—Locomotive	1,577,173	20·78	1,365,838	19·47
Transportation—Traffic	1,743,641	22·98	1,626,928	23·19
Head Office and general charges	82,528	1·09	84,721	1·21
Superannuation subsidy	141,015	1·86	80,000	1·14
	6,164,570	81·23	5,533,136	78·88
Net operating revenue	1,424,704	18·77	1,481,512	21·12

The operating expenditure per train-mile for all lines was 143·37d., as against 146·19d. for the preceding year, a decrease of 2·82d. per train mile.

The expenditure per train-mile on the North Island Main Line and Branches Section was 130·99d., and on the South Island Main Line and Branches Section 159·85d.

Subsidiary Services Expenditure.—The expenditure in connection with subsidiary services was £303,858, as against £176,516 for the year 1924–25. The particulars of the expenditure in connection with subsidiary services are :—

	1925–26.	1924–25.
	£	£
Lake Wakatipu steamers	15,613	12,279
Refreshment service	119,585	99,997
Advertising service	31,239	29,647
Departmental dwellings	129,907	34,203
Leases refreshment-rooms, bookstalls, &c.	7,514	390
	£303,858	£176,516
Net revenue from subsidiary services (including miscellaneous receipts)	£208,089	£85,596

Net Revenue.

The Net Revenue Account from all services, after setting aside the sum of £317,143 for renewals and equalization funds and paying interest charges amounting to £1,913,311, shows a surplus of £79,023, as compared with a deficit of £87,736 last year, when no provision of any kind was made for reserves.

From the surplus of £79,023 the amount of £58,000 has been placed to betterments and £21,023 carried forward.

Particulars are shown hereunder :—

	£
Net earnings, train-operating	1,424,704
Net earnings, subsidiary services	208,089
	1,632,793
Subsidy in respect of developmental lines	359,541
	1,992,334
Less interest charges	1,913,311
	£79,023
Appropriations—	£
To Betterments Fund	58,000
Carried forward	21,023
	£79,023

Renewals and Equalization Funds.—The position in respect of the renewals and equalization funds on the 31st March was :—

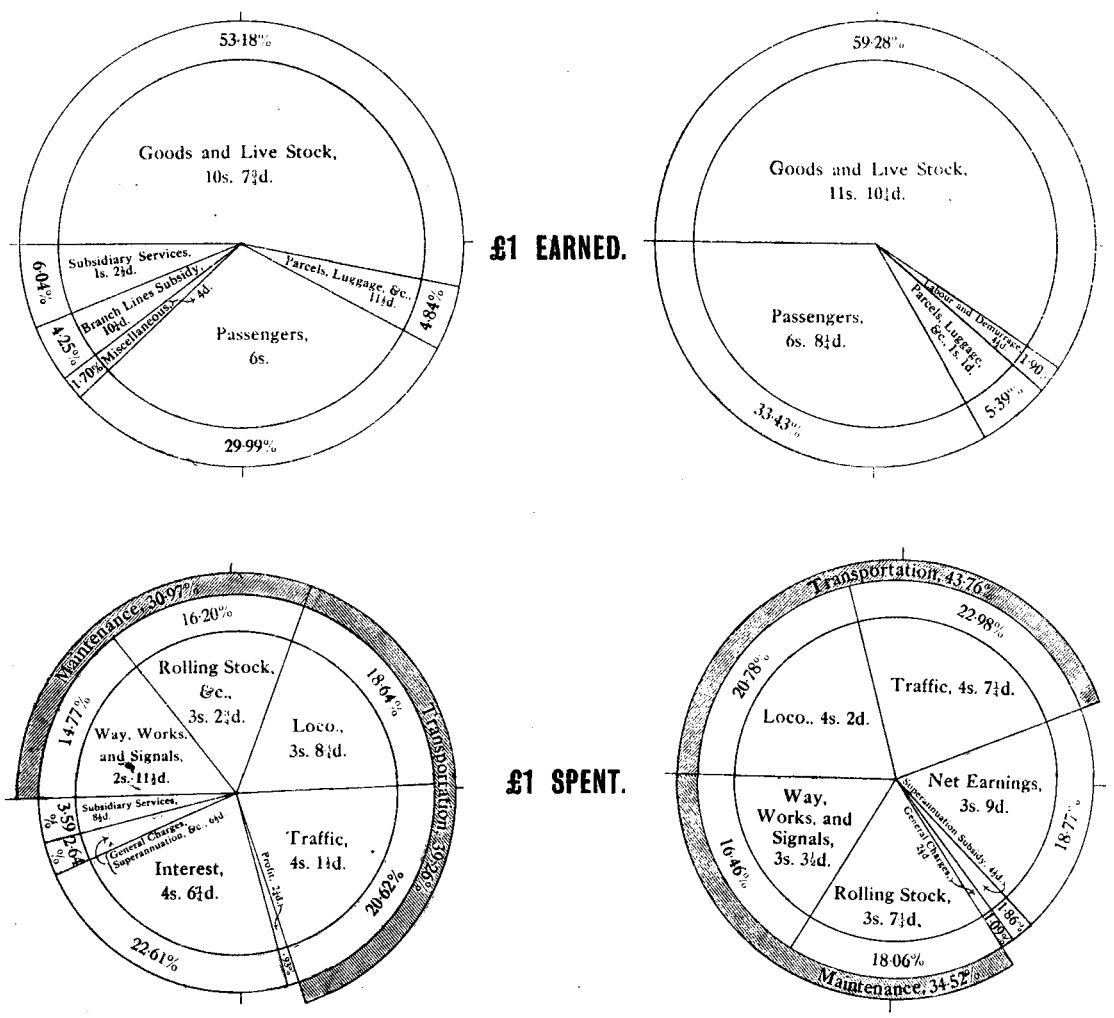
	Contributions.	Expenditure.	Balance.
	£	£	£
Renewals	553,893	273,055	280,838
Fire insurance	9,664	4,880	4,784
Slips, floods, &c.	31,505	7,300	24,205
Workers' compensation	43,174	37,858	5,316
Betterments	39,718	37,718	2,000
	677,954	360,811	317,143
Betterments : To appropriation from net revenue	58,000	——	58,000
	£735,954		£375,143

NOTE.—Owing to the altered system of accounts the following adjustments are necessary to make this year's figures comparable with those for 1924–25 :—

	£
Revenue—	
Total revenue, 1925–26	8,460,762
Deduct branch and isolated lines subsidies	359,541
	8,101,221
Total revenue, 1924–25	7,276,761
Increase	£824,460
Expenditure—	£
Total expenditure, 1925–26	6,468,428
Deduct provision for renewals, &c	317,143
	6,151,285
Total expenditure, 1924–25	5,709,652
Increase	£441,633

The expenditure for 1925–26 includes a subsidy of £145,000 to the Superannuation Fund, as against £80,000 last year.

THE WHOLE UNDERTAKING. **TRAIN OPERATION.**



New Lines opened.—The Tuatapere–Orawia Section (8 miles 23 chains), the Huarau–Portland Section (30 miles 67 chains), and the Beaumont–Miller's Flat Section (14 miles 57 chains) were taken over and opened for traffic during the year, making the total mileage open for traffic on the 31st March, 1926, 3,138 miles.

Train-mileage.—The train-mileage for the year was 10,319,407 miles, as against 9,083,623 miles the previous year, an increase of 1,235,784 miles. The particulars are as follows:—

Section.	1925–26. Miles.	1924–25. Miles.	Increase. Miles.
Kaihu	17,749	17,232	517
Gisborne	78,631	65,609	13,022
North Island Main Line and Branches	6,168,991	5,372,957	796,034
South Island Main Line and Branches	3,854,181	3,438,695	415,486
Westport	90,680	87,640	3,040
Nelson	59,112	56,469	2,643
Picton	50,063	45,021	5,042
	10,319,407	9,083,623	1,235,784

The total coaching train-miles were 3,495,331, and freight train-miles 6,824,076.

The total engine-mileage was 14,657,039, as compared with 12,854,287 the previous year, an increase of 1,802,752 miles.

Line Interruptions.—Floods and slips during the year have been extensive, the railway-lines being considerably damaged thereby. On the 25th May slips and washouts between Piriaka and Kakahi blocked all traffic with the exception of the express trains for four days.

On 1st July a fall of rock derailed two engines and eight wagons between Parera and Mt. Allen, on the Otago Central line, and caused a dislocation of traffic for two days.

On the 22nd September the Wellington–Napier express was derailed near Opapa. The Board regrets to state that three people were killed and twenty-one injured as a result of this accident. Further reference is made to the matter in this report.

On the 4th December, a heavy flood in the Grey River destroyed the Blackball combined railway and traffic bridge, causing a total blockage of traffic between Blackball and Ngahere for a period of four weeks. Steps were immediately taken to erect a temporary structure, and by working continuously night and day this work was completed on the 3rd January, when the bridge was again opened for road and railway traffic.

Owing to a washout immediately west of Otira all traffic was stopped from the 10th to the 19th December.

Train-operating.—The whole of the time-tables were revised during the year, and early in November new time-tables, providing faster express and mixed trains schedules were brought into operation. A special feature of the new time-table was the provision of a third daily express service each way between Wellington and Auckland. This service—the "Daylight Limited"—has, however, not met with the patronage anticipated except during the Christmas, New Year, and Easter holidays. With the close of the Dunedin Exhibition and the approach of the winter season the traffic fell off considerably, necessitating the reversion to the two regular express trains each way daily.

The attraction of the New Zealand and South Seas Exhibition at Dunedin gave a great impetus to traffic, particularly in the South Island, where extra express services and a large number of special trains were run to cope with the traffic.

During the year the Huarau–Portland Section of line was taken over, and a through train service for passenger and goods traffic was inaugurated between Auckland and Whangarei. A daily train service is now provided between Auckland and Opua. Improvements have also been made in goods-train services, and provision made for a through goods service between Auckland and Wellington and between Christchurch and Invercargill. These trains are a boon to the business community in the matter of expeditious transit.

The Department's organization was severely taxed with the heavy traffic to the New Zealand and South Seas Exhibition at Dunedin, which was open for a period of six months. It is gratifying to record that no hitch occurred in the arrangements, and that the very heavy traffic to Dunedin, particularly at Christmas, Easter, and in the closing hours of the Exhibition, was successfully handled without mishap.

The Board is also pleased to state that the general timekeeping of the passenger and mixed trains throughout the year was good. The following figures, which include delays from every cause, give the record of the late arrivals at destination throughout the year of the principal trains:—

	Average late arrival. Mins.		Mins.	
Long-distance passenger-trains	5·54	against	3·64	last year.
Suburban trains	0·68	,,	0·65	,,
Long-distance mixed trains	6·27	,,	4·63	,,

When the difficulties experienced in connection with slips, floods, and other unforeseen circumstances are taken into consideration it will be seen that the trains have, as a whole, run well to time.

Passenger Traffic.—The number of ordinary passengers carried during the year was 11,813,480, a decrease of 610,532 when compared with last year. 711,743 passengers were carried at holiday and other cheap excursion fares; and 193,719 children and adults at schools, factories, and friendly-societies excursion rates.

The total excursion traffic for the year was 905,462 passengers, £470,394 revenue, as against 562,122 passengers and £297,702 revenue last year, an increase of 343,340 passengers and £182,692 revenue, principally due to excursionists visiting the Exhibition at Dunedin.

Season tickets issued numbered 600,292, an increase of 62,738; workers' twelve-trip tickets issued numbered 126,179, a decrease of 6,823. Workers' weekly tickets issued on suburban lines numbered 354,716, an increase of 41,605.

There has been a good demand for the twelve- and fifty-trip bearer tickets which were first placed on sale on the 31st August, 1925. The issues up to the 31st March last were:—

	First Class.	Second Class.	Total.
Twelve-trip	4,995	27,785	32,780
Fifty-trip	1,208	3,478	4,686
Total	6,203	31,263	37,466

The total number of passenger journeys for the year was 27,653,414, as against 26,106,859 for the preceding year—an increase of 1,546,555.

Every first-class seat earned £45 and every second-class seat earned £33 6s. during the year. The total seating accommodation provided in the Department's car stock is 19,618 first-class and 49,075 second-class seats.

Goods and Live-stock Traffic.—The goods and live-stock traffic was 7,256,142 tons, an increase of 222,683 tons over last years figures. The increases were—Cattle, 39,950 head; sheep and pigs, 114,538 head; timber, 16,942 tons; other goods (including minerals), 189,054 tons.

The increase in general goods traffic was 154,083 tons, and in minerals 34,971 tons.

The traffic in imported and native hard coals dropped 14,938 and 31,924 tons respectively, but there was an increase of 57,751 tons in the quantity of native brown coal placed on rail.

The North Auckland Collieries forwarded 116,267 tons of coal during the year, as against 111,251 tons last year. The output from the collieries in the Waikato district was 447,676 tons, as compared with 456,201 tons the previous year.

The coal railed from the Westport mines was 562,058 tons—a decrease of 5,201 tons on the previous year.

The output from the mines in the Greymouth district was 341,834 tons, an increase of 8,775 tons. The 1925–26 figures show an increase of 65,102 tons over 1922–23 (prior to opening of the Otira Tunnel) in the output from the mines in the Greymouth district. The connecting-up of Westland with Canterbury in August, 1923, has been the prime factor towards this.

The output from the mines in the Wairio district served by the Ohai Railway was 188,378 tons, an increase of 60,012 tons.

Maintenance, &c.—The permanent-way, buildings, structures, and appliances have been efficiently maintained, and a considerable number of improvements have been made in the accommodation at the various stations.

Eighty-seven and a quarter miles of track have been relaid with heavier material, and 239,536 new sleepers and 166,940 cubic yards of ballast were placed on the track during the year.

TRAFFIC.

The following are the leading features of the traffic in the various districts in comparison with the previous year. In this connection it should be noted that the districts have been altered in connection with the reorganization of the Department. In the North Island the Whangarei District was merged into the Northern District, and in the South Island the Westland District was merged into the Northern District of the South Island, while the boundaries of the districts have been amended. The revenue figures shown are from transport operating services only; the non-operating services, such as advertising, refreshment-rooms, rents, &c., are not included.

Kaihu Section.—Revenue, £8,411; decrease, £661. Passengers decreased 981; parcels, £145; sheep, 405; and timber, 1,605 tons. All other goods increased 1,049 tons.

Gisborne Section.—Revenue, £39,565; increase, £1,564. Passengers decreased 9,077. Parcels, luggage, &c., decreased £270. Cattle increased 91, and sheep 6,860. Timber decreased 785 tons. All other goods increased 1,779 tons.

North Island Main Line and Branches Section.—Revenue, £4,534,946; increase, £377,435. The principal items of traffic were: Passengers, 6,738,142; decrease, 651,566. Season tickets, 432,790; increase, 37,241. Parcels, luggage, &c., revenue, £251,403; increase, £5,735. Live-stock, 4,378,911; increase, 217,929. Goods tonnage, 3,093,380 tons; increase, 304,617 tons. Timber increased 68,806 tons; all other goods 235,811 tons. The revenue per mile of railway increased from £3,601 14s. 8d. to £3,611 3s. 7d. but decreased per train-mile from 15s. 10d. to 14s. 8d.

The variations in the individual districts were approximately as follows :—

Northern District (Auckland).—Revenue, £2,048,431 ; increase, £257,958. Passengers decreased 246,558. Season tickets increased 5,821. Parcels, luggage, &c., increased £12,888. Cattle increased 3,748, and sheep 153,672. Timber increased 55,870 tons, and all other goods 190,423 tons.

Middle District (Ohakune).—Revenue, £565,145 ; increase, £45,210. Passengers increased 11,445, and season tickets 906. Parcels, luggage, &c., decreased £3,106. Cattle increased 587. Sheep decreased 73,526. Timber increased 14,317 tons, and all other goods 10,458 tons.

Western District (Wanganui).—Revenue, £499,681 ; decrease, £133,834. Passengers decreased 253,435, and season tickets 500. Parcels and luggage decreased £14,829. Cattle decreased 15,660, and sheep 177,468. Timber decreased 931 tons, and all other goods 2,438 tons.

Southern District (Wellington).—Revenue, £1,421,689 ; increase, £208,101. Passengers decreased 163,018. Season tickets increased 31,014. Parcels, luggage, &c., increased £10,782. Cattle increased 41,166, and sheep 285,410. Timber decreased 452 tons. All other goods increased 37,368 tons.

Picton Section.—Revenue, £42,352 ; increase, £8,229. Passengers increased 14,151, and season tickets 246. Cattle increased 344, and sheep 1,232. Timber increased by 557 tons, and all other goods 13,320 tons.

Nelson Section.—Revenue, £28,282 ; increase, £3,545. Passengers increased 21,989, and season tickets 212. Timber decreased 1,292 tons, and all other goods 2,884 tons.

Westport Section.—Revenue, £127,268 ; decrease, £3,098. Passengers decreased 13,697, and season tickets 369. Parcels, luggage, and mails decreased £214. All other goods decreased 3,150 tons

South Island Main Line and Branches Section.—Revenue, £2,808,451 ; increase, £510,701. The principal items of traffic were : Passengers, 4,713,881 ; increase, 549,687. Season tickets, 164,169 ; increase, 41,251. Parcels, luggage, &c., revenue, £149,256 ; increase, £3,309. Live-stock, 3,913,245 ; increase, 38,530. Timber, 305,853 tons ; increase, 161,039 tons. All other goods, 2,645,621 tons ; increase, 484,814 tons. The revenue per mile of railway increased from £1,636 16s. 7d. to £1,752 2s. 6d., but decreased from 15s. 2d. per train-mile to 14s. 7d.

The variations of traffic in the individual districts were approximately as follows :—

Northern District (Christchurch).—Revenue, £1,224,800 ; increase, £259,744. Passengers increased 227,465, and season tickets 22,269. Parcels, luggage, &c., decreased £3,549. Cattle increased 5,823. Sheep decreased 297,975. Timber increased 175,680 tons, and all other goods 216,814 tons.

Middle District (Dunedin).—Revenue, £879,341 ; increase £98,485. Passengers increased 189,148, and season tickets 15,737. Parcels, luggage, &c., increased £5,248. Cattle increased 5,813, and sheep 365,637. Timber decreased 21,914 tons. All other goods increased 89,548 tons.

Southern District (Invercargill).—Revenue, £704,310 ; increase, £152,472. Passengers increased 133,074, and season tickets 3,245. Parcels, luggage, &c., increased £1,610. Cattle increased 5,924. Sheep decreased 46,692. Timber increased 7,273 tons, and all other goods 178,452 tons.

Lake Wakatipu Steamers.—Revenue, £10,625 ; increase, £529. Passengers decreased 1,176. Parcels, &c., decreased £261. Timber increased 259 tons, and all other goods 1,057 tons.

Train-services.—The following table shows the average late arrivals of the suburban, mixed, and express trains for the year :—

Average late Arrival of Trains, Year ended 31st March, 1926.

Year ended	Period ended													Average for Year, in Minutes.
	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. 3.	Jan. 31.	Feb.	Mar.	
Express and Mail Trains.														
March 31, 1926 ..	5·22	3·98	7·10	3·11	3·82	5·26	3·57	1·92	3·84	11·27	9·39	7·39	6·43	5·54
March 31, 1925 ..	*7·95*	*4·95*	*4·67*	*2·75*	*3·72*	*1·76*	*1·28*	*2·30*	*1·47*	*9·71*	*2·91*	*1·53*	*2·41*	*3·64*
Long Distance Mixed Trains.														
March 31, 1926 ..	8·08	6·27	4·86	3·82	3·83	3·98	2·63	3·50	4·77	9·24	8·84	11·19	10·69	6·27
March 31, 1925 ..	*7·81*	*6·36*	*4·38*	*2·80*	*2·49*	*1·93*	*1·80*	*3·09*	*3·79*	*7·22*	*4·88*	*6·49*	*7·20*	*4·63*
Suburban Trains.														
March 31, 1926 ..	0·77	1·16	0·88	0·68	0·72	0·57	0·27	0·41	0·26	0·72	0·73	0·95	0·76	0·68
March 31, 1925 ..	*2·90*	*1·25*	*0·74*	*0·42*	*0·34*	*0·23*	*0·24*	*0·33*	*0·23*	*0·64*	*0·41*	*0·38*	*0·45*	*0·65*

FINANCE AND ACCOUNTS.

The new system of finance, providing for the separation of the Railway Funds from the Consolidated Fund, and a reorganization in the accounting system of the Department in order to present the accounts in a form more in accordance with commercial practice, was brought into operation at the commencement of the year now under review, and the accounts as shown in the Appendices fully set out the financial position of the Department.

The policy adopted in this regard also provides that the Department meets the actual interest paid on all fixed and floating capital, and for the year just ended the total interest charge was £1,913,311, as against £1,654,845 for the previous year—an increase of £258,466.

The rate of interest with which the Department is now charged is the actual rate paid on Railway Capital loans as compared with the policy rate of $3\frac{3}{4}$ per cent. in previous years. In addition to payment of the increased interest rate, provision has been made for depreciation and deferred expenditure in connection with the replacement of obsolescent plant and equipment by the creation of a Renewals Fund. The amount standing to the credit of this fund at the 31st March was £280,838.

With locomotives, carriages, wagons, buildings, structures, and machinery, much of which has been in use for periods in excess of twenty years, the time is approaching—and in some instances has arrived—when the plant should be replaced with more modern and up-to-date material.

This cannot be done by charging the replacements to Capital Account, and to charge heavy expenditure of this class to working-expenses in the year in which it is actually incurred is not always practicable; and, even if practicable, is not desirable, in that it entirely upsets comparisons from year to year as to actual operating results.

The alternative has therefore been adopted of charging to working-expenses a fixed percentage annually, based on the estimated life of the various assets to provide for depreciation and renewals; and for the future the renewal of all rolling-stock and equipment, when its useful and economical life is ended, will be a charge against this fund, which will necessarily require to be built up to a substantial sum in order to meet the heavy charges which can be foreseen.

A Betterments Fund has also been opened to provide an account out of which improvements and minor additions can be made, for which no capital funds are available, and an allocation of £60,000 has been made to this fund in the year's accounts.

An Insurance Fund has been opened to provide for possible losses by fire and to cover payments under the Workers' Compensation for Accidents Act, the unexpended balance being £4,784.

To further equalize the annual operating figures a small charge is regularly made against working-expenses to provide a fund to meet extraordinary expenditure caused by slips, floods, and accidents. The expenditure incurred by such causes is liable to fluctuate violently from year to year, and the provision now made will prevent such unforeseen incidents upsetting the value of the working-expenses figures. At the 31st March the unexpended balance in this account was £24,205.

In assuming its own financial burdens the Department also relieved the Consolidated Fund of the payment by way of contribution which it has been the practice to make to the Railways Superannuation Fund. For the year just ended the contribution made by the Department to this Fund was £145,000, or £65,000 more than the previous year.

BRANCH LINES.

In placing upon the Department the onus of bearing its own financial burdens, the question of developmental and unprofitable branch lines and isolated sections arose, and after full consideration it was decided as a matter of policy that the loss on certain specified lines which come within the above category should be recouped to the Department.

The revenue and working expenditure account for each of such lines is kept separately and is subject to audit by the officers of the Audit Department. In arriving at the revenue figures each line is first credited with its full proportion of the freight on the basis of the mileage carried on the branch and, in addition, on traffic which originates on the branch and is consigned to the main-line stations, or *vice versa*, the branch is also given credit for all revenue in excess of the actual cost of working the main-line services that is earned by the main line in carrying such traffic.

The effect of this is to reduce the ascertained loss on the branch lines, and it might be submitted that such a basis of calculation is not equitable to the main line, but it was decided to give the branch lines full credit not only for the actual revenue earned by conveyance on the branch but also for their value as feeders to the main line.

In adopting the policy of recouping the Railway Department for the loss incurred in the working of these developmental lines when placing the Department's finances on a definite basis, it was recognized that such lines had been provided in advance of settlement and could not be expected to pay their way until such time as the districts which they serve have arrived at a stage of much closer settlement and more intense cultivation. These lines have a value to the Dominion additional to the extent to which the country they open up is able to maintain them, and, in deciding to bear the loss on working, the Government accepted a liability, no greater than it has borne in the past, as the alternative to allowing the Railway Administration to reduce services, increase freights, or, in some cases, close branch lines altogether, a course which no Government desirous of developing the maximum welfare and prosperity of the Dominion as a whole would be likely to entertain.

STATISTICS.

The statistical system referred to in our last report has been in operation for the past year, and, while it has been of considerable value to the Board in permitting comparisons of the results attained month by month, its value will become much greater from now on in that it will enable comparison to be made with the corresponding month or period of the preceding year.

Owing to the many varying factors in railway operations from day to day, but which recur regularly every year, comparisons of results obtained with those of a corresponding period of the preceding year or years are the most reliable means of measuring progress.

The system adopted is confined to the compilation of information which will be of practical value to the Board and its officers in disclosing at a glance the results attained by different sections of the multifarious activities that comprise a modern railway undertaking.

COMMERCIAL.

The Commercial Branch of the Department has maintained its activities in the direction of regaining traffic attracted from the railways by other transportation systems, and in securing new business wherever offering, and has met with much success.

Special attention is devoted to clearing up troubles and smoothing out difficulties experienced by our customers in their dealings with the Department, and this, in conjunction with the policy of keeping in close touch and conferring with Chambers of Commerce and other public bodies, has done much to engender friendly feelings between our customers and ourselves by showing that it is our desire to render to our clients the best possible service.

The benefits of maintaining close touch with our customers and of strengthening their friendly feelings is a matter with which all members of the staff are fully impressed, and no effort will be spared to advance on these lines.

The greater part of the Dominion has been very carefully combed in an effort to secure all traffic possible to rail, and in a great measure all traffic we can reasonably expect to obtain has been obtained, except where there are exceptional circumstances. The short-distance traffic is difficult to capture, but we have had a good deal of success in this direction also; the efforts are being continued where the volume of traffic and the margin of profit are sufficient to warrant special attention.

With regard to the wool and dairy-produce, those concerned have responded in a gratifying manner to the Department's efforts to foster traffic. There are large increases in the quantities of these two commodities conveyed by rail, and except for isolated cases we are carrying all the traffic from districts served by rail; indeed, in a number of instances, we are securing traffic that has always previously been considered road traffic.

This Department is appreciative of the efforts of the carriers all over the Dominion who are feeding the railways. They are realizing that it is in their best interest to act as feeders, and their support and co-operation are of the greatest value. It is considered that where such can be arranged it is better to have mutual working arrangements with all the carriers in the locality than to have only one contracting firm working with the Department, even though the contract price might be slightly less than the charges of the associated carriers. The arrangements for the Department collecting cartage charges on behalf of carriers have worked very well.

Among the many matters dealt with by this Branch during the year the following may be specially mentioned:—

Excursion Traffic.—Attention has been devoted to the development of excursion and picnic traffic during the year, with successful results.

The total number of holiday excursion tickets issued was 711,743, showing an increase of 225,678 as compared with the previous year.

School, factory, and friendly societies' picnics also showed a satisfactory increase, the figures being 193,719, as compared with 76,057.

The possibility of still further increasing this traffic will be thoroughly explored before next summer.

Wool Traffic.—The Department's campaign to again obtain for the Railways the carriage of wool which had been diverted to the motors was an unqualified success, and for the year under review the increase in the quantity of wool carried by rail was 57,570 bales.

This result was attained by personal canvass of farmers, by arranging for the necessary cartage to rail wherever possible, and by giving the best possible facilities for transport.

Dairy-produce.—The steps taken by reduction in rates in localities where the motor competition was found to be encroaching on our dairy-produce traffic has to a considerable extent resulted in this traffic being regained. The better condition in which produce is delivered at grading stores from insulated railway wagons is a factor which should not be overlooked by dairy factories, as a slight improvement in grading may be sufficient to more than compensate for any difference in the freight charges.

Tourist Office, Dunedin Exhibition.—For the convenience of visitors to the New Zealand and South Seas Exhibition at Dunedin, a Tourist Office was installed within the building. The facilities offered were greatly appreciated by the public, enabling intending passengers to reserve seats, book tourist trips, steamer passages, &c., with a minimum of trouble.

8,715 seats were reserved and 1,300 steamship passages were booked, and, in addition, a large number of visitors availed themselves of the opportunity of a special round-trip by rail, steamer, and motor which was arranged to cover the Southern Lakes District.

Inter-Island Booking of Goods and Parcels.—During the year arrangements were brought into operation whereby passengers, goods, and parcels may be booked from a railway-station in one Island to stations in the other Island.

Passengers may now book their passage for the journey on the ferry steamers between Wellington and Lyttelton before leaving their home station instead of leaving this important matter until they arrive at the port. The convenience has been availed of by 11,751 passengers during the year.

Through booking of goods and parcels has also been availed of by a large number of business houses, no less than 5,183 tons having been dealt with by the Department up to the 31st March.

Having regard to the great convenience offered by these arrangements, there is no doubt that the business done will rapidly increase as they become more widely recognized.

Overseas Tourist Parties.—During the year two organized parties of overseas tourists visited New Zealand.

Steps were taken to see that all arrangements were satisfactory and smooth working assured. Members of the Commercial Branch accompanied the parties to render any assistance required and to furnish information. That the attention was appreciated is shown by the complimentary references made by the organizers as well as by the tourists themselves.

Cash-on-delivery System.—Arrangements have been completed which will permit of purchasers paying to the Department the cost of goods which have been forwarded by rail, the amount so collected by the Railway Department being then remitted to the senders.

This system has in other countries been found to be a great convenience to settlers living at a distance from centres, and will no doubt be similarly appreciated in New Zealand.

Improvements generally.—Among the reforms that have been introduced recently, are :—

Revision of rates and fares where necessary.

Increased facilities for checking luggage.

Removal of restrictions on availability and use of tickets.

Increased facilities for day trips and running of excursion trains.

Customs clearing of cargo to be despatched by rail. Country clients may now make their arrangements through the local Stationmasters for clearing "under bond" cargo at Wellington.

Introduction of a system whereby a purchaser may pay to the Railway Department value of contents of parcels transported, which amounts are promptly refunded to senders.

Improvements to Official Pocket Time-table; the hotel and boardinghouse advertisements will, as they are renewed, be set up in the form of a hotel guide, which should prove a convenience, besides reducing the size of the book.

Sale of tickets and facilities for reservation for passengers leaving isolated sections for main-line routes.

Arrangements for sale of railway tickets by other transport concerns.

Increased facilities for reserving of seats. In this connection, passengers from Dunedin are now able to reserve their seats on the through Invercargill–Christchurch express without reference to Invercargill. At Wellington a system has been devised whereby passengers for the South Island can reserve their seats and obtain particulars of seat numbers immediately and without reference to Christchurch. Hastings passengers can now reserve without waiting for advice from Napier.

Railway Advertising.—The past year established a record in regard to the total value of business done, and it is evident that the value of the railways as a means of advertisement is becoming more fully realized by business houses.

The high standard of work has been well maintained in respect to the class of hoardings, posters, &c., produced, the excellence of design, and the maintenance of all displays in good condition, and many favourable comments in respect thereto have been received.

The business done in the printing section has also increased, and in addition to work in connection with railway advertising, the art staff has been able to assist the Publicity Officers in the production of scenic paintings and designs for publications, &c.

Publicity.—During the last year several publications have been issued by the Department, and special advertising of various tours and excursions has been made, with satisfactory results.

Among the features dealt with, the issue of special posters and circulars in connection with the New Zealand and South Seas Exhibition may be mentioned. Other activities were the issue of an illustrated booklet in connection with tours of the Southern Lakes; a "Householder" circular giving general information regarding the various passenger concessions and other new facilities offered by the Department; a pamphlet containing particulars of various travel and sports itineraries involving train transit; a souvenir booklet issued in connection with the recent farmers' excursion through the King-country; and the New Zealand Railways Magazine, of which twenty thousand copies are distributed monthly. In addition, more of the valuable advertising space in the Pocket Guide and in the Department's seasonal excursion booklets is now used for Railway propaganda, whilst advantage is also taken of the opportunities afforded by shows, &c., to place particulars of the facilities which the Department has to offer before those whose business it is the intention of the Department to attract.

Arrangements are also in hand for the display of posters indicating the advantages the railway possesses for the conveyance of passengers and commodities.

The Department has also been in touch with the Government Publicity Department in recent publicity efforts, and for the South Taranaki Winter Show a combined exhibit was prepared illustrating pictorially some of the favourite holiday resorts in the Dominion, with artistic signs

giving fares and other particulars. This exhibit was very favourably commented on, as was also a hall set aside for the Department and decorated with mural picture signs illustrating phases of railway activities.

In order that the public both in New Zealand and overseas may be fully apprised of the advantages which the railway has to offer, the range of publicity will be further extended.

Safety First.—The problem of reducing the possibility of railway accidents to passengers, employees, and road-users is two-sided, depending for its solution not only on the perfecting of safety appliances, but requiring also the extension and continual exercise of safety practices by public and staff.

Whilst specially alert, watchful, and skilled people may live and work without coming to harm amidst surroundings which call for the constant exercise of those qualities, humanitarian considerations require that effort should be made to reduce, by the introduction of safety appliances, the risk of personal accident. As, moreover, no conceivable improvement in the methods of transport can make operations entirely safe for the careless individual, education in regard to and in the need for safety practices becomes increasingly necessary with the growing size and complexity of our business.

In the matter of appliances the Board is pushing on with the erection of warning devices at level crossings, and, in conjunction with the Main Highways Board, the elimination of the more important level crossings. Better lighting is being provided in shunting-yards where this is necessary, and the whole of the workshops reorganization is designed, both in general layout and machinery, with the idea of safe working as a primary objective.

Education in safety practices is being proceeded with. "Safety-first" showcases have been placed in 246 workshops, locomotive depots, car and wagon depots, station buildings, shunters' cabins, &c., throughout New Zealand. In these are exhibited coloured posters advocating various safety-first methods, and containing warnings against risky practices. The posters will be changed periodically to deal with new aspects of the subject.

A special feature has been made of "safety first" in its relation to shunting by the issue of a pamphlet containing advice to shunters, the various slogans being compiled in conjunction with and upon the advice of experienced shunters throughout the Department. It is recognized that the proportion of shunting accidents to employees may be reduced by a thorough understanding of safe railway practices. Five thousand copies of the pamphlet have been sent out, to be prominently exhibited in places where the notices are likely to catch the eye of those immediately concerned, and distribution has also been made amongst those who have the control of shunting immediately in their hands.

The setting-up of safety committees amongst employees to act in conjunction with the management in pointing out any dangerous conditions which may call for remedy, and checking unsafe practices wherever they may develop, is another phase of "safety first" which is receiving attention.

A further means of propaganda in regard to safety practices is found in the departmental magazine, wherein a special page has been set aside for the purpose of spreading "safety-first" news. This avenue is also used to carry the message of safety out amongst the public in regard to the need for care at level crossings. On this point it is not generally realized how large is the number of level crossings which have to be negotiated by drivers on trunk express trains during the course of their day's run.

The following figures are enlightening:—

North Island.

Engine Runs.	Number of Level Crossings.
Wellington to Taihape	130
Taihape to Ohakune	31
Ohakune to Auckland	87
	248 (3 crews).

South Island.

Christchurch to Glenavy	119
Glenavy to Waihola	100
Waihola to Invercargill	97
	316 (3 crews).

These figures show not only the impossibility of seriously contemplating the immediate elimination of all level road-crossings, but also the great strain which is placed (through the reckless actions of certain drivers of road-using vehicles) upon engine crews having to cross these roads in the course of their run. It is hoped the publication of these figures will help to bring home to such motorists the other side of the level-crossing problem, and aid them towards a fuller realization of the necessity for the exercise of care when approaching the railway-line.

The aim of the Department in connection with its operations is to secure the greatest possible immunity from accidents both to the public and its employees. It is to this end that the above devices and methods have been inaugurated, and statistics are being kept with the object of referring at the end of each year to the benefits accruing from the adoption of the new methods.

ROAD COMPETITION.

The problem of road competition, both in regard to passenger and goods business, has continued to give the Department much concern.

While the Commercial Branch has maintained its efforts to increase the goods traffic wherever possible and to regain any that has been diverted to the road, the matter of competition for passenger traffic, urban as well as suburban, has also been receiving attention.

With regard to goods traffic it may be said that most of the sources of possible traffic of any considerable volume have been explored, and that the steps taken either to induce new traffic or to attract back to the railway lost traffic have had extremely satisfactory results.

It is not the intention to relax our efforts in connection with goods traffic, but it is considered that special attention should be given to the passenger side.

It is hardly necessary to point out that motor competition is of very recent origin, and that prior to its advent the State railways had for many years, by low fares and reasonably adequate train services, without profit, enabled city workers to live in congenial surroundings in the suburbs. With the arrival of the motor-car and motor-bus, however, enterprising owners have seized the opportunity offered by good roads, absence of regulation, and inadequate taxation of road vehicles to step in and divert from the railway the best of the surburban traffic which this Department had created and fostered.

These road services do not display any anxiety to carry workers to and from their work at fares that are comparable with those charged by the Department, and which range from 2¼d. per trip up to seven miles, 2½d. up to ten miles, to 4¼d. per trip for twenty miles, nor do they provide rolling-stock to handle this peak-load traffic.

Apart from interest on the capital invested in providing and forming the railway-line, it costs the Department an average of £369 a year to maintain each mile of line, as compared with the relatively small annual license fee paid by road vehicles.

While the greater mobility of road vehicles is beyond question, it is necessary that all the various factors should be taken into consideration and carefully assessed before the conclusion is come to that they possess advantages beyond existing means of transportation, a conclusion which may involve enormous and recurring financial loss to the Dominion.

The present position, in so far as this Department is concerned, may be summed up as follows: After developing and encouraging suburban traffic for many years at unremunerative fares, the privately owned buses have come in and are catering for only that portion of the business which is profitable, leaving the low-fare, peak-load traffic to the railways. The question then arises as to the remedies that are available to the Department—whether to discontinue suburban passenger services and thus reduce costs of operating, or to go on the roads to regain that portion of the passenger traffic which has been diverted, so as to enable the railways to continue to render to the community that wider general service which has been their aim.

THE NEW ZEALAND RAILWAYS MAGAZINE.

Arrangements were made early in the present year for the publication of an official journal by the Department with the object of improving the relations between different branches of the service by providing a common ground for publicity, and also with a view to keeping the Department's clients posted in the progress of railway affairs. The first issue was produced in May, and was most cordially received both by the public and by the seventeen thousand employees amongst whom it was distributed. The magazine is being used for the general purposes of advertising, or (to use the later American word) "selling" the Department to the section of the public most interested in railway operation, while at the same time supplying information to the staff on matters directly affecting their daily work and the general development of transport.

Such topics as the economic principles of railroading, co-operation in industry, improvements in organization, safety-first methods, and matter of general educational or welfare value are featured in the journal. Space is also found for descriptive matter regarding the various rail-served pleasure resorts in New Zealand, while opportunity is given for the publication of notes of a social nature regarding matters likely to be of general interest to members of the service. It is hoped by publishing authoritative descriptions of operations in the various departmental offices, work-shops, stations, goods-sheds, signal-cabins, &c., to increase the interest of each section of the service in the work performed by other portions—to broaden the outlook of members towards the work upon which they are engaged, and, by the spread of railway knowledge, to produce greater individual and co-operative efficiency.

TARIFF.

The new tariff, the revision of which was approaching completion when the Board's report for last year was submitted, came into operation on the 31st August, 1925, and, as the result of the discussions which took place with the representatives of the various interests involved, the changes decided upon were arranged so as to operate with a minimum of disturbance to the business interests affected.

In the "Passenger" section two features new to the Dominion railways were introduced, and while both have gained popularity in the comparatively short time that has elapsed since the tariff was issued, there is no doubt that as they become more widely known their benefits will be availed of to a much greater extent than has been the case up to the present time. These are trip bearer tickets and family tickets. Trip bearer tickets are issued in two forms—twelve trips or fifty trips; the former is sold at a discount of 12½ per cent. off the price of six ordinary return tickets, and the latter at a discount of 20 per cent. off the price of twenty-five ordinary return tickets. They are

available for use by any one accompanying the holder of the ticket, and are not limited as to period of availability. The value of this class of ticket to any one requiring to make frequent journeys, although not sufficient to warrant the cost of an ordinary season ticket, and to the wives and families of those living in the suburbs, for use in their weekly shopping trips to town, will be apparent, while the reduction on the ordinary fare is sufficiently liberal to make them decidedly attractive.

Family tickets (second class) are issued on a basis designed to enable parents accompanied by their children to travel at extremely reasonable cost. Parents and members of their family to any number—but not exceeding sixteen years of age—may travel on these tickets at a total cost of three adult tickets. Cases have been observed where a man, wife, and six or more children have taken advantage of this concession, and it will be obvious that it provides a cumulative concession which becomes effective where more than two children are accompanying their parents, and increases in amount with the number of children under sixteen years of age.

In the " Parcels " section a new feature in the prepayment of freight on parcels by means of stamps was inaugurated, and has been found to be a convenience by many business firms dealing with mail orders or extensive parcels business.

In the " Goods " section various alterations were made and anomalies adjusted, but the principal work was caused by the necessity for numerous special rates in localities where road competition was developing. Generally speaking, these rates have attained the object for which they were granted, and in every case the circumstances were first fully investigated by the Commercial Branch.

REFRESHMENT BRANCH.

During the year the total number of rooms controlled by the Branch increased to twenty-six, the rooms at Patea, Clinton, Gore, Putaruru, and Ohakune being taken over by the Department.

The volume of business shows a satisfactory increase, the gross earnings amounting to £133,658, being £28,861 in excess of the preceding year.

The staff of the Branch increased in number from 274 to 368.

During the year the expansion of business necessitated a number of improvements in accommodation, the principal items being—

New bakehouse at Oamaru.
Additional staff accommodation and enlargement of bakehouse at Frankton Junction.
Additions and improvements to rooms at Frankton Junction, Patea, and Clinton.

The completion of these works afforded considerable relief, and the improved facilities have enabled us to render more efficient service.

The operations of the Branch in connection with the purchasing of foodstuffs and groceries for other Government Departments under the authority of the Stores Control Board have been maintained. The organization of the Branch was placed at the disposal of the Consul-General for the United States of America during the visit of the warships of the United States Navy to New Zealand in August, 1925, and assistance was rendered in the standardizing of tender forms and the letting of contracts for various items of foodstuffs.

The Consul-General conveyed to the Secretary of the Stores Control Board his appreciation of the services rendered in this connection.

The system of hiring cushions to passengers on the Auckland–Wellington Main Trunk express trains was inaugurated in April, 1925. Passengers travelling by these trains are enabled to hire cushions at a nominal charge of 1s. each. The facility proved a decided success from the outset and has speedily increased in popularity. The total number of cushions hired to the 31st March was 38,519.

There is no doubt that the travelling public greatly appreciates the Department's efforts to add to their comfort on the long night journeys.

No effort will be spared to maintain and improve the high standard of service that has been rendered in the past, and, as opportunity offers, other refreshment-rooms at present conducted by lessees will be taken over by the Department.

STAFF EDUCATION.

In addition to the classes provided for the instruction of newly appointed cadets in telegraphy and elementary railway work, consideration has been given to the matter of providing all members of the staff with opportunities to qualify themselves for the higher positions in the Service.

With this object a central training and correspondence school has been opened in Wellington.

The course of study prescribed for members in the Traffic Branch has been completed, and judging by the number of intending students its success is assured.

This course comprised a series of fifty-three lessons, and aims to inculcate a thorough knowledge of the practical requirements of railway-operating as it affects an officer in the Traffic Branch intermediate tests being made by periodical examinations.

The object the Board has in view is to afford all members of the Department the opportunity to qualify themselves for higher positions, and when the Training School is in full operation it will be open to every member to take up a course of study which will fit him for advancement in the particular branch of the Service which he selects.

A reference library is being established which will place at the disposal of the staff the best and most modern publications on transportation and cognate subjects.

The Board hopes at a later date to establish a Railway Institute with branches at the principal centres, where facilities will be provided for self-improvement by way of libraries and a wide range of educational classes, and in which accommodation will be available for recreation and for social gatherings of the staff.

SAWMILLS AND LOGGING AREAS.

The Department's sawmill at Mamaku produced 2,824,670 superficial feet of sawn timber during the year from logs felled in the Mamaku Bush area.

After allowing £3,922 for interest and depreciation, &c., this sawmill shows a net profit of £913 on the year's working.

The value of the timber issued during the year from the Mamaku mill was—

	£
To the construction branches, &c.	26,310
To stocks at the Department's stores	18,200
To other Government Departments	1,245
Cash sales to private parties	13,582
Total	£59,337

At the Frankton Junction sawmill, which supplies the requirements of the Architectural Branch in connection with the Department's house-building programme, 5,566,448 superficial feet of sawn timber were produced from logs felled in the Department's bush areas at Pokaka and Erua.

After allowing £6,276 for interest and depreciation charges, the Frankton Junction Sawmill shows a net profit of £2,865 on the year's operations.

The following issues were made from this sawmill during the year :—

	£
To stocks at the Department's stores	71,832
To construction branches, &c.	80,002
To other Government Departments	219
To cash sales to private parties	310
Total	£152,363

In the Pokaka Bush area the logs felled and crosscut during the year totalled 3,805,948 superficial feet, and in the Erua Bush area the logs felled and crosscut during the year totalled 3,603,301 superficial feet. Practically all this timber was forwarded to the Frankton Junction Sawmill, freight charges being debited to the Sawmill Account.

The sawmills at Mamaku and Frankton Junction were established to ensure the supply of the Department's requirements in respect of New Zealand timbers.

The sawn timber is issued to the construction branches at approximately the cost of production, and the sawmills are not carried on with the object of making profits.

STORES.

The amount expended in connection with the purchase of railway stores and materials totalled £2,278,116 16s. 10d.

Payments were divided as follows :—

	£ s. d.
To merchants and manufacturers in New Zealand	1,625,409 18 9
To Great Britain and oversea British Dominions	609,827 19 10
To stores and services, railway workshops	42,878 18 3
Total	£2,278,116 16 10

The policy of giving preference to (*a*) stores manufactured in New Zealand, and (*b*) to stores manufactured within the Empire, has been steadily continued during the year.

No pronounced difficulties have been experienced during the year in obtaining adequate supplies of stores and material necessary to maintain the railway services, and, taken on the whole, prices have been more stabilized than in any year since the war.

The work of standardizing and rebuilding the tender schedules has been completed in such form as will make them available not only to the Railway Department but to all other Departments of State. The schedules, which are comprehensive in their contents, are now in the hands of the Government Printer for printing in tender form. The conditions of contract under which tenders will be called have been revised and brought into more general application as covering the requirements of all Departments. This work has been done under the ægis of the Stores Control Board.

Arrangements have been put in hand to substantially increase the proportions of New Zealand coal to be used in all districts and to correspondingly reduce importations from overseas.

Taking the year as a whole the average consumption of coal was 7,700 tons per week.

The work of reorganizing the Stores Branch, which actively commenced in August, 1925, has been steadily continued, and is now well advanced along lines that will prove of benefit to the Service, and result in a more effective control of stocks on hand. Standard racks, unit piling, and bin-card systems have been introduced and are being extended to all main stores, sub-stores, and depots. Maximum and minimum quantities are being fixed and listed in respect of all items regularly held in stock, and this system will be extended throughout the whole railway system in such a manner as to define the kinds and to set a recognized limit upon the quantities of stores to be held in every district and division of the Service. The whole of the stocks of every kind of stores not actually in use or in course of being put into use will then be under the control of the Stores Branch.

All items manufactured in railway workshops for stock, including the output of the foundries in the several centres, will be taken over by the Stores Branch, with the object of co-ordinating and regulating manufactures to actual necessity.

The accounting systems are being revised to assist in the control of stores, and for the purpose of dovetailing and simplying methods and accounts and facilitating procedure in the reorganizations in progress.

The matter of establishing reclamation depots and a special sales organization within the Stores Branch to deal more effectively with stores taken out of service and capable of being reconditioned for further service, or of being profitably disposed of by sale, is being investigated.

During the year tenders were called for machinery required in connection with the reorganization of the locomotive workshops. The needs of the Department in respect to this machinery were extensively advertised in England, New Zealand, and in British Dominions overseas, and the fullest opportunity afforded manufacturers to tender.

STAFF.

The total number of staff employed on the 31st March, 1926, not including those engaged on works chargeable to capital, was 18,464 and the average number actually at work throughout the year was 17,990, as compared with 17,246 for the previous year. The average number of men engaged on works charged to capital was 1,058, as against 2,277 last year.

Fifty seven members of the Second Division were promoted to the First Division, 505 members resigned, 95 retired on superannuation, 48 died, 95 were dismissed, and 1,215 engaged.

The sum of £37,857 was paid under the Workers' Compensation Act during the year to members who sustained injuries in the execution of their duties.

Throughout the year under review the conduct of the staff has been good, and the Board desires to acknowledge the loyal support which has been accorded by members of all ranks of the Service.

The exceptionally heavy passenger traffic due to the Dunedin Exhibition called for the whole-hearted co-operation of the staff, and it is pleasing to note that all members concerned rose to the occasion, with the result that the traffic was expeditiously handled without accident or any serious delays.

The cordial relations which exist between the management and the staff were not disturbed by any industrial troubles during the year.

Several concessions which were withdrawn from certain sections of Division II during the previous year have now been restored—such as night rates, double rates for all time worked on Sunday, &c.

It is with regret that the Board has to place on record the death, through accident, of the late Staff Superintendent, Mr. W. O. Ennis. This officer was, at the time of his death, engaged upon the work of staff reorganization, and it is regretted he was not spared to carry these duties to finality.

Further changes have been made during the past financial year in the direction of improving staff conditions.

With regard to filling Division I vacancies, involving promotion, which arise from time to time, it frequently occurred that officers who were offered promotion involving transfer could not accept such promotion owing to domestic or other reasons. In accordance with the regulations such officers were required to forfeit promotion for a term of two years. A new departure has been made, applications now being invited in connection with all vacancies involving promotion. Under this system any member who may be in order but does not desire promotion to a particular position which may be advertised is at liberty to refrain from applying for such position without incurring forfeiture of promotion for two years.

The scheme outlined in the annual report of last year in regard to discipline is now ready for adoption, and will be put in operation shortly.

At the present time a classification committee, consisting of an officer of the Railway Department, an officer from the Post and Telegraph Department, and an officer from the Public Service, are engaged in reviewing all First Division positions in the Service with a view to determining the relative value of such positions and ensuring uniformity of classification.

During the year the method of recording particulars of the service and classification of staff has been brought into line with the system in operation in other sections of the Public Service.

The four officers mentioned in the last annual report who were sent abroad to study the working conditions in other countries have returned to the Dominion, and they have furnished reports which will prove of considerable value to the Department. At the present time Mr. F. C. Widdop, M.Inst.C.E., Chief Engineer, Maintenance Branch, is absent from the Dominion in quest of information connected with the working of his branch.

As soon as the necessary arrangements can be made it is proposed to send a number of the Department's most promising junior officers abroad for training on the railway systems of other countries. This will, it is anticipated, enable the Department to keep in touch with the latest methods of railway-working. It is probable these visits will be reciprocal, and that members from overseas railway systems will visit the Dominion in order to familiarize themselves with the conditions and methods of working which obtain in New Zealand. The system of temporary exchange of officers is in operation in several of the American and British railway companies, and the results obtained have proved eminently satisfactory.

NEW WORKS.

The expenditure during the year on works authorized under the Railways Improvement Authorization Acts and charged to capital was £546,416, making a total expenditure to 31st March, 1926, on the various schemes authorized by these Acts £1,721,133. The principal works in hand were—

Auckland Shunting-yard.—Good progress has been made with the new yard at Auckland, and tenders are being called for the erection of new goods-shed and offices. The plans for the new station building are in hand.

Helensville.—A commencement has been made with the provision of new station-yard.

Thw Auckland–Westfield new line is being proceeded with, and all plans for the completion of this work have been prepared.

The Penrose–Papakura duplication has been completed as far as Westfield, and the work is now being pushed on towards Otahuhu.

Palmerston North New Yard.—The preliminary work has been started in connection with this job, and it is expected that it will be completed within schedule time.

Wellington Station and Yard.—The contract for the erection of the sea-wall in connection with the reclamation for the new station-yard at Wellington was completed well under the stipulated time, and arrangements were made for the erection of a further length of 450 ft. of wall, the construction of which is now well forward.

A considerable amount of reclamation behind the wall has been carried out by the Harbour Board's dredge, and a second dredge has now been chartered to assist with the work.

At *Christchurch* a start has been made with the new "hump" shunting-yard between Addington and Middleton. The completion of this work will allow the rearrangement of Christchurch station and yard to be proceeded with.

Workshops.—Plans have been prepared and tenders are being called for the erection of new workshops at Otahuhu, Petone, Addington, and Hillside.

Dunedin–Burkes Duplication.—The new double track between Dunedin and Ravensbourne was opened for traffic in May, and the duplication of the line between Ravensbourne and Burkes is now in hand.

Signals, &c.—Automatic signalling with colour-light signals, for double-line working between Auckland and Westfield, and between Dunedin and Ravensbourne, has been completed and brought into operation. The tablet system was brought into use between Whangarei and Kaukapakapa, a section of 87 miles.

Traffic is now controlled by—	Miles.
Tablet system (single line)	1,746
Lock and block (double line)	16½
Three-position upper-quadrant and colour-light signals—	
Single line	126
Double line	31

Forty-two miles of poles and 456 miles of wire were erected during the year.

The Department's telegraph and telephone system now comprises—293 Morse sets, 1,866 telephones, 365 electric bells, 9,447 miles of wires, and 2,875 miles of poles.

£17,756 was expended during the year on the installation of electric lighting in stations, workshops, departmental houses, &c. Fifty-seven electric motors, aggregating 1,190 horse-power, were installed in locomotive workshops during the year.

ELECTRIFICATION: LYTTELTON–CHRISTCHURCH.

Messrs. Merz and McLennan's report on the electrification of suburban lines was received during the year. That section of the report dealing with the electrification of the line between Lyttelton and Christchurch has been reviewed by the engineers of the Public Works and Railway Departments, and Cabinet authority has been received to proceed with the work. Although the traffic on this section is not sufficiently intensive to show a profit as the result of the change over to electric traction, the discomforts due to smoke and fumes in the existing tunnel will be completely eliminated thereby, and the construction of the proposed second tunnel at a cost of £265,000 will be obviated. Detailed plans and specifications for the electrification of this section are at present in course of preparation, and the work, which will take approximately two years to complete, will shortly be put in hand. Messrs. Merz and McLennan's report is published as an appendix to this statement. (Appendix B).

HOUSING.

During the year 300 five-roomed houses were cut at Frankton Junction Factory, of which 251 were erected at fifty-seven stations, making the total number of houses erected since the inception of the housing scheme 728. In addition, there are 104 houses now in course of erection and uncompleted—at Otahuhu 20, Taumarunui 3, Wanganui 15, Palmerston North 33, Upper Hutt 4, Maungaturoto 5, and Lower Hutt 24.

The quantity of timber passed through the big planer during the year was 6,184,007 lineal feet, averaging 19,757 lineal feet per working-day.

Hot- and cold-water services were provided in all houses, and, where available, electric light and sewerage.

The actual costs for the year were—

	£
Cutting and erection of houses, including fencing, hot and cold water, electric lighting, &c.	189,662
Preparation of sites	2,943
Roading of sites	4,566
Drainage and sewerage	6,059
Water-supply	1,715
Land	12,790
Stocks of material held	8,460
	226,195
Completion of work in South Island	15
	£226,210

The amounts referred to under "Land," "Preparation of sites," "Roading," "Drainage," &c. are for more sections than those built on during current year.

The total costs to date are as follows :—

	£
North Island houses :—	
Erection of houses	557,334
Preparation of sites	8,657
Roading of sites	12,985
Drainage and sewerage	20,915
Water-supply	4,353
Work on reserves	2,011
Land	81,442
Stocks of materials held	38,979
	726,676
South Island houses :—	
Erection of houses	9,409
Preparation of sites	140
Roading of sites	26
Drainage and sewerage	333
Land	1,596
	11,504
Grand total	£738,180

Since the inception of the scheme 728 houses have been built, at average costs as follows :—

	Year 1920.	Year 1921.	Year 1922.	Year 1923.	Year 1924.	Year 1925.	Year 1926.	Total.
Five-roomed houses—								
Number	1	56	95	19	42	252	251	716
Cost	£971	£950	£914	£831	£705	£674	£635	£714
Six-roomed houses—								
Number	..	2	6	3	..	1	..	12
Cost	..	£1,297	£1,254	£1,213	..	£972	..	£1,227

Of these houses, those built in the years 1924, 1925, and 1926 are factory-cut, those built in the previous years being by contract.

The average additional cost to these figures for year 1926, to provide for land, drainage, roading, water-supply, &c., was £103.

REORGANIZATION OF WORKSHOPS.

Complete layout plans and details for the reorganization of the four main workshops have been completed. Detailed shop designs and tenders for all structural work have been called for. It is expected that actual erection of the new shops will start early in 1927.

Complete programmes have been established for the clearing of the sites as necessitated for Addington and Hillside workshops, and the work is in hand.

New Machinery.—In accordance with the plan, the first year's allotment of machinery required to replace the obsolete machinery has been tendered for and selections made. This machinery will be installed in the existing workshops, and removed to new shops when complete transfer is made. New machines put into service this year include electrically driven planing-machines, wheel lathes, slotters, grinders, welders, and shop-trucks. Considerable improvement also has been made in the rearrangement of workshop machinery into groups conforming to the organization.

Workshop Electrification. — Gas-engine drives at Addington Workshops have been entirely eliminated and electric power substituted.

At Petone approximately 50 per cent. of the gas-engines have been superseded by electric drives, and this work is progressing satisfactorily towards completion.

Electrification of Hillside has been completely planned, and tenders have been called for all motors required. It is expected to complete this by the end of the year.

Invercargill and East Town Workshops have also been arranged for motor drives to supersede steam-engines.

Electric lighting of workshops is undergoing revision, and modern lighting is gradually being installed.

Workshop Organization and Methods have been considerably improved during the past year. Detail costing systems have been installed in workshops. Time-clocks have been established to replace book system in main workshops. Shop schedules and material-tracing has been improved. Stores reorganization has also been started.

PROPOSED TRAIN-FERRY BETWEEN PICTON AND WELLINGTON.

The Royal Commission which recently inquired into the Department's services suggested that the possibilities of providing through transit between the two Islands by means of a train-ferry should be investigated.

The question was referred to a committee (Messrs. S. E. Fay, Operation Assistant. and E. Casey, Inspecting Engineer), whose inquiries dealt with the economies of linking up Wellington and Christchurch by means of a train-ferry to Picton and the completion of the line between Wharanui and Parnassus. As a result of the investigations made by the committee it was found that the project could not be established at the present time except at a heavy loss to the State.

The report of the committee is published as an appendix to this statement. **(Appendix D.)**

TRAIN SERVICES.

The reorganization of the time-table was continued during the past year, and extensive alterations and improvements were made to the train services. The express trains have been accelerated, and, where circumstances permitted, mixed trains have been relieved of a portion of the wayside-goods work, and the time-table adjusted to allow of later start in the case of early-morning trains and earlier arrival in the case of evening trains.

"Daylight Limited" express trains between Auckland and Wellington were run on trial during the summer months. The traffic on these trains was not heavy except during the Christmas, New Year, and Easter holidays. With the close of the Dunedin Exhibition and approach of the winter season the traffic showed a decline, and a reversion to the two regular express trains each way became a necessity.

The night "Limited" express between Auckland and Wellington is now well established, and has proved a very popular train for the business community desiring to make the journey with a minimum loss of time.

The ordinary expresses between Auckland and Wellington have been accelerated to the extent of an hour and a quarter each, and the arrival and departure times at Wellington have been fixed to fit more suitably with the recognized time for the midday meal.

The Huarau-Portland Section of line was taken over from the Public Works Department during the year, and a through train service to meet the requirements of passenger and goods traffic was inaugurated between Auckland and Whangarei. The completion of this section of the line formed a continuous railway from Opua to Wellington, and provided the necessary outlet for produce from the Whangarei–Opua district to markets at the main centres. The time-table, after being in operation for some months, was improved by the acceleration of the mixed trains between Maungaturoto and Whangarei. The opening of the line through to Whangarei also enabled a further improvement to be made in the schedules of the Auckland–Opua expresses. These trains have been further accelerated to the extent of twenty-five minutes. This allows an earlier start to be made from Opua in the morning and ensures an earlier arrival there in the evening. The earlier arrival is of much consequence to the district on account of the long road journey to the outlying settlements after the arrival of the train.

The Opua–Whangarei local service has also been adjusted in the direction of providing a daily train between Opua and Auckland. The express trains run through on alternate days, and on the off days the morning train from Opua is scheduled to arrive at Whangarei in time to connect with the express for Auckland, and, similarly, the afternoon train from Whangarei for Opua has been delayed to leave Whangarei after arrival of the express from Auckland. This arrangement ensures a daily service between Opua and Auckland, and incidentally a continuous through service between Opua and Wellington. A further feature is that it affords business people in the far North an opportunity of travelling to Whangarei and back on the same day, with a few hours for the transaction of business in Whangarei.

The Auckland–Rotorua expresses have been accelerated to the extent of forty minutes each way, and the Auckland–Thames expresses have been similarly improved by a curtailment of three-quarters of an hour in the running-time. In each case the trains are starting later and arriving earlier than under the old schedules.

As a measure of economy in the slack season it has been usual in the past to amalgamate the Rotorua and Thames expresses between Auckland and Morrinsville during the winter, and while this

action was in a sense warranted it had many objectionable features. With a view to providing a more popular winter time-table, and making conditions of travel more attractive, it has been decided to continue running the trains as separate services throughout the year.

When the "daylight" express was put on the evening trains from Rotorua and from Thames for Frankton were started a little earlier and accelerated to arrive at Frankton in time to connect with the daylight express for Auckland. A certain amount of traffic has been developed by this connection, and, in order to foster this business and the traffic from Te Kuiti, a passenger-train is being maintained from Frankton to Auckland on the time of the up daylight express.

A number of improvements have been made to the Auckland suburban service in order to keep pace with suburban development. Several trains serving the inner area on the south line have been extended to Papakura and Drury. On the north line the Swanson–Auckland workers' train, morning and evening, has been extended to Kumeu, and other adjustments have been arranged to suit the convenience of our clients.

Additional passenger stopping-places have been opened at Ranui and Puhinui, and the number of trains stopping at Oratia, St. George's Street, and Croydon Road has been increased.

The train that formerly left Marton at 6.55 a.m. for Wanganui has been accelerated and scheduled through to New Plymouth so as to provide a connection with the night "Limited" express from Auckland.

The early-morning train (6.50 a.m.) from Palmerston North for Napier has been accelerated and timed earlier at Napier, and the return train has been timed to leave Napier two and three-quarter hours later than formerly, thus providing facilities for business people from Palmerston North and intermediate stations to travel to Napier or Hastings and return the same day.

The early-morning trains between Masterton and Woodville have also been rearranged with the object of overcoming the previous early start.

The Foxton–Palmerston North train service has been transformed from an irregular service to a regular one of two trains of uniform timing each way per day.

The Wellington–Johnsonville–Paekakariki suburban service has also received attention, and a number of attractive improvements have been introduced.

The Greymouth–Christchurch mail-train has been further accelerated and now leaves Greymouth at 10.35 a.m. The Christchurch–Greymouth mail-train has also been slightly adjusted in the direction of ten minutes later start from Christchurch.

Local services between Greymouth and Otira, Greymouth–Reefton and Inangahua, and Greymouth and Hokitika, have been speeded up in keeping with the course followed on the main lines.

The double line between Dunedin and Ravensbourne was opened in May of last year and afforded an opportunity for some improvement to the Port Chalmers suburban service.

The branch line time-tables have also been adjusted to fit in with the main-line alterations, and where possible the services have been improved. During the Exhibition period a fast passenger service was arranged for three days a week to provide better communication between Dunedin and the Lakes district, and, instead of reverting to the original daily mixed-train service with the closing of the Exhibition, it has been arranged to make a trial of the ordinary train three days per week and a passenger-train on the alternate three days. Visitors and residents will thus have, during the winter months, a service that will compare very favourably with that provided during the Exhibition period.

The Lawrence Branch line has been extended to Miller's Flat, situated fifteen miles beyond Beaumont, the previous terminus, and the Orepuki line has been extended a further eight miles to Orawia. A suitable time-table has been arranged on each line.

The isolated sections—Dargaville, Gisborne, Nelson, Picton, and Westport—were not overlooked. Their time-tables were also reviewed and the trains accelerated where possible.

One feature of the reorganization was the institution of through goods-trains in each Island. The existing services in the North Island were adjusted to provide a train that would enable goods traffic to be worked from Auckland to Wellington, or *vice versa*, with only one day occupied in transit. In the South Island a goods-train has been specially scheduled to make the journey Christchurch to Invercargill or Invercargill to Christchurch in one day. These trains are a boon to the business community in the matter of expeditious transit.

The Dunedin and South Seas Exhibition, which was open for a period of six months, severely taxed the Department's organization. Very heavy traffic was successfully and efficiently dealt with, especially at Christmas, Easter, and in the closing-hours of the Exhibition. Throughout the currency of the Exhibition a very large number of special excursions were arranged to Dunedin from all parts of the Island. It is gratifying to record that no hitch occurred in the arrangements and that the whole traffic was successfully handled without mishap.

LOCOMOTIVE-POWER.

During the year ended 31st March, 1926, forty-five new locomotives were added to stock,—

35 Class AB Pacific type 4–6–2 from North British Locomotive Company.
4 Class AB from Messrs. Price Bros., Thames.
6 Class AB from the Department's workshops at Addington.

Two engines were sold, and one old engine written off. Two rail-cars were added to the stock during the year, and two written off. It is expected that a Clayton steam-car and an Edison storage-battery car will be placed in service early in the current year.

The following locomotives are now under construction,—

4 Class AB 4–6–2 Pacific at Addington Workshops.
10 Class WAB 4–6–4 Heavy Tank at Hillside Workshops.
8 Class WAB 4–6–4 Heavy Tank at Messrs. Price Bros., Thames.

The reorganization of the workshops, as a result of which engines are now returned to traffic with earlier despatch, and the improvements that have been made in transport arrangements whereby a greater mileage is now run by engines, have had the desired effect of giving more elasticity to the Department's locomotive stock.

It is anticipated that when the locomotives now under construction are placed in traffic the Department's requirements in respect of locomotive-power will be adequately met for some time to come, except for the replacement of a number of engines of obsolescent types which have been in traffic for periods extending from thirty-five to fifty years. A number of these engines are at present engaged in shunting services and are not capable of dealing economically with the work of the present day. These engines will be replaced by a standard type of high-powered shunting-engine, the designs for which are now being prepared.

Designs are also being obtained for high-powered articulated engines of the Garratt type for service on the heavy grades in the North Island.

CARRIAGES.

Forty-six cars and eighteen brake-vans were built in the Department's workshops during the year. Eight cars were sold, and five cars and two brake-vans were written off.

During the year a new sleeping-car was designed and exhibited at the Dunedin and South Seas Exhibition.

The car is 56 ft. by 8 ft., and is divided into nine compartments each containing two berths. The car is lighted with electricity, heated by steam, and has a lavatory-basin connected with hot- and cold-water services in each compartment. Special attention has been paid to the ventilation of the carriage.

This car is said to compare favourably with those in use in other parts of the world.

Arrangements are being made to build five of these cars in the Department's workshops and to call tenders for a further five.

Steady progress is being made with the fitting of carriages with electric lighting. One hundred and eighteen cars have been fitted to date, and it is expected that all main-line cars will be so equipped within the next two years.

Arrangements have also been made to fit main-line cars with emergency Westinghouse brake-cocks for use by guards and passengers in cases of extreme emergency.

WAGON STOCK.

The following wagons were built in the Department's workshops and placed in traffic during the year:—

- 30 Class H four-wheeled cattle-wagons.
- 92 Class J four-wheeled sheep-wagons.
- 101 Class LA four-wheeled (12 tons) high-side goods-wagons.
- 55 Class M four-wheeled (8 tons) low-side goods-wagons.
- 21 Class W four-wheeled refrigerator-vans.
- 6 Class U double-bogie goods-wagons.
- 46 Class UB double-bogie goods-wagons.
- 9 Class V double-bogie refrigerator-wagons.
- 7 Class ZP double-bogie covered goods-vans.

Total 299 four-wheeled and sixty-eight bogie wagons.

Seventy-five four-wheeled wagons were sold and forty old four-wheeled wagons were written off during the year.

The workshops are at present engaged on the following building programme:—

- 26 Class H cattle-wagons.
- 38 Class LA high-side goods-wagons.
- 99 Class M low-side goods-wagons.
- 29 Class W refrigerator-vans.
- 25 Class X, 35 Class XB } ventilated goods-vans.
- 50 Class YB hopper wagons.
- 6 Class R, 9 Class U, 15 Class UB } bogie goods-wagons.
- 2 Class UC bogie tank wagons for bulk-petrol traffic.
- 5 Class UG bogie horse-boxes.
- 2 Class Z, 3 Class ZP } covered goods-vans.

Twenty additional tank wagons for bulk-petrol traffic will be put in hand during the year to the order of the various firms engaged in this traffic.

The speeding-up of train services and the provision of additional fast goods services has given the Department a quicker turnover of its rolling-stock, and has enabled it to cope more satisfactorily with "peak" demands.

RAIL-MOTORS.

The Board has conducted experiments during the year with self-propelled rail-cars, and although a thoroughly satisfactory vehicle has not yet been produced a certain measure of success has been attained. The "Sentinel" steam-car mentioned in the Board's report for last year has been tried out on the Wellington–Melling line. It has not, however, quite met the requirements of the traffic there, and it is therefore proposed to place it on a branch line where it should prove more suitable.

The trials of a railway-carriage fitted with an internal-combustion engine were unsuccessful, and the motor unit has now been removed from the car.

A "Clayton" steam rail-car was put into service during the year, and after various modifications fairly satisfactory results have been obtained. It is anticipated that this car will be found satisfactory in regular service on branch lines, and a trial will be made on a line where the passenger traffic offering is within the capacity of the car.

Experiments have also been made in respect of light four-wheeled road-vehicles converted to run on rails. One or two of these cars are being tried out in the South Island on branch lines where passenger traffic is light. These cars are operated by one man, and their fuel-consumption and working-expenses are low.

At the time of penning this report an Edison electric-storage-battery carriage is being assembled at Christchurch. The radius of operation of this car will necessarily be limited. It is proposed to give it a trial in service between Christchurch and Lyttelton.

USE OF NEW ZEALAND COAL ON RAILWAYS.

The report of the Board set up to inquire as to the suitability of New Zealand coals for consumption in locomotives was received during the year. The Coal Inquiry Board reports, *inter alia*: "The Board does not claim that the results of the trials carried out are conclusive on all points, because the testing of coals under working-conditions is not a matter which can be disposed of by one or two trials, but must be the work of years of trial and experimentation by those actually engaged in the service, in order that the maximum results may be obtained with any particular type of coal and locomotive. However, the trials conducted by the Board have been more extensive than any series of trials previously undertaken in New Zealand, and sufficient information has been obtained to enable general conclusions to be arrived at."

Arrangements have been made to continue the trials, which have already resulted in an increased consumption of New Zealand coals, with a consequent reduction in importations of this commodity.

The full report of the Coal Inquiry Board is published as an appendix to this statement. (Appendix C.)

DISASTER AT OPAPA.

It is with deep regret that the Board has to record the serious accident which overtook the express, *en route* to Napier, near Opapa on the afternoon of the 22nd September last. Owing to excessive speed the locomotive and five cars left the rails. As a result of this accident three passengers were killed and twenty-one injured. Subsequently the engine-driver was convicted and sentenced on a charge of manslaughter.

A Board of Inquiry was set up to inquire into the cause of the derailment. The finding of this Board is published as an appendix to this statement. (Appendix A.)

DIVISIONAL CONTROL.

Divisional control was brought into operation in February, 1925. A Divisional Superintendent was appointed to each Island to enable decentralization and closer touch with our customers to be obtained.

The new system has been in force throughout the whole of the year under review, and while it is recognized that there are still matters in connection with it that require adjustment in order to get the full benefits, the year's experience has been sufficient to show that the change is beneficial, both to the Department and to our customers.

The alteration in the system of control entailed the reorganization of the various districts and the closing of the District Offices at Whangarei and Greymouth.

The change was necessarily a gradual one, and has been carried out with a minimum of inconvenience.

The responsibilities devolving on the Divisional Superintendents were at the outset necessarily limited, but once the new organization got into smooth working-order the control and direction of all transport work, including the running of trains, handling of goods and passengers, maintenance of track, structures, and appliances, and the general provision of the facilities for travel, were placed in their hands.

The Divisional Superintendents, in conjunction with the officers of the Commercial Branch, keep closely in touch with municipal authorities, Chambers of Commerce, &c., and by personal interview reduce correspondence to a minimum. Delays in meeting public demands for transport facilities are thereby avoided.

INQUIRY INTO THE CONDITIONS OF WORK OF SHUNTERS.

In July, 1925, Messrs. J. Brown, District Traffic Manager; H. L. P. Smith, Assistant Engineer (Maintenance Branch); J. E. Perry, shunter; and S. Schofield, shunter, were appointed a Board of Inquiry to inquire into the conditions of work of shunters in the Government Railways Department as affecting the hazard involved in the performance of their duties, having regard more particularly to the following factors:—

(1.) The length of the shifts which shunters are required to work.
(2.) The numbers of the employees composing shunting-gangs.
(3.) The time that is allowed for the work of making up trains.
(4.) Supervision that is afforded on shunters' work.
(5.) The general control of the work in shunting-yards.
(6.) The lighting of shunting-yards.
(7.) The lay-outs and proposed lay-outs of shunting-yards.
(8.) Drainage of shunting-yards.
(9.) The matter of employees inexperienced in shunting-work being employed thereon.
(10.) And generally any other matters which in the opinion of the Inquiry Board affect the conditions of work of shunters as bearing on the risks involved in their employment.

The Shunting Inquiry Board's report was received in November last and is published as an appendix to this statement. (Appendix E.)

Arrangements have been made to give effect, as far as practicable, to the various recommendations made by the Shunting Inquiry Board.

SUGGESTIONS AND INVENTIONS COMMITTEE.

A Committee to deal with suggestions and inventions was set up during the year.

Since its inception in June, 1925, the Committee has received a total of 858 suggestions and inventions, of which 62 were recommended for adoption, 6 are on trial, 165 still under consideration, and 625 were rejected.

Suggestions advanced by members of the general public are dealt with by the Committee in addition to those forwarded by railway employees. The matters referred to the Committee cover practically all phases of the Department's operations.

Monetary rewards were made in respect of fourteen suggestions, and commendations were noted on the official record of thirty-nine suggesters.

The Board is pleased to note the Committee has been of practical value in stimulating the initiative of the staff.

SUPERANNUATION FUND.

The report of the Government Railways Superannuation Fund for the year ended 31st March, 1926, shows the position to be as follows :—

Annual liability, £220,093.

	£
Members' contributions	154,103
Fines and donations	219
Interest	43,751
Deficit to be drawn from subsidy	22,020
	£220,093

At the same date the liability to contributors in respect of amounts paid in was	£ 1,161,717
The total accumulated fund was	862,139
Leaving a deficit of	£299,578

The annual liability, £220,093, is in respect of 1,367 members, 444 widows, and 521 children, making a total of 2,332 persons actually on the fund on the 31st March, 1926.

As from the 1st April, 1924, the amount standing to the credit of the fund has been invested separately by the Public Trustee.

The amount standing in the Investment Account in the balance-sheet is represented by the following securities :—

	£
Mortgages	512,046
Local bodies' debentures	195,415
Government securities	93,000
In hand awaiting investment	1,100
	£801,561

The average rate of interest on securities held on 31st March, 1926, was 5·76 per cent.

The average rate of interest earned on the mean funds was 5·684 per cent.

We have the honour to be,
Sir,
Your obedient servants,

F. J. Jones (Chairman),
J. Mason,
A. W. Mouat,
Board of Management.

REPORTS FROM HEADS OF BRANCHES.

MAINTENANCE.

Mr. W. R. Davidson, Assoc.M.Inst.C.E., Acting Chief Engineer, reports as follows :—

The track, structures, buildings, and appliances have been maintained in good order and repair.

Permanent-way.—The relaying done during the year was as follows :—

	Miles.
Main line and branches, 40 lb., 53 lb., 55 lb., 56 lb., 65 lb., and 70 lb. rails relaid with 70 lb. material	61¾
Main line and branches, 40 lb., 52 lb., and 53 lb. relaid with 55 lb. material ..	5
Main line and branches relaid with second-hand 53 lb. and 56 lb. material removed from main line	20½
Total relaid for year	87¼

This represents an increase of 19 miles as compared with the previous year.

Sleepers.—The number of new sleepers placed in the track during the year was 239,536.

Ballasting.—166,940 cubic yards of ballast were placed on track.

Slips and Floods.—The Kaihu Branch was flooded five times during the year at various places, but little delay to traffic was caused thereby.

Several slips and washouts occurred on the North Auckland line, but traffic was blocked for a few hours only. From the 2nd to the 7th May Mercer station-yard was flooded by the Waikato River overflowing its bank, and the speed of trains was reduced to 6 miles per hour during that period.

On the Main Trunk line on the 25th May a slip pushed several chains of the track off the formation between Piriaka and Kakahi. A light engine ran into the obstruction and was overturned clear of the track. Other slips and washouts occurred about the same time between Piriaka and Kakahi, and through traffic, with the exception of express trains, was blocked for four days.

The bridge over the Kara Stream, near Shannon, on the Manawatu line, was damaged by a flood on the 25th May, and all traffic was blocked until the following day.

The line near Porirua was washed out by a flood on the 13th September, and traffic was blocked for four hours.

During the year 28,000 cubic yards of spoil were removed from an old slip near Ethelton, in Canterbury, on the main north line, that started to move, threatening to block the line. Exceptionally heavy rain on the west coast of the South Island caused many slips and floods. The Otira River washed out a portion of the Midland line near Otira, and owing to recurring floods delaying the repair work all traffic was stopped from the 10th to the 19th December. A heavy flood in the Grey River scoured out several piers of the Blackball combined road and railway bridge on the 4th December, leaving a gap in the bridge 320 ft. wide. The work of restoring communication by means of temporary timber beam spans was carried on continuously day and night until the 3rd January, when the bridge was again opened for road and railway traffic.

About 3,500 tons of stone were used for river protective works on the Westland Section.

On the 1st July two engines and several wagons were derailed by rock which had fallen on the track between Parera and Mount Allen, on the Otago Central line. Traffic was dislocated for two days until a deviation of the line around the obstruction was completed.

Bridges.—These have been maintained in good order. A large number of bridges have been overhauled and repaired. Many timber bridges which required strengthening or renewal were replaced by steel structures. The bridge-strengthening work to allow heavier engines to run was continued on a number of lines.

Water-services.—These have received all necessary attention. A number of stations were connected up with local bodies' supplies for economy reasons.

Wharves.—The wharves belonging to the Department have been efficiently maintained. On Lake Wakatipu the wharf at Kinloch was overhauled, and the wharf at Elfins Bay was extended and repaired.

Buildings.—These have been maintained in good order. During the year the station and post-office building at Moerewa, cottages at Fairfax, Rangataua, and Owhango, and the engine-shed at Outram were destroyed by fire.

Station-yards.—Siding extensions and alterations have been carried out and additional accommodation provided at a number of stations.

Railway Improvements.—The total expenditure under the Railways Improvement Authorization Account during the year was £337,049, as against £131,196 last year. This amount does not include expenditure under this account on the Auckland–Westfield Deviation, and Hutt Valley Railway, which are being carried out by the Public Works Department.

A considerable amount of work was done in connection with the rearrangement of Auckland station-yard. The earthwork and formation are practically completed, and good progress has been made with the laying of sidings, and the erection of the Campbell Point Road overbridge. Public tenders for the erection of the outward goods-shed will be called shortly.

The duplication of the track between Penrose and Westfield was completed, and the double line was brought into use on the 20th December. Work on the duplication of track between Westfield and Otahuhu is proceeding satisfactorily.

The rearrangement of Paeroa station-yard was practically completed, and traffic was diverted to the new station-site on the 31st August. The new double-track bridge over the Ohinemuri River, and the approach embankments, are nearly completed. The land required for the Palmerston North deviation and new station-yard was taken by Proclamation, and claims for compensation are now being dealt with.

The contract for the erection of the sea-wall in connection with the reclamation for the new station-yard at Wellington was completed well under the stipulated time, and arrangements were made with the contractor, Mr. C. F. Pulley, for the erection of a further length of 450 ft. of wall, the construction of which is now well forward. A considerable amount of reclamation behind the wall has been carried out by the Harbour Board's dredge.

The deviating and doubling of the line between Dunedin and Ravensbourne was completed, and the new line was opened for traffic in May. The work of carrying out similar alterations between Ravensbourne and Burkes is now proceeding.

The construction of the new gravitation marshalling-yard at Middleton, near Christchurch, was put in hand, and good progress with the earthwork is being made.

The strengthening of bridges between Oamaru and Dunedin is nearing completion, and a considerable amount of this work has been carried out on other lines.

The plans and specifications for the erection of new locomotive workshops at Lower Hutt and Otahuhu were completed, and public tenders, to close in August and September respectively, have been called for their erection. Tenders will also be called shortly for the erection of the new workshops at Addington and Hillside, as the plans and specifications for these works will be completed shortly.

Additions to Open Lines.—The expenditure under this heading during the year was £94,252, the principal works being station rearrangements at Maungaturoto (completed), Whangarei (nearing completion), Hokitika (in hand), and Greymouth; siding extensions at Otorohanga, Poro-o-tarao, Henderson, Hamilton, New Plymouth, Wanganui, Tamaki, Westport, Flaxmill, Fairlie, Waikiwi, and Wairio; the duplication of line between Whangarei and Kioreroa; erection of goods-sheds at Kiwitahi and Makarau; erection of refreshment-rooms at Putaruru; the erection of overbridges at Kingsland and Waipara; the provision of new stock-yards at Methven; the installation of sewerage systems at Taihape, Frankton Junction, Mangaweka, and Marton; and the erection of houses at Thornbury, Rakaia, Bonny Glen, Haywards, and Sheffield.

Betterments.—The expenditure under this heading, and charged to working-expenses, was £17,711, the principal works being the provision of ladies' waiting-rooms at Tahekeroa and Makarau; improvements to stock-yards at Walton, Te Kuiti, Waipukurau, and Waipawa; the provision of wool-loading bank at Eketahuna; the provision of car-cleaning facilities at Ohakune; and the improvement of booking facilities at Dunedin.

Expenditure.—The expenditure for the year was as follows: Maintenance (charged to working-expenses) £1,144,384; new works (charged to capital) £431,301.

The maintenance expenditure charged to working-expenses amounted to £369 per mile, compared with £362 per mile in 1924–25, £373 per mile in 1923–24, £342 per mile in 1922–23, £367 per mile in 1921–22, £350 per mile in 1920–21, £280 per mile in 1919–20, £252 per mile in 1918–19, £240 per mile in 1917–18, £243 per mile in 1916–17, £251 per mile in 1915–16, and £254 per mile in 1914–15.

Mileage.—The mileage open for traffic on the 31st March, 1926, was 3,148 miles 38 chains. During the year 53 miles 41 chains additional lines were open for traffic, and 2 miles 34 chains of line (Nightcaps private line) was closed.

Land and Leases.—Number of leases registered during year, 690; aggregate rental of same, £12,317 11s. 2d. Total number of leases current on 31st March, 1926, 6,434; aggregate rental of same, £57,832 8s. 7d. Private-siding agreements registered during year, 117; aggregate rental of same, £4,219 10s. Total number of agreements current on 31st March, 1926, 519; aggregate rental of same, £19,804 10s. Miscellaneous agreements entered into, 10; aggregate rental of same, £250. Total number of Proclamations issued, taking or giving up land, 48; total amount of compensation paid during the year for land taken, £84,333 13s. 6d. Total fees collected for preparation of deeds, &c., £818 2s.

Staff.—Maintenance Branch: Working staff, 4,450; office staff, 198: total, 4,648.

Signal and Electrical.

Fixed Signals at Officered Stations.—Home and distant signals have been provided at Kauri, Portland, Mangapai, Tauaraoa, Waiotira, Taipuha, Paparoa, Kaiwaka, Topuni, Kaipara Flats, Ahuroa, Tahekeroa, Rotowaro, Pukemiro, Glen Afton, service siding near Tirohia, Waharoa, Rotorua, Whakarongo, and Lochiel. Additional signals have been installed at Onoke, Whangarei, Huntly, Okahukura, Rolleston, Waikiwi, Wallacetown, and Winton.

The total number of officered stations (including tablet stations) is 485, of which 331 are equipped with fixed signals, 110 are interlocked, and 44 unequipped.

Twenty-seven signal-repeaters have been installed during the year, making a total of 424 now in use.

Interlocking of Points and Signals.—Special locking arrangements for points and signals have been installed at Waharoa and Whakarongo.

Alterations to signalling and interlocking arrangements have been carried out at Whangarei, Auckland, Newmarket, Penrose, Paeroa, Okahukura, Lambton, Ravensbourne, Pelichet Bay, and Dunedin.

Interlocking with tablet system has been installed as follows: Tauraroa Station, Ohirangi Station, Metcalfe Road Station, Puhinui Station, Defence Department's private siding near Ngaruawahia, service siding at 5 miles 26 chains near Karangahake, service siding at 8 miles 43 chains near Waikino, Waihi Gold-mining Company's private siding at Waikino, service siding at 10 miles 8 chains near Waihi, Greymouth Power Board's private siding near Dobson, Greymouth Harbour Board's private siding at Greymouth, and ballast-pit siding at 2 miles 60 chains near Oporo.

Special switch-locks have been provided at Kauri, Portland, Mangapai, Tauraroa, Waiotira, Taipuha, Paparoa, Kaiwaka, Topuni, Kaipara Flats, Ahuroa, Tahekeroa, Rotowaro, Pukemiro, Glen Afton, Waharoa, Rotorua, Okahukura, Whakarongo, Methven, Makarewa, and Winton.

Detection of facing-points by fixed signals has been installed at Onoke, Kauri, Portland, Mangapai, Tauraroa, Waiotira, Taipuha, Paparoa, Kaiwaka, Topuni, Kaipara Flats, Ahuroa, Tahekeroa, Pukemiro, Waharoa, Okahukura, and Whakarongo.

Mechanical signalling and interlocking has been installed at Brunner.

Special interlocking has been provided at Southdown, Hutt Valley Railway near Lower Hutt, and Palmer's Siding near Dunedin.

Total stations now interlocked, 113; tramway crossings, 7; sidings and flag stations interlocked with tablet, 242; stations where Woods locks are installed, 333.

Automatic and Power Signalling.—Double-line automatic signalling between Auckland and Westfield, also between Dunedin and Ravensbourne, has been completed and brought into operation.

Automatic signalling between Westfield and Frankton, and power signalling at Whangarei, Paeroa, Paerata, Papakura, Papatoetoe, and Stillwater Stations is in hand, progressing satisfactorily.

The total mileage equipped with automatic signalling is as follows: Double line, 30 miles 77 chains; single line, 125 miles 51 chains. Total stations equipped with power signalling, 6.

Block Working and Electric Tablet.—The tablet system has been installed and brought into use between Whangarei and Kaukapakapa, comprising the following stations: Portland, Mangapai, Tauraroa, Waiotira, Taipuha, Paparoa, Maungaturoto, Kaiwaka, Topuni, Wellsford, Kaipara Flats, Ahuroa, and Tahekeroa. Alterations to tablet installations have been made at Whangarei, Kaukapakapa, Penrose, Westfield, Kaiata, Greymouth, and Brunner.

The total mileage equipped is 1,746 miles of single track, out of a total of 3,148 miles of line open for traffic. The number of tablet instruments now in use is 927, at 391 stations. The total number of automatic tablet-exchangers in use is 356.

Lock and Block.—5 miles 58 chains of lock-and-block working have been replaced by automatic signalling. The total mileage now equipped with the lock-and-block system is 16½ miles of double line. The number of lock-and-block instruments in use is twenty-six at twelve stations.

Telegraph and Telephone Facilities.—42 miles of poles and 456 miles of wire have been erected during the year. Forty-two connections to railway telephone circuits have been provided. Twenty-six new connections to public exchanges have been made and nine connections given up. Thirteen electric bells and four Morse instruments have been installed.

Metallic circuiting has been completed on the following sections: Waiotira to Helensville, Henderson to Auckland, Frankton to Thames, Morrinsville to Putaruru, Taumarunui to Ohakune, New Plymouth to Hawera, Johnsonville to Thorndon, Woodville to Masterton, Ngahere to Reefton, Studholme to Waimate, Oamaru to Palmerston South, Gore to Invercargill.

Totals now in use: Morse sets, 293; telephones, 1,866; electric bells, 365; miles of wires, 9,447; miles of poles, 2,875.

Electric Lighting—Electric-lighting installations have been made in a large number of station buildings, yards, and departmental dwellings.

Electric-power Installations.—The following work has been done in connection with the electrification of machinery in locomotive workshops: Newmarket—twelve motors installed, aggregating 260 horse-power; Petone — twenty-three motors aggregating 412 horse-power; Addington—twenty-one motors, aggregating 415 horse-power; Hillside—one 10 horse-power motor.

A motor generator set of 60 horse-power has been installed at Newmarket as a standby plant for the automatic signalling.

Motors, &c., have been installed as follows: Thorndon—one motor, 29 horse-power; Lambton—two motors, 1·5 horse-power; Christchurch — one motor, ⅜ horse-power; Rolleston — one motor, 1 horse-power.

The 11,000-volt substation at Petone, of 1,050 kv.a., is nearing completion. This substation is for the direct supply of power for the locomotive workshops from Khandallah Substation.

All workshop distribution panels in shops have been completed and cable work installed.

The general electrification of machinery in locomotive workshops is well in hand.

Level-crossing Automatic Alarm-bells.—Five level crossings have been equipped with warning-bells and wig-wag signals, as follows: Stratford (two—Fenton Street and Regan Street), Wanganui (Ferguson Street), Petone (Hutt Road), and Christchurch (Riccarton Road).

The level crossings at Onslow Road and Edendale Road, near Kingsland, have been replaced by overbridges, and the warning-bells removed.

The following level crossings equipped with warning-bells have been provided with wig-wag signals: Wanganui (two—Victoria Avenue and Liverpool Street), East Town (No. 3 Line). The present number of level crossings fitted with warning-bells, &c., is seventy-three.

Expenditure.—Particulars of expenditure for the Signal Branch for the year ended 31st March, 1926, are as follows:—

New Works:—	£	s.	d.
Additional signalling and interlocking	7,067	19	7
Fixed signals at officered stations	9,278	19	4
Tablet locking at flag stations	299	7	9
Power interlocking at stations	45,211	10	1
Automatic signalling	38,489	1	3
Additional telephone and telegraph lines	4,387	8	4
Metallic circuiting electric lines	16,275	7	10
Additional telephones installed	475	16	6
Electric tablet-working	2,221	18	2
Level-crossing alarms	1,170	0	1
Electric lighting	17,756	13	0
Electric equipment, Frankton Junction	3,928	8	8
	146,562	10	7
Installing electric motors and works for other Departments	19,750	0	0
Total	£166,312	10	7

Maintenance:—	£	s.	d.
Signals and interlocking	27,322	1	10
Automatic and power signalling	13,507	3	11
Level-crossing signals	1,735	6	11
Telegraph, tablet and block instruments	18,557	19	7
Overhead lines, telegraph, telephone, and block working	15,017	16	11
Overhead lines for automatic signalling	3,449	10	7
Electric lighting used in operation	8,281	4	7
Overhead electrification	2,978	4	6
Electric-power appliances used in operation	1,180	1	2
Signal Branch buildings	3,750	12	0
Superintendence	8,700	16	7
Betterments	582	14	8
Total	£105,063	13	3

LOCOMOTIVE.

Mr. G. S. Lynde, A.M.I.Mech.E., M.I.Loco.E., Chief Mechanical Engineer, reports as follows:—

The plant, locomotives, tenders, carriages, brake-vans, wagons, machinery, and tools have been maintained in good working-order during the year.

Locomotives.—On the 31st March, 1926, there were 704 engines. The additional stock during the year consisted of thirty-five Class AB engines, imported from the North British Locomotive Company, Glasgow; four Class AB, built by Messrs A. and G. Price (Ltd.), Thames; and six Class AB built in the Government Railway workshops. One old engine was written off, and two engines were sold.

There was an increase of 899,497 lb. (equal to 8·71 per cent.) in the tractive force available due to the above alterations in stock, also to locomotives being reboilered.

In the Government Railway workshops 217 engines have been built to date, and twenty-four old locomotives have been rebuilt.

Details of work on locomotives in the Government workshops during the year were as follows: Number passed through workshops, 743; built new, 6; erected new, 35; re-erected, 1; heavy repairs, 210; medium repairs, 62; light repairs, 142; wreck or defect repairs, 209; running repairs, 78. Included in the above are three engines repaired for the Public Works Department and three engines for private firms.

There were on order at the close of the year four Class AB, ten Class WAB, being built in the Government workshops, and eight Class WAB being built by Messrs, A. and G. Price (Limited), Thames.

Boilers.—Twenty-eight boilers were built, 123 received heavy repairs, 97 medium repairs, 243 light, and 27 wreck or defect repairs. Included in the above are three boilers repaired for Public Works Department, and four for private firms. Twenty boilers were in hand at the close of the year, and ten have been ordered from Great Britain.

Carriages.—On the 31st March, 1926, there were 1,599 cars. Forty-six cars were added to the stock. Eight old cars were sold, and five old cars were written off, and one second-hand car was converted to a sleeping-van.

Details of car work were as follows: Number passed through workshops, 2,433; built new, 46; converted, 1; heavy repairs, 1,512; light repairs, 874. Included in the above are seven cars repaired for the Cape Foulwind line. Nineteen cars were on order at the end of the year, included in which were ten sleeping-cars to a new design.

Rail-cars.—There were three rail-cars on the line on the 31st March, 1926. During the year two Ford rail-cars were added to the stock, and two old rail-cars were written off.

It is expected that a Clayton car and an Edison storage-battery car will be placed in service early in the current year.

Brake-vans.—On the 31st March, 1926, there were 476 brake-vans in service. Eighteen vans were built, and two vans were written off.

Details of work done on brake-vans were as follows: Number passed through workshops, 825; built new, 18; heavy repairs, 429; light repairs, 378. There were four vans in hand at the close of the year.

Wagons.—On the 31st March, 1926, there were 26,281 wagons in stock. The additional stock comprised sixty-eight bogie, 299 four-wheel, built in the Government workshops, and one four-wheel converted from a second-hand car. Forty four-wheel wagons were written off, and seventy-five four-wheel wagons were sold. The carrying-capacity of wagons was increased by 4,213 tons.

Details of work done on wagons were as follows: Number passed through workshops, 29,924; built new, 367; rebuilt, 14; heavy repairs, 15,129; light repairs, 14,414.

Included in the above are 103 wagons required for the Cape Foulwind line. In addition, material for six bogie wagons was prepared for the Public Works Department.

There were on order at the end of the year forty-two bogie and 302 four-wheel wagons. Included are two rail tank-wagons being built for a private firm for carriage of motor-spirit in bulk. During the current year an additional twenty wagons of a similar type will be constructed for private firms.

Tarpaulins.—The tarpaulin stock on the 31st March, 1926, was 21,875. Four hundred new sheets were added to stock; 1,915 worn-out tarpaulins were replaced with a similar number of new sheets. Twenty tarpaulins were also made for the Public Works Department.

The work done on tarpaulins during the year was as follows: Number passed through workshops, 42,080; manufactured new, 420; condemned and replaced, 1,915; repaired, 39,745.

Axles.—During the year 3,366 car, van, and wagon axles were replaced with modern steel axles.

Train-lighting.—On the 31st March, 1926, there were 108 cars fitted with electric light. It is the intention to equip all main-line cars which may run on mail or express trains with electric light within two years.

Engine Headlights.—The total number of locomotives fitted with electric headlights on the 31st March, 1926, was eighty-seven. All new locomotives will be fitted, and engines running on fast passenger-trains will also be equipped. This work will be completed during the current year, when the equipping of engines on fast goods and mixed services will be proceeded with.

STORES.

Mr. E. J. Guinness, Comptroller of Stores, reports as follows:—

The value of the stores, material, and plant (purchased under Railway vote) on hand at the 31st March, 1926, at the various stores, depots, and sawmills amounted to £977,322 13s. 8d., as against £988,009 6s. 10d. on 31st March, 1925.

The value of the stores on hand on account of additions to open lines amounted to £114,804 17s. 9d., as against £123,988 17s. 9d. on the 31st March, 1925.

The value of the stores on hand on account of Railway Improvement Authorization amounted to £25,260 12s. 10d., as against £10,816 6s. 10d. on the 31st March, 1925.

The whole of the stock is in good order, has been systematically inspected, and is value for the amount stated.

BALANCE-SHEETS,

STATEMENTS OF ACCOUNTS,

AND

STATISTICAL RETURNS.



INDEX OF STATEMENTS

ACCOMPANYING ANNUAL REPORT OF THE BOARD OF MANAGEMENT OF THE NEW ZEALAND GOVERNMENT RAILWAYS, 1925-26.

No. 1. Capital Account.
General Balance-sheet.

No. 2. Income and Expenditure of the Whole Undertaking.
Net Revenue Account.
Net Revenue Appropriation Account.

No. 3. Income and Expenditure in respect of Railway Operation.
Abstract A—Maintenance of Way and Works.
Abstract B—Maintenance of Signals and Electrical Appliances.
Abstract C—Maintenance of Rolling-stock.
Abstract D—Examination, Lubrication, and Lighting of Vehicles.
Abstract E—Locomotive Transportation.
Abstract F—Traffic Transportation.
Abstract G—Head Office and General Charges.
Summary of Expenditure Abstracts.

No. 4. Income and Expenditure in respect of Lake Wakatipu Steamers.

No. 5. Income and Expenditure in respect of Refreshment Service.

No. 6. Income and Expenditure in respect of Advertising Service.

No. 7. Income and Expenditure in respect of Departmental Dwellings.

No. 8. Income and Expenditure in respect of Buildings occupied by Refreshment Service, Bookstall Proprietors, &c.

No. 9. Railway Sawmills and Bush Accounts.

No. 10. Statement of Subsidy from Consolidated Fund in respect of Services rendered by Non-paying Developmental Branch Lines and Isolated Sections.

No. 11. Statement of Cash Receipts and Payments—Working Railways Account.
Reconciliation Statement.

No. 12. Renewals and Equalization Funds.
Slips, Floods, and Accidents Equalization Fund.
Workers Compensation Fund.
Fire Insurance Fund.
General Renewals Fund.
Betterments Fund.

No. 13. Expenditure on Construction of Railways, Rolling-stock, &c.
Net Revenue, and Rate of Interest earned on Capital expended on Opened Lines.

No. 14. Expenditure under Vote "Additions to Open Lines" charged to Capital Account; also Expenditure under the Railways Improvement Authorization Act, 1914 Account, and Section 7 of the Finance Act, 1924, and Section 10 of the Finance Act, 1925.

No. 15. Comparative Statement of Operating Traffic and Revenue.
(1.) Operating Traffic.
(2.) Operating Revenue.

No. 16. Statement of Season Tickets issued.

No. 17. Statement of Passenger Bookings at Excursion Fares.

No. 18. Traffic and Revenue for each Station.

No. 19. Comparative Statement of Mileage, Capital Cost, Earnings, Expenditure, and Traffic, New Zealand Government Railways.

No. 20. Comparative Statement of Mileage, Capital Cost, Earnings, and Expenditure on Australasian Railways.

No. 21. Number of Employees.

No. 22. Accidents.

No. 23. Renewals of Rails.

No. 24. Renewals and Removals of Sleepers.

No. 25. Number of Stations and Private Sidings.

No. 26. Mileage of Railways open for Traffic and under Maintenance.

No. 27. Weights of Rails in various Lines.

No. 28. Sleepers laid and removed each year.

No. 29. Carriage and Wagon Stock and Tarpaulins.

No. 30. Locomotive Stock.

No. 31. Locomotive Performances.

INDEX OF STATEMENTS

ACCOMPANYING ANNUAL REPORT OF THE BOARD OF MANAGEMENT OF THE NEW ZEALAND GOVERNMENT RAILWAYS, 1929–30.

No. 1. Capital Account.
No. 2. Income and Expenditure of the Whole Undertaking.
No. 3. Income and Expenditure in respect of Railway Operation.
No. 4. Income and Expenditure in respect of Advertising Service.
No. 5. Income and Expenditure in respect of Departmental Dwellings.
No. 6. Income and Expenditure in respect of Buildings occupied by Refreshment Service, Bookstall Proprietors, &c.
No. 7. Railway Revenue and Train Mileage.
No. 8. Statement of Accounts owing Consolidated Fund in respect of Services rendered by Non-paying Departmental Railway Lines and Inland Services.
No. 9. Comparative Statement of Working Results and Expenditure in detail.
No. 10. Statement of Expenditure on Renewals, Betterments, &c.
No. 11. Expenditure on Construction of Railways, Reclamations, &c.
No. 12. Expenditure under Vote "Additions to Open Lines" charged to Capital Account.
No. 13. Comparative Statement of Operating Traffic and Results.
No. 14. Statement of Expenditure in respect of Electric Power Supply.
No. 15. Statement of Expenditure in respect of Electric Power Supply.
No. 16. Traffic and Revenue by each Railway.
No. 17. Comparative Statement of Working Capital, Earnings, Expenditure, and Traffic, New Zealand Government Railways.
No. 18. Comparative Statement of Working Capital, Earnings, and Expenditure on Auckland Railways.
No. 19. Number of Employees.
No. 20. Accidents.
No. 21. Renewals of Rails.
No. 22. Renewals and Improvements of Sleepers.
No. 23. Number of Stations and Private Sidings.
No. 24. Mileage of Railways open for Traffic and under Maintenance.
No. 25. Weights of Rails in various Lines.
No. 26. Sleepers laid and removed each year.
No. 27. Cuttings and Wash-outs and Tunnels.
No. 28. Locomotive Stock.
No. 29. Locomotive Performance.

STATEMENT No. 1.

CAPITAL ACCOUNT AS AT 31ST MARCH, 1926.

—	Total to 31st March, 1925.	Year ended 31st March, 1926.	Total to 31st March, 1926.	—	Total to 31st March, 1925.	Year ended 31st March, 1926.	Total to 31st March, 1926.
Expenditure.	£ s. d.	£ s. d.	£ s. d.	*Receipts.*	£ s. d.	£ s. d.	£ s. d.
Lines open for traffic	34,500,174 10 10	2,539,345 10 11	37,039,520 1 9	From General Government Funds—			
Rolling-stock	9,745,139 15 9	482,631 14 0	10,227,771 9 9	Public Works Fund	40,254,375 4 1	2,473,410 1 8	42,727,785 5 9
Lake Wakatipu steamer service ..	44,300 11 1	..	44,300 11 1	Wellington–Hutt Railway Improvement Account	228,373 5 5	..	228,373 5 5
House-factory and sawmill at Frankton Junction	146,323 3 6	10,695 13 6	157,018 17 0	Railways Improvement Account, 1904	641,275 7 8	..	641,275 7 8
Stores and material..	134,808 8 6	5,257 2 1	140,065 10 7	Railways Improvement Authorization Act, 1914 Account	1,185,537 4 8*	534,662 7 4	1,720,199 12 0
				Consolidated Fund	4,296 7 10	..	4,296 7 10
				Westport Harbour Loans.. ..	350,000 0 0	..	350,000 0 0
				Works constructed from Harbour Board funds—			
				Westport	71,640 0 0	..	71,640 0 0
				Greymouth	47,508 0 0	..	47,508 0 0
				Works constructed by provinces and Midland Railway Company at valuation	1,787,741 0 0	..	1,787,741 0 0
				Advances to Capital Account from Working Railways Account	..	3,585 16 8	3,585 16 8
				Outstanding liabilities	..	26,271 14 10	26,271 14 10
	£44,570,746 9 8	3,037,930 0 6	47,608,676 10 2		£44,570,746 9 8	3,037,930 0 6	47,608,676 10 2

* Exclusive of investments held by Treasury at 31st March, 1925 (£577,601 5s. 7d.).

NOTE.—Unopened lines are under the control of the Public Works Department, and all expenditure in connection therewith is included in the accounts of that Department.

STATEMENT No. 1—*continued.*

GENERAL BALANCE-SHEET AS AT 31ST MARCH, 1926.

Liabilities.	£	s.	d.
Sundry creditors (including unpaid wages)	288,695	2	7
Collections for refund to Harbour Boards, shipping companies, and other carriers	20,583	4	7
General Reserve Fund	1,375,662	6	1
General Renewals Fund	280,835	19	0
Betterments Fund..	60,000	0	0
Insurance Funds	34,304	16	0
Net Revenue Account—Unappropriated surplus	21,022	16	9
	£2,081,104	5	0

Assets.	£	s.	d.	£	s.	d.
Sawmills—						
Stocks of timber, &c.	293,121	11	5			
Less reserve	20,427	6	9			
				272,694	4	8
Stores and material on hand—						
Stores Branch	704,628	9	0			
Advertising Branch	1,615	18	9			
Refreshment Branch	10,426	15	11			
				716,671	3	8
Sundry assets—						
Advertising Branch	44,096	16	2			
Refreshment Branch	26,396	12	6			
				70,493	8	8
Sundry debtors—						
Advances to capital	3,585	16	8			
Government Departments	13,585	12	4			
Advances under Hutt Valley Lands Settlement Act, 1925	4,240	8	1			
Work in progress	2,971	6	1			
	24,383	3	2			
Less amounts paid in advance ..	14,245	6	6			
				10,137	16	8
Accrued interest on investments ..	1,039	11	7			
Accrued subsidies on branch lines and isolated sections	14,710	9	11			
				15,750	1	6
Outstandings at stations—						
Cash in hand	30,314	0	5			
Freight, &c., owing by Government Departments	26,867	19	11			
Freight owing by sundry debtors ..	140,025	2	3			
				197,207	2	7
Investments				175,000	0	0
Cash in Working Railways Account				623,150	7	3
				£2,081,104	5	0

H. VALENTINE,
Chief Accountant.

STATEMENT No. 2.

INCOME AND EXPENDITURE OF THE WHOLE UNDERTAKING FOR THE YEAR ENDED 31ST MARCH, 1926.

	Statement No.	Year 1925–26. Gross Revenue.	Expenditure.	Net Revenue.	Year 1924–25. Gross Revenue.	Expenditure.	Net Revenue.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Railway operating	3	7,589,274 2 6	6,164,569 14 1	1,424,704 8 5	*7,014,648 13 7*	*5,533,136 3 11*	*1,481,512 9 8*
Lake Wakatipu service	4	10,625 0 0	15,612 14 1	*Dr.* 4,987 14 1	*10,096 2 4*	*12,279 6 10*	*Dr. 2,183 4 6*
Refreshment service	5	133,657 14 6	119,585 9 0	14,072 5 6	*104,796 14 0*	*99,996 14 0*	*4,800 0 0*
Advertising service	6	45,454 5 2	31,238 12 2	14,215 13 0	*30,731 1 3*	*29,647 2 5*	*1,083 18 10*
Dwellings	7	68,661 4 3	129,907 9 10	*Dr.* 61,246 5 7	*52,572 0 0*	*34,203 0 0*	*18,369 0 0*
Refreshment buildings, bookstalls, &c.	8	19,062 1 11	7,513 19 7	11,548 2 4	*13,347 0 0*	*390 0 0*	*12,957 0 0*
Miscellaneous revenue	..	234,486 13 5	..	234,486 13 5	*50,569 11 0*	..	*50,569 11 0*
Subsidies, branch lines and isolated sections	10	359,540 8 6	..	359,540 8 6	..	..	..
		8,460,761 10 3	6,468,427 18 9		*7,276,761 2 2*	*5,709,652, 7 2*	
Total net revenue to Net Revenue Account	..	..	..	1,992,333 11 6	..	..	*1,567,108 15 0*

NET REVENUE ACCOUNT.

Dr.	1925–26.	1924–25.	*Cr.*	1925–26.	1924–25.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Interest on capital	1,913,310 14 9	*1,651,845 4 10*	By Net earnings before charging interest on capital	1,992,333 11 6	*1,567,108 15 0*
Surplus for year 1925–26 carried to Net Revenue Appropriation Account	79,022 16 9	..	Deficit for year 1924–25	..	*87,736 9 10*
	1,992,333 11 6	*1,654,845 4 10*		1,992,333 11 6	*1,654,845 4 10*

NET REVENUE APPROPRIATION ACCOUNT.

Dr.	£ s. d.	*Cr.*	£ s. d.
To Appropriation to Betterments Fund	58,000 0 0	By Net Revenue Account	79,022 16 9
Balance carried forward	21,022 16 9		
	£79,022 16 9		£79,022 16 9

H. VALENTINE,
Chief Accountant.

STATEMENT No. 3.

INCOME AND EXPENDITURE IN RESPECT OF RAILWAY OPERATION, YEAR ENDED 31ST MARCH, 1926.

EXPENDITURE.	See Abstract.	1925–26.	1924–25.	Per Cent. of Operating Revenue. 1925–26.	Per Cent. of Operating Revenue. 1924–25.
		£ s. d.	£ s. d.		
Maintenance, way and works ..	A	1,144,384 8 10	*1,137,628 19 0*	15·08	*16·22*
Maintenance, signals	B	105,063 13 3	*83,880 11 1*	1·38	*1·20*
Maintenance, rolling-stock ..	C	1,311,317 6 8	*1,095,639 12 4*	17·28	*15·62*
Examination, lubrication, and lighting of vehicles	D	59,446 15 10	*58,500 0 0*	0·78	*0·83*
Locomotive transportation ..	E	1,577,173 3 11	*1,365,838 1 6*	20·78	*19·47*
Traffic transportation	F	1,743,641 8 6	*1,626,927 15 7*	22·98	*23·19*
Head Office and general charges ..	G	82,528 6 1	*84,721 4 5*	1·09	*1·21*
Superannuation subsidy £145,000 0 0					
Less amount allocated to subsidiary services, &c. 3,985 9 0					
	G	141,014 11 0	*80,000 0 0*	1·86	1·14
Total operating expenses ..	..	6,164,569 14 1	*5,533,136 3 11*	81·23	*78·88*
Net operating revenue ..	..	1,424,704 8 5	*1,481,512 9 8*	18·77	*21·12*
	..	7,589,274 2 6	*7,014,648 13 7*	100·00	*100·00*

REVENUE.	See Statement No.	1925–26.	1924–25.	Per Cent. of Operating Revenue. 1925–26.	Per Cent. of Operating Revenue. 1924–25.
		£ s. d.	£ s. d.		
Passengers, ordinary	15	2,271,497 12 7	*2,073,456 3 8*	29·93	*29 56*
Passengers season tickets ..	15	265,549 4 2	*210,741 11 0*	3·50	*3·00*
Parcels, luggage, and mails ..	15	409,206 13 9	*416,223 3 10*	5·39	*5·93*
Goods	15	4,499,160 0 9	*4,117,745 19 7*	59·28	*58·70*
Labour, demurrage, &c. ..	15	143,860 11 3	*196,481 15 6*	1·90	*2·81*
	..	7,589,274 2 6	*7,014,648 13 7*	100·00	*100·00*

Abstract A.—Maintenance of Way and Works.

Item.	Expenditure.								Kaihu.			Gisborne.			North Island Main Line and Branches.			South Island Main Line and Branches.			Westport.			Nelson.			Picton.			Total.		
	Kaihu.	Gisborne.	North Island Main Line and Branches.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.
Superintendence—	£	£	£	£	£	£	£	£	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.
General	21	98	11,273	7,039	319	72	106	18,928	0·2	0·9	0·3	0·2	1·6	0·3	0·2	9·0	0·4	0·3	4·4	0·4	0·3	7·4	0·8	0·3	1·2	0·3	0·3	1·9	0·5	0·2	6·1	0·4
District	110	373	18,905	14,623	355	334	300	35,000	1·3	4·6	1·5	0·9	6·2	1·1	0·4	15·1	0·7	0·5	9·1	0·9	0·3	8·3	0·9	1·2	5·5	1·4	0·7	5·4	1·4	0·5	11·3	0·8
Road-bed	1,881	2,669	85,206	99,121	3,206	4,725	5,630	202,438	22·4	78·4	25·4	6·7	44·3	8·1	1·9	67·8	3·3	3·5	61·8	6·2	2·5	74·6	8·5	16·7	77·5	19·2	13·3	100·5	27·0	2·7	65·2	4·7
Track-renewals	2,214	6,983	241,350	238,657	7,793	5,284	4,887	507,168	26·3	92·3	29·9	17·6	116·4	21·3	5·3	192·2	9·4	8·5	148·9	14·9	6·1	181·2	20·6	18·7	86·6	21·5	11·5	87·3	23·4	6·7	163·4	11·8
Ballasting	149	50	23,238	16,226	421	179	80	40,343	1·8	6·2	2·0	0·1	0·8	0 2	0·5	18·5	0·9	0·6	10·1	1·0	0·3	9·8	1·1	0·6	2·9	0·7	0·2	1·4	0·4	0·5	13·0	0·9
Slips and floods	223	2,574	20,815	37,485	219	683	1,085	63,084	2·7	9·3	3·0	6·5	42·9	7·9	0·5	16·6	0·8	1·3	23·4	2·3	0·2	5·1	0·6	2·4	11·2	2·8	2·6	19·4	5·2	0·8	20·3	1·5
Fences, &c.	26	241	12,405	14,014	1,783	587	295	29,351	0·3	1·1	0·4	0·6	4·0	0·7	0·3	9·9	0·5	0·5	8·7	0·9	1·4	41·5	4·7	2·1	9·6	2·4	0·7	5·3	1·4	0·4	9·5	0·7
Roads, &c.	..	139	7,973	3,834	66	73	83	12,168	..	..	..	0·4	2·3	0·4	0·2	6·3	0·3	0·1	2·4	0·2	0·1	1·5	0·2	0·3	1·2	0·3	0·2	1·5	0·4	0·2	3·9	0·3
Bridges, &c.	335	913	38,202	33,561	1,096	876	1,239	76,222	4·0	14·0	4·5	2·3	15·2	2·8	0·8	30·4	1·5	1·2	20·9	2·1	0·9	25·5	2·9	3·1	14·4	3·6	2·9	22·1	5·9	1·0	24·6	1·8
Water-service, &c.	7	236	10,401	9,115	441	175	292	20,667	0·1	0·3	0·1	0·6	3·9	0·7	0·2	8·3	0·4	0·3	5·7	0·6	0·3	10·3	1·2	0·6	2·9	0·7	0·7	5·2	1·4	0·3	6·7	0·5
Wharves	52	*Cr.* 5	287	439	244	*Cr.* 19	451	1,449	0·6	2·2	0·7	..	0·1	..	..	0·2	..	..	0·3	..	0·2	5·7	0·6	0·1	0·3	0·1	1·1	8·1	2·2	..	0·5	..
Cattle-yards, &c...	142	220	6,851	5,122	46	47	133	12,561	1·7	5·9	1·9	0·6	3·7	0·7	0·2	5·5	0·3	0·2	3·2	0·3	..	1·1	0·1	0·2	0·8	0·2	0·3	2·4	0·6	0·2	4·0	0·3
Operation buildings ..	125	661	57,468	46,006	1,057	1,002	974	107,293	1·5	5·2	1·7	1·7	11·0	2·0	1·3	45·8	2·2	1·6	28·7	2·9	0·8	24·6	2·8	3·5	16·4	4·1	2·3	17·4	4·7	1·4	34·6	2·5
Betterments	55	25	11,206	6,231	134	61	..	17,712	0·7	2·3	0·7	0·1	0·4	0·1	0·2	8·9	0·4	0·2	3·9	0·4	0·1	3·1	0·4	0·2	1·0	0·2	..	..	..	0·2	5·7	0·4
Totals	5,340	15,177	545,580	531,473	17,180	14,079	15,555	1,144,384	63·5	222·5	72·2	38·3	253·0	46·3	12·0	434·4	21·2	18·9	331·5	33·1	13·5	399·5	45·5	49·8	230·8	57·2	36·7	277·8	74·6	15·1	368·8	26·6

Abstract B.—Maintenance of Signals and Electrical Appliances.

Item.	Expenditure.								Kaihu.			Gisborne.			North Island Main Line and Branches.			South Island Main Line and Branches.			Westport.			Nelson.			Picton.			Total.		
	Kaihu.	Gisborne.	North Island Main Line and Branches.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.
	£	£	£	£	£	£	£	£	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.
Superintendence	10	44	5,192	3,228	147	32	47	8,700	0·1	0·4	0·1	0·1	0·7	0·1	0·1	4·1	0·2	0·1	2·0	0·2	0·1	3·4	0·4	0·1	0·5	0·1	0·1	0·8	0·2	0·1	2·8	0·2
Signals and interlocking	..	33	17,354	9,691	195	35	14	27,322	..	..	..	0·1	0·6	0·1	0·4	13·8	0·7	0·3	6·0	0·6	0·2	4·5	0·5	0·1	0·6	0·1	..	0·3	0·1	0·4	8·8	0·6
Automatic and power signalling ..	..	..	4,810	8,697	..	..	..	13,507	..	..	..	0·1	3·8	0·2	0·3	5·4	0·5	..	..	..	..	..	..	..	..	..	..	..	..	0·2	4·4	0·3
Level-crossing signals	..	..	1,195	541	..	..	..	1,736	..	..	..	..	..	..	..	1·0	..	..	0·3	..	..	..	..	..	..	..	..	..	..	..	0·6	..
Block-working, tablet and telephones	11	50	11,187	6,990	224	59	36	18,557	0·1	0·5	0·1	0·1	0·8	0·2	0·2	8·9	0·4	0·2	4·4	0·4	0·2	5·2	0·6	0·2	1·0	0·2	0·1	0·6	0·2	0·2	6·0	0·4
Overhead electric block, tablet, telephone, and telegraph lines	22	65	8,299	6,399	177	21	35	15,018	0·3	0·9	0·3	0·2	1·1	0·2	0·2	6·6	0·3	0·2	4·0	0·4	0·1	4·1	0·5	0·1	0·3	0·1	0·1	0·6	0·2	0·2	4·8	0·3
Overhead lines for automatic signalling	..	..	790	2,660	..	..	..	3,450	..	..	..	..	..	..	..	0·6	..	0·1	1·7	0·2	..	..	..	..	..	..	..	..	..	..	1·1	0·1
Electric lighting	..	1	5,067	3,120	..	16	78	8,282	..	..	..	..	..	..	0·1	4·0	0·2	0·1	1·9	0·2	..	..	..	..	0·3	0·1	0·2	1·4	0·4	0·1	2·7	0·2
Overhead electrification and bonding	..	..	..	2,978	..	..	..	2,978	..	..	..	..	..	..	..	..	..	0·1	1·9	0·2	..	..	..	..	..	..	..	..	..	..	1·0	0·1
Electric-power appliances ..	..	..	588	592	..	..	..	1,180	..	..	..	..	..	..	..	0·5	..	..	0·4	..	..	..	..	..	..	..	..	..	..	..	0·4	..
Buildings	..	..	2,004	1,742	5	..	..	3,751	..	..	..	..	..	..	..	1·6	0·1	0·1	1·1	0·1	..	0·1	..	0·1	..	..	..	..	..	..	1·2	0·1
Betterments	..	..	498	85	..	..	..	583	..	..	..	..	..	..	..	0·4	..	..	0·1	..	..	..	..	..	..	..	..	..	..	..	0·2	..
Totals	43	193	56,984	46,723	748	163	210	105,064	0·5	1·8	0·6	0·5	3·2	0·6	1·3	45·4	2·2	1·7	29·1	2·9	0·6	17·4	2·0	0·6	2·7	0·7	0·5	3·8	1·0	1·4	33·9	2·4

Abstract C.—Maintenance of Rolling-stock.

Item.	Expenditure.								Kaihu.			Gisborne.			North Island Main Line and Branches.			South Island Main Line and Branches.			Westport.			Nelson.			Picton.			Total.		
	Kaihu.	Gisborne.	North Island Main Line and Branches.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.
	£	£	£	£	£	£	£	£	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.
General superintendence	28	132	15,090	9,389	425	94	139	25,297	0·3	1·2	0·4	0·3	2·2	0·4	0·3	12·0	0·6	0·3	5·9	0·6	0·3	9·9	1·1	0·3	1·5	0·4	0·3	2·5	0·7	0·3	8·2	0·6
Locomotives (including rail and electric)	726	2,574	307,758	234,271	6,343	2,267	3,961	557,900	8·6	30·3	9·8	6·5	42·9	7·9	6·8	245·0	12·0	8·3	146·1	14·6	5·0	147·5	16·8	8·0	37·2	9·2	9·4	70·7	19·0	7·3	179·8	13·0
Car and wagon supervision ..	..	..	3,608	2,708	..	..	..	6,316	..	..	..	..	..	..	0·1	2·9	0·1	0·1	1·7	0·2	..	..	..	..	..	..	..	..	..	0·1	2·0	0·1
Cars	172	698	114,446	76,679	1,588	807	617	195,007	2·0	7·2	2·3	1·8	11·6	2·1	2·5	91·1	4·5	2·7	47·8	4·8	1·2	36·9	4·2	2·9	13·2	3·3	1·5	11·0	3·0	2·6	62·8	4·5
Vans and postal vans	54	306	20,247	12,557	402	177	163	33,906	0·6	2·3	0·7	0·8	5·1	0·9	0·4	16·1	0·8	0·4	7·8	0·8	0·3	9·3	1·1	0·6	2·9	0·7	0·4	2·9	0·8	0·4	10·9	0·8
Wagons..	603	2,206	220,536	182,695	13,399	1,275	2,130	422,844	7·2	25·1	8·2	5·6	36·8	6·7	4·9	175·6	8·6	6·5	114·0	11·4	10·5	311·6	35·5	4·5	20·9	5·2	5·0	38·0	10·2	5·7	136·3	9·8
Service vehicles	6	35	6,101	5,368	2,041	19	65	13,635	0·1	0·3	0·1	0·1	0·6	0·1	0·1	4·9	0·2	0·2	3·3	0·3	1·6	47·5	5·4	0·1	0·3	0·1	0·2	1·2	0·3	0·2	4·4	0·3
Tarpaulins, ropes, and nets ..	44	229	17,370	22,475	268	132	398	40,916	0·5	1·8	0·6	0·6	3·8	0 7	0 4	13 8	0 7	0 8	14·0	1·4	0·2	6·2	0·7	0·5	2·2	0·5	0·9	7·1	1·9	0·5	13·2	1·0
Betterments	..	..	10,439	4,993	64	..	..	15,496	..	..	..	..	..	..	0·2	8·3	0·4	0·2	3·1	0·3	0·1	1·5	0·2	..	..	..	..	..	..	0·2	5·0	0·4
Totals	1,633	6,180	715,595	551,135	24,530	4,771	7,473	1,311,317	19·4	68·0	22·1	15·6	103·0	18·9	15·8	569·7	27·8	19·6	343·8	34·3	19·3	570·5	64·9	16·9	78·2	19·4	17·6	133·5	35·8	17·3	422·6	30·5

Abstract D.—Examination, Lubrication, and Lighting of Vehicles.

Item.	Expenditure.								Kaihu.			Gisborne.			North Island Main Line and Branches.			South Island Main Line and Branches.			Westport.			Nelson.			Picton.			Total.		
	Kaihu.	Gisborne.	North Island Main Line and Branches.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.
	£	£	£	£	£	£	£	£	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.
Examination and lubrication of cars, vans, and wagons	..	131	17,528	11,773	871	91	84	30,478	..	..	..	0·3	2·2	0·4	0·4	14·0	0·7	0·4	7·3	0·7	0·7	20·3	2·3	0·3	1·5	0·4	0·2	1·5	0·4	0·4	9·8	0.7
Lighting rolling-stock, Pintsch and acetylene gas	19	117	17,037	7,588	*Cr.* 6	72	61	24,888	0·2	0·8	0·3	0·3	2·0	0·4	0·4	13·6	0·7	0·3	4·7	0·5	..	0·1	..	0·3	1·2	0·3	0·1	1·1	0·3	0·3	8·0	0·6
Electric lighting of vehicles ..	..	..	2,126	260	..	..	..	2,386	..	..	..	..	..	..	..	1·7	0·1	..	0·2	..	..	..	..	..	..	..	..	..	..	..	0·8	0·1
Depot expenses	..	..	1,544	140	..	2	9	1,695	..	..	..	..	..	..	..	1·2	0·1	..	0·1	..	..	..	..	..	..	..	..	0·2	..	..	0·5	..
Totals	19	248	38,235	19,761	865	165	154	59,447	0·2	0·8	0·3	0·6	4·1	0·8	0·8	30·4	1·5	0·7	12·3	1·2	0·7	20·1	2·3	0·6	2·7	0·7	0·4	2·8	0·7	0·8	19·2	1.4

Abstract E.—Locomotive Transportation.

Item.	Expenditure.								Kaihu.			Gisborne.			North Island Main Line and Branches.			South Island Main Line and Branches.			Westport.			Nelson.			Picton.			Total.		
	Kaihu.	Gisborne.	North Island Main Line and Branches.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.
	£	£	£	£	£	£	£	£	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.
District superintendence	..	..	4,372	3,790	5	..	..	8,167	..	..	..	..	..	..	0·1	3·5	0·2	0·1	2·4	0·2	..	0·1	..	..	..	..	..	..	..	0·1	2·6	0·2
Depot supervision	3	276	26,550	13,884	846	59	362	41,980	..	0·1	..	0·7	4·6	0·8	0·6	21·1	1·0	0·5	8·7	0·9	0·7	19·7	2·2	0·2	1·0	0·2	0·9	6·5	1·7	0·6	13·5	1·0
Wages, allowances, and expenses ..	817	3,189	280,351	182,423	6,846	3,615	2,715	479,956	9·7	34·0	11·0	8·1	53·2	9·7	6·2	223·2	10·9	6·5	113·8	11·4	5·4	159·2	18·1	12·8	59·3	14·7	6·4	48·5	13·0	6·3	154·7	11·2
Fuel	714	5,886	503,306	294,761	5,836	3,768	4,263	818,534	8·5	29·8	9·7	14·9	98·1	18·0	11·1	400·7	19·6	10·5	183·9	18·4	4·6	135·7	15·4	13·3	61·8	15·3	10·1	76·1	20·4	10·8	263·8	19·0
Water	13	141	15,273	9,405	301	590	74	25,797	0·2	0·5	0·2	0·4	2·4	0·4	0·3	12·2	0·6	0·3	5·9	0·6	0·2	7·0	0·8	2·1	9·7	2·4	0·2	1·3	0·4	0·3	8·3	0·6
Stores	36	119	15,516	7,814	253	91	98	23,927	0·4	1·5	0·5	0·3	2·0	0·4	0·3	12·4	0·6	0·3	4·9	0·5	0·2	5·9	0·7	0·3	1·5	0·4	0·2	1·8	0·5	0·3	7·7	0·6
Shed expenses	176	722	99,429	73,269	2,906	910	1,400	178,812	2·1	7·3	2·4	1·8	12 0	2·2	2·2	79·2	3·9	2·6	45·7	4·6	2·3	67·6	7·7	3·2	14·9	3·7	3·3	25·0	6·7	2·4	57·6	4·2
Totals	1,759	10,333	944,797	585,346	16,993	9,033	8,912	1,577,173	20·9	73·3	23·8	26·1	172·2	31·5	20·8	752·2	36·8	20·8	365·2	36·4	13·4	395·2	45·0	31·9	148·1	36·7	21·0	159·1	42·7	20·8	508·3	36·7

Abstract F.—Traffic Transportation.

Item.	Expenditure.								Kaihu.			Gisborne.			North Island Main Line and Branches.			South Island Main Line and Branches.			Westport.			Nelson.			Picton.			Total.		
	Kaihu.	Gisborne.	North Island Main Line and Branches.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.
	£	£	£	£	£	£	£	£	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.	£	£	d.
Superintendence—																																
General	44	189	21,014	13,850	592	140	212	36,041	0·5	1·8	0·6	0·5	3·2	0·6	0·5	16·7	0·8	0·5	8·6	0·9	0·5	13·8	1·6	0·5	2·3	0·6	0·5	3·8	1·0	0·5	11·6	0·8
District	35	1,291	59,025	39,770	1,643	1,339	1,227	104,330	0·4	1·5	0·5	3·3	21·5	3·9	1·3	47·0	2·3	1·4	24·8	2,5	1·3	38·2	4·3	4·7	22·0	5·4	2·9	21·9	5·9	1·4	33·6	2·4
Station expenses—																																
Supervision and office	896	2,084	235,748	198,774	3,669	2,688	2,608	446,467	10·7	37·3	12·1	5·3	34·7	6·4	5·2	187·7	9·2	7·1	124·0	12·4	2·9	85·3	9·7	9·5	44·1	10·9	6·2	46·6	12·5	5·9	143·9	10·4
Platform	324	240	87,057	51,287	2,262	177	416	141,763	3·9	13·5	4·4	0·6	4·0	0·7	1·9	69·3	3·4	1·8	32·0	3·2	1·8	52·6	6·0	0·6	2·9	0·7	1·0	7·4	2·0	1·9	45·7	3·3
Signalling	2	518	106,927	57,128	1,956	245	4	166,780	..	0·1	..	1·3	8·6	1·6	2·4	85·1	4·2	2·0	35·6	3·6	1·5	45·5	5·2	0·9	4·0	1·0	..	0·1	..	2·2	53·7	3·9
Shunting and marshalling yards ..	92	497	100,291	81,065	4,492	501	533	187,471	1·1	3·8	1·2	1·3	8·3	1·5	2·2	79·8	3·9	2·9	50·6	5·0	3·5	104·5	11·9	1·8	8·2	2·0	1·3	9·5	2·6	2·5	60·4	4·4
Goods-shed and goods-yard ..	287	295	106,328	118,658	572	674	1,382	228,196	3·4	12·0	3·9	0·7	4·9	0·9	2·3	84·7	4·1	4·2	74·0	7·4	0·4	13·3	1·5	2·4	11·0	2·7	3·3	24·7	6·6	3·0	73·5	5·3
Wharves	52	..	25,991	73,685	14,731	..	3,401	117,860	0·6	2·2	0·7	..	..	..	0·6	20·7	1·0	2·6	46·0	4·6	11·6	342·6	39·0	..	..	..	8·0	60·7	16·3	1·6	38·0	2·7
Fuel, water, stationery, and other station expenses	90	849	26,471	19,085	306	298	452	47,551	1·1	3·8	1·2	2·1	14·2	2·6	0·6	21·1	1·0	0·7	11·9	1·2	0·2	7·1	0·8	1·1	4·9	1·2	1·1	8·1	2·2	0·6	15·3	1·1
Train expenses—																																
Running expenses	494	1,097	108,606	73,559	2,023	1,265	921	187,965	5·9	20·6	6·7	2·8	18·3	3·3	2·4	86·5	4·2	2·6	45·9	4·6	1·6	47·0	5·4	4·5	20·7	5·1	2·2	16·4	4·4	2·5	60·6	4·4
Cleaning and heating vehicles ..	..	712	32,362	21,716	7	261	392	55,450	..	..	..	1·8	11·9	2·2	0·7	25·8	1·3	0·8	13·5	1·4	..	0·2	..	0·9	4·3	1·0	0·9	7·0	1·9	0·7	17·9	1·3
Sleeping-cars	..	..	6,469	..	..	..	..	6,469	..	..	..	..	..	..	0·1	5·2	0·3	..	..	..	..	..	..	..	..	..	..	..	..	0·1	2·1	0·2
Miscellaneous	2	7	15,061	2,180	9	29	10	17,298	..	0·1	..	..	0·1	..	0·3	12·0	0·6	0·1	1·4	0·1	..	0·2	..	0·1	0·5	0·1	..	0·2	..	0·2	5·6	0·4
Totals	2,318	7,779	931,350	750,757	32,262	7,617	11,558	1,743,641	27·6	96·6	31·3	19·7	129·7	23·7	20·5	741·5	36·2	26·7	468·3	46·7	25·3	750·3	85·4	26·9	124·9	30·9	27·3	206·4	55·4	23·0	561·9	40·5

Abstract G.—Head Office and General Charges.

Item.	Expenditure.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.
	£	£	£	d.
Head Office	35,882	0·5	11·6	0·8
Departmental buildings	4,323	0·1	1·4	0·1
Appeal Board	859	..	0·3	..
Chief Accountant	26,028	0·3	8·4	0·6
Divisional superintendence—				
North Island	5,172	0·1	1·7	0·1
South Island	5,088	0·1	1·6	0·1
Training School	5,176	0·1	1·7	0·1
Totals	82,528	1·1	26·6	1·9
Superannuation subsidy	141,015	1·9	45·4	3·3

Summary of Expenditure Abstracts.

Abstract and Item.	1925–26.				1924–25.			
	Expenditure.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Expenditure.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.
	£	£	£	d.	£	£	£	d.
A—Maintenance of Way and Works..	1,144,385	15·079	368·800	26·615	*1,137,629*	*16·218*	*370·926*	*30·057*
B—Maintenance of Signals and Electrical Appliances	105,064	1·384	33·859	2·443	*83,880*	*1·196*	*27·349*	*2·216*
C—Maintenance of Rolling-stock ..	1,311,317	17·279	422·597	30·497	*1,095,640*	*15·619*	*357·235*	*28·948*
D—Examination, Lubrication, and Lighting of Vehicles	59,447	0·783	19·158	1·383	*58,500*	*0·834*	*19·074*	*1·546*
E—Locomotive Transportation ..	1,577,173	20·782	508·273	36·681	*1,365,838*	*19·472*	*445·334*	*36·088*
F—Traffic Transportation	1,743,641	22·975	561·920	40·552	*1,626,928*	*23·193*	*530·462*	*42·985*
G—Head Office and General Charges	82,528	1·087	26·596	1·919	*84,721*	*1·208*	*27·623*	*2·238*
Superannuation Subsidy ..	141,015	1·858	45·445	3·280	*80,000*	*1·140*	*26·084*	*2·114*
Totals	6,164,570	81·227	1,986·648	143·370	*5,533,136*	*78·880*	*1,804·087*	*146·192*

STATEMENT No. 4.

INCOME AND EXPENDITURE IN RESPECT OF LAKE WAKATIPU STEAMERS.

EXPENDITURE.	1925–26.	1924–25.	Per Cent. of Revenue. 1925–26.	Per Cent. of Revenue. 1924–25.	REVENUE.	1925–26.	1924–25.	Per Cent. of Revenue. 1925–26.	Per Cent. of Revenue. 1924–25.
	£ s. d.	£ s. d.				£ s. d.	£ s. d.		
Salaries and wages, shore staff	1,706 2 1		16·06		Ordinary passengers	4,129 10 6	*4,168 16 11*	38·87	*41·30*
Salaries and wages, steamer staff	4,950 10 1		46·59		Season tickets	187 12 10	*204 7 6*	1·77	*2·02*
Coal and stores	3,427 12 0	*12,279 6 10*	32·26	*117·85*	Parcels, luggage, and mails	1,065 12 11	*1,327 2 5*	10·03	*13·14*
Repairs, steamers	1,665 4 11		15·67		Goods	5,149 0 1	*4,270 16 3*	48·46	*42·30*
Repairs, wharves, &c.	680 5 0		6·40		Miscellaneous	93 3 8	*124 19 3*	0·87	*1·24*
Insurance renewals and interest	3,183 0 0	..	29·96			10,625 0 0	*10,096 2 4*	100·00	*100·00*
					Loss on operation	4,987 14 1	*2,183 4 6*		
	15,612 14 1	*12,279 6 10*	146·94	*117·85*		15,612 14 1	*12,279 6 10*		

STATEMENT No. 5.

INCOME AND EXPENDITURE IN RESPECT OF REFRESHMENT SERVICE.

EXPENDITURE.	1925–26.	1924–25.	Per Cent. of Revenue. 1925–26.	Per Cent. of Revenue. 1924–25.	REVENUE.	1925–26.	1924–25.
	£ s. d.	£ s. d.				£ s. d.	£ s. d.
Salaries and wages	37,315 16 11	*31,154 2 3*	27·92	*29·74*	Receipts from refreshment-rooms	133,657 14 6	*104,796 14 0*
Provisions consumed	54,978 2 10	*44,494 13 8*	41·13	*42·44*			
Light, fuel, and water	2,266 12 3	*2,060 19 11*	1·70	*1·97*			
Freights	2,545 18 0	*2,598 8 0*	1·90	*2·48*			
Rents	8,915 13 3	*5,766 0 0*	6·67	*5·50*			
Renewals	3,729 4 0	*2,653 12 5*	2·79	*2·53*			
Betterments	5,534 3 5	*8,807 8 10*	4·14	*8·41*			
Interest, insurance, and miscellaneous ..	4,299 18 4	*2,461 8 11*	3·22	*2·35*			
Total expenditure	119,585 9 0	*99,996 14 0*	89·47	*95·42*			
Net profit	14,072 5 6	*4,800 0 0*	10·53	*4·58*			
	133,657 14 6	*104,796 14 0*	100·00	*100·00*		133,657 14 6	*104,796 14 0*

STATEMENT No 6.

INCOME AND EXPENDITURE IN RESPECT OF ADVERTISING SERVICE.

EXPENDITURE.	1925–26.	1924–25.	Per Cent. of Revenue. 1925–26.	Per Cent. of Revenue. 1924–25	REVENUE.	1925–26.	1924–25.	Per Cent. of Revenue. 1925–26.	Per Cent. of Revenue. 1924–25.
	£ s. d.	£ s. d.				£ s. d.	£ s. d		
Salaries, wages, and allowances	9,336 4 0		20·54		Advertising-signs, printing, &c.	43,542 9 2	*29,825 12 11*	95·79	*97·05*
Stores and materials	2,670 4 6	*29,647 2 5*	5·87	*96·47*	Miscellaneous receipts	1,911 16 0	*905 8 4*	4·21	*2·95*
Rent of premises, sites, and commission ..	12,404 5 5		27·30						
Office and general expenses	3,328 11 0		7·32						
Interest, insurance, and depreciation ..	3,105 4 8	..	6·83	..					
Betterments	394 2 7	..	0·87	..					
Total expenditure	31,238 12 2	*29,647 2 5*	68·73	*96·47*					
Net profit	14,215 13 0	*1,083 18 10*	31·27	*3·53*					
	45,454 5 2	*30,731 1 3*	100·00	*100·00*		45,454 5 2	*30,731 1 3*	100·00	*100·00*

STATEMENT No. 7.

INCOME AND EXPENDITURE IN RESPECT OF DEPARTMENTAL DWELLINGS.

EXPENDITURE.	1925–26.	1924–25.	Per Cent. of Revenue. 1925–26.	Per Cent. of Revenue. 1924–25.	REVENUE.	1925–26.	1924–25.	Per Cent. of Revenue. 1925–26.	Per Cent. of Revenue. 1924–25.
	£ s d	£ s. d.				£ s. d.	£ s. d.		
Wages and charges	44,924 1 8	*34,203 0 0*	34·58	*65·06*	Rentals	68,661 4 3	*52,572 0 0*	52·85	*100·00*
Materials	8,023 8 2		6·18		Net loss, 1925–26	61,246 5 7	..	47·15	..
Insurance	3,000 0 0	..	2·31	..					
Interest	51,140 0 0	..	39·36	..					
Renewals	22,820 0 0	..	17·57	..					
Net profit, 1924–25	..	*18,369 0 0**	..	*34·94*					
	129,907 9 10	*52,572 0 0*	100·00	*100·00*		129,907 9 10	*52,572 0 0*	100·00	*100·00*

* Interest and renewals not charged against dwellings in accounts for 1924–25.

STATEMENT No. 8.

INCOME AND EXPENDITURE IN RESPECT OF BUILDINGS OCCUPIED BY REFRESHMENT SERVICE, BOOKSTALL PROPRIETORS, ETC.

EXPENDITURE.	1925-26.	1924-25.	Per Cent. of Revenue. 1925-26.	Per Cent. of Revenue. 1924-25.	REVENUE.	1925-26.	1924-25.
	£ s. d.	£ s. d.				£ s. d.	£ s. d.
Wages and charges	1,128 14 3	*390 0 0*	5·93	*2·92*	Rentals	19,062 1 11	*13,347 0 0*
Materials	25 5 4		0·13	..			
Insurance, interest, and renewals	6,360 0 0	..	33·36	..			
Total expenditure	7,513 19 7	*390 0 0*	39·42	*2·92*			
Net profit	11,548 2 4	*12,957 0 0*	60·58	*97·08*			
	19,062 1 11	*13,347 0 0*	100·00	*100·00*		19,062 1 11	*13,347 0 0*

STATEMENT No. 9.

RAILWAY SAWMILLS AND BUSH ACCOUNTS.—COMBINED TRADING AND PROFIT AND LOSS ACCOUNTS.

Dr.	1925-26.	*1924-25.*	*Cr.*	1925-26.	*1924-25.*
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Stock of timber, firewood, and logs on hand at 1st April, 1925	159,538 17 4	*136,256 10 5*	By sales, issues, and transfers—		
Purchases and transfers— £ s. d.			Timber .. £ 218,851 11 0		
Timber .. 78,081 14 8			Firewood .. 3,999 3 4		
Firewood 1,235 0 9			Logs .. 34,585 10 3		
Logs .. 40,910 14 11				257,436 4 7	*230,840 12 1*
	120,227 10 4	*151,990 10 2*	Stocks on hand at 31st March, 1926—		
Royalty payments	14,163 3 0	*16,555 4 5*	Timber .. £ 144,049 11 4		
Wages	45,104 11 9	*51,364 6 10*	Firewood .. 197 14 0		
Salaries and miscellaneous payments, including interest on capital	60,665 12 8	*31,313 8 6*	Logs .. 1,183 16 8		
				145,431 2 0	*159,538 17 4*
Balance to Reserve Account	3,777 12 0	*3,516 18 5*	Rents	610 0 6	*617 9 4*
	403,477 7 1	*396,996 18 9*		403,477 7 1	*390,996 18 9*

STATEMENT No. 10.

STATEMENT OF SUBSIDY FROM CONSOLIDATED FUND IN RESPECT OF SERVICES RENDERED BY NON-PAYING DEVELOPMENTAL BRANCH LINES AND ISOLATED SECTIONS: 1ST APRIL, 1925, TO 31ST MARCH, 1926.

Branches showing Loss.	Mileage.	Loss on Working.	Feeder Value.	Total Net Loss.	Loss including Interest.	Average per Mile of Line.					
						Branch Revenue.	Feeder Value.	Total Revenue.	Working-expenses.	Interest.	Total Loss.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£	£	£	£	£	£
Kaikohe	25	1,352 13 6	2,090 1 6	737 8 0*	5,277 15 6	127	84	211	181	241	211
Waiuku	13	1,167 18 8	3,505 14 7	2,337 15 11*	6,058 12 1	430	270	700	520	646	466
Toko	48	10,660 4 2	2,719 8 9	7,940 15 5	44,934 5 5	288	57	345	510	771	936
Greytown	3	2,251 2 6	2,142 16 8	108 5 10	622 5 2	237	714	951	988	171	207
Eskdale	12	2,544 15 0	1,025 2 9	1,519 12 3	8,388 17 5	216	85	301	428	572	699
North Island totals ..	101	17,976 13 10	11,483 4 3	6,493 9 7	65,281 15 7	257	114	370	434	582	646
Eyreton-Oxford	54	5,684 10 2	1,058 17 10	4,625 12 4	11,190 16 4	168	20	188	273	122	207
Cheviot	44	5,604 14 9	1,419 16 2	4,184 18 7	18,227 6 7	285	32	317	413	319	414
Little River	23	2,316 10 10	236 8 5	2,080 2 5	6,823 8 11	304	10	314	405	206	297
Southbridge	26	2,480 11 6*	1,012 3 4	3,492 14 10*	1,771 11 4	740	39	779	645	202	68
Whitecliffs	12	1,023 18 6	1,414 18 11	391 0 5*	801 6 5	324	118	442	409	99	67
Methven	23	1,200 9 1	1,556 7 8	355 18 7*	3,080 4 5	375	68	443	427	149	134
Springburn	28	11,484 10 6	789 1 4	10,695 9 2	13,511 8 0	193	28	221	603	101	483
Fairlie	37	1,855 18 11*	1,303 3 2	3,159 2 1*	3,426 8 1	411	35	446	361	178	93
Waimate	13	3,516 18 6	2,658 15 11	858 2 7	3,161 5 1	339	205	544	609	177	243
Kurow	38	1,896 13 8	1,225 9 11	671 3 9	6,466 18 3	252	32	284	302	153	170
Ngapara–Livingstone ..	27	4,026 7 7	705 10 9	3,320 16 10	10,269 0 6	152	26	178	301	257	380
Waihemo	9	886 3 2	845 15 1	40 8 1	1,486 17 3	162	94	256	261	161	165
Otago Central	147	1,400 1 2*	2,090 3 11	3,490 5 1*	53,773 14 10	579	14	593	569	390	366
Lawrence	52	3,920 13 2	1,713 10 5	2,207 2 9	14,364 15 11	287	33	320	363	234	276
Tapanui	27	4,460 9 0	1,725 2 11	2,735 6 1	7,826 12 7	215	64	279	380	189	290
Waikaka	13	1,471 8 7	681 1 9	790 6 10	3,690 18 6	205	52	257	318	223	264
Switzers	14	1,907 2 3	568 10 6	1,338 11 9	4,645 17 7	113	41	154	249	236	332
Glenham	10	3,014 4 3	1,173 14 5	1,840 9 10	4,033 5 2	183	117	300	485	219	403
Seaward Bush	34	2,278 6 3*	1,006 0 4	3,284 6 7*	4,322 13 1	437	30	467	370	224	127
Orawia	9	322 2 7	227 6 9	94 15 10	1,708 13 2	31	25	56	67	179	190
Forest Hill	13	942 8 1	1,238 3 2	295 15 1*	899 8 11	223	95	318	295	92	69
Mararoa	12	717 14 1	380 14 7	336 19 6	1,410 15 10	90	32	122	150	90	118
South Island totals ..	665	46,382 0 11	25,030 17 3	21,351 3 8	176,893 6 9	348	38	386	418	234	266
Cape Foulwind	8	1,455 19 8	53 13 8	1,402 6 0	4,724 3 6	103	7	110	285	415	591
Losses from 1st April, 1925, to 27th February, 1926 ..	774	65,814 14 5	36,567 15 2	29,246 19 3	246,899 5 10	334	47	381	419	281	319
Estimated loss from 28th February to 31st March, 1926	..	..	..	..	8,500 0 0						
					255,399 5 10						
Isolated Sections.											
Kaihu	24	2,640 18 4	..	2,640 18 4	10,567 13 4	..	..	351	473	330	452
Gisborne	60	719 9 1	..	719 9 1	36,393 10 3	..	..	659	685	595	621
Nelson	61	8,324 6 4	..	8,324 6 4	26,690 14 4	..	..	364	601	301	538
Picton	56	2,099 1 7	..	2,099 1 7	30,489 4 9	..	..	756	802	507	553
Totals	201	13,783 15 4	..	13,783 15 4	104,141 2 8	..	..	590	667	450	527
Grand totals ..	975	79,598 9 9	36,567 15 2	43,030 14 7	359,540 8 6	..	..	..	..	..	..

* Indicates profit.

STATEMENT No. 11.

Statement of Cash Receipts and Payments—Working Railways Account.

Receipts.	£ s. d.	*Payments.*	£ s. d.
To Receipts from Consolidated Fund under subsection 1 (*a*) (*b*) of section 4 of Government Railways Amendment Act, 1925 ..	475,337 16 8	By Wages and vouchers	6,556,447 6 1
Revenue receipts	8,162,941 9 6	Refunds to Harbour Boards, shipping companies, and other carriers	289,994 4 9
"Credits in aid" (Working Railways expenditure)	574,793 8 1	Interest on capital	1,913,310 14 9
Receipts from Consolidated Fund under subsection 1 (*d*) of section 4 of Government Railways Amendment Act, 1925	344,829 18 7	Investments	175,000 0 0
		Balance as per general balance-sheet	623,150 7 3
	£9,557,902 12 10		£9,557,902 12 10

Reconciliation Statement.

	£ s. d.
Credit balance in Working Railways Account as per Treasury figures ..	614,528 13 4
Add Imprests outstanding	8,621 13 11
Credit balance as per above statement	£623,150 7 3

STATEMENT No. 12.

RENEWALS AND EQUALIZATION FUNDS.

Slips, Floods, and Accidents Equalization Fund.

Expenditure.	£ s. d.	*Income.*	£ s. d.
To Rolling-stock	7,300 0 0	By Contributions debited to working-expenses	31,505 0 0
Balance	24,205 0 0		
	£31,505 0 0		£31,505 0 0
		By Balance	£24,205 0 0

Workers' Compensation Fund.

Expenditure.	£ s. d.	*Income.*	£ s. d.
To Accident payments	37,857 4 4	By Premiums debited to working-expenses	43,173 11 6
Balance	5,316 7 2		
	£43,173 11 6		£43,173 11 6
		By Balance	£5,316 7 2

Fire Insurance Fund.

Expenditure.	£ s. d.	*Income.*	£ s. d.
To Fire losses on—		By Premiums debited to working-expenses	9,664 0 0
Operating buildings	560 14 6		
Dwellings	1,827 11 3		
Goods in transit	60 8 8		
Upkeep Railway fire brigades and fire appliances	2,431 16 9		
Balance	4,783 8 10		
	£9,664 0 0		£9,664 0 0
		By Balance	£4,783 8 10

General Renewals Fund.

Expenditure.	£ s. d.	*Income.*	£ s. d.
To Relaying of track	191,918 4 9	By Contributions debited to working-expenses	553,890 15 4
Bridges, buildings, &c.	9,142 8 5		
Signals, interlocking, &c.	3,478 2 3		
Rolling-stock	58,425 19 11		
Locomotive workshops and plant ..	9,690 18 10		
Dwellings	399 2 2		
Balance	280,835 19 0		
	£553,890 15 4		£553,890 15 4
		By Balance	£280,835 19 0

Betterments Fund.

Expenditure.	£ s. d.	*Income.*	£ s. d.
To Way, works, buildings, and structures	17,711 7 1	By Contributions debited to working-expenses	39,718 1 0
Signals, &c.	582 14 8	Appropriation from net revenue ..	58,000 0 0
Rolling-stock	15,495 13 3		
Refreshment service	3,534 3 5		
Advertising service	394 2 7		
Balance	60,000 0 0		
	£97,718 1 0		£97,718 1 0
		By Balance	£60,000 0 0

STATEMENT No. 13.

EXPENDITURE ON CONSTRUCTION OF RAILWAYS, ROLLING-STOCK, ETC., TO 31ST MARCH, 1926; NET REVENUE AND RATE OF INTEREST EARNED ON CAPITAL EXPENDED ON OPENED LINES FOR YEAR ENDED SAME DATE.

Section of Railway.	Opened Lines.			Unopened Lines.	Net Revenue.	Rate of Interest Earned.
	Lines and Works.	Rolling-stock.	Total.			
	£	£	£	£	£	£ s. d.
Kaihu	176,122	13,043	189,165	..	– 2,943	..
"	..	..	..	..	..	..
Tauranga	..	..	..	..	..	..
"	..	..	..	1,336,421	..	..
Gisborne	773,450	75,172	848,622	..	– 1,545	..
"	..	..	..	698,715	..	..
North Island Main Lines and Branches ..	16,858,029	5,523,963	22,381,992	..	1,167,908	5 10 11
"	..	..	..	3,543,051	..	..
South Island Main Lines and Branches ..	16,187,444	4,371,099	20,558,543	..	241,462	1 4 0
" ..	..	..	..	107,468	..	..
Westport	547,645	150,214	697,859	..	30,744	4 8 1
"	..	..	..	141,301	..	..
Nelson	394,003	43,132	437,135	..	– 8,373	..
"	..	..	..	161,753	..	..
Picton	629,734	51,149	680,883	..	– 2,549	..
"	..	..	..	17,243	..	..
	35,566,427	10,227,772	45,794,199	..	1,424,704	3 4 8
	..	..	..	6,005,952	..	..
Lake Wakatipu steamer service	44,300	..	44,300	..	– 4,988	..
Subsidiary Services	1,620,070	..	1,620,070	..	213,077	13 3 0
Subsidy Branch Lines and Isolated Sections ..	..	..	..	..	359,540	..
In suspense—						
Surveys, North Island	..	..	..	39,689	..	..
Miscellaneous, North Island	..	..	..	5,169	..	..
Surveys, South Island	..	..	..	5,763	..	..
Miscellaneous, South Island	..	..	..	5,168	..	..
General	3,698	..	3,698	..	..	
P.W.D. stock of permanent-way	..	..	..	22,458	..	..
W.R.D. stock of A.O.L. and R.I.A. stores ..	31,604	114,805	146,409	..	..	..
Balance of cost of raising loan of £500,000 for Railways Improvement Authorization Act 1914 Account	..	..	..	23,580	..	..
	37,266,099	10,342,577	47,608,676	..	1,992,333	4 6 11
	..	..	..	6,107,779	..	..
Total cost of opened and unopened lines at 31st March, 1926	..	..	53,716,455		..	3 16 8

NOTE.—The amount stated in this return as the cost of construction of opened lines includes the Provincial and General Government expenditure on railways. It also includes the Midland Railway and expenditure by the Greymouth and Westport Harbour Boards on railways and wharves under the provisions of section 7 of the Railways Authorization Act, 1885, the information regarding the last-mentioned being furnished by the respective Boards. The rate of interest earned has been computed on cost proportionately to the time during which the lines, taken over by the Working Railways Department, within the financial year were earning revenue, thus:—

North Island Main Lines and Branches; Huarau–Portland, opened for traffic 29th November, 1925.

South Island Main Lines and Branches: Tuatapere–Orawia, opened for traffic 20th October 1925. Beaumont–Miller's Flat, opened for traffic 16th December, 1925.

STATEMENT No. 14.

EXPENDITURE UNDER VOTE FOR ADDITIONS TO OPEN LINES, CHARGED TO CAPITAL ACCOUNT, FOR THE YEAR ENDED 31ST MARCH, 1926.

——	Amount.	Total.
	£ s. d.	£ s. d.
Material on hand at 31st March, 1925	123,988 18 5	
Expenditure charged to Vote No. 43 by Treasury	842,321 14 9	
Outstanding vouchers	3,662 11 10	
	969,973 5 0	
Less material on hand at 31st March, 1926	114,804 17 9	
		£855,168 7 3
Expenditure on works, &c.—		
Way and Works Branch	335,564 10 0	
Locomotive Branch	519,603 17 3	
		£855,168 7 3

WAY AND WORKS BRANCH: PARTICULARS OF WORKS, ETC.

Railway.	Work, &c.	Amount.	Total.
		£ s. d.	£ s. d.
Gisborne	Additions to station buildings, extension of station-yards, and other facilities	98 14 2	98 14 2
North Island Main Lines and Branches	Sidings, loading-banks, stockyards, crossings, &c.	10,308 1 9	
	Additions to station buildings, extension of station-yards, and other facilities	48,922 4 9	
	Purchase of land	12,819 4 3	
	Additional dwellings	217,045 9 3	
	Bridgework and subways	*Cr.* 959 3 9	
	Cranes, weighbridges, and turntables	6,916 10 1	
	Additions to workshops and sawmills	11,843 13 0	
	Engine depots	2,432 17 4	
	Tablet installations	2,176 13 3	
			311,505 9 11
South Island Main Lines and Branches	Sidings, loading-banks, stockyards, crossings, &c.	2,090 7 5	
	Additions to station buildings, extension of station-yards, and other facilities	6,280 9 3	
	Additional water-services for Locomotive Branch	10 13 9	
	Purchase of land	191 4 5	
	Additional dwellings	2,008 0 3	
	Bridgework and subways	3,600 13 2	
	Cranes, weighbridges, and turntables	7,508 19 11	
	Additions to workshops	264 6 5	
	Fencing of railway-line	592 14 11	
			22,547 9 6
Picton	Additions to station buildings, extension of station-yards, and other facilities	273 10 2	273 10 2
Westport	Sidings, loading-banks, stockyards, crossings, &c.	221 15 7	
	Additional dwellings	324 8 7	
	Capstan on wharf	593 2 1	
			1,139 6 3
			£335,564 10 0

STATEMENT No. 14—*continued.*

LOCOMOTIVE BRANCH: PARTICULARS OF ROLLING-STOCK, ETC.

Description of Stock ordered.	Order.	Number Incomplete on 31st March, 1925.	Number Complete on 31st March, 1926.	Number Incomplete on 31st March, 1926.	Expenditure, Year ended 31st March, 1926.
					£ s. d.
Locomotives, Class AB (A. and G. Price, Limited)	A—11	4	4	..	49,286 10 5
Replacement of cars written off or sold ..	H—11	27	18	9	21,311 17 0
Replacement of wagons written off or sold ..	I—11	140	10	130	810 5 7
Additional seating for cars	N—11	..	..	..	1,205 16 2
Steam-heating locomotives and cars	U—11	..	..	..	825 11 0
Additional superheater gear for locomotives ..	V—11	..	..	..	432 6 2
Replacement of brake-vans written off or sold ..	W—11	7	3	4	6,266 16 2
Electric headlights for locomotives	X—11	..	..	..	497 12 8
Carriages, Classes A and AA, 1922–23 programme	Y—11	17*	17	..	23,381 7 1
Brake-vans, Class F, 1922–23 programme ..	Z—11	4†	4	..	4,153 18 5
Wagons, bogie, 1922–23 programme	A—12	32	14	18	6,289 9 1
Wagons, four-wheel, 1922–23 programme ..	B—12	160‡	80	80	12,807 0 1
Locomotives, Class AB (fourth lot)	C—12	10	6	4	25,169 5 3
Fitting Pintsch gas to cars, Westland Section ..	G—12	..	..	..	434 9 4
Locomotives, Class WAB (third lot)	I—12	10	..	10	22,807 1 10
Electric lighting for cars	K—12	..	..	..	14,171 19 11
Tarpaulins, 1924–25 programme	L—12	400	400	..	1,609 4 7
Wagons, bogie, 1924–25 programme	M—12	69	54	15	12,349 8 5
Wagons, four-wheel, 1924–25 programme ..	N—12	308§	209	99	68,102 16 4
Rail motors	P—12	6‖	4	2	12,344 16 8
Strengthening ends of Main Trunk cars ..	R—12	..	..	..	1,019 14 11
Fitting additional lavatories to cars (including double lavatories to Main Trunk cars)	S—12	..	..	..	2,511 8 10
Fitting additional top doors to British LA wagons	V—12	..	..	..	4,378 9 6
Carriages, Class A, 1924–25 programme ..	W—12	10	10	..	20,151 2 8
Locomotives, Class AB, from North British Locomotive Company	X—12	35	35	..	222,858 11 0
Transfer of rolling-stock	Y—12	..	..	..	226 19 3
Sleeping-car (Exhibition car)	Z—12	1	1	..	7,377 7 6
Additional steam cranes	A—13	..	..	..	1,566 14 8
Locomotives, Class WAB (A. and G. Price, Limited)	B—13	8	..	8	2,302 5 6
Brake-vans, Class F, 1925–26 programme ..	C—13	11	11	..	10,001 8 0
Sleeping-cars	D—13	10	..	10	..
Obsolete locomotives written off	..	..	..	..	*Cr.* 10,260 0 0
Sale of locomotives	..	..	..	..	*Cr.* 3,670 0 0
Rail-motors written off	..	..	..	..	*Cr.* 9,400 0 0
Rolling-stock written off	..	..	..	..	*Cr.* 27,170 0 0
Sale of rolling-stock	..	..	..	..	*Cr.* 23,520 0 0
Workshop machinery	..	..	..	..	44,752 18 10
Workshop machinery written off	..	..	..	..	*Cr.* 7,913 0 0
Workshop machinery sold	..	..	..	..	*Cr.* 15 0 0
Machinery for locomotive running and car and wagon depots	..	..	..	..	147 4 5
Total	..	..	..	..	£519,603 17 3
Total locomotives	..	67	45	22	..
„ carriages	..	65	46	19	..
„ brake-vans	..	22	18	4	..
„ wagons, bogie	..	108	68	40	..
„ wagons, four-wheel	..	601	299	302	..
„ tarpaulins	..	400	400	..	..

* Reduced by 12. † Increased by 1. ‡ Reduced by 2. § Increased by 17. ‖ Increased by 2.

EXPENDITURE UNDER THE RAILWAYS IMPROVEMENT AUTHORIZATION ACT, 1914, AND SECTION 7 OF FINANCE ACT, 1924, AND SECTION 10 OF FINANCE ACT, 1925, CHARGED TO CAPITAL ACCOUNT, FOR THE YEAR ENDED 31ST MARCH, 1926.

	£ s. d.	£ s. d.
Material on hand at 31st March, 1925	10,819 10 1	
Expenditure charged by Treasury	796,939 14 0	
Balance of cost of raising loan, 31st March, 1925	42,193 3 10	
Cost of raising loan, 1925–26 .. .. £42,007 14 0		
Less amount not yet allocated 23,579 19 7		
	18,427 14 5	
Vouchers outstanding	26,194 19 8	
	894,575 2 0	
Less material on hand at 31st March, 1926	25,260 12 10	
		869,314 9 2
		£ s. d.
New stations and station-yards, goods-sheds, and terminal facilities at Auckland, Wellington, Christchurch, Addington, Lyttelton, Paeroa, and New Plymouth	223,187 16 4	
Rearrangement of, or alterations and additions to, Greymouth, Hikurangi, Stratford, Wanganui, and Morrinsville	38,041 13 3	
Duplications, Newmarket–New Lynn, Penrose, Papakura	36,035 2 8	
Grade easements—Penrose–Mercer	*Cr.* 33 16 10	
Workshops and equipment of Locomotive Branch	58,543 9 8	
New line, Auckland–Westfield	21,483 14 0	
Bridge strengthening	8,609 3 2	
Elimination of level crossings	6,581 2 0	
Deviations: Ravensbourne–Burke's, Pelichet Bay, Tawa Flat, Palmerston North	10,459 7 5	
Signalling, interlocking, and safety appliances	125,366 10 1	
Electric lighting	18,142 2 6	
		546,416 4 3
Expenditure charged by Public Works Department—		
New Line—Auckland–Westfield	160,416 2 3	
Hutt Valley Railway	83,858 2 7	
Tawa Flat deviation	3,445 2 4	
Miscellaneous works	75,178 17 9	
		322,898 4 11
		£869,314 9 2

STATEMENT No. 15.

COMPARATIVE STATEMENT OF OPERATING TRAFFIC AND REVENUE FOR THE YEAR ENDED 31ST MARCH, 1926.

(1) OPERATING TRAFFIC.

Section	Length Open for Traffic.	Passengers.						Live-stock.				Goods.			Gross Total Tonnage.
		First Class.		Second Class.		Total.	Season Tickets.	Cattle.	Sheep and Pigs.	Total.	Equivalent Tonnage.	Timber.	Goods.	Total.	
1925–26.	Miles.	Single.	Return.	Single.	Return.	Number.	Number.	Number.	Number.	Number.	Tons.	Tons.	Tons.	Tons.	Tons.
Kaihu	24	451	790	13,227	13,472	27,940	16	26	942	968	46	6,948	4,467	11,415	11,461
Gisborne	60	6,134	3,234	33,475	24,374	67,217	369	1,017	122,901	123,918	5,223	11,755	46,582	58,337	63,560
North Island Main Lines and Branches	1,276	399,863	547,262	2,048,831	3,742,186	6,738,142	432,790	280,322	4,098,589	4,378,911	248,889	434,346	2,659,034	3,093,380	3,342,269
South Island Main Lines and Branches	1,618	240,657	533,900	995,560	2,943,764	4,713,881	164,169	108,466	3,804,779	3,913,245	185,059	305,853	2,645,621	2,951,474	3,136,533
Westport	43	252	786	27,362	53,698	82,098	1,217	144	2,093	2,237	128	6,304	582,011	588,315	588,443
Nelson	61	1,244	2,636	23,189	51,614	78,683	997	562	20,521	21,083	991	3,820	30,620	34,440	35,431
Picton	56	11,225	4,024	29,837	34,676	79,762	714	1,112	160,140	161,252	6,743	1,628	60,624	62,252	68,995
	3,138	659,826	1,092,632	3,171,481	6,863,784	11,787,723	600,272	391,649	8,209,965	8,601,614	447,079	770,654	6,028,959	6,799,613	7,246,692
Lake Wakatipu steamers	..	3,069	3,034	5,932	13,722	25,757	20	174	10,170	10,344	460	922	8,068	8,990	9,450
Totals	3,138	662,895	1,095,666	3,177,413	6,877,506	11,813,480	600,292	391,823	8,220,135	8,611,958	447,539	771,576	6,037,027	6,808,603	7,256,142
1924–25.	Miles.	Single.	Return.	Single.	Return.	Number.	Number.	Number.	Number.	Number.	Tons.	Tons.	Tons.	Tons.	Tons.
Kaihu	24	576	1,014	12,303	15,028	28,921	15	34	1,347	1,381	64	8,553	3,418	11,971	12,035
Gisborne	60	7,531	2,784	41,421	24,558	76,294	264	926	116,041	116,967	4,923	12,540	44,803	57,343	62,266
North Island Main Lines and Branches	1,246	441,078	642,472	2,163,228	4,352,050	7,598,828	397,208	254,133	3,961,652	4,215,785	235,477	402,492	2,592,268	2,994,760	3,230,237
South Island Main Lines and Branches	1,595	263,993	510,476	1,029,185	2,671,282	4,474,936	137,215	95,116	3,833,476	3,928,592	182,161	317,803	2,533,947	2,851,750	3,033,911
Westport	43	348	896	33,043	61,508	95,795	1,586	110	2,607	2,717	137	6,400	585,161	591,561	591,698
Nelson	61	1,482	1,992	23,516	29,704	56,694	785	594	21,284	21,878	1,032	5,112	33,504	38,616	39,648
Picton	56	10,162	4,860	25,117	25,472	65,611	468	768	158,908	159,676	6,589	1,071	47,861	48,932	55,521
Lake Wakatipu steamers	..	2,830	3,230	6,069	14,804	26,933	13	192	10,282	10,474	469	663	7,011	7,674	8,143
Totals	3,085	728,000	1,167,724	3,333,882	7,194,406	12,424,012	537,554	351,873	8,105,597	8,457,470	430,852	754,634	5,847,973	6,602,607	7,033,459

STATEMENT No. 15—*continued.*

COMPARATIVE STATEMENT OF OPERATING TRAFFIC AND REVENUE FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

(2) OPERATING REVENUE.

Section.	Revenue.								Mileage.		
	Ordinary Passengers.	Season Tickets.	Parcels, Luggage, and Mails.	Total Coaching.	Goods.	Labour, Demurrage, &c.	Total Goods.	Total Revenue.	Train.	Shunting, &c.	Total.
1925–26.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	Number.	Number.	Number.
Kaihu	2,337 2 11	297 3 4	994 12 6	3,628 18 9	4,696 2 9	85 19 8	4,782 2 5	8,411 1 2	17,749	5,031	22,780
Gisborne	10,941 1 10	1,024 8 8	2,563 18 10	14,529 9 4	24,735 1 9	300 9 10	25,035 11 7	39,565 0 11	78,631	16,778	95,409
North Island Main Lines and Branches	1,464,357 1 8	175,322 4 0	251,402 14 9	1,891,082 0 5	2,568,212 13 9	75,651 4 0	2,643,863 17 9	4,534,945 18 2	6,168,991	2,539,517	8,708,508
South Island Main Lines and Branches	771,459 13 6	85,079 3 10	149,255 16 11	1,005,794 14 3	1,748,634 15 11	54,021 14 10	1,802,656 10 9	2,808,451 5 0	3,854,181	1,651,417	5,505,598
Westport	6,093 1 5	1,079 19 2	1,295 12 5	8,468 13 0	109,819 11 9	8,979 10 3	118,799 2 0	127,267 15 0	90,680	73,872	164,552
Nelson	8,113 16 5	1,571 11 4	1,619 8 7	11,304 16 4	14,744 13 0	2,232 1 9	16,976 14 9	28,281 11 1	59,112	19,223	78,335
Picton	8,195 14 10	1,174 13 10	2,074 9 9	11,444 18 5	28,317 1 10	2,589 10 11	30,906 12 9	42,351 11 2	50,063	31,794	81,857
	2,271,497 12 7	265,549 4 2	409,206 13 9	2,946,253 10 6	4,499,160 0 9	143,860 11 3	4,643,020 12 0	7,589,274 2 6	..	..	..
Lake Wakatipu steamers	4,129 10 6	187 12 10	1,065 12 11	5,382 16 3	5,149 0 1	93 3 8	5,242 3 9	10,625 0 0	..	..	..
Totals	2,275,627 3 1	265,736 17 0	410,272 6 8	2,951,636 6 9	4,504,309 0 10	143,953 14 11	4,648,262 15 9	7,599,899 2 6	10,319,407	4,337,632	14,657,039

Section.	Revenue.									Mileage.		
	Ordinary Passengers.	Season Tickets.	Parcels, Luggage, and Mails.	Total Coaching.	Goods.	Miscellaneous.	Rents and Commission.	Total Goods.	Grand Total Revenue.	Train.	Shunting, &c.	Total.
1924–25.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	Number.	Number.	Number.
Kaihu	2,539 13 7	129 12 5	1,140 9 5	3,809 15 5	4,830 0 7	88 2 8	343 15 7	5,261 18 10	9,071 14 3	17,232	4,149	21,381
Gisborne	9,626 6 1	354 4 6	2,834 8 7	12,814 19 2	23,447 0 0	393 14 1	1,345 4 7	25,185 18 8	38,000 17 10	65,609	14,533	80,142
North Island Main Lines and Branches	1,349,714 14 11	148,171 19 2	250,033 5 4	1,747,919 19 5	2,348,137 2 2	70,597 18 8	89,235 0 0	2,507,970 0 10	4,255,890 0 3	5,372,957	2,212,805	7,585,762
South Island Main Lines and Branches	692,880 1 3	59,863 15 8	157,021 17 0	909,765 13 11	1,591,972 3 3	55,529 2 11	52,973 3 4	1,700,474 9 6	2,610,240 3 5	3,438,695	1,419,667	4,858,362
Westport	6,965 5 2	884 2 0	1,509 16 8	9,359 3 10	111,744 13 0	8,168 6 6	1,093 12 1	121,006 11 7	130,365 15 5	87,640	75,492	163,132
Nelson	5,527 9 6	809 12 3	1,645 9 1	7,982 10 10	15,635 4 8	228 9 1	890 12 7	16,754 6 4	24,736 17 2	56,469	17,720	74,189
Picton	6,202 13 2	528 5 0	2,037 17 9	8,768 15 11	21,979 15 11	2,094 6 6	1,279 16 9	25,353 19 2	34,122 15 1	45,021	26,298	71,319
Lake Wakatipu steamers	4,168 16 11	204 7 6	1,327 2 5	5,700 6 10	4,270 16 3	49 2 11	75 16 4	4,395 15 6	10,096 2 4	..	..	..
Totals	2,077,625 0 7	210,945 18 6	417,550 6 3	2,706,121 5 4	4,122,016 15 10	137,149 3 4	147,237 1 3	4,406,403 0 5	7,112,524 5 9	9,083,623	3,770,664	12,854,287

NOTE.—The figures for 1924–25 include net revenue of subsidiary services and miscellaneous non-operating receipts, while those for 1925–26 represent operating revenue only.

STATEMENT No. 16.

STATEMENT OF SEASON TICKETS ISSUED FOR THE YEAR ENDED 31ST MARCH, 1926.

Description of Tickets.	1925–26.				1924–25.			
	Number.	Amount.			Number.	Amount.		
		£	s.	d.		£	s.	d.
Travellers' annual, all lines	26	2,455	0	0	*26*	*2,378*	*8*	*9*
Travellers' annual, North Island ...	110	7,597	6	0	*117*	*7,869*	*11*	*4*
Travellers' annual, South Island ...	21	1,335	9	0	*28*	*1,820*	*11*	*0*
Reporters' annual	54	1,061	8	4	*104*	*1,301*	*9*	*10*
Sectional annual, North Island ...	500	21,420	16	9	*519*	*21,868*	*14*	*3*
Sectional annual, South Island ...	281	11,505	13	10	*284*	*11,520*	*12*	*5*
Tourist, all lines	284	4,615	0	0	*310*	*4,893*	*15*	*0*
Tourist, North Island	842	8,980	0	0	*892*	*9,507*	*10*	*0*
Tourist, South Island	74	825	0	0	*76*	*852*	*10*	*0*
School	39,530	30,394	1	11	*25,983*	*19,921*	*2*	*3*
Bearer twelve-trip	32,780	12,185	11	2	...	...		
,, fifty-trip	4,686	9,920	14	11	...	...		
Weekly twelve-trip	126,179	24,292	0	1	*136,563*	*25,720*	*1*	*8*
Weekly workmen's	354,716	43,852	12	9	*331,861*	*40,784*	*1*	*3*
All other season	40,209	85,296	2	3	*40,791*	*62,507*	*10*	*9*
Totals	600,292	265,736	17	0	*537,554*	*210,945*	*18*	*6*

STATEMENT No. 17.

Statement of Passenger Tickets issued at Cheap Excursion Rates for Year ended 31st March, 1926.

Sections.	Schools, Factories, and Friendly Societies.					Excursions (other than Schools, Factories, and Friendly Societies).				Gross Total.	
	Schools, Factories, and Friendly Societies. Children not exceeding 15 Years of Age.	Schools only. Senior Scholars over 15 but not exceeding 19 Years of Age.	Schools, Factories, and Friendly Societies. Pupils exceeding 19 Years of Age and Adults.	Total.	Revenue.	First Class.	Second Class.	Total.	Revenue.	Number of Tickets.	Revenue.
	Number.	Number.	Number.	Number.	£ s. d.	Number.	Number.	Number.	£ s. d.	Number.	£ s. d.
Kaihu	..	..	..	..	..	35	775	810	116 17 4	810	116 17 4
Gisborne	1,319	89	667	2,075	111 18 4	378	1,261	1,639	2,251 2 11	3,714	2,363 1 3
Auckland	6,580	1,984	4,221	12,785	1,167 14 3	19,172	117,478	136,650	75,195 14 7	149,435	76,363 8 10
Ohakune	2,513	802	1,480	4,795	718 17 7	2,856	17,511	20,367	16,052 19 10	25,162	16,771 17 5
Wanganui	7,350	2,364	5,533	15,247	1,555 9 9	5,369	33,666	39,035	21,560 14 5	54,282	23,116 4 2
Wellington	20,970	3,146	19,241	43,357	3,839 11 2	62,502	106,467	168,969	113,273 4 6	212,326	117,112 15 8
Picton	844	247	592	1,683	109 12 8	1,860	3,938	5,798	1,023 7 4	7,481	1,133 0 0
Nelson	1,776	279	1,031	3,086	166 12 10	447	9,573	10,020	1,640 4 10	13,106	1,806 17 8
Westport	940	229	477	1,646	68 1 1	23	7,230	7,253	839 15 11	8,899	907 17 0
Christchurch	24,872	5,080	24,083	54,035	6,781 7 8	24,965	79,652	104,617	81,994 14 2	158,652	88,776 1 10
Dunedin	12,675	2,929	15,562	31,166	3,989 5 3	15,161	110,944	126,105	60,479 8 11	157,271	64,468 14 2
Invercargill	8,622	2,048	13,174	23,844	6,190 10 0	9,128	72,651	81,779	47,445 14 10	105,623	53,636 4 10
Head Office	..	..	..	..	..	4,521	4,180	8,701	23,820 16 3	8,701	23,820 16 3
Totals	88,461	19,197	86,061	193,719	24,699 0 7	146,417	565,326	711,743	445,694 15 10	905,462	470,393 16 5
Total, year ending—											
31st March, 1898 ..	39,963	5,398	35,064	80,425	5,569 18 1	66,012	383,569	449,581	80,822 8 1	530,006	86,392 6 2
31st March, 1899 ..	45,748	6,192	39,955	91,895	6,215 11 8	70,531	411,747	482,278	84,794 15 6	574,173	91,010 7 2
31st March, 1900 ..	37,839	5,616	31,164	74,619	4,752 3 10	81,528	501,176	582,704	96,154 7 5	657,323	100,906 11 3
31st March, 1901 ..	38,864	5,602	34,550	79,016	5,234 16 8	87,544	541,624	629,168	102,932 10 9	708,184	108,167 7 5
31st March, 1902 ..	42,506	5,736	37,708	85,950	5,466 16 9	95,628	588,813	684,441	136,813 0 1	770,391	142,279 16 10
31st March, 1903 ..	41,540	6,048	41,555	89,143	6,050 11 3	84,448	517,566	602,014	103,279 8 6	691,157	109,329 19 9
31st March, 1904 ..	50,364	6,975	54,344	111,683	7,424 19 7	100,417	594,967	695,384	125,624 4 0	807,067	133,049 3 7
31st March, 1905 ..	52,742	7,359	53,558	113,659	7,490 16 0	100,968	592,485	693,453	130,068 16 9	807,112	137,559 12 9
31st March, 1906 ..	55,478	7,715	57,027	120,220	7,882 16 1	110,823	626,852	737,675	140,939 16 3	857,895	148,822 12 4
31st March, 1907 ..	48,044	7,837	39,783	95,664	6,514 18 4	125,280	731,132	856,412	194,185 2 9	952,076	200,700 1 1
31st March, 1908 ..	51,031	8,163	53,886	113,080	7,604 10 4	113,617	618,518	732,135	141,519 16 11	845,215	149,124 7 3
31st March, 1909 ..	55,199	9,266	52,579	117,044	7,641 5 10	122,312	667,867	790,179	166,471 6 3	907,223	174,112 12 1
31st March, 1910 ..	53,917	7,811	53,677	115,405	7,964 15 7	128,277	735,561	863,838	211,133 6 10	979,243	219,098 2 5
31st March, 1911 ..	66,381	10,799	66,695	143,875	9,488 14 7	107,208	576,251	683,459	155,444 10 11	827,334	164,933 5 6
31st March, 1912 ..	62,289	8,924	63,612	134,825	9,702 15 3	135,590	704,883	840,473	206,472 13 1	975,298	216,175 8 4
31st March, 1913 ..	63,040	9,723	61,134	133,897	9,509 8 7	159,730	804,965	964,695	271,611 17 7	1,098,592	281,121 6 2
31st March, 1914 ..	111,029	18,246	59,712	188,987	13,235 8 4	131,416	683,851	815,267	210,109 0 9	1,004,254	223,344 9 1
31st March, 1915 ..	47,846	7,974	48,197	104,017	7,919 1 9	144,260	782,355	926,615	259,547 10 6	1,030,632	267,466 12 3
31st March, 1916 ..	43,038	8,198	36,091	87,327	6,072 18 9	136,401	763,690	900,091	269,097 16 0	987,418	275,170 14 9
31st March, 1917 ..	38,477	8,788	32,901	80,166	6,159 17 6	168,098	735,468	903,566	313,006 7 3	983,732	319,166 4 10
31st March, 1918* ..	591	124	743	1,458	131 6 7	20,148	110,482	130,630	62,968 15 11	132,088	63,100 2 6
31st March, 1919* ..	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
31st March, 1920 ..	38,357	3,968	42,461	84,786	7,173 12 2	76,713	260,159	336,872	161,401 18 3	421,658	168,575 10 5
31st March, 1921 ..	94,175	12,346	70,794	177,315	14,966 19 8	146,404	524,246	670,650	371,525 9 4	847,965	386,492 9 0
31st March, 1922 ..	76,537	13,835	71,852	162,224	14,955 1 5	109,414	338,791	448,205	242,464 18 6	610,429	257,419 19 11
31st March, 1923 ..	83,716	15,700	73,855	173,271	16,228 5 3	119,261	393,682	512,943	323,015 18 8	686,214	339,244 3 11
31st March, 1924 ..	96,338	18,363	86,047	200,748	19,699 5 2	111,124	322,061	433,185	267,717 7 0	633,933	287,416 12 2
31st March, 1925 ..	42,540	13,589	19,928	76,057	7,702 14 4	123,341	362,724	486,065	289,999 8 8	562,122	297,702 3 0
31st March, 1926 ..	88,461	19.197	86,061	193,719	24,699 0 7	146,417	565,326	711,743	445,694 15 10	905,462	470,393 16 5

* The issue of school, factory, friendly-society, and holiday excursion tickets was suspended in connection with staff-saving time-table on 23rd April, 1917.

STATEMENT No. 18.

STATEMENT OF TRAFFIC AND REVENUE FOR EACH STATION FOR THE YEAR ENDED 31ST MARCH, 1926.

Stations.	OUTWARD. Number of Tickets. First-class Single.	First-class Return.	Second-class Single.	Second-class Return.	Total.	Number of Season Tickets.	Cattle and Calves.	Sheep and Pigs.	Timber, Hundreds of Superficial Feet.	Other Goods.	Ordinary Passengers. £ s. d.	Season Tickets. £ s. d.	Parcels, &c. £ s. d.	Luggage, Mails, &c. £ s. d.	Goods. £ s. d.	Miscellaneous. £ s. d.	Total Value forwarded. £ s. d.	INWARD. Cattle and Calves.	Sheep and Pigs.	Timber, Hundreds of Superficial Feet.	Other Goods.	Stations.
NORTH ISLAND MAIN LINES AND BRANCHES—							Number.	Number.		Tons.								Number.	Number.		Tons.	NORTH ISLAND MAIN LINES AND BRANCHES—
Auckland (Coaching) ..	55,156	24,773	209,329	163,044	452,302	21,591	..	..	..	..	277,797 11 3	25,299 0 10	32,625 8 1	12,969 9 1	*Cr.* 369 12 9	2,047 5 8	350,369 2 2	..	..	..	..	Auckland (Coaching).
„ (Goods) ..	..	..	..	..	..	..	485	9,968	66,921	336,053	..	..	..	..	356,772 17 6	5,135 3 7	361,908 1 1	720	2,131	144,229	245,722	„ (Goods).
Newmarket	4,888	4,155	34,840	42,025	85,908	11,104	34	..	3,741	6,203	13,553 3 4	2,503 7 4	832 7 10	170 2 9	15,446 1 6	276 2 3	32,781 5 0	53	..	80,455	24,796	Newmarket.
Mount Eden	1,367	1,017	21,463	32,484	56,331	5,551	57	287	4,114	38,365	5,820 5 9	1,147 16 8	270 18 9	44 19 1	8,042 1 11	450 1 5	15,776 3 7	870	16	82,628	82,027	Mount Eden.
Avondale	541	291	26,426	43,709	70,967	49,798	184	25	1,226	47,337	4,368 19 7	7,048 3 1	560 6 4	21 6 4	9,186 8 8	224 7 6	21,409 11 6	673	659	82,711	16,213	Avondale.
Henderson	640	545	24,777	62,346	88,308	21,596	1,567	10,795	42,711	7,319	7,489 6 11	5,191 0 7	1,102 14 1	20 18 1	9,083 6 6	434 4 2	23,321 10 4	1,161	5,685	16,449	28,528	Henderson.
Helensville	5,373	2,025	18,746	20,778	46,922	520	6,456	41,378	23,196	16,343	9,856 0 4	416 14 11	1,635 9 6	61 18 11	16,617 4 11	429 12 10	29,017 1 5	1,702	10,641	8,263	45,734	Helensville.
Wellsford	743	199	3,858	1,885	6,685	54	3,601	13,213	1,751	2,167	1,986 6 4	36 2 6	599 0 5	12 4 2	4,018 11 2	20 18 11	6,673 3 6	2,165	3,305	2,043	9,328	Wellsford.
Maungaturoto	2,055	606	7,772	3,187	13,620	2	11,655	28,018	5,543	5,605	4,803 9 11	2 0 0	384 3 5	16 6 0	12,077 17 3	480 3 10	17,764 0 5	717	1,285	4,481	63,111	Maungaturoto.
Paparoa	353	54	1,021	501	1,929	2	1,118	3,596	497	501	876 19 4	2 0 0	61 17 11	5 14 3	955 6 6	9 18 0	1,911 16 0	40	1,452	95	1,299	Paparoa.
Waiotira	178	124	2,710	1,713	4,725	..	2,897	17,939	4,054	6,072	1,361 19 8	..	108 10 7	7 4 8	7,471 4 7	153 10 6	9,102 10 0	54	282	689	33,032	Waiotira.
Onerahi	91	10	4,481	3,678	8,260	736	20	42	79	3,197	478 12 3	213 7 6	13 5 1	43 1 3	1,826 16 1	375 12 0	2,950 14 2	36	33	7,396	54,181	Onerahi.
Whangarei	12,857	1,514	51,888	18,227	84,486	941	3,192	17,411	6,189	8,299	22,223 2 11	668 4 5	1,347 1 3	239 16 7	9,583 13 3	708 17 8	34,770 16 1	1,138	6,358	49,973	15,847	Whangarei.
Hikurangi	329	136	4,509	2,204	7,178	210	592	6,957	45,385	149,699	1,596 9 2	174 10 11	539 5 9	7 14 6	38,739 13 6	17 4 6	41,074 18 4	247	1,450	9,836	6,218	Hikurangi.
Otiria	815	199	2,768	1,350	5,132	9	263	4,975	98,913	4,902	1,629 3 7	7 10 0	1,302 6 3	12 12 0	11,818 14 0	15 17 9	14,786 3 7	275	1,906	1,051	6,562	Otiria.
Kawakawa	1,224	444	5,761	1,702	9,131	58	31	86	22,102	7,785	3,140 3 6	21 4 6	437 17 1	14 16 6	666 1 10	8 2 11	4,288 6 4	253	36,804	73,952	4,787	Kawakawa.
Opua	1,763	378	11,279	6,588	20,008	70	7	380	..	3,991	4,290 4 9	16 11 0	113 9 3	12 12 3	2,591 2 10	360 13 3	7,384 13 4	12	48	32,159	7,101	Opua.
Kaikohe	2,007	581	8,712	4,641	15,941	15	1,663	34,632	5,930	1,115	5,373 17 1	17 5 8	304 0 10	22 8 7	4,205 13 5	14 4 7	9,937 10 2	237	1,531	2,632	7,442	Kaikohe.
Remuera	450	218	1,090	556	2,314	2,403	606	253	117	62	103 3 1	1,020 7 0	106 11 3	2 1 3	315 9 6	11 19 0	1,559 11 1	796	510	35,411	3,562	Remuera.
Green Lane	404	336	2,052	4,810	7,602	5,544	..	..	93	140	515 3 0	1,452 14 4	48 14 2	2 11 8	67 19 9	16 7 9	2,103 10 8	7	..	10,638	3,516	Green Lane.
Ellerslie	818	1,109	6,891	9,712	18,530	11,793	585	..	250	472	1,253 7 7	2,411 3 6	1,130 2 11	9 1 0	1,545 17 10	26 6 5	6,375 19 3	613	..	7,186	2,638	Ellerslie.
Penrose	400	492	8,714	7,070	16,676	6,816	1,120	6,422	1,143	102,951	1,088 10 4	1,132 17 9	105 3 7	11 11 0	57,740 19 6	144 13 4	60,223 15 6	57,460	346,970	16,137	54,733	Penrose.
Onehunga Town ..	142	66	5,649	5,224	11,081	10,342	17	..	2,172	2,291	656 17 5	1,608 16 8	197 4 6	12 2 2	825 10 1	23 15 11	3,324 6 9	289	88	26,703	44,367	Onehunga (Town).
Onehunga Wharf ..	..	..	..	..	..	..	2	..	4,658	30,458	..	..	14 1 3	2 18 10	4,921 1 5	689 19 9	5,628 1 3	27	18	2,041	32,459	„ (Wharf).
Otahuhu	802	1,936	16,127	36,437	55,302	18,424	1,691	28,099	114	63,965	4,698 11 5	3,983 9 5	316 18 11	43 14 9	50,613 16 6	568 10 1	60,225 1 1	21,227	107,647	14,856	80,280	Otahuhu.
Papatoetoe	679	1,540	12,089	33,217	47,525	10,997	892	3,934	4,544	3,439	3,848 16 4	3,030 15 0	1,211 6 8	20 18 11	1,888 15 4	8 19 3	10,009 11 6	2,099	6,032	32,316	11,974	Papatoetoe.
Papakura	2,159	4,192	34,369	75,550	116,270	18,492	1,393	31,838	740	3,261	13,366 17 3	4,766 0 9	1,475 11 1	70 15 7	2,485 16 4	147 0 9	22,312 1 9	1,954	19,491	9,370	19,575	Papakura.
Drury	310	428	4,793	8,775	14,306	435	448	13,545	764	6,356	2,096 3 3	416 17 3	972 5 4	14 16 5	4,669 5 3	17 11 10	8,186 19 4	217	2,889	2,606	9,825	Drury.
Waiuku	687	390	7,086	4,287	12,450	17	721	7,563	194	695	3,064 17 0	27 5 4	222 15 1	17 12 11	1,310 15 7	31 17 8	4,675 3 7	256	5,126	8,489	22,486	Waiuku.
Pukekohe	2,362	1,748	21,549	16,536	42,195	978	4,076	16,432	618	13,090	9,946 5 1	428 12 6	998 18 0	109 8 11	14,576 19 3	50 11 3	26,110 15 0	2,471	6,851	12,368	22,761	Pukekohe.
Tuakau	985	759	7,761	7,681	17,186	656	2,637	38,946	2,796	4,834	3,530 9 5	313 0 9	379 10 7	42 19 8	5,744 7 6	38 14 8	10,049 2 7	1,453	15,935	5,394	11,739	Tuakau.
Pokeno	277	212	4,352	3,799	8,640	97	856	6,473	431	579	1,540 18 9	73 2 1	772 15 1	8 4 7	951 5 0	23 12 4	3,369 17 10	438	5,569	1,504	5,401	Pokeno.
Mercer	516	1,255	7,067	5,873	14,711	107	49	466	12,347	37,661	2,919 14 10	95 14 3	218 5 5	25 0 5	11,364 11 3	30 18 8	14,654 4 10	49	1,735	1,270	2,810	Mercer.
Te Kauwhata	326	240	3,332	2,514	6,412	38	4,493	32,577	557	6,106	1,834 2 6	50 5 1	1,269 18 4	11 9 10	5,636 16 9	24 0 3	8,826 12 9	1,058	15,242	3,542	7,793	Te Kauwhata.
Huntly	1,218	933	23,642	21,428	47,221	20,492	701	2,826	1,099	279,122	8,809 4 7	5,071 9 8	927 13 10	65 2 0	168,212 6 10	817 12 2	183,903 9 1	1,126	3,337	4,618	13,153	Huntly.
Glen Afton	27	64	3,723	6,535	10,349	33	987	7,659	47	172,492	1,722 15 5	24 13 0	101 1 0	5 10 1	106,844 9 4	117 2 2	108,815 11 0	299	2,343	3,385	7,480	Glen Afton.
Taupiri	349	203	4,555	2,226	7,333	114	964	9,920	9,427	2,299	1,705 3 6	88 6 8	386 10 1	15 15 11	5,611 11 3	14 10 7	7,821 18 0	914	2,108	4,741	6,934	Taupiri.
Ngaruawahia	778	373	10,403	3,950	15,504	229	2,962	12,484	241	65,223	3,852 3 1	139 8 3	393 16 2	56 5 3	41,942 5 8	670 5 8	47,054 4 1	1,276	4,829	4,542	12,188	Ngaruawahia.
Frankton Junction ..	12,858	5,580	72,314	28,560	119,312	92	7,564	85,651	2,021	14,981	52,161 15 4	391 17 11	1,935 19 8	850 7 6	30,082 12 0	1,001 7 1	86,423 19 6	5,801	72,794	119,987	38,586	Frankton Junction.
Hamilton	6,436	2,656	33,949	10,821	53,862	601	6,302	26,695	7,586	13,928	20,957 9 11	1,646 16 8	4,232 12 5	438 4 9	24,976 1 11	309 12 4	52,560 18 0	1,684	2,331	43,784	45,945	Hamilton.
Cambridge	1,633	403	13,794	6,815	22,645	307	2,226	19,949	1,719	1,629	6,853 13 11	203 17 9	1,686 19 1	110 9 3	4,127 9 10	177 7 7	13,159 17 5	1,549	12,221	16,988	27,797	Cambridge.
Morrinsville	2,121	939	18,479	11,928	33,467	446	5,330	55,763	1,940	8,935	8,309 8 7	284 12 10	1,374 7 2	177 1 11	16,815 4 7	344 12 0	27,305 7 1	3,153	25,067	21,678	53,738	Morrinsville.
Matamata	1,897	759	13,698	8,762	25,116	87	6,000	40,854	6,362	4,235	8,236 7 8	65 5 7	2,247 5 7	87 5 0	12,195 1 4	140 13 1	22,971 18 3	2,638	14,076	12,144	43,455	Matamata.
Putaruru	1,776	548	15,486	6,364	24,174	221	628	15,457	126,067	3,794	8,663 18 2	244 5 5	1,303 1 7	120 9 11	28,757 19 11	166 14 4	39,256 9 4	2,103	23,698	6,474	38,384	Putaruru.
Mamaku	281	793	3,899	5,706	10,679	262	3,971	17,453	149,781	8,929	2,511 1 0	291 2 0	293 6 5	17 13 9	40,959 14 10	9 12 7	44,082 10 7	281	1,131	458	3,770	Mamaku.
Rotorua	7,860	1,397	26,228	12,197	47,682	1,024	7,071	33,702	100	2,785	28,452 8 4	550 13 0	1,450 0 11	365 9 4	10,414 2 7	121 15 2	41,354 9 4	2,001	8,649	13,364	25,421	Rotorua.
Waitoa	186	127	4,921	2,642	7,876	135	2,742	14,427	2,570	6,540	1,617 8 2	93 4 3	200 17 2	16 15 5	10,670 17 5	62 1 0	12,661 3 5	1,147	2,220	4,522	23,185	Waitoa.
Te Aroha	2,915	934	19,656	9,218	32,723	375	938	5,081	565	35,011	9,187 18 10	231 17 7	960 5 10	130 16 10	8,418 11 10	50 0 0	18,979 10 11	1,577	8,976	12,343	13,500	Te Aroha.
Paeroa	2,383	964	25,897	16,310	45,554	656	2,734	15,522	10,036	12,641	9,147 11 2	378 1 3	1,286 13 7	108 9 7	11,661 13 8	37 18 10	22,620 8 1	1,276	6,169	7,290	9,178	Paeroa.
Waihi	1,540	622	14,226	10,456	26,844	1,336	539	2,624	1,082	1,991	7,996 10 3	394 14 3	744 15 11	127 6 7	2,255 1 5	777 15 11	12,296 4 4	1,443	3,006	6,222	21,240	Waihi.
Thames South	1,825	322	11,855	3,088	17,090	442	36	..	234	1,706	5,163 19 8	293 19 4	578 3 7	65 9 10	3,492 13 9	7 11 9	9,601 17 11	361	12	4,444	2,921	Thames South.
Thames	1,137	284	10,386	5,530	17,337	8	19	395	595	1,670	4,213 17 8	59 8 6	504 16 7	54 7 1	3,794 2 11	16 1 2	8,642 13 11	1,999	8,564	2,902	9,149	Thames.
Ohaupo	132	70	2,338	2,062	4,602	49	893	14,418	91	772	728 3 1	39 3 2	814 18 2	9 6 2	2,059 0 11	9 19 6	3,660 11 0	1,185	10,545	1,747	7,756	Ohaupo.
Te Awamutu	2,035	967	15,206	8,212	26,420	294	4,557	32,504	3,202	8,745	9,870 9 3	236 13 5	1,790 16 2	147 12 7	11,816 2 4	94 6 3	23,956 0 0	4,630	25,403	15,192	37,947	Te Awamutu.
Otorohanga	809	385	7,896	5,004	14,094	304	2,292	25,225	29,763	63,997	3,904 6 4	185 3 5	803 9 1	56 19 10	25,841 7 1	105 9 2	30,896 14 11	1,874	15,607	8,217	17,091	Otorohanga.
Te Kuiti	4,297	1,481	34,420	19,165	59,363	623	7,668	87,311	113,133	21,034	18,344 12 0	724 2 9	1,557 17 4	261 5 8	43,320 1 1	259 12 6	64,467 11 4	6,322	53,365	13,063	19,562	Te Kuiti.
Ongarue	199	109	7,454	7,862	15,624	105	1,854	33,498	118,540	4,991	3,495 18 1	73 3 9	300 1 9	19 8 8	35,422 14 6	285 18 5	39,597 5 2	1,871	14,736	3,323	9,569	Ongarue.
Taringamotu	18	22	1,399	1,037	2,476	60	138	14,641	63,309	3,609	187 14 10	32 19 7	98 15 4	1 14 6	19,505 17 11	195 12 8	20,022 14 10	358	865	419	4,338	Taringamotu.
Taumarunui	4,657	2,109	58,619	31,124	96,509	1,002	3,952	64,379	76,315	15,322	28,990 2 1	843 5 7	1,466 3 2	395 2 7	36,457 6 0	1,173 13 0	69,325 12 5	2,755	45,145	5,998	13,880	Taumarunui.
Waimarino	415	61	1,350	873	2,699	41	356	18,530	205,187	8,962	1,232 16 1	36 11 10	385 10 2	24 9 3	60,978 8 7	10 3 10	62,667 19 9	642	4,353	11,469	8,534	Waimarino.
Ohakune	3,297	2,431	29,837	16,920	52,485	49	109	3,470	178,794	13,353	17,081 5 3	198 15 5	498 12 8	201 18 6	52,393 15 4	314 2 0	70,688 9 2	143	902	6,529	3,067	Ohakune.
Raetihi	255	82	3,093	1,205	4,635	28	489	42,848	64,579	4,287	1,216 8 3	37 6 2	297 1 5	8 2 4	22,157 4 11	54 13 8	23,770 16 9	1,242	20,472	2,043	6,088	Raetihi.
Rangataua	402	589	6,715	4,513	12,219	133	279	12,362	62,658	4,931	2,518 2 11	92 19 2	107 16 1	10 11 4	20,247 4 8	139 6 10	23,116 1 0	693	7,754	261	4,561	Rangataua.
Mataroa	360	483	2,471	2,340	5,654	258	1,438	55,797	144,081	3,936	619 14 9	169 8 9	316 8 7	10 5 3	39,390 8 7	69 16 0	40,576 1 11	152	3,648	2,289	3,255	Mataroa.
Taihape	5,634	2,261	23,597	9,108	40,600	156	2,346	70,682	10,834	3,200	17,076 0 4	296 19 2	1,248 12 10	273 16 2	11,210 14 1	100 5 4	30,206 7 11	677	3,078	4,994	13,478	Taihape.
Utiku	341	395	2,667	2,328	5,731	13	529	43,978	30,585	3,667	751 14 3	2 8 9	126 18 4	10 19 3	13,078 15 6	5 0 1	13,975 16 2	456	1,420	16,359	1,635	Utiku.
Mangaweka	704	338	2,259	2,248	5,549	13	1,044	51,802	4	1,451	1,913 3 3	13 5 0	369 19 0	30 19 10	3,966 12 6	4 6 10	6,298 6 5	636	5,038	2,353	3,068	Mangaweka.
Hunterville	1,160	594	8,000	4,436	14,190	88	2,049	99,646	3,395	3,084	4,046 15 11	92 0 2	541 4 8	48 15 6	9,442 13 11	15 3 7	14,186 13 9	1,000	16,449	4,848	7,569	Hunterville.
Marton	7,529	2,783	23,143	10,718	44,173	256	3,105	139,733	6,465	12,896	21,544 13 2	357 10 4	1,121 15 9	432 6 5	17,555 3 6	502 19 8	41,514 8 10	574	57,735	44,213	17,686	**Marton.**
New Plymouth ..	7,586	1,820	31,896	10,828	52,130	323	1,129	6,242	7,483	87,137	25,029 19 3	681 5 3	2,103 13 8	283 3 9	48,314 4 7	5,852 12 0	82,264 18 6	2,407	10,017	38,961	105,129	**New Plymouth.**
New Plym'th (Breakwater)	..	..	..	..	..	..	..	..	..	64,956	..	..	..	..	17,268 11 8	..	17,268 11 8	..	..	35	25,234	**N.P. (Breakwater).**
Waitara	578	179	6,884	3,592	11,233	284	44	2,647	4,006	13,512	2,726 6 11	211 9 0	173 15 0	26 17 3	8,465 14 2	194 7 10	11,798 10 2	12,808	103,664	7,535	18,480	**Waitara.**
Inglewood	910	249	8,401	3,989	13,549	328	3,076	22,470	291	5,192	2,863 16 6	252 9 0	377 19 8	38 1 2	6,064 11 3	135 0 11	9,731 18 6	1,305	15,051	4,155	20,360	**Inglewood.**

STATEMENT No. 18—*continued.*

STATEMENT OF TRAFFIC AND REVENUE FOR EACH STATION FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

Stations.	OUTWARD. Number of Tickets. First-class Single.	First-class Return.	Second-class Single.	Second-class Return.	Total.	Number of Season Tickets.	Cattle and Calves.	Sheep and Pigs.	Timber, Hundreds of Superficial Feet.	Other Goods.	Ordinary Passengers.	Season Tickets.	Parcels, &c.	Luggage, Mails, &c.	Goods.	Miscellaneous.	Total Value forwarded.	INWARD. Cattle and Calves.	Sheep and Pigs.	Timber, Hundreds of Superficial Feet.	Other Goods.	Stations.
NORTH ISLAND MAIN LINES AND BRANCHES—*contd.*							Number	Number.		Tons.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	Number.	Number.		Tons.	NORTH ISLAND MAIN LINES AND BRANCHES—*contd.*
Tariki	137	45	2,079	914	3,175	99	128	2,610	288	1,951	450 1 1	69 12 6	93 9 1	3 6 11	747 2 11	16 3 8	1,379 16 2	158	1,214	1,688	2,659	Tariki.
Midhirst	170	59	2,730	1,323	4,282	387	90	1,728	..	2,330	515 6 8	146 5 9	36 10 1	2 13 11	1,635 11 3	66 16 11	2,403 4 7	114	1,054	1,384	3,140	Midhirst.
Stratford	3,153	1,019	22,055	11,319	37,546	367	3,777	26,108	1,009	7,804	10,822 16 2	341 15 6	954 4 7	151 5 0	9,366 5 3	161 0 9	21,797 7 3	3,147	11,974	9,868	17,571	Stratford.
Te Wera	61	145	910	549	1,668	20	536	9,201	1,103	17,182	234 10 5	16 5 0	424 0 9	4 19 4	4,418 11 4	276 17 7	5,375 4 5	1,276	10,689	972	4,325	Te Wera.
Whangamomona	624	360	6,463	4,963	12,410	28	1,076	20,334	41	488	1,498 2 11	35 12 2	345 12 4	15 16 7	1,763 19 10	289 13 2	3,948 17 0	1,061	3,942	4,056	17,542	Whangamomona.
Eltham	1,529	490	11,223	5,660	18,902	347	1,875	41,235	8,202	12,003	6,257 3 3	324 11 10	881 0 3	87 12 10	12,326 0 11	1,168 12 4	21,045 1 5	1,115	10,779	40,037	18,986	Eltham.
Normanby	122	53	3,017	1,253	4,445	44	402	4,836	..	5,419	581 10 5	31 3 6	58 2 5	6 19 10	4,006 7 5	12 2 4	4,696 5 11	635	3,062	1,013	7,386	Normanby.
Hawera	4,560	1,789	31,404	15,168	52,921	381	7,253	53,642	2,586	14,405	20,023 18 7	445 12 11	1,590 6 2	258 11 8	15,029 3 5	225 3 3	37,572 16 0	5,353	47,834	23,859	40,100	Hawera.
Patea	836	383	6,895	3,442	11,556	208	853	12,824	597	14,477	3,569 5 4	129 16 11	621 19 0	55 11 9	17,452 4 1	319 1 9	22,147 18 10	1,602	44,107	1,941	34,640	Patea.
Waverley	653	258	4,496	2,522	7,929	92	2,340	45,481	30	2,284	2,348 15 2	74 12 3	618 0 2	35 2 10	3,869 1 9	3 3 1	6,948 15 3	1,415	20,579	7,589	8,949	Waverley.
Waitotara	105	97	1,499	1,433	3,134	..	2,354	53,801	12	910	723 0 8	..	515 15 2	7 1 8	3,749 1 0	3 8 7	4,998 7 1	1,269	13,458	1,382	2,894	Waitotara.
Kai Iwi	132	148	1,644	628	2,552	14	1,341	52,238	..	758	320 4 6	8 15 0	440 10 0	4 16 8	2,563 7 2	8 19 8	3,346 13 0	285	4,989	2,610	2,477	Kai Iwi.
Aramoho	2,223	637	10,071	3,287	16,218	60	859	23,000	290	5,434	5,894 3 11	54 5 0	232 9 11	159 15 10	4,202 19 10	80 11 5	10,624 5 11	876	26,454	18,871	11,718	Aramoho.
Wanganui	9,007	3,800	44,991	18,307	76,105	101	2,275	21,716	7,015	19,704	34,616 11 3	872 5 10	3,846 19 7	757 17 3	23,334 13 11	7,779 17 10	71,208 5 8	8,869	367,184	75,446	55,670	Wanganui.
„ (Wharf)	..	..	..	..	..	..	7	..	8,623	39,048	..	..	..	..	24,660 1 4	6,716 0 1	31,376 1 5	161	..	8,642	10,641	„ (Wharf).
Fordell	236	162	2,483	825	3,706	77	1,006	42,696	336	1,796	743 14 1	66 4 4	235 12 9	16 0 5	2,708 3 3	9 4 0	3,778 18 10	871	20,827	2,089	3,361	Fordell.
Turakina	185	102	4,693	1,333	6,313	107	845	42,798	2,626	1,553	1,088 1 4	64 5 8	370 19 7	16 1 1	2,762 13 11	16 6 7	4,318 8 2	225	8,176	1,466	2,835	Turakina.
Greatford	250	115	1,988	1,148	3,501	5	1,225	34,386	87	21,484	869 14 0	4 7 6	194 18 11	18 4 4	9,401 7 10	43 10 1	10,532 2 8	333	10,459	968	2,591	Greatford.
Halcombe	124	115	3,236	3,301	6,776	118	262	25,935	3,830	1,717	1,059 11 11	82 13 6	104 6 7	13 0 3	2,728 3 3	4 7 4	3,992 2 10	112	7,277	1,404	2,301	Halcombe.
Feilding	4,281	1,661	21,178	9,066	36,186	333	11,564	128,799	990	10,809	12,939 2 5	284 3 9	1,306 15 1	283 8 11	24,760 3 4	84 2 5	39,657 15 11	2,994	99,896	15,167	26,120	Feilding.
Palmerston North	22,242	8,269	94,523	49,307	174,341	737	6,388	49,603	3,494	31,159	69,973 6 0	2,124 17 11	5,703 9 0	1,890 1 0	45,302 13 5	703 12 5	125,697 19 9	5,097	116,896	86,521	66,020	Palmerston North.
Ashhurst	951	266	5,377	1,639	8,233	76	894	38,290	16	989	2,042 15 6	68 4 2	106 5 5	29 16 2	2,604 5 1	5 0 9	4,856 7 1	1,407	13,464	971	2,604	Ashhurst.
Longburn	298	263	3,793	5,885	10,239	152	4,658	87,761	250	14,246	1,021 12 9	110 8 11	575 6 6	13 19 7	20,556 8 10	Cr. 202 12 11	22,075 3 8	808	142,047	1,609	6,791	Longburn.
Foxton	457	192	8,221	3,689	12,559	109	333	8,439	2,657	6,659	1,836 12 0	94 6 9	307 11 1	31 7 8	7,168 7 7	445 4 9	9,883 9 10	824	7,805	9,082	20,873	Foxton.
Shannon	793	819	11,414	12,407	25,433	226	1,465	17,711	3,303	8,132	5,516 3 6	184 18 5	285 17 6	70 16 1	12,760 18 6	6 15 8	18,825 9 8	1,131	15,818	7,505	10,231	Shannon.
Levin	2,377	1,353	14,819	8,993	27,542	393	4,275	24,548	3,201	5,315	8,720 6 0	285 17 9	846 10 2	139 9 11	7,307 8 10	50 14 4	17,350 7 0	1,046	21,499	8,886	12,716	Levin.
Otaki	1,916	983	9,890	5,838	18,627	328	1,851	30,530	1,643	6,419	5,509 4 7	214 8 4	2,365 16 11	96 19 6	7,572 11 0	20 0 4	15,779 0 8	769	10,931	3,912	8,530	Otaki.
Packakariki	2,768	4,335	16,235	24,126	47,464	1,209	953	26,338	5,005	17,916	7,594 0 10	553 2 2	1,711 15 6	35 5 8	6,206 9 11	20 2 8	16,120 16 9	708	4,567	6,648	8,364	Packakariki.
Johnsonville	1,510	4,366	12,600	45,613	64,089	17,860	604	16,917	237	291	5,128 15 0	3,442 7 3	276 5 5	16 12 8	906 9 6	20 13 2	9,791 3 0	9,195	48,553	7,297	15,780	Johnsonville.
Thorndon (Coaching)	28,881	27,199	95,750	133,000	284,830	15,068	..	..	..	..	100,721 14 9	5,635 14 2	20,887 3 5	4,868 18 2	Cr. 217 7 2	271 2 1	132,167 5 5	..	..	..	..	Thorndon (Coaching).
Lambton (Coaching)	24,885	56,649	85,870	151,863	319,267	28,646	..	..	..	..	54,378 12 3	10,844 8 7	3,548 13 8	2,715 9 11	Cr. 25 15 4	428 6 4	71,889 15 5	..	..	..	..	Lambton (Coaching).
Wellington (Goods)	..	..	..	..	..	..	814	2,056	55,651	200,329	..	..	..	..	275,731 8 0	2,336 1 4	278,067 9 4	2,357	7,229	83,595	158,713	Wellington (Goods).
„ (Wharf)	..	..	..	..	..	..	..	..	..	151	..	..	..	..	13 12 11	..	13 12 11	..	..	..	21,998	„ (Wharf).
Central Booking-office	15,618	7,725	13,405	13,198	49,946	6,214	..	..	..	..	98,815 11 5	18,429 19 5	4,436 18 11	..	..	77 4 9	121,759 14 6	..	..	..	..	Central Booking-office.
Ngahauranga	130	360	3,433	6,299	10,222	1,971	39	110	..	9,291	385 3 2	417 19 5	25 15 2	2 11 7	2,225 0 3	0 3 0	3,056 12 7	14,468	399,089	1	4,474	Ngahauranga.
Petone	2,370	7,910	22,226	64,694	97,200	54,358	88	1,224	119	16,140	6,354 13 11	9,209 10 5	230 3 1	94 7 1	6,163 12 0	63 0 7	22,115 7 1	14,241	608,682	41,802	14,986	Petone.
Lower Hutt	4,032	7,422	22,691	43,254	77,399	47,797	320	204	178	51,153	5,652 10 0	11,027 8 9	1,141 18 2	128 18 10	14,613 12 4	208 17 0	32,773 5 1	267	420	27,571	22,721	Lower Hutt.
Upper Hutt	2,513	4,701	23,364	51,504	82,082	14,267	738	4,667	2,064	9,861	8,909 2 10	3,571 17 2	1,307 11 9	46 7 10	3,163 15 0	181 18 2	17,180 12 9	925	3,513	2,017	19,510	Upper Hutt.
Featherston	3,110	1,344	6,993	5,605	17,052	320	10,009	156,585	3,660	7,302	5,487 5 5	246 9 0	951 16 9	109 19 10	16,150 15 3	114 15 6	23,061 1 9	773	9,967	11,168	12,393	Featherston.
Greytown	753	429	2,383	1,295	4,860	70	522	12,903	38	2,363	1,675 12 4	53 0 0	262 5 5	24 6 7	2,519 1 4	5 10 3	4,539 15 11	106	1,800	974	3,579	Greytown.
Carterton	2,214	1,214	7,379	3,290	14,097	121	2,535	89,663	619	10,481	4,679 19 9	104 8 9	653 1 1	89 14 4	17,982 3 2	21 15 9	23,531 2 10	1,234	56,917	9,182	12,988	Carterton.
Masterton	8,811	3,626	20,614	9,770	42,821	152	10,607	159,354	4,843	8,158	18,403 17 10	375 15 5	1,518 12 5	320 4 3	21,234 15 1	115 13 1	41,968 18 1	1,385	15,559	27,207	26,746	Masterton.
Mauriceville	208	103	1,232	994	2,537	14	171	15,872	136	9,505	651 7 1	12 8 3	87 13 4	9 2 8	4,518 4 6	14 17 5	5,293 13 3	107	1,433	864	2,575	Mauriceville.
Eketahuna	1,469	505	4,588	2,108	8,670	85	1,479	53,923	1,268	3,130	3,212 1 6	145 8 2	491 1 3	55 14 0	7,107 7 5	25 10 6	11,037 2 10	279	3,799	1,121	4,993	Eketahuna.
Hukanui	127	31	1,176	1,211	2,545	28	178	9,527	447	1,657	534 5 1	22 16 6	206 18 1	9 5 11	1,794 15 9	2 19 10	2,571 1 2	115	2,428	1,194	1,619	Hukanui.
Pahiatua	1,789	443	4,935	2,227	9,394	19	1,629	65,069	347	3,059	3,876 16 2	64 14 7	346 3 8	63 12 7	8,853 15 1	28 14 9	13,233 16 10	552	6,010	9,704	8,226	Pahiatua.
Mangatainoka	182	57	1,227	580	2,046	3	1,821	56,066	16	2,352	740 18 2	1 12 9	212 2 11	14 17 4	8,063 18 5	10 2 1	9,043 11 8	300	2,132	942	2,999	Mangatainoka.
Woodville	2,519	1,162	14,074	7,576	25,331	105	8,688	108,328	2,314	5,715	6,413 4 2	143 10 6	586 17 3	149 4 8	17,414 7 9	113 5 0	24,820 9 4	2,351	13,176	2,879	6,348	Woodville.
Dannevirke	5,711	2,042	27,740	12,925	48,418	317	4,064	114,349	1,849	12,112	16,346 3 2	281 10 5	1,349 10 6	343 14 4	18,653 0 8	206 9 5	37,180 8 6	1,643	15,145	19,866	18,499	Dannevirke.
Ormondville	535	298	3,769	3,476	8,078	122	2,259	81,725	67	3,292	2,023 15 4	87 3 9	121 13 6	34 6 6	7,020 7 5	24 0 1	9,311 16 7	461	8,941	6,845	3,673	Ormondville.
Takapau	861	361	3,481	2,794	7,497	106	2,549	113,051	478	3,142	2,582 4 1	51 4 2	272 11 5	43 2 11	8,258 19 1	10 2 1	11,218 3 9	190	3,346	2,187	3,017	Takapau.
Waipukurau	4,167	1,506	15,921	10,494	32,088	127	15,271	217,876	4,887	3,415	9,359 19 4	110 14 9	678 16 6	145 7 11	18,689 15 7	81 3 2	29,065 17 3	848	6,905	15,916	12,000	Waipukurau.
Waipawa	2,292	824	8,115	5,975	17,206	111	1,198	83,981	1,888	3,715	5,380 2 9	36 5 6	593 16 4	96 2 5	6,532 3 3	36 16 6	12,675 16 9	380	1,026	3,672	6,678	Waipawa.
Otane	475	262	2,722	3,355	6,814	115	9,361	151,666	973	2,897	1,283 17 9	75 12 4	180 17 9	12 11 6	14,857 10 9	4 3 0	16,414 13 1	436	9,474	1,841	5,425	Otane.
Hastings	10,604	10,806	50,337	61,444	133,191	2,341	1,130	43,406	1,266	30,047	33,568 12 3	1,445 12 1	2,962 9 7	523 17 1	36,162 14 5	314 5 8	74,977 11 1	3,998	150,609	21,064	49 999	Hastings.
Clive	203	500	2,540	7,384	10,627	898	249	2,813	57	18,370	794 7 1	250 8 0	104 18 5	8 10 9	7,937 12 1	2 16 1	9,098 12 5	5,556	435,645	4,928	7,424	Clive.
Napier	15,185	12,002	51,994	53,763	132,944	4,323	547	25,299	1,560	11,332	52,517 17 7	2,319 1 5	2,892 19 7	740 17 11	13,522 12 11	665 19 11	72,659 9 4	1,047	10,731	19,295	28,761	Napier.
Port Ahuriri	..	..	..	..	..	..	33	445	4,257	48,049	..	..	89 11 10	..	28,212 5 7	801 6 8	29,103 4 1	257	4,585	13,050	37,640	Port Ahuriri.
Chief Accountant	8,284	4,582	2,928	14,874	30,668	557	..	..	..	..	36,894 5 7	21,619 14 0	..	59,353 11 11	1,153 3 4	23,747 6 3	142,768 1 1	..	..	..	1	Chief Accountant.
Overseas Traffic	..	..	..	..	..	..	65	27	18	1,076	..	..	..	..	8,453 7 7	..	8,453 7 7	65	27	18	1,076	Overseas Traffic.
Totals	399,863	273,631	2,048,831	1,871,093	4,593,418	432,790	280,322	4,098,589	1,954,548	2,659,034	1,464,357 1 8	175,322 4 0	157,980 11 8	93,422 3 1	2,568,212 13 9	75,651 4 0	4,534,945 18 2	280,322	4,098,589	1,954,548	2,659,034	Totals.
KAIHU SECTION—																						KAIHU SECTION—
Dargaville	389	337	12,099	5,770	18,595	16	22	23	302	1,611	1,967 1 1	8 1 10	227 13 11	2 5 6	1,114 13 10	65 13 4	3,385 9 6	4	919	30,973	2,856	Dargaville.
Donnelly's Crossing	62	58	1,128	803	2,051	..	4	919	30,973	2,856	349 17 10	..	427 6 9	1 6 4	3,575 19 9	20 6 4	4,374 17 0	22	23	302	1,611	Donnelly's Crossing.
District Office	..	..	..	163	163	..	..	..	..	..	20 4 0	289 1 6	..	336 0 0	5 9 2	..	650 14 8	..	..	..	..	District Office.
Totals	451	395	13,227	6,736	20,809	16	26	942	31,275	4,467	2,337 2 11	297 3 4	655 0 8	339 11 10	4,696 2 9	85 19 8	8,411 1 2	26	942	31,275	4,467	Totals.
GISBORNE SECTION—																						GISBORNE SECTION—
Gisborne	3,092	636	20,359	7,103	31,190	158	85	3,788	1,531	7,977	6,891 15 8	199 18 3	547 11 6	68 16 11	4,909 0 5	296 7 10	12,913 10 7	350	91,119	49,290	37,215	Gisborne.
Te Karaka	586	286	4,749	1,242	6,863	198	823	106,007	3,617	33,601	782 11 0	106 6 3	852 0 1	7 9 3	11,171 7 4	2 7 4	12,922 1 3	75	7,001	2,983	5,477	Te Karaka.
Motuhora	2,456	695	8,367	3,488	15,006	12	109	13,106	47,753	5,004	3,223 5 5	17 3 2	238 11 9	9 9 4	8,654 14 0	8 10 7	12,151 14 3	592	24,781	628	3,890	Motuhora.
District Office	..	..	..	354	354	1	..	..	..	..	43 9 9	701 1 0	..	840 0 0	..	Cr. 6 15 11	1,577 14 10	..	..	..	..	District Office.
Totals	6,134	1,617	33,475	12,187	53,413	369	1,017	122,901	52,901	46,582	10,941 1 10	1,024 8 8	1,638 3 4	925 15 6	24,735 1 9	300 9 10	39,565 0 11	1,017	122,901	52,901	46,582	Totals.

STATEMENT No. 18—*continued.*

STATEMENT OF TRAFFIC AND REVENUE FOR EACH STATION FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

OUTWARD

Stations.	Number of Tickets. First-class Single.	First-class Return.	Second-class Single.	Second-class Return.	Total.	Number of Season Tickets.	Cattle and Calves.	Sheep and Pigs.	Timber, Hundreds of Superficial Feet.	Other Goods.	Ordinary Passengers.	Season Tickets.	Parcels, &c.	Luggage, Mails, &c.	Goods.	Miscellaneous.	Total Value forwarded.
SOUTH ISLAND MAIN LINES AND BRANCHES—							Number.	Number.		Tons.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Lyttelton	37,975	37,393	40,094	84,503	199,965	13,143	3,187	42,138	73,846	349,504	29,385 1 10	3,447 10 8	1,892 15 1	134 18 8	132,791 12 8	13,302 18 10	180,954 17 9
,, (Wharf) ..	..	..	..	..	..	..	..	..	..	14,063	..	..	..	..	2,528 8 11	..	2,528 8 11
Heathcote	655	3,884	3,010	22,654	30,203	3,501	..	..	..	3,188	1,366 5 1	968 15 9	70 8 4	11 19 11	1,958 18 1	4 12 2	4,380 19 4
Woolston	307	415	2,356	7,690	10,768	2,408	15	..	..	4,479	512 16 11	439 11 5	107 3 10	4 18 8	1,605 4 3	4 4 11	2,674 0 0
Opawa	668	709	1,953	4,312	7,642	3,802	..	..	..	..	503 8 2	552 0 10	25 5 4	7 5 11	*Cr.* 7 3 9	0 0 10	1,080 17 4
Christchurch (Coaching)..	55,492	65,463	131,386	245,117	497,458	27,903	..	..	..	..	122,369 16 1	8,167 5 10	17,837 12 10	6,762 9 11	*Cr.* 163 1 1	585 10 9	155,559 14 4
,, (Goods) ..	..	..	..	..	..	..	1,069	281	16,564	88,512	..	..	..	..	94,937 16 3	4,402 4 1	99,340 0 4
Central Booking-office ..	5,772	8,107	3,725	11,993	29,597	217	..	..	..	..	46,728 19 5	2,032 11 10	1,524 8 2	10 1 0	*Cr.* 1 3 3	25 13 1	50,320 10 3
Addington	362	766	4,371	4,063	9,562	1,846	7,590	359,572	9,880	32,455	1,405 9 9	264 6 9	411 0 4	50 15 10	30,372 6 5	372 0 1	32,875 19 2
Riccarton	483	154	1,710	550	2,897	376	..	..	3,310	5,273	564 5 11	79 5 11	32 10 4	19 10 10	1,850 3 0	5 6 2	2,551 2 2
Papanui	1,339	334	4,936	2,665	9,274	1,806	83	12	740	5,217	1,368 2 5	368 13 11	166 1 4	33 0 7	2,889 4 3	6 1 1	4,831 3 7
Belfast	300	597	4,246	9,398	14,541	469	170	2,032	273	24,479	1,052 7 3	243 9 11	48 8 5	15 13 10	11,834 13 6	17 13 8	13,212 6 7
Kaiapoi	829	816	8,089	13,801	23,535	796	755	12,568	3,946	17,905	3,127 1 9	620 2 7	431 13 11	61 16 8	8,282 13 11	24 15 11	12,548 4 9
Rangiora	2,156	3,217	16,244	26,739	48,356	562	1,632	42,545	1,818	22,893	7,209 2 3	570 12 10	700 10 5	126 8 7	10,796 14 6	59 8 11	19,462 17 6
Cust	33	59	893	808	1,793	93	399	23,879	20	2,598	305 11 8	79 4 0	40 9 6	7 8 7	1,589 16 7	5 18 4	2,028 8 8
Oxford East	142	37	1,566	1,710	3,455	44	1,076	61,704	75	2,570	912 17 3	59 15 0	346 19 3	15 8 0	2,954 7 5	0 15 1	4,290 2 0
Sefton	93	55	1,237	1,415	2,800	87	474	8,413	6	4,465	371 1 9	63 18 6	124 8 0	7 6 6	2,035 3 6	3 13 7	2,605 11 10
Amberley	639	319	1,773	1,252	3,983	84	312	54,924	99	2,102	1,015 1 6	74 16 9	220 13 5	24 2 10	2,670 0 8	12 19 1	4,017 14 3
Waipara	885	481	2,704	990	5,060	18	1,759	136,972	30	2,664	1,912 4 5	21 2 0	297 7 8	16 6 11	7,048 6 11	9 8 4	9,304 16 3
Mina	226	97	733	282	1,338	1	1,426	67,052	15	1,711	760 9 9	0 12 6	271 10 5	9 2 6	4,668 9 0	52 17 4	5,763 1 6
Parnassus	343	332	869	649	2,193	1	1,257	50,939	6	958	573 10 7	0 12 6	388 7 5	10 14 6	4,325 1 5	44 15 0	5,343 1 5
Waikari	534	314	2,427	2,308	5,583	12	241	32,036	63	1,601	1,347 5 9	13 5 0	114 4 2	21 4 9	2,115 2 2	31 3 1	3,642 4 11
Hawarden	356	110	1,154	514	2,134	11	882	88,563	32	5,584	720 12 4	10 9 9	212 8 10	12 12 0	6,852 12 8	16 15 2	7,825 10 9
Culverden	590	54	1,915	265	2,824	4	1,972	72,722	1,052	2,824	1,292 16 2	3 2 6	313 18 11	27 16 7	6,593 3 10	69 6 3	8,300 4 3
Waiau	245	44	937	298	1,524	..	1,030	60,435	..	1,137	822 5 9	..	140 10 9	11 15 2	4,411 9 9	13 7 5	5,399 8 10
Hornby	151	207	1,648	974	2,980	130	688	5,846	71	51,831	718 18 1	89 15 8	998 16 6	8 1 9	26,452 4 0	9 6 8	28,277 2 8
Prebbleton	62	26	818	1,776	2,682	66	8	684	1	7,870	239 12 0	53 6 7	24 2 9	2 7 8	2,362 14 4	0 1 0	2,682 4 4
Lincoln	168	76	1,314	1,269	2,827	75	1,428	42,356	20	11,913	433 6 3	62 0 11	160 11 0	10 7 1	4,022 15 0	2 18 10	4,691 19 1
Springston	37	17	677	707	1,438	42	693	28,026	..	8,786	154 5 0	31 11 5	168 3 9	2 19 6	3,611 13 2	3 7 5	3,972 0 3
Leeston	209	167	1,208	1,084	2,668	70	640	15,880	..	5,380	705 12 4	59 18 10	493 13 7	14 12 9	2,647 5 3	7 5 2	3,928 7 11
Southbridge	275	175	3,313	3,008	6,771	38	882	26,920	..	8,513	939 0 4	32 8 7	521 1 11	13 15 10	4,506 11 6	16 15 2	6,029 13 4
Little River	386	296	2,906	2,631	6,219	28	4,273	108,462	17	3,392	1,354 7 0	24 7 6	460 15 3	10 14 6	4,653 3 10	38 13 9	6,542 1 10
Islington	222	113	2,517	4,751	7,603	200	31	1,478	314	17,341	631 13 11	130 13 5	79 5 7	4 6 5	7,170 19 10	16 13 2	8,033 12 4
Templeton	70	55	680	1,094	1,899	40	18	1,469	20	2,383	169 17 0	25 11 0	28 14 7	1 13 3	635 16 4	0 6 11	861 19 1
Rolleston	233	347	2,944	3,553	7,077	46	939	31,513	1,520	6,188	1,171 15 7	39 17 9	133 4 7	10 10 9	3,320 17 9	1 18 9	4,678 5 2
Kirwee	109	86	1,127	1,279	2,601	25	473	20,329	27	3,479	569 5 7	23 2 6	58 3 6	8 14 9	1,966 18 6	5 4 9	2,631 9 7
Darfield	396	262	3,144	3,009	6,811	61	436	63,845	2,434	8,862	1,693 18 7	50 5 7	149 10 5	24 6 6	5,655 16 0	18 16 9	7,592 13 10
Coalgate	154	104	1,339	1,433	3,036	33	677	55,044	4	8,531	649 13 5	30 2 10	237 18 9	12 2 9	5,820 11 6	134 0 5	6,884 9 8
Sheffield	115	108	793	1,022	2,038	62	530	30,513	..	2,787	570 2 6	74 17 10	305 18 0	9 4 2	2,308 7 8	4 3 6	3,272 13 8
Springfield	379	334	2,355	1,702	4,770	50	499	12,529	119	4,211	1,250 2 3	40 17 6	448 4 11	45 7 8	3,476 3 1	29 2 7	5,289 18 0
Arthur's Pass	259	63	564	310	1,196	..	4	2,357	30	351	392 11 3	..	19 1 1	5 3 8	435 3 2	56 1 2	908 0 4
Otira	866	526	6,560	4,325	12,277	35	499	3,380	47,390	1,107	2,816 17 1	31 17 6	468 10 0	20 17 1	12,322 11 1	21 7 9	15,682 0 6
Moana	165	163	2,068	973	3,369	36	407	907	144,610	1,782	802 17 2	51 10 11	333 0 11	9 11 1	24,693 11 3	6 7 0	25,896 18 4
Stillwater	356	589	3,500	5,224	9,669	209	59	21	62,648	17,269	1,390 2 0	100 19 4	120 18 4	13 0 1	18,329 11 1	2 13 8	19,957 4 6
Ngahere	327	345	3,760	3,716	8,148	207	1,287	8,463	92,500	2,699	1,465 6 1	78 5 3	200 5 4	21 19 2	14,949 8 11	2 8 3	16,717 13 0
Blackball	100	137	2,733	3,410	6,380	90	2	..	1,442	113,704	1,055 13 8	65 19 9	45 2 6	4 19 2	33,073 13 3	2 14 8	34,248 3 0
Ikamatua	260	184	1,570	1,069	3,083	81	385	6,073	13,843	3,475	1,011 7 5	72 14 2	219 7 3	14 17 5	5,186 8 9	14 1 3	6,518 16 3
Reefton	2,550	809	9,804	4,401	17,564	85	784	7,231	49,639	37,964	6,494 19 0	53 19 7	467 11 8	84 13 7	34,913 16 1	351 17 6	42,366 17 5
Greymouth	7,238	3,505	48,108	35,170	94,021	3,461	652	1,412	23,852	14,701	21,979 6 10	1,664 6 8	2,296 19 6	521 19 4	15,727 0 8	7,135 8 10	49,325 1 10
,, (Wharf) ..	..	..	..	..	..	..	1	124	116	3,938	..	..	..	..	3,816 18 5	..	3,816 18 5
Runanga	33	125	6,698	17,816	24,672	1,919	7	..	1,156	66,054	1,628 13 1	551 11 9	45 13 5	8 19 11	27,120 4 11	19 19 7	29,375 2 8
Rewanui	1	30	1,318	2,250	3,599	9,299	4	..	..	104,234	294 15 9	1,624 15 6	3 17 11	0 13 6	30,963 9 10	206 5 0	33,093 17 6
Kumara	383	296	2,706	1,885	5,270	108	1,089	3,982	135,252	2,454	861 12 4	87 15 0	91 1 9	16 6 8	20,351 17 7	9 8 4	21,418 1 8
Hokitika	2,885	1,461	12,689	8,215	25,250	97	131	1,343	160,489	3,264	8,250 11 5	107 5 11	610 10 10	122 5 1	30,095 4 7	224 0 2	39,409 18 0
Ross	262	285	3,071	5,532	9,150	21	801	9,998	66,241	1,918	1,243 6 6	15 5 0	192 14 7	21 0 8	14,962 0 10	71 3 7	16,505 11 2
Dunsandel	187	181	2,229	2,789	5,386	100	431	36,263	151	5,732	1,528 13 9	87 2 11	233 16 4	22 4 10	3,643 16 11	15 9 3	5,531 4 0
Rakaia	601	815	4,868	6,185	12,469	285	861	82,278	4,219	16,533	3,775 3 6	267 9 8	472 18 2	51 10 11	12,372 3 8	21 6 6	16,960 12 5
Methven	16	65	3,227	2,625	5,933	14	520	116,274	..	7,257	1,636 15 1	54 14 3	158 14 6	21 17 8	9,064 10 1	22 1 1	10,958 12 8
Chertsey	90	161	1,200	1,257	2,708	62	1,546	42,648	906	8,624	566 1 11	59 3 11	129 17 11	5 19 6	10,355 15 5	2 13 11	11,119 12 7
Ashburton	3,914	2,527	23,212	23,285	52,938	673	604	4,591	6,066	20,460	18,954 13 3	646 19 5	1,488 0 11	373 12 8	14,605 4 10	256 11 8	36,325 2 9
Tinwald	79	74	1,702	1,326	3,181	200	1,194	96,530	2,835	13,935	211 4 4	161 16 3	167 9 1	4 6 8	11,209 19 2	5 6 8	11,760 2 2
Mount Somers ..	78	30	428	411	947	46	390	16,410	3	3,999	319 5 9	35 7 6	133 5 0	9 1 5	2,725 19 0	5 0 9	3,227 19 5
Hinds	78	90	1,439	1,822	3,429	152	312	74,081	13	7,232	640 18 6	110 0 0	85 18 6	9 7 6	5,678 9 8	18 2 10	6,542 17 0
Rangitata	77	28	658	1,006	1,769	40	209	34,966	735	2,519	389 12 1	26 16 0	60 11 4	7 12 5	2,060 0 0	4 11 9	2,549 3 7
Orari	1,071	586	4,076	3,684	9,417	119	838	63,393	329	3,614	3,808 11 1	116 7 10	402 4 7	67 19 7	3,512 4 3	34 13 8	7,942 1 0
Winchester	124	178	1,092	1,812	3,206	100	406	7,147	163	3,856	624 19 2	70 12 6	76 10 8	8 4 5	1,914 9 4	1 6 7	2,696 2 8
Temuka	1,182	768	7,431	8,596	17,977	110	2,452	18,522	420	9,383	6,045 15 1	99 2 6	369 14 4	113 16 10	6,426 6 2	33 5 2	13,088 0 1
Washdyke	79	33	1,195	914	2,221	53	502	8,702	313	15,311	247 15 8	35 10 0	415 19 3	1 19 3	6,256 6 4	2 17 0	6,960 7 6
Pleasant Point..	205	89	1,981	1,798	4,073	32	327	60,260	70	7,579	751 17 8	26 5 0	125 17 6	16 5 6	5,004 13 0	16 19 6	5,941 18 2
Albury	97	91	1,427	1,084	2,699	42	248	38,046	92	1,887	687 9 5	38 18 2	72 14 4	11 10 9	2,048 17 0	19 7 1	2,878 16 9
Fairlie	807	361	4,734	3,143	9,045	15	449	53,332	..	2,631	2,298 16 10	17 0 6	357 10 1	37 4 7	4,138 16 10	32 2 9	6,881 11 7
Timaru	10,085	5,142	43,345	32,073	90,645	2,032	611	7,781	17,054	75,425	37,627 5 10	719 17 8	2,692 17 4	759 14 4	41,602 15 5	4,145 17 1	87,548 7 8
,, (Wharf) ..	..	..	..	..	..	..	..	..	..	58,398	..	..	..	..	8,586 5 6	..	8,586 5 6
St. Andrew's	117	49	2,673	2,422	5,261	178	770	17,543	304	11,537	780 14 0	135 4 6	72 0 10	13 3 5	4,761 18 8	21 4 8	5,784 6 1
Makikihi	66	88	1,273	1,036	2,463	22	316	18,155	30	4,307	468 7 7	14 12 6	41 3 11	7 3 3	2,154 17 11	5 15 10	2,692 1 0
Studholme	754	462	2,859	2,594	6,669	100	839	23,714	..	7,305	1,603 14 0	89 14 0	108 10 5	31 2 5	4,212 6 1	10 10 2	6,055 17 1
Waimate	1,988	1,231	8,165	8,188	19,572	121	1,134	56,778	266	7,415	6,792 1 7	83 10 8	888 1 7	128 6 5	7,592 13 4	40 18 4	15,525 11 11
Morven	80	47	890	985	2,002	53	141	34,443	..	7,931	522 6 3	42 2 4	62 13 6	6 11 0	4,894 13 4	23 16 7	5,552 3 0
Glenavy	56	48	1,133	986	2,223	70	170	12,689	52	2,651	500 2 5	37 1 7	113 2 5	8 9 9	1,651 11 8	11 6 4	2,321 14 2
Pukeuri Junction ..	39	72	1,085	472	1,668	28	494	29,408	17	10,669	194 1 8	21 11 3	209 12 0	4 14 8	6,755 12 3	2 15 3	7,188 7 1
Duntroon	43	27	582	385	1,037	99	441	45,198	32	2,302	272 12 6	74 5 0	213 6 10	4 11 1	3,275 3 4	2 6 4	3,842 5 1
Kurow	261	131	2,332	1,635	4,359	18	417	33,953	12	3,756	927 7 9	13 17 6	300 5 2	27 6 11	5,020 0 4	29 2 2	6,317 19 10
Oamaru	4,292	2,726	23,218	18,597	48,833	230	515	21,977	2,483	23,896	20,259 1 5	241 9 1	2,141 2 3	539 18 6	11,705 16 11	925 16 6	35,813 4 8
Breakwater	..	..	..	..	..	..	..	..	3,333	13,177	..	..	..	..	3,260 15 2	1,058 9 9	4,319 4 11
Waiareka Junction ..	27	30	488	364	909	2	275	24,075	2	13,896	141 15 5	0 12 9	126 14 8	0 18 1	8,086 7 9	32 0 7	8,388 9 3
Ngapara	54	39	1,691	1,202	2,986	38	369	4,959	..	5,502	150 1 1	25 10 0	40 12 5	2 0 7	2,702 14 0	0 12 9	2,921 10 10
Maheno	43	21	1,601	937	2,602	71	1,497	14,858	51	5,652	412 3 4	51 10 0	469 7 6	7 9 2	4,011 16 9	6 14 1	4,959 0 10
Herbert	35	58	772	678	1,543	51	66	5,324	..	887	297 6 11	46 0 0	49 3 4	4 3 6	759 7 11	0 6 7	1,156 8 3
Hampden	207	134	1,697	1,033	3,071	43	597	18,841	49	7,647	737 8 9	23 0 11	219 6 0	13 4 10	4,331 12 10	29 0 7	5,353 13 11
Palmerston	1,361	1,097	10,607	10,034	23,099	181	543	41,737	25	13,381	4,886 12 8	165 19 4	626 15 3	58 4 0	8,010 12 1	77 18 11	13,826 2 3
Makaraeo	..	..	..	..	..	..	..	..	..	12,370	..	..	..	..	4,489 2 6	..	4,489 2 6
Waikouaiti	287	325	2,132	2,290	5,034	113	1,079	24,402	20	909	1,120 19 0	159 3 5	248 3 10	19 3 10	2,175 12 6	3 7 9	3,726 10 4
Seacliff	468	678	3,392	7,139	11,677	358	188	1,207	2	679	2,103 7 10	134 11 8	185 6 4	7 16 3	749 13 9	2 5 10	3,183 1 8
Waitati	447	539	3,940	7,940	12,866	187	175	1,006	3	816	1,502 0 3	172 9 9	574 9 10	8 12 11	444 5 1	1 3 5	2,703 1 3
Port Chalmers Upper ..	202	674	1,751	5,063	7,690	98	107	1,241	..	141	1,291 14 10	35 13 6	241 14 7	18 19 9	129 19 3	*Cr.* 0 3 0	1,717 18 11
Sawyer's Bay	371	1,673	4,465	17,166	23,675	4,564	57	311	..	66	1,292 8 2	997 3 8	27 5 9	7 4 0	56 19 10	3 13 0	2,384 14 5
Port Chalmers	2,181	11,761	15,080	56,660	85,682	12,393	15	5	604	45,557	6,318 17 0	3,709 18 0	255 19 1	31 13 4	16,340 13 1	1,097 14 10	27,754 15 4
Burke's	353	1,464	1,119	6,054	8,990	2,319	..	..	..	..	374 8 10	733 1 8	6 13 9	2 6 1	*Cr.* 0 6 3	0 3 6	1,116 7 7

INWARD.

Cattle and Calves.	Sheep and Pigs.	Timber, Hundreds of Superficial Feet.	Other Goods.	Stations.
Number.	Number.		Tons.	SOUTH ISLAND MAIN LINES AND BRANCHES—
1,499	9,782	8,212	206,267	Lyttelton.
1	..	..	39,751	,, (Wharf).
2	15	697	7,038	Heathcote.
20	49	1,162	14,093	Woolston.
..	..	..	3	Opawa.
..	..	..	..	Christchurch (Coaching).
1,042	460	209,706	329,683	,, (Goods).
..	..	..	..	Central Booking-office.
27,079	546,871	95,127	76,590	Addington.
..	..	55,721	21,372	Riccarton.
685	165	10,950	7,322	Papanui.
909	532,844	6,621	9,901	Belfast.
851	170,512	3,884	8,439	Kaiapoi.
1,141	21,008	10,317	11,735	Rangiora.
189	9,328	773	3,553	Cust.
261	21,469	3,015	5,546	Oxford East.
271	5,151	526	2,061	Sefton.
223	25,319	1,592	2,289	Amberley.
294	12,198	758	716	Waipara.
391	10,608	3,561	4,729	Mina.
520	11,460	784	2,047	Parnassus.
80	4,906	1,331	1,908	Waikari.
216	8,411	1,104	2,319	Hawarden.
652	12,072	4,032	4,971	Culverden.
294	7,772	1,539	2,359	Waiau.
2,143	15,305	1,065	25,399	Hornby.
46	767	26	2,150	Prebbleton.
161	4,184	660	4,792	Lincoln.
35	2,293	222	1,894	Springston.
488	23,862	2,754	5,668	Leeston.
175	9,582	1,892	2,538	Southbridge.
1,372	30,762	2,903	3,391	Little River.
2,352	373,741	6,452	10,704	Islington.
37	804	1,015	854	Templeton.
1,427	12,145	978	3,153	Rolleston.
82	18,026	409	2,369	Kirwee.
147	7,617	1,796	2,395	Darfield.
329	11,010	4,970	10,711	Coalgate.
127	15,425	409	2,558	Sheffield.
691	9,824	761	2,069	Springfield.
46	2,109	359	474	Arthur's Pass.
218	760	531	3,431	Otira.
339	1,513	336	2,275	Moana.
78	366	2,281	5,866	Stillwater.
107	2,486	617	1,897	Ngahere.
1	70	834	3,013	Blackball.
829	2,044	3,296	6,100	Ikamatua.
1,266	4,091	4,358	4,950	Reefton.
1,992	8,125	18,971	23,782	Greymouth.
..	..	392,796	203,733	,, (Wharf).
26	4	559	2,736	Runanga.
109	1,098	1,429	3,655	Kumara.
460	3,673	1,607	13,100	Hokitika.
111	307	820	4,247	Ross.
177	26,236	1,293	3,642	Dunsandel.
205	29,416	1,559	4,460	Rakaia.
345	45,870	3,348	9,128	Methven.
176	54,900	718	1,417	Chertsey.
786	37,605	20,721	28,631	Ashburton.
373	30,082	804	3,363	Tinwald.
209	11,932	1,807	4,928	Mount Somers.
196	20,939	2,208	4,107	Hinds.
49	12,234	809	1,575	Rangitata.
155	9,700	4,307	5,148	Orari.
164	2,124	415	2,472	Winchester.
210	15,179	7,066	10,937	Temuka.
1,194	151,341	1,999	4,063	Washdyke.
298	15,078	685	3,827	Pleasant Point.
119	3,192	577	3,075	Albury.
214	2,893	2,879	6,375	Fairlie.
613	196,520	29,517	160,402	Timaru.
..	..	..	38,567	,, (Wharf).
395	104,455	1,966	5,261	St. Andrew's.
61	4,904	1,907	2,115	Makikihi.
214	8,580	1,106	2,178	Studholme.
307	3,502	8,575	13,813	Waimate.
85	4,399	582	2,065	Morven.
117	4,421	962	2,815	Glenavy.
836	123,714	709	3,602	Pukeuri Junction.
91	6,358	1,036	3,273	Duntroon.
158	5,606	3,092	6,094	Kurow.
903	8,984	17,978	50,301	Oamaru.
1	150	..	24,202	Breakwater.
252	14,567	144	3,925	Waiareka Junction.
179	3,166	2,719	7,832	Ngapara.
152	9,755	1,545	4,686	Maheno.
8	1,660	211	1,488	Herbert.
213	5,980	921	3,233	Hampden.
559	6,051	4,082	8,159	Palmerston.
..	..	30	3,673	Makaraeo.
393	6,629	2,241	3,816	Waikouaiti.
220	1,588	1,663	5,876	Seacliff.
126	1,629	1,218	2,823	Waitati.
1	169	..	13	Port Chalmers Upper.
68	316	948	3,442	Sawyer's Bay.
7	589	6,650	46,508	Port Chalmers.
..	..	..	..	Burke's.

STATEMENT No. 18—*continued.*

STATEMENT OF TRAFFIC AND REVENUE FOR EACH STATION FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

Stations.	OUTWARD. Number of Tickets. First-class Single.	First-class Return.	Second-class Single.	Second-class Return.	Total.	Number of Season Tickets.	Cattle and Calves.	Sheep and Pigs.	Timber, Hundreds of Superficial Feet.	Other Goods.	Ordinary Passengers.	Season Tickets.	Parcels, &c.	Luggage, Mails, &c.	Goods.	Miscellaneous.	Total Value forwarded.	INWARD. Cattle and Calves.	Sheep and Pigs.	Timber, Hundreds of Superficial Feet.	Other Goods.	Stations.
SOUTH ISLAND MAIN LINES AND BRANCHES—*contd.*							Number.	Number.		Tons.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	Number.	Number.		Tons.	SOUTH ISLAND MAIN LINES AND BRANCHES—*contd.*
Ravensbourne	1,972	6,100	4,844	19,135	32,051	6,082	..	..	..	13	999 11 3	1,782 15 3	17 12 10	10 14 8	*Cr.* 7 13 5	2 14 3	2,805 14 10	..	..	788	2,020	Ravensbourne.
Pelichet Bay	33	173	275	824	1,305	163	..	..	31	787	81 3 1	19 5 5	1 8 5	0 7 3	102 11 0	16 1 10	220 17 0	..	..	903	3,540	Pelichet Bay.
Dunedin (Coaching)	32,448	41,761	112,209	213,593	400,011	14,654	..	..	..	..	134,916 11 9	10,977 13 9	17,775 5 10	4,851 10 4	*Cr.* 186 16 5	530 8 6	168,864 13 9	..	..	..	..	Dunedin (Coaching).
,, (Goods)	..	..	..	..	..	..	1,194	991	37,796	133,362	..	..	..	..	168,106 12 9	2,073 4 4	170,179 17 1	1,209	1,595	131,463	302,081	,, (Goods).
Exhibition Booking-office	1,204	194	1,046	282	2,726	2	..	..	..	..	3,445 4 6	20 0 0	..	..	..	1 5 9	3,466 10 3	..	..	..	..	Exhibition Booking-office
Caversham	603	672	4,695	8,474	14,444	1,790	..	..	31	999	1,788 11 8	255 19 8	117 13 8	24 13 0	871 13 6	2 7 5	3,060 18 11	15	..	2,041	6,698	Caversham.
Burnside	442	964	4,770	10,972	17,148	3,238	3,040	39,653	29	39,947	681 9 3	660 9 2	49 9 5	5 7 3	20,612 5 11	76 12 10	22,085 13 10	19,987	294,199	3,168	21,330	Burnside.
Green Island	709	4,556	4,039	24,565	33,869	6,617	..	..	..	42,007	1,504 11 2	1,732 12 11	24 5 4	8 11 0	6,644 17 0	1 12 1	9,916 9 6	..	..	618	10,524	Green Island.
Abbotsford	411	2,983	4,086	25,687	33,167	7,811	..	..	..	6,020	1,804 4 2	1,659 16 8	18 7 2	11 10 10	1,228 7 6	43 10 3	4,765 16 7	1	..	207	2,389	Abbotsford.
Wingatui	350	1,302	3,740	11,860	17,252	1,789	452	11,255	1	7,725	1,517 14 9	578 10 9	367 0 3	15 15 3	3,906 17 6	1 19 6	6,387 18 0	413	2,497	684	1,559	Wingatui.
Middlemarch	601	305	1,421	1,285	3,612	22	1,353	42,152	40	3,225	981 0 6	14 10 0	631 18 2	10 17 11	5,574 16 1	11 18 10	7,225 1 6	332	7,949	1,352	3,721	Middlemarch.
Waipiata	398	201	1,069	639	2,307	..	343	22,183	25	944	1,063 14 8	..	113 13 8	7 8 1	2,704 2 2	24 9 5	3,913 8 0	193	3,384	2,945	3,888	Waipiata.
Ranfurly	745	413	1,561	1,027	3,746	10	278	31,031	103	2,675	1,879 6 1	7 14 11	340 7 9	12 10 1	4,588 8 3	16 12 3	6,844 19 4	125	1,392	2,220	3,657	Ranfurly.
Oturehua	128	88	563	371	1,150	37	712	42,448	82	2,782	599 4 9	30 19 6	218 3 10	5 7 7	6,225 10 11	9 16 11	7,089 3 6	31	4,644	1,266	1,309	Oturehua.
Omakau	486	259	1,291	599	2,635	..	391	28,055	68	1,814	1,383 11 0	..	277 1 10	9 0 10	4,198 11 7	12 13 8	5,880 18 11	208	3,474	2,605	4,003	Omakau.
Alexandra	719	358	1,613	682	3,372	21	39	3,685	91	2,167	1,967 7 9	76 15 0	266 6 4	16 5 6	3,587 10 11	10 8 4	5,924 13 10	190	2,960	2,172	3,966	Alexandra.
Clyde	463	242	860	500	2,065	113	11	1,105	183	1,049	1,024 10 9	89 17 3	200 14 8	9 7 11	1,773 3 6	9 16 10	3,107 10 11	59	669	1,302	1,913	Clyde.
Cromwell	1,160	413	2,591	1,314	5,478	24	802	14,967	12	5,295	3,732 14 1	13 12 6	316 13 1	37 12 8	8,914 13 0	22 14 0	13,037 19 4	163	5,186	5,799	5,669	Cromwell.
Mosgiel	1,464	5,284	12,141	47,755	66,644	9,319	931	6,526	23	15,597	6,721 1 4	2,887 0 7	1,018 1 5	145 7 3	3,686 16 11	21 11 11	14,479 19 5	1,015	3,520	2,268	2,260	Mosgiel.
Outram	235	39	5,604	2,979	8,857	354	176	2,862	23	2,297	941 10 5	189 2 7	125 3 9	12 0 6	892 19 0	4 13 7	2,165 9 10	333	3,424	2,006	9,307	Outram.
Allanton	224	384	4,636	7,604	12,848	63	720	11,047	24	4,317	1,733 15 6	45 3 9	351 13 10	7 4 5	1,960 19 7	15 16 6	4,114 13 7	1,250	5,977	1,087	3,952	Allanton.
Milburn	42	65	1,135	1,031	2,273	104	197	10,568	118	51,766	334 8 7	45 8 9	47 4 11	3 3 2	17,237 7 7	272 9 0	17,940 2 0	270	2,322	2,482	18,616	Milburn.
Milton	1,300	1,458	6,985	10,775	20,518	141	840	24,841	560	15,149	6,012 11 9	128 10 11	507 9 7	74 4 3	8,683 10 2	119 15 7	15,526 2 3	573	8,428	4,700	12,844	Milton.
Waitahuna	110	48	630	1,002	1,790	10	230	11,816	5	648	399 9 4	21 13 11	108 17 9	7 16 8	902 9 9	9 14 1	1,450 1 6	41	2,625	1,014	2,580	Waitahuna.
Lawrence	950	661	3,555	4,263	9,429	9	198	16,157	131	1,193	2,404 7 2	11 4 5	419 18 9	32 2 5	1,933 16 6	17 15 7	4,819 4 10	159	2,624	986	4,208	Lawrence.
Beaumont	263	48	1,050	278	1,639	..	164	351	58	471	576 7 4	..	120 13 5	13 4 9	493 10 8	657 15 1	1,861 11 3	15	1,800	1,183	3,402	Beaumont.
Miller's Flat	152	71	607	512	1,342	..	88	7,404	24	4,034	484 16 2	..	83 11 2	9 13 10	5,883 6 7	111 18 3	6,573 6 0	91	822	5,865	5,186	Miller's Flat.
Lovell's Flat	59	143	687	973	1,862	41	170	12,543	57	33,158	326 17 8	40 19 5	47 0 1	2 17 7	13,100 18 2	346 1 7	13,864 14 6	137	4,421	1,785	2,093	Lovell's Flat.
Stirling	319	274	4,586	4,614	9,793	139	4,396	5,644	28	88,906	1,830 11 8	176 8 9	247 11 6	13 13 9	43,623 15 0	702 1 1	46,594 1 9	1,452	2,624	3,746	5,778	Stirling.
Balclutha	1,978	1,887	15,532	13,053	32,450	131	1,750	53,242	1,405	9,184	11,568 9 9	302 12 1	1,088 2 10	117 15 6	11,069 1 6	61 3 0	24,207 4 8	1,603	38,680	7,125	13,256	Balclutha.
Owaka	229	124	3,313	2,758	6,424	20	768	15,869	66,430	7,324	1,952 3 9	23 9 2	447 18 5	28 11 6	18,867 13 4	8 19 6	21,328 15 8	712	55,610	2,209	10,453	Owaka.
Tahakopa	135	156	3,852	7,125	11,268	..	236	1,442	44,570	1,631	1,865 5 1	..	146 12 8	17 17 5	10,174 9 4	87 9 3	12,291 13 9	205	3,433	113	2,615	Tahakopa.
Waiwera	90	62	719	546	1,417	9	478	23,448	51	1,607	450 13 10	7 15 0	356 16 2	5 3 10	2,183 15 2	2 4 0	3,006 8 0	91	2,576	669	6,456	Waiwera.
Clinton	387	451	7,689	7,290	15,817	26	535	26,671	42	2,084	3,660 16 4	31 7 7	114 16 2	22 15 8	2,895 11 5	16 5 7	6,741 12 9	127	6,524	1,347	5,715	Clinton.
Waipahi	150	147	1,153	1,846	3,296	12	874	48,860	65	4,035	950 4 4	10 6 8	158 19 10	9 8 1	5,623 11 0	2 4 2	6,754 14 1	383	4,515	2,796	12,196	Waipahi.
Tapanui	247	180	1,367	735	2,529	2	138	6,759	105	538	1,041 3 4	2 0 0	148 4 7	18 7 6	1,110 0 1	7 2 1	2,326 17 7	100	1,303	1,459	5,346	Tapanui.
Kelso	54	44	576	539	1,213	2	272	13,099	50	962	412 19 11	2 10 0	63 6 1	5 6 9	1,756 3 8	4 1 11	2,244 8 4	123	2,382	553	3,421	Kelso.
Heriot	176	110	1,509	1,076	2,871	23	754	41,862	981	1,675	1,124 17 11	24 1 11	204 16 4	17 1 11	5,051 16 5	11 8 4	6,434 2 10	154	3,376	1,214	4,916	Heriot.
Gore	2,975	2,566	24,720	20,430	50,691	713	1,785	36,079	2,318	24,773	17,701 8 9	571 13 9	1,533 13 11	276 7 6	15,176 13 11	230 14 5	35,490 12 3	1,390	8,143	11,464	30,613	Gore.
Riversdale	211	266	2,232	2,565	5,274	90	1,175	46,978	52	5,123	1,401 12 0	67 19 5	275 0 4	26 3 3	6,464 2 1	20 15 3	8,255 12 4	278	6,864	5,203	16,927	Riversdale.
Mataura	440	318	7,269	10,071	18,098	461	569	6,023	3,392	21,970	4,182 18 9	293 13 4	264 9 2	43 16 10	16,128 15 0	23 14 4	20,937 7 5	471	53,333	2,714	11,987	Mataura.
Edendale	432	430	4,958	5,760	11,580	225	1,286	10,626	64	4,186	3,827 9 9	189 0 11	214 8 1	35 15 9	4,998 13 9	85 14 11	9,351 3 2	622	7,404	2,945	17,391	Edendale.
Wyndham	244	234	3,795	2,553	6,826	46	1,423	12,167	125	3,112	1,693 6 8	42 8 2	272 12 0	24 18 8	4,277 19 1	8 16 11	6,320 1 6	470	2,855	3,521	11,328	Wyndham.
Woodlands	140	166	3,085	3,018	6,409	194	894	16,352	151	4,207	1,458 8 9	146 2 6	156 0 10	16 0 2	3,273 11 8	25 5 8	5,075 9 7	790	10,266	1,625	24,851	Woodlands.
Invercargill (Coaching)	10,778	12,128	72,379	87,262	182,547	4,943	..	..	..	..	62,685 2 10	4,094 12 5	6,655 10 4	1,238 11 4	*Cr.* 50 15 8	199 6 5	74,822 7 8	..	..	..	..	Invercargill (Coaching).
,, (Goods)	..	..	..	..	..	..	4,154	26,729	29,125	70,228	..	..	..	..	56,916 7 4	983 7 1	57,899 14 5	3,503	21,912	63,105	161,843	,, (Goods).
Waimahaka	186	269	7,733	7,527	15,715	192	2,000	22,631	26,926	3,471	1,582 8 11	145 19 9	354 1 11	4 12 5	7,267 19 3	20 4 1	9,375 6 4	476	4,718	5,684	20,374	Waimahaka.
Bluff	1,098	2,738	7,872	19,882	31,590	1,977	70	12	17,679	98,558	5,271 9 4	1,179 11 11	611 12 3	30 8 10	47,649 7 3	5,114 0 4	59,856 9 11	1,443	129,090	32,827	63,816	Bluff.
,, (Wharf)	..	..	..	..	..	..	..	..	..	5,992	..	..	..	..	887 5 3	..	887 5 3	..	..	..	22,817	,, (Wharf).
Makarewa	71	158	1,222	883	2,334	718	1,293	27,838	6,544	35,802	218 16 10	255 9 5	172 11 8	4 18 0	12,223 19 0	16 4 6	12,891 19 5	1,734	70,324	1,970	17,593	Makarewa.
Thornbury	122	85	1,928	1,436	3,571	175	332	28,199	8,360	9,506	617 9 2	131 19 7	70 8 4	7 2 7	4,911 3 6	8 3 9	5,746 6 11	97	4,561	799	8,836	Thornbury.
Riverton	733	438	6,267	2,473	9,911	317	318	4,992	35,836	3,578	2,435 8 5	238 5 5	573 14 1	30 8 11	8,981 9 8	26 10 7	12,285 17 1	241	522	1,482	6,078	Riverton.
Orepuki	292	448	4,738	5,822	11,300	239	320	10,587	37,896	3,281	2,191 9 1	182 4 8	220 4 10	11 4 10	10,480 3 1	10 3 0	13,095 9 6	132	2,060	782	3,927	Orepuki.
Tuatapere	624	565	8,639	8,421	18,249	39	439	18,646	64,154	4,499	4,232 4 4	40 17 6	449 3 8	28 7 6	19,137 11 8	231 19 8	24,120 4 4	477	2,873	274	4,784	Tuatapere.
Otautau	296	202	2,681	2,320	5,499	336	846	29,773	7,434	156,908	1,344 8 8	269 5 10	305 8 8	13 5 0	90,125 7 0	1,663 5 3	93,721 0 5	370	4,969	413	8,613	Otautau.
Wairio	66	81	959	2,409	3,515	69	63	2,924	..	41,797	1,080 3 1	56 14 7	39 8 0	3 8 6	26,419 14 10	572 13 10	28,172 2 10	67	143	878	2,357	Wairio.
Nightcaps	273	350	3,694	3,499	7,816	95	35	919	..	2,945	2,079 2 7	66 7 6	110 9 8	23 11 3	1,242 8 5	8 3 0	3,520 2 5	98	1,573	4,238	14,708	Nightcaps.
Winton	803	632	8,629	6,203	16,267	703	1,846	67,658	26,285	47,330	3,325 9 6	572 4 4	570 15 11	23 11 3	25,264 19 10	20 12 7	29,777 13 5	643	10,384	3,061	18,354	Winton.
Dipton	142	181	1,390	1,043	2,756	76	217	17,598	432	3,982	739 16 2	53 19 6	125 11 7	6 19 10	2,090 16 2	7 14 6	3,024 17 9	282	2,359	1,520	8,975	Dipton.
Lumsden	924	774	9,681	6,177	17,556	238	973	33,374	69	4,539	4,072 5 7	187 19 8	642 0 8	37 3 0	5,779 9 0	14 14 5	10,733 12 4	285	6,736	3,967	11,469	Lumsden.
Kingston	622	213	2,465	1,986	5,286	..	35	2,809	64	417	1,940 3 9	..	28 16 1	89 16 3	551 19 9	9 4 9	2,620 0 7	44	2,635	1,191	3,129	Kingston.
Through traffic (Lake Wakatipu)	..	..	..	..	..	..	13	3,253	8	1,821	..	..	269 2 6	..	2,853 16 9	..	3,122 19 3	57	1,258	3,983	5,850	Through traffic (Lake Wakatipu).
Chief Accountant	6,172	1,847	13,776	16,345	38,140	335	..	..	..	..	23,584 12 11	21,484 7 3	..	40,538 11 4	1,630 6 8	3,862 13 9	91,100 11 11	..	..	..	..	Chief Accountant.
Overseas traffic	..	..	..	..	..	..	89	56	..	822	..	..	..	..	8,700 15 8	..	8,700 15 8	89	56	..	822	Overseas traffic.
Totals	240,657	266,950	995,560	1,471,882	2,975,049	164,169	108,466	3,804,779	1,376,340	2,645,621	771,459 13 6	85,079 3 10	90,225 13 11	59,030 3 0	1,748,634 15 11	54,021 14 10	2,808,451 5 0	108,466	3,804,779	1,376,340	2,645,621	Totals.
WESTPORT SECTION—																						WESTPORT SECTION—
Westport	164	298	13,298	11,194	24,954	451	98	1,892	1,248	9,935	2,968 8 6	204 9 2	373 1 6	38 4 0	10,519 5 3	8,887 7 0	22,990 15 5	27	201	20,817	567,533	Westport.
Waimangaroa Junction	27	29	3,850	4,609	8,515	327	22	..	20,639	211,642	683 7 9	127 10 6	145 16 0	4 5 0	32,902 15 9	35 11 11	33,899 6 11	11	436	4,090	6,694	Waimangaroa Junction.
Granity	61	66	10,214	10,757	21,098	439	24	201	6,488	360,434	2,405 0 4	288 14 5	161 10 10	12 15 1	66,397 10 9	2 14 4	69,268 5 9	106	1,456	3,468	7,784	Granity.
District Office	..	..	..	289	289	..	..	..	..	..	36 4 10	459 5 1	..	560 0 0	..	53 17 0	1,109 6 11	..	..	..	..	District Office.
Totals	252	393	27,362	26,849	54,856	1,217	144	2,093	28,375	582,011	6,093 1 5	1,079 19 2	680 8 4	615 4 1	109,819 11 9	8,979 10 3	127,267 15 0	144	2,093	28,375	582,011	Totals.
NELSON SECTION—																						NELSON SECTION—
Port Nelson	..	..	..	..	..	..	..	..	..	4,754	..	..	..	..	336 2 7	..	336 2 7	..	..	..	263	Port Nelson.
Nelson	896	1,000	13,457	14,197	29,550	788	36	117	2,024	8,853	5,871 3 7	792 14 0	276 15 0	91 9 0	5,584 1 3	223 17 5	12,840 0 3	223	8,559	13,591	20,609	Nelson.
Wakefield	208	187	6,847	8,747	15,989	201	272	7,598	1,553	10,793	1,403 15 3	92 11 5	82 12 0	10 14 9	3,200 17 7	5 1 10	4,795 12 10	22	320	1,647	5,440	Wakefield.
Kohatu	53	72	785	375	1,285	7	170	9,330	9,580	4,884	226 2 9	9 7 10	248 2 4	5 1 10	3,237 9 3	8 2 4	3,734 6 4	56	1,487	259	1,152	Kohatu.
Glenhope	87	59	2,100	1,997	4,243	..	84	3,476	4,036	1,232	551 7 4	..	40 4 10	10 8 10	1,926 16 2	210 0 8	2,738 17 10	261	10,155	1,696	3,052	Glenhope.
District Office	..	..	..	491	491	1	..	..	..	..	61 7 6	676 18 1	..	854 0 0	37 8 1	1,784 19 6	3,414 13 2	..	..	..	..	District Office.
Overseas traffic	..	..	..	..	..	..	..	..	..	104	..	..	..	..	421 18 1	..	421 18 1	..	..	..	104	Overseas traffic.
Totals	1,244	1,318	23,189	25,807	51,558	997	562	20,521	17,193	30,620	8,113 16 5	1,571 11 4	647 14 2	971 14 5	14,744 13 0	2,232 1 9	28,281 11 1	562	20,521	17,193	30,620	Totals.
PICTON SECTION—																						PICTON SECTION—
Picton	5,126	468	10,244	5,760	21,598	211	117	9,367	3,875	23,586	2,394 19 10	170 8 8	155 1 8	43 12 3	11,815 1 5	2,449 5 5	15,746 15 6	188	116,567	663	25,590	Picton.
Blenheim	5,772	1,381	14,596	6,602	28,351	468	579	124,997	3,413	28,627	4,176 1 4	377 1 4	700 13 3	150 16 11	13,250 16 6	138 9 11	18,793 19 3	524	25,557	2,828	30,871	Blenheim.
Ward	327	163	4,997	4,525	10,012	35	416	25,776	35	8,385	1,568 17 11	30 8 6	232 1 7	8 4 1	2,915 0 11	0 13 1	4,755 6 1	400	18,016	3,832	4,137	Ward.
District Office	..	..	..	451	451	..	..	..	..	..	55 15 9	596 15 4	..	784 0 0	10 1 5	1 2 6	1,447 15 0	..	..	..	..	District Office.
Overseas traffic	..	..	..	..	..	..	..	..	..	26	..	..	..	..	326 1 7	..	326 1 7	..	..	..	26	Overseas traffic.
Totals	11,225	2,012	29,837	17,338	60,412	714	1,112	160,140	7,323	60,624	8,195 14 10	1,174 13 10	1,087 16 6	986 13 3	28,317 1 10	2,589 10 11	42,351 11 2	1,112	160,140	7,323	60,624	Totals.
LAKE WAKATIPU STEAMERS—																						LAKE WAKATIPU STEAMERS—
Totals	3,069	1,517	5,932	6,861	17,379	20	174	10,170	4,149	8,068	4,129 10 6	187 12 10	497 2 1	568 10 10	5,149 0 1	93 3 8	10,625 0 0	174	10,170	4,149	8,068	Totals.

STATEMENT No. 19.

STATEMENT SHOWING MILEAGE, CAPITAL COST, TRAFFIC, REVENUE, AND EXPENDITURE OF NEW ZEALAND GOVERNMENT RAILWAYS FROM 1ST APRIL, 1918, TO 31ST MARCH, 1926.

MILEAGE, CAPITAL COST, TRAFFIC, AND REVENUE.*

Year.	Miles.	Capital Cost.	Train-mileage.	Passengers.		Season Tickets.		Coaching.	Cattle.	Sheep and Pigs.	Timber.
				Number.	Revenue	Number.	Revenue.	Revenue.			
		£			£		£	£	Number.	Number.	Tons.
1918–1919 ..	2,993	36,167,681	7,477,583	11,374,521	1,799,381	351,124	150,901	258,524	346,544	6,691,760	487,729
1919–1920 ..	3,006	36,390,115	7,408,608	12,760,814	2,138,391	400,621	165,596	290,453	357,976	7,316,556	611,171
1920–1921 ..	3,018	37,235,254	9,303,392	15,315,640	2,459,362	464,691	198,717	335,754	376,745	7,129,222	717,701
1921–1922 ..	3,030	39,309,097	8,717,265	14,262,440	2,212,633	472,865	205,594	339,482	279,904	7,635,515	708,212
1922–1923 ..	3,037	40,275,161	8,346,731	14,256,610	2,216,514	485,681	204,106	393,322	293,930	7,367,763	663,213
1923–1924 ..	3,053	41,399,427	9,024,503	13,836,311	2,136,999	525,744	212,601	406,832	320,434	7,723,971	724,116
1924–1925 ..	3,085	44,570,746	9,083,623	12,424,012	2,077,625	537,554	210,946	417,550	351,873	8,105,597	754,634
1925–1926 ..	3,138	46,138,500	10,319,407	11,787,273	2,271,498	600,272	265,549	409,207	391,649	8,209,965	770,654

Year.	Goods	Total.	Goods Revenue.	Miscellaneous Revenue, Labour, Demurrage, &c.	Rents and Commission.	Total Revenue.	Revenue per Train-mile.
	Tons.	Tons.	£	£	£	£	d.
1918–1919 ..	4,750,728	5,238,457	2,608,336	78,828	92,662	4,988,632	160·00
1919–1920 ..	4,986,061	5,597,232	2,956,237	105,072	96,738	5,752,487	186·00
1920–1921 ..	5,367,659	6,085,360	3,676,665	136,505	101,528	6,908,531	178·00
1921–1922 ..	5,222,900	5,931,112	3,646,594	124,106	115,182	6,643,591	182·69
1922–1923 ..	5,571,594	6,234,807	3,671,008	119,933	122,919	6,727,802	193·18
1923–1924 ..	5,795,341	6,519,457	3,953,213	141,968	132,598	6,984,211	185·50
1924–1925 ..	5,847,973	6,602,607	4,122,017	137,149	147,237	7,112,524	187·65
1925–1926 ..	6,028,959	6,799,613	4,499,160	143,861	..	7,589,274	176·51

EXPENDITURE.*

Year	Expenditure per Train-mile.	Expenditure per Cent. of Revenue.	Maintenance of Way and Works.				Maintenance of Signals.				Maintenance of Locomotives, Carriages, and Wagons.		
			Amount.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Amount.	Per Cent. of Revenue.	Per Mile of Railway.	Per Train-mile.	Amount.	Per Cent. of Revenue.	Per Train-mile.
	d.	£	£	£	£	d.	£	£	£	d.	£	£	d.
1918–1919 ..	105·97	66·32	715,858	14·35	239·98	22·98	36,700	0·75	12·30	1·18	566,140	11·35	18·17
1919–1920 ..	132·72	71·36	783,033	13·61	262·17	25·37	54,877	0·98	18·37	1·77	724,473	12·59	23·47
1920–1921 ..	145·14	81·59	983,940	14·24	327·00	25·38	69,109	1·02	22·97	1·79	984,244	14·25	25·39
1921–1922 ..	171·37	93·89	1,111,883	16·76	368·45	30·61	72,343	1·09	23·97	1·99	1,113,170	16·76	30·65
1922–1923 ..	157·81	81·79	1,040,892	15·49	343·76	29·93	67,425	1·01	22·27	1·94	1,043,590	15·51	30·00
1923–1924 ..	143·43	77·37	1,143,281	16·39	375·57	30·40	70,912	1·02	23·29	1·88	1,048,567	15·01	27·89
1924–1925 ..	146·19	77·97	1,113,048	15·67	362·95	29·40	81,201	1·14	26·48	2·14	1,083,788	15·24	28·63
1925–1926 ..	143·37	81·23	1,144,385	15·08	368·08	26·62	105,064	1·38	33·86	2·43	1,311,317	17·28	30·50

Year.	Traffic Transportation.			Locomotive Transportation.			Head and Departmental Offices.			Lake Wakatipu Steamers.		Total Expenditure.
	Amount.	Per Cent. of Revenue.	Per Train-mile	Amount.	Per Cent. of Revenue.	Per Train-mile.	Amount.	Per Cent. of Revenue.	Per Train-mile.	Amount.	Per Cent. of Revenue.	
	£	£	d.	£	£	d.	£	£	d.	£	£	£
1918–1919	1,032,609	20·73	33·14	815,656	16·35	26·18	134,626	2·70	4·32	6,985	104·53	3,308,575
1919–1920	1,301,935	22·66	42·17	1,061,018	18·44	34·37	171,767	2·99	5·57	7,964	101·09	4,105,067
1920–1921	1,712,375	24·82	44·17	1,672,567	24·21	43·15	203,906	2·95	5·26	10,458	116·34	5,636,601
1921–1922	1,703,049	25·66	46·89	2,020,994	30·42	55·64	202,948	3·06	5·59	13,339	166·34	6,237,727
1922–1923	1,527,033	22·73	43·91	1,613,564	23·98	46·40	195,894	2·91	5·63	14,100	150·79	5,502,497
1923–1924	1,530,652	21·94	40·71	1,395,491	19·98	37·11	204,407	2·93	5·44	10,456	117·85	5,403,766
1924–1925	1,599,668	22·52	42·27	1,408,927	19·81	37·23	246,504	3·47	6·51	12,279	121·62	5,545,415
1925–1926	1,743,641	22·98	40·55	1,636,620	21·56	38·06	223,543	2·94	5·20	..	..	6,164,570

* Figures for 1925–26 are for train operation only and do not include subsidiary services as in previous years.

STATEMENT No. 20

COMPARATIVE STATEMENT OF THE MILEAGE OPENED, CAPITAL EXPENDED, EARNINGS, EXPENSES, ETC., OF RAILWAYS IN THE FOLLOWING STATES (TAKEN FROM LATEST OFFICIAL RECORDS).

—	Area in Square Miles.	Population.	Miles open.	Gauge.	Total Cost.	Cost per Mile.	Population per Mile of Railway.	Cost per Head of Population.	Train-miles run.*	Gross Earnings.	Earnings per Train-mile.	Working-expenses.	Working-expenses per Train-mile.	Profit on Working.	Net Earnings per Train-mile	Percentage of Net Earnings to Capital.	Percentage of Working-expenses to Earnings.	Earnings per Head of Population.	Passengers carried.†	Tonnage of Goods.	Earnings per Average Mile open.	Working-expenses per Average Mile open.	Net Earnings per Average Mile.	Expenses. Maintenance per Mile of Railway.	Expenses. Locomotive, Car, and Wagon per Train-mile.	Expenses. Traffic per Cent. of Revenue.	Expenses. General Charges (including Compensation, &c.) per Cent. of Revenue	Number of Locomotives.	Number of Passenger-carriages.	Number of Wagons and Brake-vans.	Year ending
				Ft. in.	£	£		£ s. d.		£	d.	£	d.	£	d.			£ s. d.			£	£	£	£	d.						
Victoria	87,884	1,670,852	4,484	5 3	67,739,091	15,107	373	40 10 10	17,482,006	12,759,197	175·25	9,644,815	132·50	3,114,382	42·75	4·61	75·59	7 12 9	166,444,142	8,959,556	2,868	2,168	700	442	55·62	24·26	3·78	728	1,980	20,736	30 June, 1925.
New South Wales ..	309,432	2,273,584	5,656	4 8½	99,623,216	17,615	402	43 16 4	23,304,916	16,769,452	172·75	11,939,686	123·00	4,829,766	49·75	5·01	71·20	7 7 6	128,532,038	16,208,476	3,010	2,143	867	391	59·47	18·61	5·19	1,403	1,805	24,173	,, ,,
Queensland ..	670,500	855,214	6,114	3 6	51,911,969	8,490	140	60 14 0	12,107,995	7,109,210	141·00	5,425,167	107·50	1,684,043	33·50	3·24	76·31	8 6 3	29,657,832	5,083,658	1,170	893	277	211	48·86	22·41	1·30	714	942	16,796	,, ,,
South Australia ..	380,070	544,000	2,452	3 6 / 5 3	24,046,664	9,8 8	222	44 5 6	6,653,248	4,012,736	144·75	2,935,755	105·90	1,076,981	38·85	4·90	73·16	7 7 9	25,647,487	3,611,313	1,637	1,197	440	205	56·31	19·76	1·86	479	756	10,370	,, ,,
Western Australia..	975,920	368,201	3,733	3 6	20,318,120	5,443	99	55 3 8	5,068,737	3,359,501	159·07	2,355,087	111·51	1,004,414	47·56	4·94	70·10	9 4 5	17,196,672	3,689,632	916	642	274	144	53·23	19·03	1·91	404	403	10,299	,, ,,
Tasmania ..	26,215	211,906	673	3 6 / 2 0	6,416,194	9,535	3:5	30 5 7	1,380,405	548,256	95·32	531,590	92·42	16,666	2·89	0·26	96·96	2 11 9	2,656,018	690,561	815	790	25	215	60·11	22·32	4·87	96	151	1,957	,, ,,
New Zealand ..	103,861	857,985	2,262	3 6	19,081,735	8,436	379	22 4 10	5,443,333	1,974,038	87·00	1,343,415	59·23	630,623	27·77	3·30	68·05	2 6 0	7,575,390	3,730,394	873	594	279	204	21·36	18·24	3·19	372	751	12,992	31 Mar., 1903.
,, ..	103,861	882,097	2,305	3 6	20,692,911	8,977	383	23 9 2	5,685,399	2,180,641	91·75	1,438,724	60·48	741,917	31·27	3·58	65·98	2 9 5	8,306,383	4,072,576	943	622	321	213	22·21	17·22	3·14	377	809	13,433	,, 1904.
,, ..	103,861	908,114	2,347	3 6	21,701,572	9,141	387	23 17 11	6,107,079	2,209,231	86·50	1,492,900	58·46	716,331	28·04	3·30	67·58	2 8 8	8,514,112	4,011,511	938	634	304	217	21·05	18·28	3·10	389	864	13,885	,, 1905.
,, ..	103,861	933,111	2,391	3 6	22,498,972	9,410	391	24 2 3	6,413,573	2,349,704	87·75	1,621,239	60·47	728,465	27·28	3·24	69·00	2 10 4	8,826,382	4,241,422	980	676	304	229	21·99	18·86	3·01	395	906	14,127	,, 1906.
,, ..	103,861	961,604	2,427	3 6	23,504,272	9,570	396	24 8 10	6,755,454	2,624,600	93·00	1,812,482	64·21	812,118	28·79	3·45	69·06	2 14 7	9,600,786	4,592,099	1,078	744	334	253	23·37	18·90	2·80	398	966	14,605	,, 1907.
,, ..	103,861	985,318	2,469	3 6	24,365,647	9,861	399	24 14 7	7,051,274	2,761,938	93·75	1,949,759	66·18	812,179	27·57	3·33	70·59	2 16 1	9,756,716	4,834,534	1,114	786	328	258	24·96	19·40	2·76	410	1,002	15,475	,, 1908.
,, ..	103,861	1,016,044	2,556	3 6	27,762,592	10,351	398	27 6 6	7,458,236	2,929,526	94·00	2,114,815	67·89	814,711	26·11	3·13	72·19	2 17 8	10,457,144	4,871,874	1,148	828	320	258	25·56	20·73	3·16	452	1,116	16,476	,, 1909.
,, ..	103,861	1,035,211	2,704	3 6	28,513,476	10,494	383	27 10 10	7,889,166	3,249,790	98·75	2,169,474	65·84	1,080,316	32·91	3·80	66·76	3 2 9	11,141,142	5,223,414	1,203	803	400	230	25·35	18·96	2·96	465	1,140	17,220	,, 1910.
,, ..	103,861	1,055,640	2,742	3 6	29,606,546	10,723	385	28 1 0	8,141,075	3,494,182	102·75	2,303,272	67·75	1,190,910	35·00	4·06	65·92	3 6 2	11,200,613	5,555,292	1,275	840	435	254	25·81	18·10	2·81	478	1,166	18,036	,, 1911.
,, ..	103,861	1,081,344	2,801	3 6	30,506,089	10,864	386	28 4 2	8,371,687	3,676,509	105·25	2,465,896	70·52	1,210,613	34·73	3·98	67·07	3 8 0	20,336,577	5,599,756	1,314	881	433	263	27·30	18·27	2·76	493	1,212	18,521	,, 1912.
,, ..	103,861	1,111,592	2,840	3 6	31,611,220	11,053	391	28 8 9	9,016,224	3,971,002	105·50	2,705,609	71·84	1,265,393	33·66	4·04	68·13	3 11 5	22,310,867	5,957,005	1,400	954	446	271	28·20	19·40	2·64	513	1,282	19,515	,, 1913.
,, ..	103,861	1,139,669	2,861	3 6	32,355,087	11,309	398	28 7 9	9,319,268	4,043,328	104·00	2,880,323	74·00	1,163,005	30·00	3·61	71·24	3 10 11	23,173,472	5,661,340	1,416	1,008	408	268	29·72	20·73	2·91	534	1,363	20,251	,, 1914
,, ..	103,861	1,150,430	2,917	3 6	34,133,825	11,702	394	29 13 5	9,383,420	4,105,457	104·75	2,920,455	74·54	1,185,002	30·21	3·53	71·14	3 11 4	23,542,903	6,075,282	1,410	1,002	408	254	30·26	21·20	2·98	557	1,397	21,226	,, 1915
,, ..	103,861	1,152,048	2,959	3 6	34,857,882	11,780	389	30 5 2	9,356,522	4,548,356	116·50	2,910,883	74·50	1,637,473	42·00	4·72	64·00	3 19 0	24,600,693	5,960,562	1,540	985	555	251	29·77	19·60	2·50	585	1,452	21,994	,, 1916
,, ..	103,861	1,150,605	2,970	3 6	35,378,664	11,912	387	30 15 0	9,146,331	4,800,810	125·75	2,926,864	76·63	1,873,946	49·12	5·30	60·97	4 3 5	24,782,602	5,826,265	1,619	987	632	244	30·88	18·87	2·47	607	1,480	22,380	,, 1917.
,, ..	103,861	1,154,559	2,977	3 6	36,001,432	12,029	389	32 0 11	7,468,646	4,687,700	150·50	3,042,907	97·54	1,644,793	52·96	4·60	64·91	4 1 3	21,438,325	5,373,136	1,578	1,023	555	240	40·02	20·38	2·67	624	1,488	22,517	,, 1918.
,, ..	103,861	1,175,325	2,993	3 6	36,167,681	12,084	393	30 15 6	7,477,583	4,988,632	160·00	3,308,575	105·97	1,680,057	54·03	4·65	66·32	4 4 11	22,030,327	5,611,738	1,670	1,107	563	252	44·35	20·73	2·70	620	1,489	22,658	,, 1919.
,, ..	103,861	1,223,915	3,006	3 6	36,390,115	12,106	407	29 14 8	7,408,608	5,752,487	186·00	4,105,067	132·72	1,647,420	53·28	4·53	71·36	4 14 0	24,582,186	6,000,279	1,923	1,372	551	281	57·84	22·66	2·99	616	1,492	22,937	,, 1920.
,, ..	103,861	1,268,046	3,018	3 6	37,235,254	12,338	420	29 7 3	9,303,392	6,908,531	178·00	5,636,601	145·14	1,271,930	32·86	3·42	81·59	5 9 0	28,821,783	6,487,279	2,293	1,870	423	350	68·54	24·82	2·95	608	1,492	23,119	,, 1921.
,, ..	103,861	1,300,967	3,030	3 6	39,309,097	12,973	429	30 4 4	8,717,265	6,643,591	182·69	6,237,727	171·37	405,864	11·32	1·07	93·89	5 2 0	28,121,763	6,321,351	2,199	2,063	136	393	86·29	25·66	3·06	637	1,496	23,974	,, 1922.
,, ..	103,861	1,325,310	3,037	3 6	40,275,161	13,261	436	30 7 9	8,346,731	6,727,802	93·18	5,502,497	157·81	1,225,305	35·37	3·04	81·79	5 1 6	28,22 ,362	6,618,588	2,219	1,813	406	366	76·40	22·73	2·91	639	1,498	26,106	,, 1923.
,, ..	103,861	1,347,723	3,053	3 6	41,399,427	13,560	441	30 14 4	9,024,503	6,984,211	185·50	5,403,766	143·43	1,580,445	42·07	3·83	77·37	5 3 8	28,436,475	6,925,517	2,291	1,772	519	399	65·00	21·94	2·93	655	1,527	26,195	,, 1924.
,, ..	103,861	1,379,487	3,085	3 6	44,570,746	14,448	447	32 6 2	9,083,623	7,112,524	187·65	5,545,416	146·19	1,567,108	41·46	3·55	77·97	5 3 1	26,106,859	7,033,459	2,316	1,804	512	389	65·87	22·52	3·47	662	1,568	26,488	,, 1925.
,, ‡	**103,861**	**1,407,165**	**3,138**	**3 6**	**45,794,199**	**14,593**	**449**	**32 10 3**	**10,319,407**	**7,589,274**	**176·51**	**6,164,570**	**143·37**	**1,424,704**	**33·14**	**3·24**	**81.23**	**5 7 10**	**27,653,414**	**7,256,142**	**2,446**	**1,987**	**459**	**403**	**68·56**	**22·98**	**2·95**	**704**	**1,602**	**26,767**	,, **1926.‡**

* The figures for train-miles run in New Zealand prior to 1925 included mileage run by assisting engines.

† The figures for passenger traffic in New Zealand prior to 1912 are exclusive of season tickets.

‡ New Zealand figures for 1926 are for operation only, subsidiary services not included as hitherto.

STATEMENT No. 21.

COMPARATIVE STATEMENT OF THE NUMBER OF EMPLOYEES FOR YEARS 1925-26 AND 1924-25.

Department.	Kaihu.	Gisborne	North Island Main Line and Branches.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Stores.	Refreshment Branch.	Architectural Branch.	Total.
1925-26.											
General	1	3	612	143	4	4	3	381	294	176	1,621
Traffic	6	23	2,836	2,467	81	21	32	..	..	..	5,466
Maintenance	16	42	2,463	1,658	52	41	44	..	..	..	4,316
Locomotive	6	23	3,593	2,844	74*	24	23	..	..	..	6,587
Totals	29	91	9,504	7,112	211	90	102	381	294	176	17,990
1924-25.											
General	1	3	549	150	4	4	3	327	264	190	1,495
Traffic	6	23	2,696	2,360	79	21	27	..	..	..	5,212
Maintenance	15	38	2,359	1,651	45	41	45	..	..	..	4,194
Locomotive	5	23	3,421	2,738	114	21	23	..	..	..	6,345
Totals	27	87	9,025	6,899	242	87	98	327	264	190	17,246

* Workshops staff only. Westport locomotive-running staff are included under South Island Main Line and Branches.

STATEMENT No. 22.

STATEMENT OF ACCIDENTS FOR THE YEAR ENDED 31ST MARCH, 1926.

Section.	Train Accidents.				Accidents on Line (other than Train Accidents).						Shunting Accidents.						Employees proceeding to or from Duty within the Railway Boundary.		Persons killed or injured at Crossings.		Trespassers.		Miscellaneous.		Accidents in Railway Workshops, &c.				Total.	
	Passengers.		Employees.		Passengers.		Employees.		Other Persons.		Passengers.		Employees.		Other Persons.										Railway Employees.		Other Persons.			
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Kaihu	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Gisborne	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	2
North Island Main Line and Branches	4	23	1	7	2	22	1	48	6	7	..	..	11	77	..	1	..	7	13	27	..	..	1	517	2	342	..	..	41	1,078
South Island Main Line and Branches	..	1	..	..	4	7	1	9	2	2	..	..	1	42	1	..	..	2	2	4	..	..	1	477	1	340	..	..	13	884
Westport	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	3	..	3	..	..	..	8
Nelson	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	7
Picton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	2
Totals ..	4	24	2	7	6	29	2	59	8	9	..	..	12	125	1	1	..	9	15	31	..	..	2	1,002	3	686	..	..	55	1,982

STATEMENT No. 23.

STATEMENT OF RAILS RELAID DURING THE YEAR ENDED 31ST MARCH, 1926.

Weight.	Kaihu.	Gisborne.	North Island Main Line and Branches.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.
RAILS RELAID:—								
53 lb. steel	..	..	..	..	..	..	..	..
55 "	..	..	1,387	73	..	10	..	1,470
56 "	..	..	..	..	..	..	..	..
70 "	..	..	10,223	5,010	32	..	..	15,265
100 "	..	..	..	62	..	..	..	62
Totals	..	..	11,610	5,145	32	10	..	16,797

STATEMENT No. 24.

STATEMENT OF SLEEPERS RELAID AND REMOVED DURING THE YEAR ENDED 31ST MARCH, 1926.

Description.	Kaihu.	North Island Main Line and Branches.	Gisborne.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.
SLEEPERS RELAID:—								
Ironbark	..	50	..	..	..	..	..	50
Jarrah	486	122,506	610	82,794	..	..	319	206,715
Totara	608	284	..	1,718	2,300	591	..	5,501
Birch	..	..	..	..	14	..	..	14
Silver-pine	..	2,015	..	11,693	6,064	147	403	20,322
Puriri	140	..	..	..	..	..	..	140
Hardwood	..	..	..	1,581	..	..	..	1,581
Powellized	..	..	..	..	..	..	..	..
Yellow Pine	..	..	..	..	939	4	..	943
Totals	1,234	124,855	610	97,786	9,317	742	722	235,266
SLEEPERS REMOVED:—								
Kauri	25	..	..	..	..	..	..	25
Maire	..	..	..	..	..	..	..	..
Ironbark	..	222	..	3,178	..	..	..	3,400
Jarrah	72	22,770	175	5,520	..	..	68	28,605
Matai and Rimu	..	354	..	2,762	..	..	..	3,116
Totara	574	58,230	44	2,866	50	4	..	61,768
Birch	..	4,006	..	304	443	63	27	4,843
Silver-pine	14	24,237	391	69,903	6,010	662	627	101,904
Powellized	..	497	..	2,202	10	..	..	2,709
Puriri	549	10,385	..	1,014	19	..	..	11,967
Creosoted	..	3,975	..	4,648	13	..	..	8,636
Grey-gum	..	20	..	253	..	..	..	273
Blue-gum	..	..	..	4	..	..	..	4
Yellow Pine	..	..	..	..	2,628	..	..	2,628
Totals	1,234	124,756	610	92,654	9,173	729	722	229,878

STATEMENT No. 25.

STATEMENT OF NUMBER OF STATIONS AND PRIVATE SIDINGS ON EACH SECTION FOR THE YEAR ENDED 31ST MARCH, 1926.

Section.	Length.	Number of Stations and Stopping-places in the Time-tables.	Number of Private Sidings.		
			At Stations.	Out of Stations.	Total.
	M. ch.				
Kaihu	24 10	12	..	..	..
Gisborne	60 50	20	9	2	11
North Island Main Line and Branches	1,285 17	448	196	46	242
South Island Main Line and Branches	1,619 7	572	218	32	250
Westport	43 2	22	3	4	7
Nelson	60 20	22	4	1	5
Picton	56 12	19	8	..	8
Totals	3,148 38	1,115	438	85	523

STATEMENT No. 26.

COMPARATIVE STATEMENT OF MILEAGE OF RAILWAYS OPEN FOR TRAFFIC AND UNDER MAINTENANCE ON 31ST MARCH, 1926.

Section.	Mileage open for Traffic on 31st March, 1925.	Additional Lengths opened during Year.			Reduced Mileage equivalent to Maintenance for whole Period.	Length closed during Year.		Net Addition to Mileage open for Traffic.	Net Addition to Mileage under Maintenance.	Total Mileage open for Traffic on 31st March, 1926.	Equivalent Total Mileage maintained during Financial Year ended 31st March, 1926.
		Line opened.	Date of Opening.	Length opened.		Line.	Length.				
	M. ch.			M. ch.	M. ch.		M. ch.	M. ch.	M. ch	M. ch.	M. ch.
Kaihu	24 10	..	..	..	..	..	..	..	..	24 10	24 10
North Island Main Lines and Branches	1,254 56	Huarau–Portland ..	29th November, 1925	30 41	10 23	..	..	30 41	30 41	1,285 17	1,264 79
Gisborne	60 50	..	..	..	..	..	..	..	..	60 50	60 50
South Island Main Lines and Branches	1,595 67	Beaumont–Miller's Flat	16th December, 1925	14 67	4 25	..	..	20 66*	20 66	1,619 07	1,603 64
		Tautapere–Orawia ..	20th October, 1925	8 13	3 52						
South Island Main Lines and Branches, Private Line—Nightcaps Branch ..	2 34	..	..	..	..	Nightcaps Branch	2 34	..	..	..	..
Westport	43 02	..	..	..	..	..	..	..	..	43 02	43 02
Nelson	60 20	..	..	..	..	..	..	..	..	60 20	60 20
Picton	56 12	..	..	..	..	..	..	..	..	56 12	56 12
Totals	3,097 11	..	..	53 41	18 20	..	2 34	51 27	51 27	3,148 38	3,112 77

* Mileage of South Island Main Lines and Branches increased by 20 chains in connection with the closing of Nightcaps Branch.

STATEMENT No. 27.

Statement showing Weights of Rails in various Lines on 31st March, 1926.

Line.	40 lb. Iron.	40 lb. Steel.	45 lb. Steel.	52 lb. Iron.	52 lb. Steel.	53 lb. Steel	55 lb. Steel.	56 lb. Iron.	56 lb. Steel.	65 lb. Steel.	70 lb. Iron.	70 lb. Steel.	100 Stee	Total.
	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.
Kaihu Section—														
Kaihu Branch	..	..	..	..	..	17 15	6 75	..	..	..	..	..	..	24 10
North Island Main Lines and Branches—														
Kaikohe Branch	..	..	..	..	..	..	24 59	..	..	..	..	..	..	24 59
Auckland–Wellington	..	..	..	..	..	0 5	..	..	0 5	12 16	..	413 39	..	425 65
North Auckland Line	..	..	..	..	..	1 44	102 60	..	34 29	..	..	45 41	..	184 14
Onehunga Branch	..	..	..	..	0 10	..	..	..	1 48	..	..	0 24	..	2 59
Waiuku Branch	..	..	..	..	..	..	12 70	..	..	..	..	..	..	12 70
Huntly–Awaroa Railway	..	..	..	..	..	..	9 6	..	..	..	..	..	..	9 6
Thames Branch	..	..	..	..	..	5 12	..	..	18 0	..	..	39 63	..	62 75
Waihi Branch	..	..	..	..	..	..	..	..	11 37	..	..	0 67	..	12 24
Cambridge Branch	..	..	..	..	..	6 75	2 36	..	2 42	..	..	0 8	..	12 1
Rotorua Branch	..	..	..	..	..	16 68	..	..	0 3	..	..	51 69	..	68 60
Raetihi Branch	..	..	..	..	..	6 35	2 3	..	..	..	..	..	..	8 28
Marton–New Plymouth	..	..	..	..	..	0 16	..	..	12 50	..	..	124 17	..	137 3
Waitara Branch	..	..	..	..	..	3 77	..	..	0 3	..	..	..	..	4 62
Toko Branch	..	..	..	..	..	15 45	31 34	..	0 31	..	..	..	..	47 30
Mount Egmont Branch	..	..	..	..	..	..	..	..	6 2	..	..	..	..	6 2
Wanganui Branch	..	..	..	..	..	..	0 9	..	1 70	..	..	1 21	..	3 20
Foxton Branch	..	..	..	..	0 2	10 70	..	..	8 41	..	..	..	..	19 33
Palmerston North–Eskdale	..	..	..	..	..	0 47	11 73	..	28 12	..	..	83 24	..	123 76
Port Ahuriri Branch	..	..	..	..	..	1 66	0 3	..	..	..	..	0 1	..	1 70
Wellington–Woodville	..	..	..	..	..	5 47	0 1	..	12 17	..	..	96 58	..	114 43
Greytown Branch	..	..	..	..	3 7	..	..	..	..	..	..	..	..	3 7
Gisborne Section—														
Gisborne Line	..	..	..	0 20	..	..	..	..	..	..	..	..	..	49 10
Ngatapa Branch	..	..	..	..	..	..	11 40	..	..	..	..	..	..	11 40
South Island Main Lines and Branches—														
Lyttelton–Bluff	..	..	..	..	0 8	..	0 3	..	0 1	..	..	390 19	1 50	392 1
Main North Line	..	..	..	..	..	..	28 28	12 79	..	..	..	39 25	..	80 52
Oxford Branch	..	..	..	..	11 46	..	..	..	18 35	0 2	..	3 36	..	0 6	..	33 45
Eyreton Branch	..	..	..	..	..	..	..	..	20 14	0 7	..	..	..	..	..	20 21
Cheviot Branch	..	..	..	..	..	..	..	..	..	12 52	..	31 29	..	..	..	44 1
Southbridge Branch	..	..	..	..	..	..	..	..	23 11	1 0	..	1 20	..	0 8	..	25 39
Little River Branch	..	..	..	..	0 9	..	..	..	0 48	17 47	..	4 23	..	0 1	..	22 48
Midland Line	..	..	..	..	..	..	..	..	0 4	..	..	..	..	122 10	8 51	130 65
White Cliffs Branch	..	..	..	..	..	..	..	..	11 29	..	..	0 10	..	0 7	..	11 46
Methven Branch	..	..	..	..	..	..	22 16	..	..	0 1	..	..	..	0 3	..	22 20
Springburn Branch	..	..	..	3 29	2 23	..	..	..	..	4 48	..	16 74	..	0 22	..	27 36
Albury Branch	..	..	..	0 65	..	..	..	..	22 40	4 78	..	7 66	..	0 4	..	36 13
Waimate Branch	..	..	..	..	..	..	2 2	2 44	..	..	..	..	..	..	..	4 46
Waimate Gorge Branch	..	..	..	..	..	7 21	..	1 0	..	..	..	..	..	..	..	8 21
Duntroon Branch	..	..	..	1 16	..	0 4	..	28 51	3 61	..	3 69	..	..	..	..	37 41
Carried forward	..	..	..	5 64	14 64	..	10 37	24 18	250 24	304 52	..	224 59	12 16	..	1,409 57	10 21	2,267 12

STATEMENT No. 27—*continued.*

STATEMENT SHOWING WEIGHTS OF RAILS IN VARIOUS LINES ON 31ST MARCH, 1926—*continued.*

Line.	40 lb. Iron.	40 lb. Steel.	45 lb. Steel.	52 lb. Iron.	52 lb. Steel.	53 lb. Steel.	55 lb. Steel.	56 lb. Iron.	56 lb. Steel.	65 lb. Steel.	70 lb. Iron.	70 lb. Steel.	100 lb. Steel.	Total.
	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.
Brought forward	5 64	14 64	..	10 37	24 18	250 24	304 52	..	224 59	12 16	..	1,409 57	10 21	2,267 12
South Island Main Lines and Branches—*continued.*														
Oamaru Breakwater Branch	0 23	..	..	..	..	0 40	..	..	..	..	..	..	..	0 63
Ngapara Branch	..	..	..	..	..	11 44	..	..	3 45	..	..	..	..	15 9
Livingstone Branch	..	..	..	..	..	..	10 36	..	1 39	..	..	..	..	11 75
Waihemo Branch	..	6 76	..	0 53	..	0 16	..	..	1 0	..	..	..	..	8 65
Port Chalmers Branch	..	..	..	..	..	0 16	..	..	..	..	..	1 10	..	1 26
Walton Park Branch	0 2	..	..	..	..	1 48	0 19	..	0 48	..	..	0 1	..	2 38
Fernhill Branch	..	..	..	..	..	1 57	..	..	..	..	..	..	..	1 57
Otago Central Railway	..	..	..	..	..	65 73	15 27	..	65 58	..	..	..	..	146 78
Outram Branch	0 1	..	..	..	..	6 26	0 73	..	1 53	..	..	0 7	..	9 0
Lawrence Branch	..	..	..	..	..	1 40	33 7	..	15 8	..	..	..	..	49 55
Catlin's River Branch	..	..	..	..	..	15 26	20 5	..	3 46	..	..	4 1	..	42 78
Tapanui Branch	..	..	..	..	..	10 40	9 3	..	6 58	..	..	..	..	26 21
Waikaka Branch	..	..	..	..	..	..	12 56	..	..	..	..	0 1	..	12 57
Glenham Branch	..	..	..	..	..	8 33	..	..	0 48	..	..	0 34	..	9 35
Seaward Bush Branch	..	..	..	..	..	1 52	25 9	..	7 4	..	..	..	..	33 65
Kingston Branch	..	..	..	..	..	42 48	..	..	25 63	..	..	18 47	..	86 78
Orepuki Branch	..	..	..	..	..	16 73	16 19	..	10 16	..	..	13 8	..	56 36
Wairio Branch	..	..	..	..	..	..	..	..	..	..	..	22 44	..	22 44
Forest Hill Branch	2 41	7 5	..	..	..	..	3 18	..	0 2	..	..	..	..	12 66
Mararoa Branch	..	10 16	..	..	..	0 24	..	..	0 1	..	..	..	..	10 41
Waimea Plains Branch	..	..	..	..	..	..	..	..	..	..	..	36 37	..	36 37
Switzers Branch	..	..	..	..	..	1 77	11 69	..	..	..	..	0 1	..	13 67
Greymouth–Ross	..	..	..	..	..	14 2	..	..	17 22	..	..	7 5	..	38 29
Stillwater–Inangahua	..	..	..	..	..	27 66	14 52	..	8 75	..	..	5 40	..	56 73
Blackball Branch	..	..	..	..	..	..	1 0	..	2 31	..	..	..	..	3 31
Point Elizabeth Branch	..	..	..	..	..	0 15	..	..	4 46	..	..	3 24	..	8 5
7-Mile Branch	..	..	..	..	..	..	2 43	..	..	..	..	..	..	2 43
Westport–Mokihinui	..	..	..	..	..	0 18	0 1	..	8 67	..	..	21 11	..	30 17
Westport–Te Kuha	..	..	..	..	..	..	5 61	..	..	..	..	..	..	5 61
Cape Foulwind Line	..	..	..	..	..	..	..	..	7 4	..	..	..	..	7 4
Nelson Line	..	..	..	..	..	25 38	17 60	..	16 73	..	..	0 9	..	60 20
Picton Line	..	..	..	..	..	17 12	22 48	..	16 29	..	..	0 3	..	56 12
Totals	8 51	39 1	..	11 10	24 18	522 28	527 18	..	450 15	12 16	..	1,543 20	10 21	3,148 38

STATEMENT No. 28.

STATEMENT SHOWING APPROXIMATELY SLEEPERS LAID AND REMOVED UP TO 31ST MARCH, 1926.

Year.	Approximate Length opened each Year.						Sleepers.	
	North Island.		Middle Island.		Total.		Laid during Construction. (2,100 per mile.)	Removed during Maintenance.*
	M.	ch.	M.	ch.	M.	ch.		
1867	..		45	70	45	70	96,338	..
1870-71	..		18	58	18	58	39,323	..
1871-72	..		11	68	11	68	24,885	..
1872-73	..		27	62	27	62	58,327	..
1873-74	10	55	11	21	21	76	46,095	..
1874-75	61	19	126	78	188	17	395,246	..
1875-76	69	23	248	4	317	27	666,409	..
1876-77	64	24	152	39	216	63	455,254	..
1877-78	103	76	94	58	198	54	417,217	..
1878-79	27	19	56	46	83	65	176,006	..
1879-80†	26	33	40	73	67	26	141,382	..
1880-81	68	39	32	71	101	30	212,888	74,261
1881-82	22	67	40	16	63	3	132,379	73,947
1882-83	2	2	40	19	42	21	88,751	106,763
1883-84	22	19	22	50	44	69	94,211	125,632
1884-85	56	0	24	0	80	0	168,000	148,325
1885-86	43	26	47	52	90	78	191,048	137,993
1886-87	58	72	11	39	70	31	147,814	139,040
1887-88	11	47	17	32	28	79	60,874	122,027
1888-89	18	31	..		18	31	42,814	108,690
1889-90	11	57	20	68	32	45	68,381	129,634
1890-91	28	21	5	68	34	9	71,636	133,954
1891-92	..		27	27	27	27	57,408	139,912
1892-93	17	26	..		17	26	36,382	132,569
1893-94	28	38	33	58	62	16	130,620	155,827
1894-95	16	62	27	24	44	6	92,558	170,681
1895-96	14	73	3	48	18	41	38,876	188,291
1896-97	3	64	1	11	4	75	10,370	210,588
1897-98	27	46	10	2	37	48	78,960	243,479
1898-99	22	46	11	13	33	59	70,848	282,326
1899-1900	..		19	26	19	26	40,582	302,354
1900-1901	4	30	103	38	107	68	226,485	345,433
1901-1902	11	20	12	32	23	52	49,665	369,339
1902-1903	28	40	27	43	56	3	117,679	330,029
1903-1904	33	12	4	44	37	56	79,170	309,296
1904-1905	17	61	27	75	45	56	95,970	302,252
1905-1906	23	5	8	52	31	57	66,596	309,183
1906-1907	..		50	7	50	7	105,184	283,293
1907-1908	10	38	4	61	15	19	31,999	331,678
1908-1909	186	21	23	21	209	42	440,003	279,190
1909-1910	3	60	31	43	35	23	74,104	236,390
1910-1911	14	64	29	76	44	60	93,975	282,682
1911-1912	23	30	23	1	46	31	97,414	273,586
1912-1913	25	37	26	77	52	34	110,092	235,378
1913-1914	..		3	6	3	6	6,458	261,748
1914-1915	40	22	51	3	91	25	191,756	227,674
1915-1916	7	43	7	73	15	36	32,445	157,970
1916-1917	..		..		..		..	86,595
1917-1918	22	70	..		22	70	48,038	88,540
1918-1919	..		..		..		..	70,743
1919-1920	..		12	75	12	75	27,169	78,663
1920-1921	11	54	0	7	11	61	24,701	100,280
1921-1922	..		12	27	12	27	25,909	139,187
1922-1923	7	70	..		7	70	16,538	163,735
1923-1924	24	66	2	43	27	29	57,461	227,075
1924-1925	18	8	14	75	33	3	69,379	184,036
1925-1926	30	41	20	66	51	27	107,809	235,266
Totals ..	..		..		..		6,547,881	9,035,534

* Complete information not recorded until 1880-81. † Nine months only.

STATEMENT No. 29.

STATEMENT OF CARRIAGE, RAIL-CAR, BRAKE-VAN, AND WAGON STOCK, AND TARPAULINS, FOR THE YEAR ENDED 31ST MARCH, 1926.

Description.	Class.	Kaihu.	North Island Main Line and Branches, and Whangarei.	Gisborne.	South Island Main Line and Branches, and Westland.	Westport.	Nelson.	Picton.	Total.
CARRIAGES.									
Sleepers, bogie, 56 ft.	AA	..	1	..	..	..	..	..	1
Sleepers, bogie, 50 ft.	AA	..	15	..	..	..	..	..	15
First-class, bogie, 50 ft.	AA	..	43	..	..	..	..	..	43
Ladies' (composite), bogie, 50 ft.	AA	..	6	..	..	..	..	..	6
Second-class bogie, 50 ft.	AA	..	56	..	..	..	..	..	56
Royal saloon, bogie, 50 ft.	AA	..	2	..	..	..	..	..	2
Postal, bogie, 50 ft.	AA	..	1	..	..	..	..	..	1
Royal saloon, bogie, 44 ft.	A	..	..	..	1	..	..	..	1
Gallery-cars, bogie, 44 ft.	A	..	..	..	5	..	..	..	5
Saloon, bogie, 47½ ft.	A	..	1	..	..	..	..	..	1
Saloon, bogie, 44 ft.	A	..	..	..	1	..	..	..	1
,, ,, 41 ft.	A	..	5	..	4	..	..	..	9
,, ,, 39½ ft.	A	..	7	..	7	..	..	..	14
,, ,, 37½ ft.	A	..	2	..	..	..	..	..	2
,, ,, 35 ft.	A	..	1	..	2	..	..	..	3
Ladies' (composite), bogie, 47½ ft.	A	..	..	..	4	..	..	..	4
,, ,, 50 ft.	A	..	10	..	..	..	..	..	10
Motor-train, bogie, 60 ft.	A	..	4	..	1	..	..	..	5
First-class, bogie, 50 ft.	A	..	45	..	..	..	..	..	45
,, ,, 47½ ft.	A	..	40	..	88	..	..	2	130
,, ,, 44 ft.	A	..	3	..	2	..	..	..	5
,, ,, 43 ft.	A	..	11	..	..	..	..	..	11
,, ,, 30 ft.	B	..	..	..	1	..	..	..	1
Composite, bogie, 60 ft.	A	..	8	..	..	..	..	..	8
,, ,, 50 ft.	A	..	52	..	1	..	..	..	53
,, ,, 47½ ft.	A	..	102	2	105	1	4	2	216
,, ,, 46 ft.	A	..	..	..	7	..	..	..	7
,, ,, 44 ft.	A	..	66	7	92	2	1	2	170
,, ,, 43 ft.	A	..	7	..	..	..	..	..	7
,, ,, 42½ ft.	A	..	15	..	30	..	..	..	45
,, ,, 39½ ft.	A	..	2	..	4	1	2	1	10
,, ,, 30 ft.	B	..	13	..	19	..	..	..	32
,, 6-wheel	C	2	2	..	3	..	..	..	7
Second-class, bogie, 52 ft.	A	..	1	..	..	..	..	..	1
,, ,, 50 ft.	A	..	105	..	1	..	..	..	106
,, ,, 47½ ft.	A	..	99	..	137	3	..	..	239
,, ,, 46 ft.	A	..	..	..	4	..	..	..	4
,, ,, 44 ft.	A	..	86	4	109	3	3	4	209
,, ,, 43 ft.	A	..	18	..	..	..	..	..	18
,, ,, 42½ ft.	A	..	3	..	14	..	..	..	17
,, ,, 39½ ft.	A	..	9	..	3	..	..	..	12
,, ,, 35 ft.	A	..	3	..	..	..	..	..	3
,, ,, 30 ft.	B	..	6	..	16	..	..	1	23
,, 6-wheel	C	2	6	..	4	2	4	..	18
,, 4-wheel	D	..	3	..	..	..	..	..	3
Postal, bogie, 50 ft.	A	..	7	..	2	..	..	..	9
,, ,, 44 ft.	A	..	4	..	4	..	..	..	8
,, ,, 39½ ft.	A	..	2	..	..	..	..	..	2
,, ,, 30 ft.	B	..	..	..	1	..	..	..	1
Totals	..	4	872	13	672	12	14	12	1,599
RAIL-CARS.									
Rail-car, 56½ ft.	..	..	1	..	..	..	..	..	1
,, 16 ft.	..	..	2	..	..	..	..	..	2
Totals	..	..	3	..	..	..	..	..	3
BRAKE-VANS.									
Brake-vans, 4-wheel	F	2	14	..	58	2	3	..	79
,, bogie	F	..	234	4	136	5	3	4	386
,, Fell	F	..	7	..	4	..	..	..	11
Totals	..	2	255	4	198	7	6	4	476

STATEMENT No. 29—*continued.*

STATEMENT OF CARRIAGE, BRAKE-VAN, AND WAGON STOCK, AND TARPAULINS, FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

Description.	Class.	Kaihu.	North Island Main Line and Branches, and Whangarei.	Gisborne.	South Island Main Line and Branches, and Westland.	Westport.	Nelson.	Picton.	Total.
WAGONS.									
Horse-boxes	G	..	140	1	116	..	1	4	262
Cattle ..	H	..	354	4	263	4	5	4	634
Sheep ..	J	..	1,010	40	927	..	10	40	2,027
Covered goods	K	1	340	2	408	5	6	3	765
Sleeping-vans	K	..	25	..	44	1	1	..	71
High sides	L	4	5,349	47	5,024	17	103	174	10,718
„	LA	..	2,276	..	2,382	..	..	..	4,658
Wharf ..	LB	..	..	..	13	..	..	..	13
Low sides	M	12	442	40	915	24	14	21	1,468
„ steel	MA	..	148	12	..	..	..	..	160
Work-train	MB	..	86	..	34	..	..	..	120
Timber ..	N	40	177	..	196	32	8	..	453
Iron hopper	O	..	21	..	..	..	..	..	21
„ for ballast	OB	..	28	..	..	..	..	..	28
Platform coal	P	..	228	..	..	..	..	..	228
Movable hopper	Q	..	..	..	495	673	..	..	1,168
Frozen meat	W	..	261	7	95	..	15	..	378
Cool, insulated	X	..	179	..	32	..	..	..	211
„ ventilated	XA	1	163	..	145	..	..	7	316
„ „	XB	..	98	..	56	..	..	..	154
Work-train hopper	Y	..	..	..	12	..	..	..	12
„	YB	..	211	..	152	..	..	..	363
High side, bogie	R	2	223	..	84	..	..	..	309
„ „	RB	..	70	..	21	..	..	..	91
„ „	RD	..	61	..	..	..	..	..	61
„ „	RN	..	34	..	..	..	..	..	34
Sheep, bogie	S	..	68	..	52	..	..	..	120
Cattle, „	T	..	49	..	26	..	..	..	75
Platform, „	U	..	227	40	135	4	4	6	416
Gas-storeholders, bogie	UA	..	11	..	7	..	..	..	18
Platform, „	UB	..	129	..	209	..	..	..	338
Horse-boxes, „	UG	..	32	..	29	..	..	..	61
Frozen meat, „	V	..	47	12	75	..	..	..	134
„ „	VB	..	124	..	60	..	..	..	184
Covered goods, „	Z	..	61	..	40	..	..	..	101
„ „	ZP	..	43	..	68	..	..	..	111
Totals	..	60	12,715	205	12,115	760	167	259	26,281
TARPAULINS ..	..	24	9,874	115	11,345	52	175	290	21,875

STATEMENT No. 30.

STATEMENT OF LOCOMOTIVE STOCK FOR THE YEAR ENDED 31ST MARCH, 1926.

Class.	Type.	Cylinder.		Coupled Wheels.		Truck Wheels.		Kaihu.	North Island Main Line and Branches, and Whangarei.	Gisborne.	South Island Main Line and Branches.	Westport.	Nelson.	Picton.	Total.
		Diameter.	Stroke.	No.	Diameter.	No.	Diameter.								
		In.	In.		Ft. in.		In.								
A	Tender (4-cyl. balanced compound)	12 &19	22	6	4 6	6	30½	..	50	..	7	..	..	..	57
AA	Tender (superheated) ..	18	24	6	4 1	6	30½	..	10	..	..	..	..	..	10
AB	,, ,, ..	17	26	6	4 6	2 4	26½ 30½	..	87	..	50	..	..	..	137
AB	,, (409) ,, ..	17	26	6	4 6	6	30½	..	..	..	1	..	..	..	1
B	,, ...	16	22	8	3 6½	4	30½	..	..	..	8	..	..	..	8
BA	,, ...	16	22	8	3 6½	4	26½	..	..	..	10	..	..	..	10
BB	,, (superheated) ..	17	22	8	3 6½	4	26½	..	30	..	..	..	..	..	30
BC	,, (compound)	11½ & 19	20	8	3 7	2 2	28 30½	..	1	..	..	..	..	..	1
D	Tank	9½	18	4	3 0½	2	18	..	..	..	1	..	..	..	1
F	,, ...	10½	18	6	3 0½	..	..	2	24	..	41	2	1	..	70
FA	,, ...	12	18	6	3 0½	2	24	..	7	1	3	2	3	2	18
H	,, (Fell)	14	16	4	2 8	2	30½	..	6	..	..	..	..	..	6
J	Tender	14	20	6	3 6½	2	24⅝	..	14	..	14	..	..	..	28
K	,, ...	12	20	4	4 1⅛	4	30½	..	..	..	5	..	..	..	5
L	Tank	12	18	4	3 6½	6	26½	..	4	..	1	..	..	..	5
LA	,, ...	12	18	4	3 9	4	26½	..	..	..	1	..	..	..	1
M	,, ...	13	20	4	3 6¼	6	28½	..	2	..	..	..	..	..	2
N	Tender	15	20	6	4 1⅛	4	28½	..	9	..	1	..	..	..	10
N	,, ...	15	20	6	4 1⅛	4	30½	..	..	..	2	..	..	..	2
NA	,, (compound) ..	10 &17	20	6	4 1	4	30½	..	2	..	..	..	..	..	2
NC	,, ,, ..	10 &17	20	6	4 1	4	30½	..	2	..	..	..	..	..	2
OA	,, ,, ..	11 &18	20	8	3 7	2	30½	..	1	..	..	..	..	..	1
OB	,, ...	16	20	8	3 7	2	30½	..	2	..	..	..	..	..	2
OC	,, (compound) ..	11 &18	20	8	3 7	2	30½	..	1	..	..	..	..	..	1
P	,, ...	15	20	8	3 5	2	26½	..	2	..	6	..	..	..	8
Q	,, ...	16	22	6	4 1⅛	2 4	30½ 26½	..	6	..	7	..	..	..	13
R	Single Fairlie	12¼	16	6	3 0½	4	36⅝	..	5	..	7	..	..	..	12
S	,, ...	13	16	6	3 0½	4	36⅝	..	3	..	..	..	..	..	3
T	Tender	15	18	8	3 0½	2	24⅝	..	1	..	3	..	..	..	4
U	,, ...	16	20	6	4 6	4	30½	..	..	..	9	..	..	..	9
UA	,, ...	16	20	6	4 1⅛	4	30½	..	..	..	6	..	..	..	6
UB	,, ...	16	20	6	4 1⅛	4	26½	..	..	..	20	..	..	..	20
UB	,, ...	16	22	6	4 1⅛	4	30½	..	..	..	2	..	..	..	2
UC	,, ...	16	22	6	4 1⅛	4	30½	..	..	..	10	..	..	..	10
UD	,, ...	16½	22	6	4 10	4	28	..	2	..	..	..	..	..	2
V	,, ...	15	20	6	4 1⅛	4	26½	..	..	..	8	..	..	..	8
W	Tank	14	20	6	3 0½	4	26½	..	..	..	2	..	..	..	2
WA	,, ...	14	20	6	3 3¾	4	28½	..	2	6	3	..	..	..	11
WA	,, (converted) ..	14	20	6	3 6½	4	24⅝	..	3	..	1	..	..	..	4
WAB	,, (superheated) ..	17	26	6	4 6	4 4	30½ 26½	..	3	..	..	..	..	..	3
WB	,, ...	14	20	6	3 3¾	4	25	..	6	..	..	6	..	..	12
WD	,, ...	14	20	6	3 3½	6	25	..	11	..	7	..	..	..	18
WE	,, ...	16	22	6	3 6½	8	30½	..	1	..	1	..	..	..	2
WF	,, ...	14	22	6	3 9	6	30½	..	14	..	17	..	3	4	38
WG	,, ...	14	22	6	3 9	8	26½	..	20	..	..	..	..	..	20
WH	,, ...	12	18	6	3 1	4	24½	..	2	..	..	..	..	..	2
WJ	,, ...	17	20	8	3 7	2 4	30½ 26½	..	1	..	..	..	..	..	1
WS	,, (superheated) ..	17	26	6	4 6	4 4	30½ 26½	..	9	..	..	..	..	..	9
WW	,, ,, ..	15½	22	6	3 9	8	26½	..	48	..	2	..	..	..	50
X	Tender (4-cyl. balanced compound)	13½ & 22	22	8	3 9	2 4	30½ 26¼	..	18	..	..	..	..	..	18
..	Small Tank	..	..	..	..	..	..	..	1	..	..	..	..	..	1
..	Electric	..	..	8	3 8⅞	..	..	..	..	..	5	..	..	..	5
..	Battery	..	..	8	3 0½	..	..	..	..	..	1	..	..	..	1
	Totals	..	..	..	..	..	..	2	410	7	262	10	7	6	704

STATEMENT No. 31.

PERFORMANCES OF LOCOMOTIVES FOR THE YEAR ENDED 31ST MARCH, 1926.

Type.	Number of Engines.	Engine-mileage. Details. Train.	Shunting, Assisting, Light, and Miscellaneous.	Work train.	Total.	Quantity of Stores. Running. Coal.	Oil.	Cost. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Cost per Engine-mile, in Pence. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Days in Steam.	Type.
KAIHU SECTION.																			
						Cwt.	Qt.	£	£	£	£	£							
F	2	17,749	5,031	59	22,839	6,075	595	575	33	715	838	2,161	6·04	0·35	7·51	8·81	22·71	313	F.
Betterments and depreciation charges	..	..	..	..	..	..	..	..	..	..	..	117	..	..	..	..	1·23	..	
Water charges	..	..	..	..	..	..	..	..	..	..	..	13	..	..	..	..	0·14	..	
General charges	..	..	..	..	..	..	..	..	..	..	..	221	..	..	..	..	2·32	..	
				59	22,839							2,512					26·40		
				59	59*							5†							
Totals	..	17,749	5,031	..	22,780	..	..	..	..	..	..	2,507	..	..	..	..	..	..	
GISBORNE SECTION.																			
						Cwt.	Qr.	£	£	£	£	£							
FA	1	661	138	..	799	194	29	63	2	32	31	128	18·92	0·60	9·62	9·31	38·45	13	FA.
WA	6	77,970	16,640	1,103	95,713	35,230	3,301	1,714	183	5,819	3,335	11,051	4·30	0·46	14·59	8·36	27·71	871	WA.
Totals	7	78,631	16,778	1,103	96,512	35,424	3,330	1,777	185	5,851	3,366	11,179	4·42	0·46	14·55	8·37	27·80	884	
Betterments and depreciation charges	..	..	..	..	..	..	..	..	..	..	..	689	..	..	..	..	1·71	..	
Water charges	..	..	..	..	..	..	..	..	..	..	..	141	..	..	..	..	0·35	..	
General charges	..	..	..	..	..	..	..	..	..	..	..	1,139	..	..	..	..	2·83	..	
				1,103	96,512							13,148					32·69		
				1,103	1,103*							127†					..		
Totals	..	78,631	16,778	..	95,409	..	..	..	..	..	..	13,021	..	..	..	..	..	..	

* Mileage run by engines performing work-train services for Maintenance Branch, "working-expenses" classifications. † Credits for same.

STATEMENT No. 31—*continued.*

PERFORMANCES OF LOCOMOTIVES FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

Type.	Number of Engines.	Engine-mileage. Details. Train.	Shunting, Assisting, Light, and Miscellaneous.	Work train.	Total.	Quantity of Stores. Running. Coal.	Oil.	Cost. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Cost per Engine-mile, in Pence. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Days in Steam.	Type.
NORTH ISLAND MAIN LINE AND BRANCHES.																			
						Cwt.	Qt.	£	£	£	£	£							
A	50	991,498	242,493	6,065	1,240,056	602,062	51,226	44,172	2,840	68,325	41,145	156,482	8·55	0·55	13·22	7·96	30·28	10,897	A.
AA	10	216,907	47,431	1,103	265,441	151,324	9,931	5,925	553	17,216	8,101	31,795	5·36	0·50	15·57	7·32	28·75	2,160	AA.
AB	87	2,193,405	319,766	2,080	2,515,251	1,135,247	83,051	43,197	4,538	130,195	66,805	244,735	4·12	0·43	12·42	6·38	23·35	18,764	AB.
BB	30	612,310	196,843	14,487	823,640	465,881	30,247	21,093	1,650	53,088	28,133	103,964	6·15	0·48	15·46	8·20	30·29	7,328	BB.
BC	1	2,360	1,169	1,551	5,080	3,885	286	103	20	437	252	812	4·87	0·94	20·65	11·90	38·36	91	BC.
F	24	6,385	159,178	30,708	196,271	61,019	5,992	7,481	355	6,601	10,832	25,269	9·15	0·43	8·07	13·25	30·90	3,502	F.
FA	7	1,604	59,415	9,669	70,688	29,123	2,485	4,439	141	2,808	3,961	11,349	15·07	0·48	9·53	13·45	38·53	1,049	FA.
H..	6	12,730	28,538	459	41,727	47,008	2,690	4,255	183	5,384	4,453	14,275	24·47	1·05	30·97	25·61	82·10	1,284	H.
J	14	390	251,803	7	252,200	119,222	9,340	6,078	560	13,406	15,366	35,410	5·78	0·53	12·76	14·62	33·69	3,031	J.
L	4	10,606	7,982	209	18,797	5,713	457	711	28	652	939	2,330	9·08	0·36	8·32	11·99	29·75	378	L.
M..	2	19,248	21,245	466	40,959	13,509	1,233	683	70	1,543	1,757	4,053	4·00	0·41	9·04	10·30	23·75	571	M.
N..	8	5,137	39,537	1,600	46,274	24,542	1,646	2,455	95	2,770	2,667	7,987	12·73	0·49	14·37	13·83	41·42	596	N.
N (compound)	1	344	124	..	468	252	24	27	2	31	17	77	13·85	1·01	15·90	8·73	39·49	7	N (compound).
NA	2	15,114	7,759	16	22,889	9,600	803	163	43	1,093	640	1,939	1·71	0·45	11·46	6·71	20·33	219	NA.
NC	2	14,734	6,922	..	21,656	10,304	868	178	49	1,178	847	2,252	1·97	0·54	13·06	9·39	24·96	254	NC.
OA	1	10,336	2,811	..	13,147	6,728	528	1,013	31	746	471	2,261	18·49	0·56	13·62	8·60	41·27	161	OA.
OB	2	40,048	8,839	152	49,039	25,864	1,673	1,274	92	2,968	1,544	5,878	6·24	0·45	14·52	7·56	28·77	467	OB.
OC	1	23,651	5,603	..	29,254	14,108	1,052	155	58	1,581	920	2,714	1·27	0·47	12·97	7·55	22·26	247	OC.
P	2	Not working																	P.
Q	6	83,497	26,916	22,923	133,336	74,898	5,185	5,035	284	8,425	5,104	18,848	9·06	0·51	15·16	9·19	33·92	1,300	Q.
R	5	43	8,959	..	9,002	4,462	284	532	18	382	537	1,469	14·18	0·48	10·18	14·32	39·16	263	R.
S	3	68	2,907	..	2,975	1,657	99	49	6	182	192	429	3·95	0·48	14·68	15·49	34·60	70	S.
T	1	13	16,519	630	17,162	11,461	792	162	44	1,284	1,107	2,597	2·26	0·62	17·96	15·48	36·32	226	T.
UD	2	22,648	19,226	3,886	45,760	22,166	1,663	282	93	2,496	1,944	4,815	1·48	0·49	13·09	10·19	25·25	536	UD.
V	1	..	..	..	..	..	..	254	..	..	..	254	..	..	..	..	..	..	V.
WA	2	18,292	12,969	611	31,872	12,580	885	1,092	55	1,429	1,289	3,865	8·22	0·41	10·76	9·71	29·10	435	WA.
WA (converted)	3	14,040	32,859	1,318	48,217	19,212	1,798	1,811	100	2,146	2,346	6,403	9·01	0·50	10·68	11·68	31·87	544	WA (converted).
WAB	3	70,732	4,192	185	75,109	40,937	3,246	1,474	167	4,658	1,891	8,190	4·72	0·53	14·88	6·04	26·17	634	WAB.
WB	6	77,938	40,112	8,878	126,928	73,620	4,667	2,623	265	4,558	4,656	12,102	4·96	0·50	8·62	8·80	22·88	1,479	WB.
WD	11	68,043	93,129	17,564	178,736	104,747	6,833	5,652	398	9,970	8,391	24,411	7·59	0·53	13·39	11·27	32·78	2,218	WD.

NOTES.—Whangarei Section included with North Island. One V engine written off, one D engine sold, and one WF engine transferred to Nelson Section.

STATEMENT No. 31—*continued.*

PERFORMANCES OF LOCOMOTIVES FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

Type.	Number of Engines.	Engine-mileage. Details. Train.	Shunting, Assisting, Light, and Miscellaneous.	Work train.	Total	Quantity of Stores. Running. Coal.	Oil.	Cost. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Cost per Engine-mile, in Pence. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Days in Steam.	Type.
NORTH ISLAND MAIN LINE AND BRANCHES—*continued.*																			
						Cwt.	Qt.	£	£	£	£	£							
WE	1	969	7,790	4	8,763	4,509	365	179	25	505	471	1,180	4·90	0·68	13·84	12·90	32·32	164	WE.
WF	14	115,342	114,682	11,849	241,873	123,002	8,392	9,537	487	12,330	9,937	32,291	9·46	0·48	12·24	9·86	32·04	2,914	WF.
WG	20	127,283	196,564	16,063	339,910	170,212	12,362	14,709	726	19,172	15,399	50,006	10·38	0·51	13·54	10·87	35·30	3,929	WG.
WH	2	12,886	18,274	1,725	32,885	11,038	1,062	254	67	1,248	1,517	3,086	1·85	0·49	9·11	11·07	22·52	360	WH.
WJ	1	3,258	5,297	..	8,555	6,530	350	1,301	22	732	479	2,534	36·50	0·62	20·53	13·44	71·09	118	WJ.
WS	9	255,353	48,418	567	304,338	153,246	10,790	3,997	587	17,393	10,268	32,245	3·15	0·46	13·72	8·10	25·43	2,463	WS.
WW	48	774,416	386,118	22,619	1,183,153	584,636	42,820	34,096	2,366	66,651	46,000	149,113	6·92	0·48	13·52	9·33	30·25	12,539	WW.
X	18	336,071	43,178	1,747	380,996	281,251	25,162	18,340	1,286	31,969	13,995	65,590	11·55	0·81	20·14	8·82	41·32	3,297	X.
Small tank	1	Not working		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Small tank.
RM 1	1	11,292	1,295	..	12,587	868	491	328	23	98	295	744	6·25	0·45	1·87	5·62	14·19	124	RM 1.
RM 2	1	Trial runs only		..	..	..	..	48	..	..	..	48	..	..	..	..	..	30	RM 2.
RM 3	1	Trial runs only		..	..	..	..	20	..	..	..	20	..	..	..	..	..	3	RM 3.
RM 4–5	2	Trial runs only		..	..	..	..	7	..	..	..	7	..	..	..	..	..	8	RM 4–5.
Totals	416	6,168,991	2,486,862	179,141	8,834,994	4,426,423	330,778	245,184	18,327	495,650	314,668	1,073,829	6·66	0·50	13·46	8·55	29·17	84,660	
Betterments and depreciation charges	..	..	..	..	..	..	..	..	..	..	..	52,515	..	..	..	..	1·42	..	
Water charges	..	..	..	..	..	..	..	..	..	..	..	15,273	..	..	..	..	0·41	..	
General charges	..	..	..	..	..	..	..	..	..	..	..	140,597	..	..	..	..	3·82	..	
			2,486,862	179,141	8,834,994							1,282,214					34·83		
			37,283*	89,203†	126,486							16,917‡							
Totals	..	6,168,991	2,449,579	89,938	8,708,508	..	..	..	..	..	..	1,265,297	..	..	..	..	..	..	

* Mileage run by engines performing shunting services for workshops. † Mileage run by engines performing work-train services for Maintenance Branch, "Working-expenses" classifications. ‡ Credits for same.

STATEMENT No. 31—*continued.*

PERFORMANCES OF LOCOMOTIVES FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

Type.	Number of Engines.	Engine-mileage.				Quantity of Stores.		Cost.					Cost per Engine-mile, in Pence.					Days in Steam.	Type.
		Details.			Total	Running.		Repairs.	Running.			Total.	Repairs.	Running.			Total.		
		Train.	Shunting, Assisting, Light, and Miscellaneous.	Work train.		Coal.	Oil.	Wages and Material.	Stores.	Fuel.	Wages.		Wages and Material.	Stores.	Fuel.	Wages.			
SOUTH ISLAND MAIN LINE AND BRANCHES.																			
						Cwt.	Qt.	£	£	£	£	£							
A	7	132,157	17,300	74	149,531	85,901	6,309	8,627	341	8,843	5,093	22,904	13·84	0·55	14·19	8·18	36·76	1,247	A.
AB 409	1	33,347	5,147	..	38,494	18,726	1,291	250	70	1,948	1,128	3,396	1·56	0·44	12·14	7·03	21·17	256	AB 409.
AB	50	1,326,225	211,529	2,509	1,540,263	748,160	56,015	34,018	2,862	78,383	42,504	157,767	5·30	0·45	12·21	6·62	24·58	10,345	AB.
B	8	147,665	35,815	15	183,495	120,247	8,081	8,246	429	11,980	7,467	28,122	10·79	0·56	15·66	9·77	36·78	1,877	B.
BA	10	141,705	71,541	87	213,333	134,778	9,746	5,440	535	13,491	9,268	28,734	6·12	0·60	15·18	10·43	32·33	2,453	BA.
D	1	..	8,280	..	8,280	2,271	275	41	18	125	274	458	1·19	0·52	3·62	7·95	13·28	226	D.
F	41	40,806	529,958	2,428	573,192	197,331	20,419	14,966	1,170	19,263	34,385	69,784	6·27	0·49	8·07	14·39	29·22	9,154	F.
FA	3	23,669	19,566	1,465	44,700	16,411	1,550	2,010	101	1,707	2,084	5,902	10·79	0·54	9·17	11·19	31·69	675	FA.
J	14	88,418	127,364	35,034	250,816	108,253	8,730	6,158	502	11,381	12,378	30,419	5·89	0·48	10·89	11·84	29·10	3,309	J.
K	5	9,965	5,659	..	15,624	5,759	459	140	32	584	563	1,319	2·15	0·49	8·97	8·65	20·26	236	K.
L	1	10,862	5,875	364	17,101	6,007	368	106	22	633	834	1,595	1·49	0·31	8·88	11·70	22·38	251	L.
LA	1	1,679	4,191	9,871	15,741	5,646	550	103	31	589	658	1,381	1·57	0·47	8·98	10·03	21·05	253	LA.
N	3	37,245	38,852	681	76,778	41,294	2,188	1,586	128	4,330	2,763	8,807	4·96	0·40	13·53	8·64	27·53	725	N.
P	6	79,292	24,358	8,953	112,603	52,894	3,261	2,075	189	5,520	4,063	11,847	4·42	0·40	11·77	8·66	25·25	1,256	P.
Q	7	159,777	20,443	17	180,237	120,298	6,888	8,634	359	12,123	6,176	27,292	11·50	0·48	16·14	8·22	36·34	1,525	Q.
R	7	14,050	71,394	323	85,767	31,560	2,551	2,638	150	3,334	5,277	11,399	7·38	0·42	9·33	14·77	31·90	1,425	R.
T	3	11,487	29,391	51	40,929	22,427	1,735	778	104	2,145	2,637	5,664	4·56	0·61	12·58	15·46	33·21	632	T.
U	9	171,950	28,612	845	201,407	102,797	6,675	7,186	368	10,818	6,206	24,578	8·56	0·44	12·89	7·40	29·29	1,825	U.
UA	6	132,224	20,264	76	152,564	70,818	4,478	6,279	246	7,431	4,526	18,482	9·88	0·39	11·68	7·12	29·07	1,274	UA.
UB	22	469,263	88,757	1,470	559,490	323,037	18,963	19,944	1,017	33,486	18,808	73,255	8·56	0·43	14·36	8·07	31·42	5,047	UB.
UC	10	182,728	45,763	645	229,136	133,205	8,209	11,626	425	13,875	7,899	33,825	12·18	0·45	14·53	8·27	35·43	2,200	UC.
V	8	158,092	26,785	490	185,367	91,858	5,374	1,830	309	9,668	6,231	18,038	2·37	0·40	12·52	8·06	23·35	1,760	V.
W	2	25,344	12,401	58	37,803	21,357	1,547	330	90	2,245	2,006	4,671	2·09	0·57	14·25	12·74	29·65	542	W.
WA	3	39,879	12,304	1,257	53,440	28,292	2,003	3,790	113	2,996	2,189	9,088	17·02	0·50	13·46	9·83	40·81	598	WA.
WA (converted)	1	2,337	5,881	489	8,707	3,402	403	1,512	26	348	499	2,385	41·68	0·72	9·59	13·75	65·74	160	WA (converted).
WD	7	60,210	61,446	6,101	127,757	74,444	5,234	7,500	298	7,415	6,134	21,347	14·09	0·56	13·93	11·52	40·10	1,627	WD.
WE	1	11,021	4,903	60	15,984	11,233	752	218	42	1,182	891	2,333	3·27	0·63	17·75	13·38	35·03	262	WE.
WF	17	273,402	86,209	9,954	369,565	177,479	13,419	13,544	724	18,600	13,567	46,435	8·80	0·47	12·08	8·81	30·16	3,947	WF.
WW	2	42,708	11,636	375	54,719	26,968	2,163	2,923	117	2,776	2,267	8,083	12·82	0·51	12·18	9·94	35·45	505	WW.
E1*	1	..	20	4,532	4,552	..	130	917	10	..	188	1,115	48·35	0·53	..	9·91	58·79	125	E1.

NOTE—One F and one LA engine sold during the year.

* Electric locos. at Otira.

STATEMENT No. 31—*continued.*

PERFORMANCES OF LOCOMOTIVES FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

Type.	Number of Engines.	Engine-mileage. Details. Train.	Shunting, Assisting, Light, and Miscellaneous.	Work train.	Total.	Quantity of Stores. Running. Coal.	Oil.	Cost. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Cost per Engine-mile, in Pence. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Days in Steam.	Type.
SOUTH ISLAND MAIN LINE AND BRANCHES—*continued.*						Cwt.	Qt.	£	£	£	£	£							
E2–6*	5	26,674	35,037	..	61,711	..	1,286	7,425	101	..	1,776	9,302	28·88	0·39	..	6·91	36·18	1,219	E 2–6.
A88†	1	Trial runs	only	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	A 88.
Totals	263	3,854,181	1,666,681	88,224	5,609,086	2,782,853	201,052	180,840	10,929	287,219	210,739	689,727	7·74	0·47	12·28	9·02	29·51	56,943	
Betterments and depreciation charges	..	..	..	..	..	..	..	..	..	..	..	42,373	..	..	..	..	1·81	..	
Water charges	..	..	..	..	..	..	..	..	..	..	..	9,405	..	..	..	..	0·40	..	
General charges	..	..	..	..	..	..	..	..	..	..	..	103,432	..	..	..	..	4·43	..	
			1,666,681	88,224	5,609,086							844,937					36·15		
			34,386‡	69,102§	103,488							15,951‖					..		
Totals	..	3,854,181	1,632,295	19,122	5,505,598	..	..	..	..	..	..	828,986	..	..	..	..	..	..	

* Electric locos. at Otira. † Petrol rail-motor. ‡ Mileage run by engines performing shunting services for workshops. § Mileage run by engines performing work-train services for Maintenance Branch and Signal Branch, "working-expenses" classifications. ‖ Credits for same.

WESTPORT SECTION.

						Cwt.	Qt.	£	£	£	£	£							
F	5	3,041	26,258	1,189	30,488	8,018	1,272	382	73	537	2,023	3,015	3·01	0·57	4·23	15·92	23·73	546	F.
FA	2	11,743	17,496	202	29,441	11,404	1,108	559	66	758	1,495	2,878	4·55	0·54	6·18	12·19	23·46	432	FA.
WB	6	75,896	31,345	243	107,484	63,846	4,457	3,665	258	4,275	4,502	12,700	8·18	0·58	9·55	10·05	28·36	1,290	WB.
Totals	13	90,680	75,099	1,634	167,413	83,268	6,837	4,606	397	5,570	8,020	18,593	6·60	0·57	7·98	11·50	26·65	2,268	
Betterments and depreciation charges	..	..	..	..	..	..	..	..	..	..	..	1,404	..	..	..	..	2·01	..	
Water charges	..	..	..	..	..	..	..	..	..	..	..	301	..	..	..	..	0·43	..	
General charges	..	..	..	..	..	..	..	..	..	..	..	3,645	..	..	..	..	5·23	..	
			75,099	1,634	167,413							23,943					34·32		
			1,828*	1,033†	2,861							400‡					..		
Totals	..	90,680	73,271	601	164,552	..	..	..	..	..	..	23,543	..	..	..	..	..	..	

NOTE.—F type at Westport includes three Cape Foulwind engines.

* Mileage run by engines performing shunting services for workshops. † Mileage run by engines performing work-train services for Maintenance Branch "working-expenses" classifications. ‡ Credits for same.

STATEMENT No. 31—*continued.*

PERFORMANCES OF LOCOMOTIVES FOR THE YEAR ENDED 31ST MARCH, 1926—*continued.*

Type.	Number of Engines.	Engine-mileage. Details. Train.	Shunting, Assisting, Light, and Miscellaneous.	Work train.	Total	Quantity of Stores. Running. Coal.	Oil.	Cost. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Cost per Engine-mile, in Pence. Repairs. Wages and Material.	Running. Stores.	Fuel.	Wages.	Total.	Days in Steam.	Type
NELSON SECTION.																			
						Cwt.	Qt.	£	£	£	£	£							
F	1	135	450	..	585	3,856	404	44	23	419	686	1,172	0·57	0·30	5·45	8·92	15·24	10	F.
FA	3	17,541	12,142	135	29,818	10,030	840	849	48	1,090	1,140	3,127	6·83	0·39	8·77	9·18	25·17	533	FA.
WF	3	41,436	6,521	378	48,335	19,499	1,496	541	89	2,125	1,401	4,156	2·69	0·44	10·55	6·96	20·64	614	WF.
Totals	7	59,112	19,113	513	78,738	33,385	2,740	1,434	160	3,634	3,227	8,455	3·56	0·40	9·03	8·02	21·01	1,157	
Betterments and depreciation charges	..	..	..	..	..	..	..	..	..	..	..	390	..	..	..	..	0·97	..	
Water charges	..	..	..	..	..	..	..	..	..	..	..	590	..	..	..	..	1·46	..	
General charges	..	..	..	..	..	..	..	..	..	..	..	2,004	..	..	..	..	4·98	..	
				513	78,738							11,439					28·42		
				403	403*							40†					..		
Totals	..	59,112	19,113	110	78,335	..	..	..	..	..	..	11,399	..	..	..	..	..	..	

NOTES.—One WF engine transferred to Nelson from North Island Main Line and Branches. 17,864 miles run by F engine on loan to Public Works Department, Nelson, have been added when computing averages on Nelson Section.

* Mileage run by engines performing work-train services for Maintenance Branch, "working-expenses" classifications. † Credits for same.

PICTON SECTION.

						Cwt.	Qt.	£	£	£	£	£							
FA	2	11,677	11,488	..	23,165	9,014	770	394	43	1,109	929	2,475	4·08	0·45	11·49	9·62	25·64	473	
WF	4	38,386	20,278	133	58,797	24,228	1,809	2,578	130	3,000	2,128	7,836	10·52	0·53	12·25	8·69	31·99	767	
Totals	6	50,063	31,766	133	81,962	33,242	2,579	2,972	173	4,109	3,057	10,311	8·70	0·51	12·03	8·95	30·19	1,240	
Betterments and depreciation charges	..	..	..	..	..	..	..	..	..	..	..	468	..	..	..	..	1·37	..	
Water charges	..	..	..	..	..	..	..	..	..	..	..	74	..	..	..	..	0·22	..	
General charges	..	..	..	..	..	..	..	..	..	..	..	2,145	..	..	..	..	6·28	..	
				133	81,962							12,998					38·06		
				105	105*							13†					..		
Totals	..	50,063	31,766	28	81,857	..	..	..	..	..	..	12,985	..	..	..	..	..	..	

* Mileage run by engines performing work-train services for Maintenance Branch, "working-expenses." classifications. † Credits for same.

STATEMENT No. 31—*continued.*

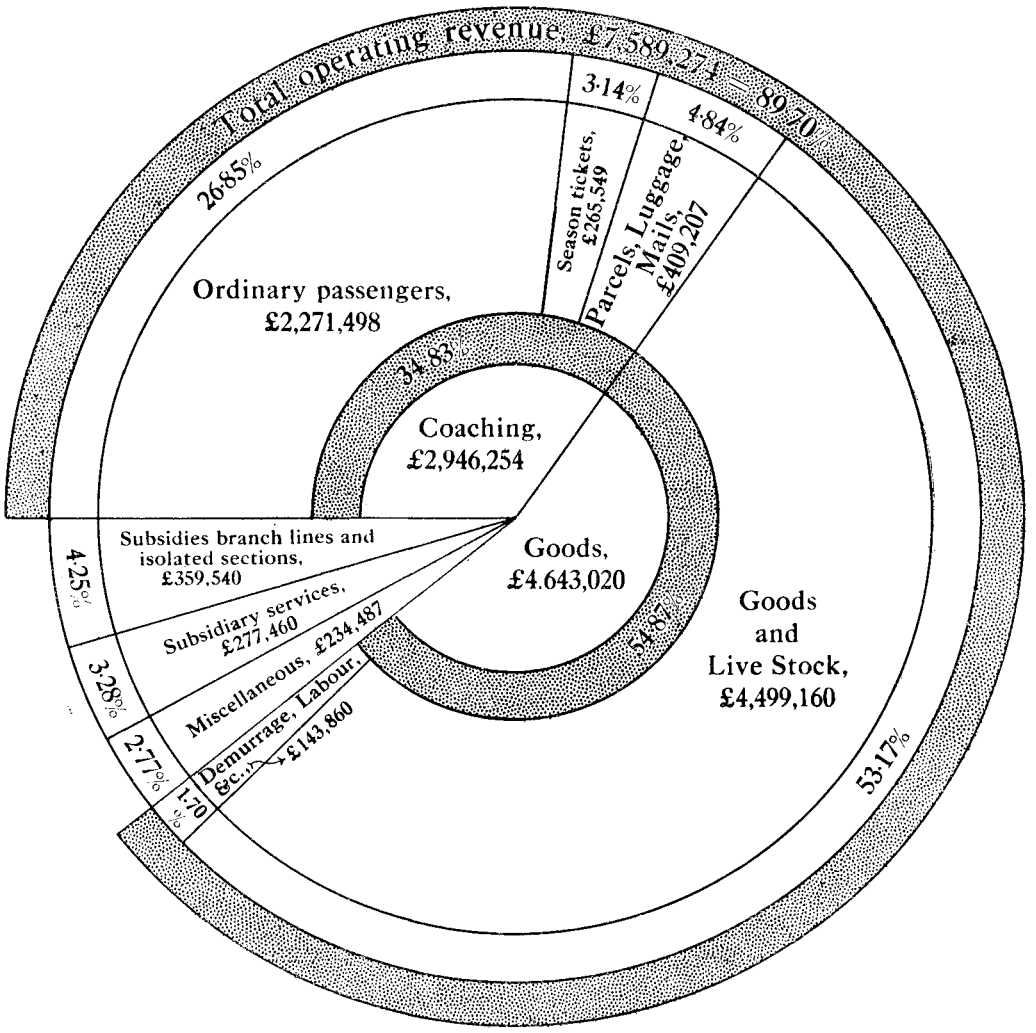
SUMMARY.

Section.	Number of Engines.	Engine-mileage. Detail. Train.	Shunting, Assisting, Light, and Miscellaneous.	Work-train.	Total.	Less Recoverable Mileage.	Net Total Mileage	Quantity of Stores. Running. Coal.	Oil.	Cost. Repairs. Wages and Material	Running. Stores.	Fuel.	Wages.	Total.	Section.
ALL SECTIONS.															
								Cwt.	Qt.	£	£	£	£	£	
Kaihu	2	17,749	5,031	59	22,839	59	22,780	6,075	595	575	33	715	838	2,161	Kaihu.
Gisborne	7	78,631	16,778	1,103	96,512	1,103	95,409	35,424	3,330	1,777	185	5,851	3,366	11,179	Gisborne.
N.I.M.L. and branches ..	416	6,168,991	2,486,862	179,141	8,834,994	126,486	8,708,508	4,426,423	330,778	245,184	18,327	495,650	314,668	1,073,829	N.I.M.L. and branches.
S.I.M.L. and branches ..	263	3,854,181	1,666,681	88,224	5,609,086	103,488	5,505,598	2,782,853	201,052	180,840	10,929	287,219	210,739	689,727	S.I.M.L. and branches.
Westport	13	90,680	75,099	1,634	167,413	2,861	164,552	83,268	6,837	4,606	397	5,570	8,020	18,593	Westport.
Nelson	7	59,112	19,113	513	78,738	403	78,335	33,385	2,740	1,434	160	3,634	3,227	8,455	Nelson.
Picton	6	50,063	31,766	133	81,962	105	81,857	33,242	2,579	2,972	173	4,109	3,057	10,311	Picton.
	714	10,319 407	4,301,330	270,807	14,891,544	234,505	14,657,039	7,400,670	547,911	437,388	30,204	802,748	543,915	1,814,255	

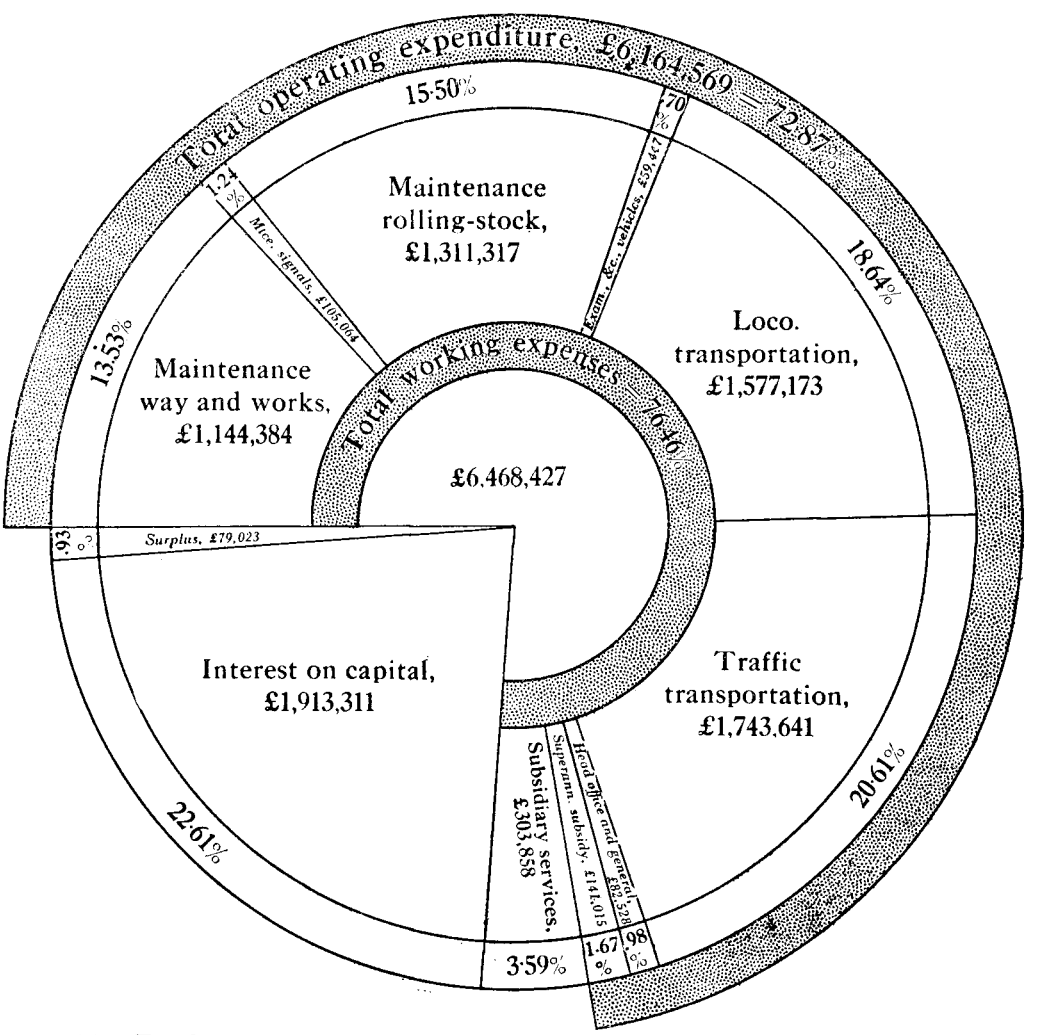
Section.	Cost per Engine-mile in Pence. Repairs. Wages and Materials.	Running. Stores.	Fuel.	Wages.	Total.	Betterments and Depreciation Charges.	Water Charges.	General Charges.	Cost of Betterments and Depreciation Charges per Engine-mile in Pence.	Cost of Water Charges per Engine-mile in Pence.	Cost of General Charges per Engine-mile in Pence.	Total Cost.	Total Cost per Engine-mile in Pence.	Less Recoverable Expenditure.	Net Total Expenditure.	Days in Steam.	Section.
						£	£	£				£		£	£		
Kaihu..	6·04	0·35	7·51	8·81	22·71	117	13	221	1·23	0·14	2·32	2,512	26·40	5	2,507	313	Kaihu
Gisborne	4·42	0·46	14·55	8·37	27·80	689	141	1,139	1·71	0·35	2·83	13,148	32·69	127	13,021	884	Gisborne
N.I.M.L. and branches ..	6·66	0·50	13·46	8·55	29·17	52,515	15,273	140,597	1·43	0·41	3·82	1,282,214	34·83	16,917	1,265,297	84,660	N.I.M.L. and branches
S.I.M.L. and branches ..	7·74	0·47	12·28	9·02	29·51	42,373	9,405	103,432	1·81	0·40	4·43	844,937	36·15	15,951	828,986	56,943	S.I.M.L. and branches
Westport	6·60	0·57	7·98	11·50	26·65	1,404	301	3,645	2·01	0·43	5·23	23,943	34·32	400	23,543	2,268	Westport
Nelson	3·56	0·40	9·03	8·02	21·01	390	590	2,004	0·97	1·46	4·98	11,439	28·42	40	11,399	1,157	Nelson
Picton	8·70	0·51	12·03	8·95	30·19	468	74	2,145	1·37	0·22	6·28	12,998	38·06	13	12,985	1,240	Picton
	7·05	0·48	12·94	8·77	29·24	97,956	25,797	253,183	1·58	0·41	4·08	2,191,191	35·31	33,453	2,157,738	147,465	

STATEMENT No.

Revenue and Expenditure, Year ended 31st March, 1926.



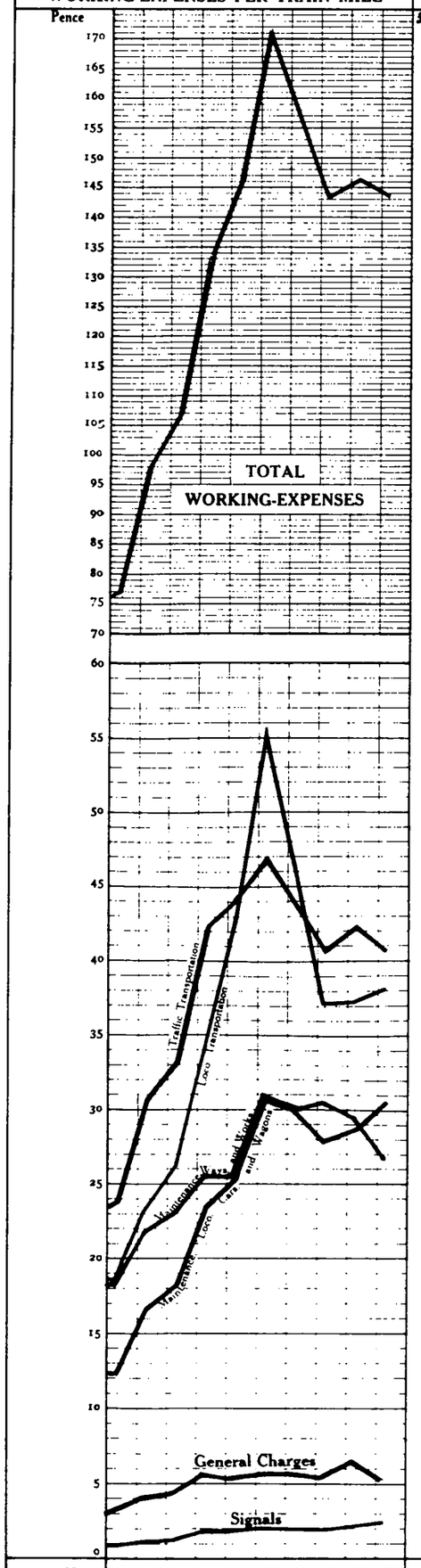
Revenue, £8,460,762.



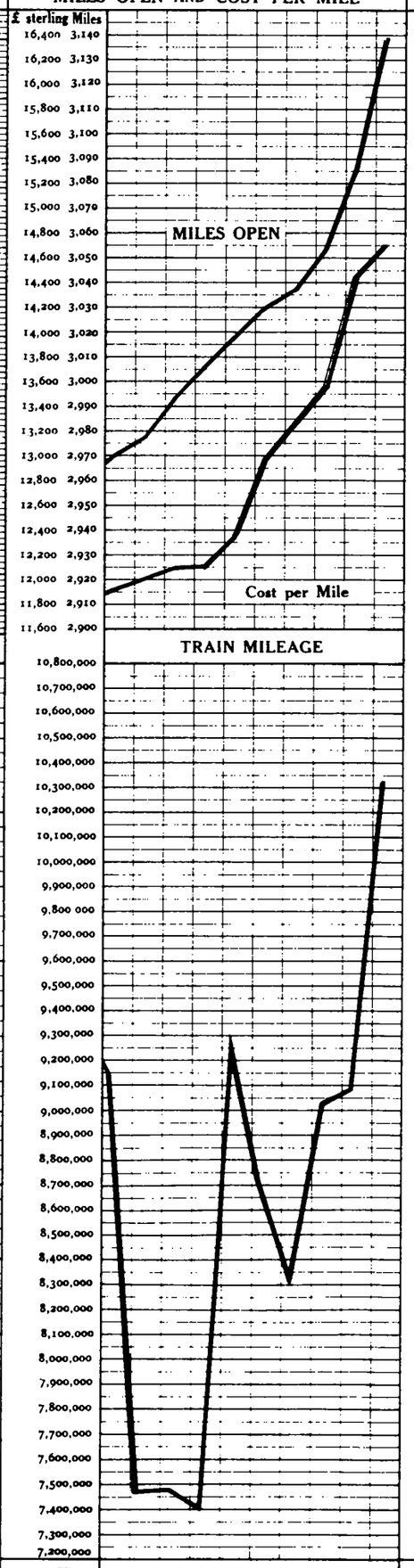
Expenditure, £8,381,739.

NEW ZEALAND GOVERNMENT RAILWAYS.

WORKING-EXPENSES PER TRAIN MILE

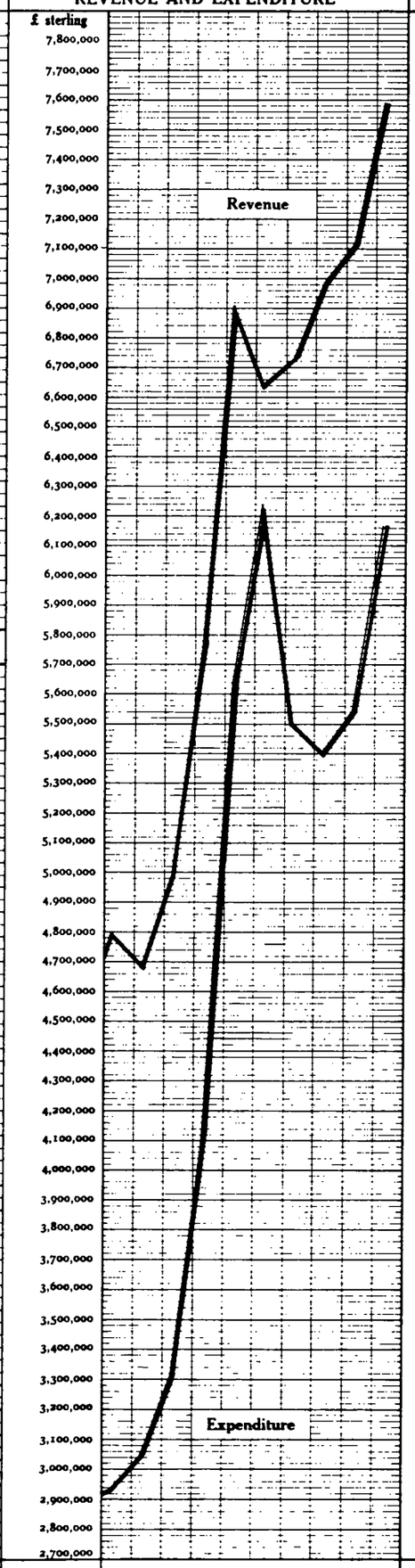


MILES OPEN AND COST PER MILE

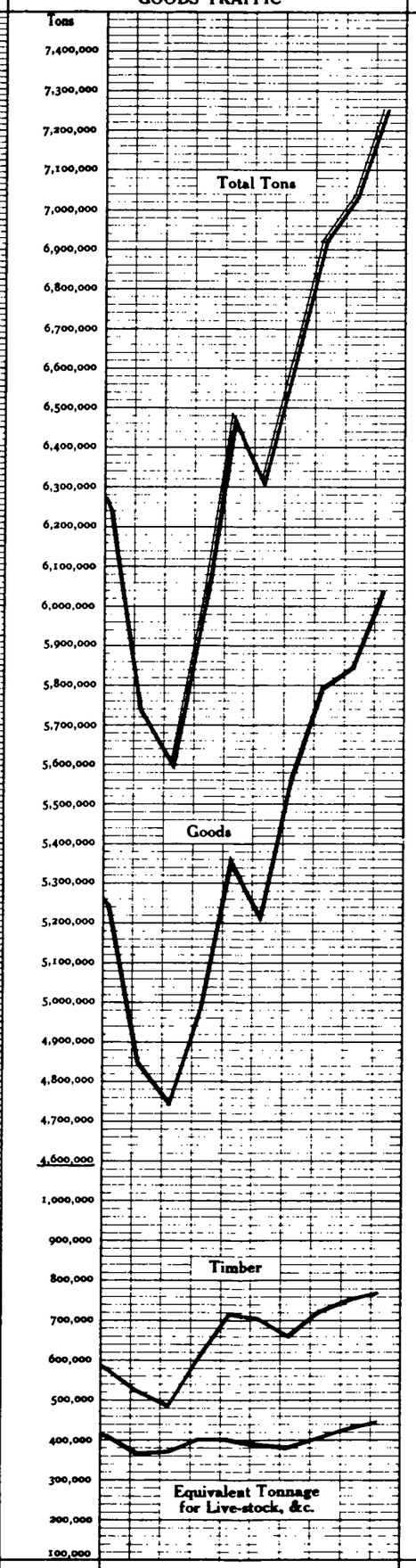


TRAIN MILEAGE

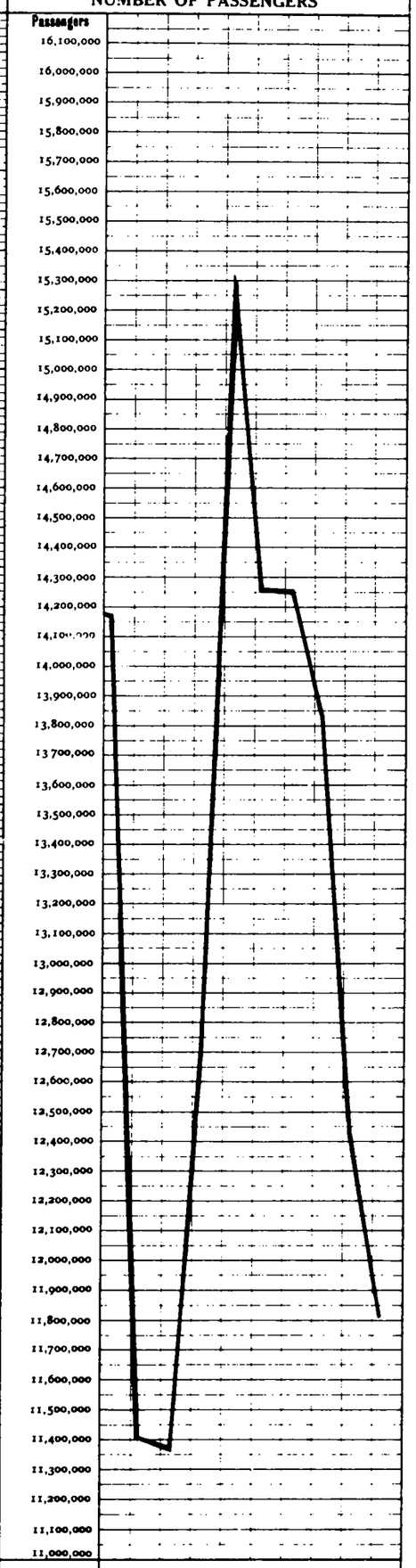
REVENUE AND EXPENDITURE



GOODS TRAFFIC



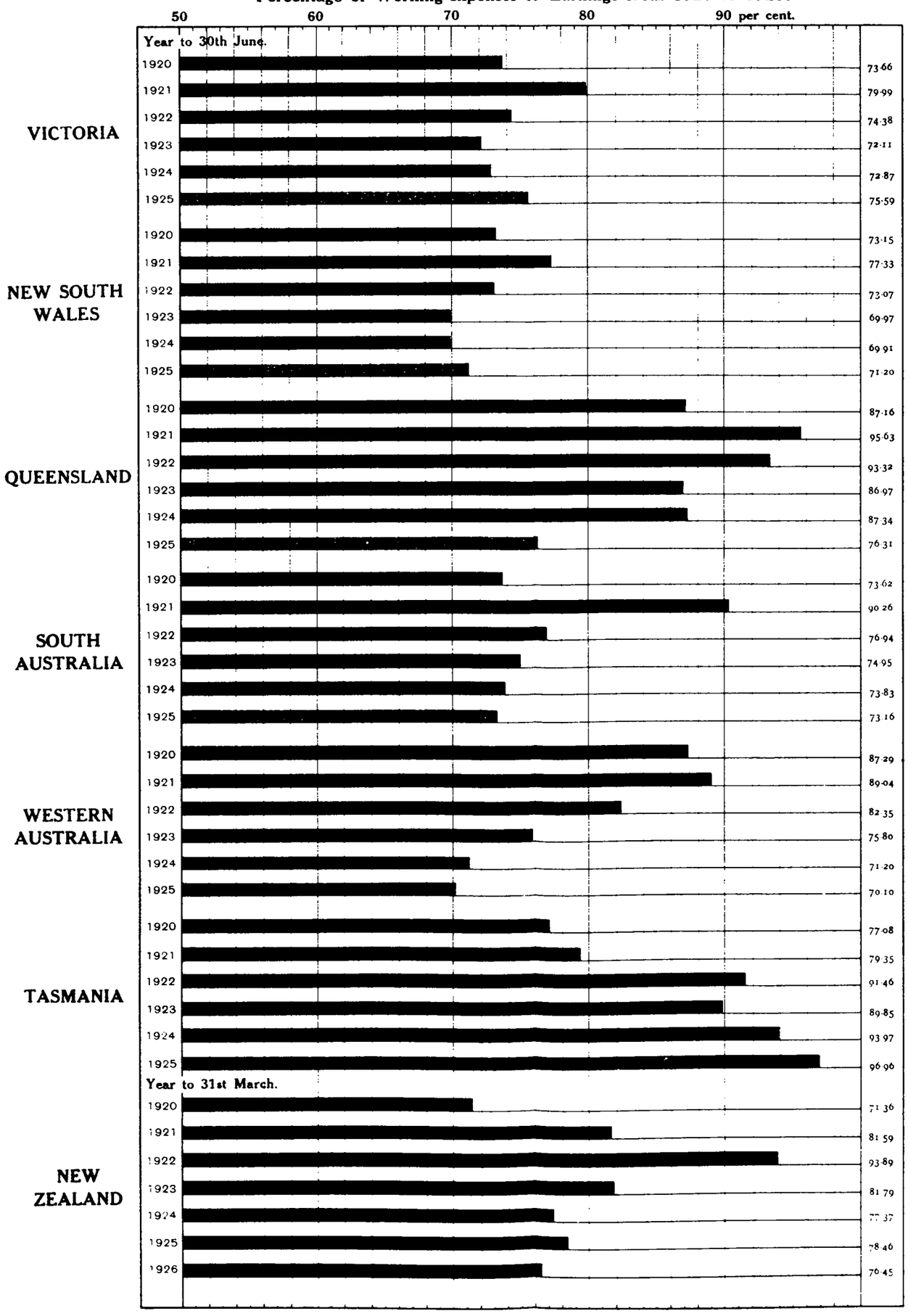
NUMBER OF PASSENGERS



GOVERNMENT RAILWAYS OF AUSTRALASIA.

COMPARATIVE STATEMENT.

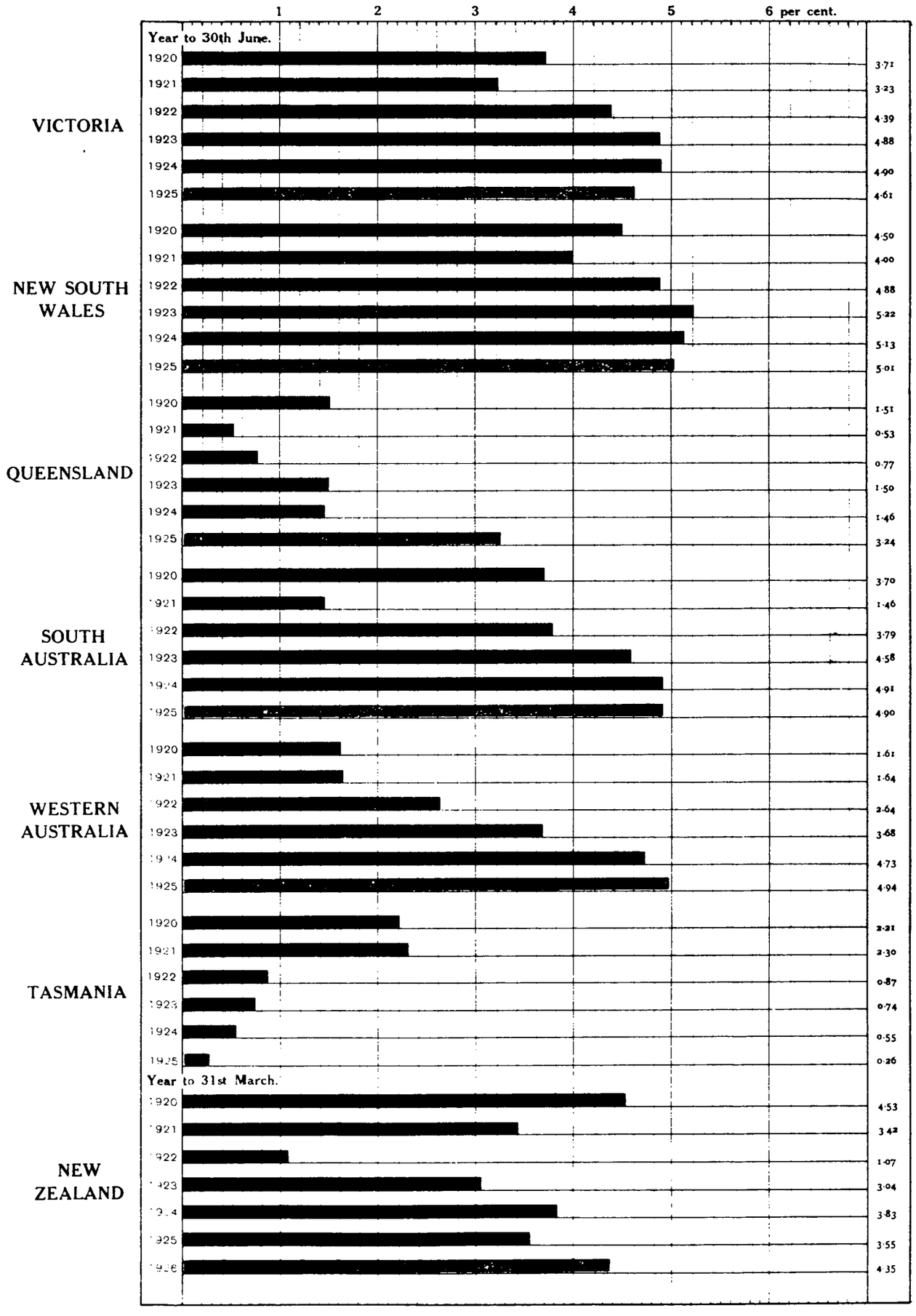
Percentage of Working-expenses to Earnings from 1920 to 1926.



GOVERNMENT RAILWAYS OF AUSTRALASIA.

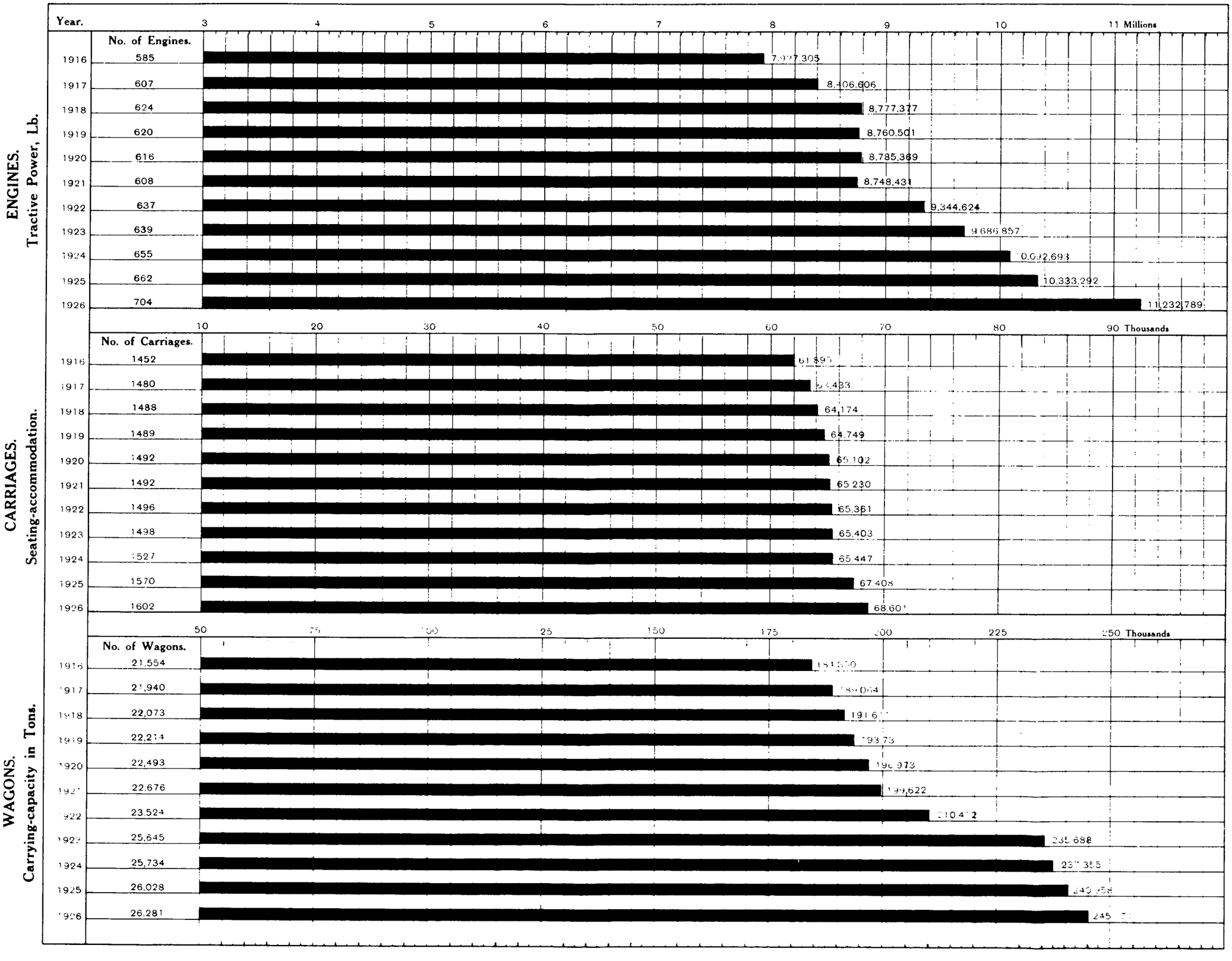
COMPARATIVE STATEMENT.

Percentage of Net Earnings to Capital from 1920 to 1926.



NEW ZEALAND GOVERNMENT RAILWAYS.

Number of Engines, and Tractive Power. Number of Carriages and Seating-accommodation. Number of Wagons and Carrying-capacity in use from 1916 to 1926.



Percentage of Increase, 1916-1926

Engines
20·34 per cent.

Tractive Power
41·70 per cent.

Percentage of Increase, 1916-1926

Carriages
10·33 per cent.

Seating-accommodation
10·83 per cent.

Percentage of Increase, 1916-1926

Wagons
21·93 per cent.

Carrying-capacity.
32·99 per cent.

Land Available for Contractors' Use

Kiwi St.

Roadway

Sidings Available for Contractors' Use

W. M. Office 100' × 25'

Dining Room, Social Hall & Library 165' × 35'

Kitchen

Bicycles 136' × 15'

End of Gantry

Lean-to 200' × 25'

Steel Wagons & Covered Shelter 200'

Repair Shop 200' × 100'

Roadway

Lean-to 300' × 25'

Wood Wagons & Repair Shop

Covered Shelter 250'

300' × 100'

Material Storage 300' × 25

Roadway

Platform 6'

Platform 120' × 58'6"

Reclaim Dept. 80' × 80'

Oil Store 50'-30'

Platform

Stores 160' × 82'

Platform 15'

Roadway

Power House 80' × 80'

Machine Shop 200' × 82'

Roadway

Iron Rack 80' × 25'

Blacksmiths 200' × 100'

Roadway

End of Gantry

Light Plate & Structural Steel Shop 240' × 82'

2/5 Ton Cranes

Structural Steel Storage 200' × 82' Gantry

Roadway

Trimmers & Upholsterers 100' × 80'

Roadway

Air Brake 80' × 50'

Pipe Fitters 80' × 50'

Paint 80' × 50'

Carpenters 140' × 50'

Tin & Copper Smiths 80' × 50'

Electrical 80' × 50'

New & Repair Car Shop 540' × 82'

56 Pits

Traverser Pit 640' long

Traverser 80' × 30'

New & Repair Car Shop 240' × 182'

50' Pit

2 Ton Crane

20 Ton Crane

Wheels & Bogies 100' × 82'

Roadway

Mill Storage Yard 100' × 164'

Wood Mill 200' × 164'

Wood Verandah 12' high over this half

Timber Storage 500' × 164'

Covered Storage 200' × 30'

N.Z.R.

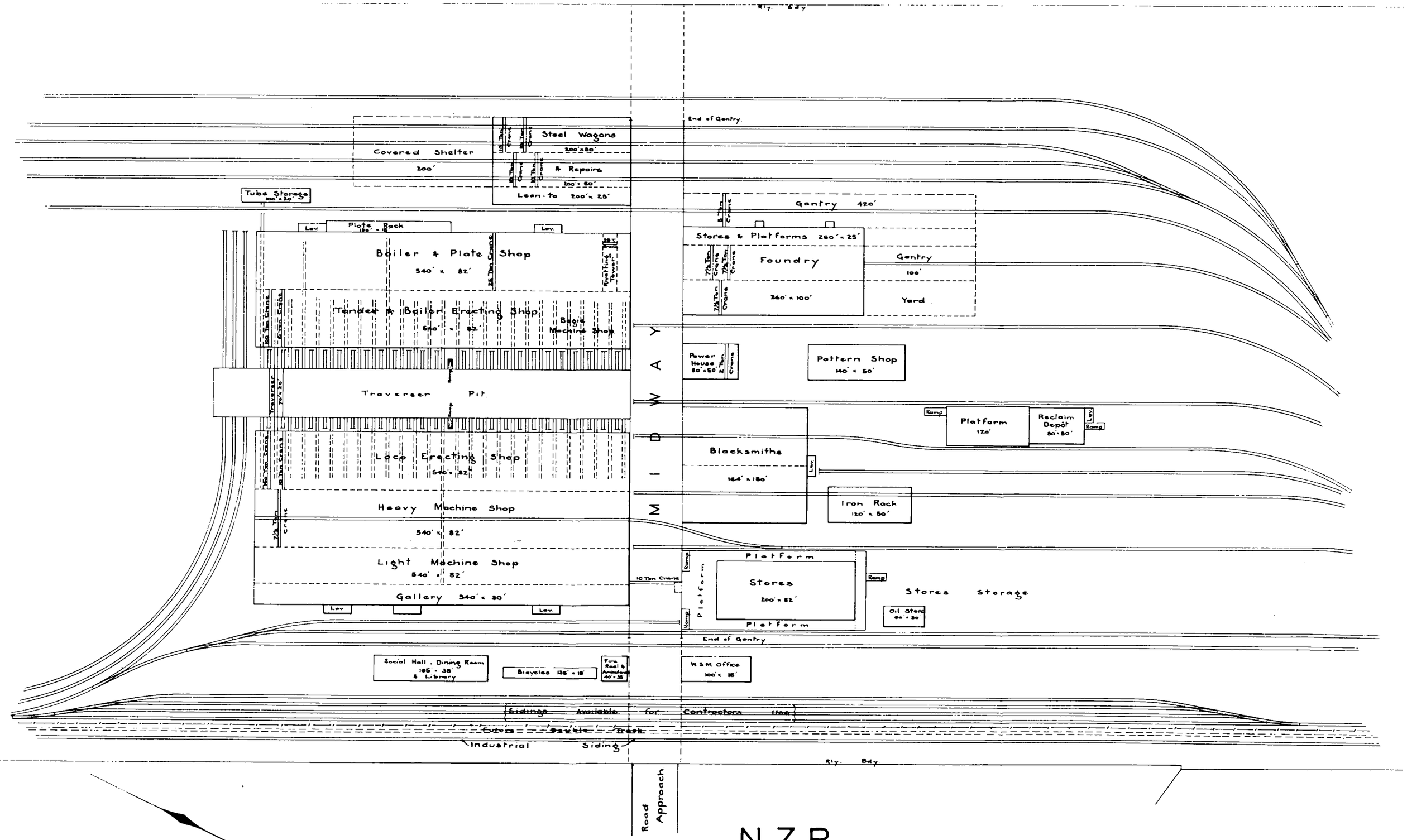
NEW CAR & WAGON SHOPS

OTAHUHU

GENERAL PLAN OF LAYOUT SHOWING SIDINGS

SCALE

100 80 60 40 20 0 100 200 300 400 500



N.Z.R.

NEW LOCOMOTIVE SHOPS

HUTT VALLEY

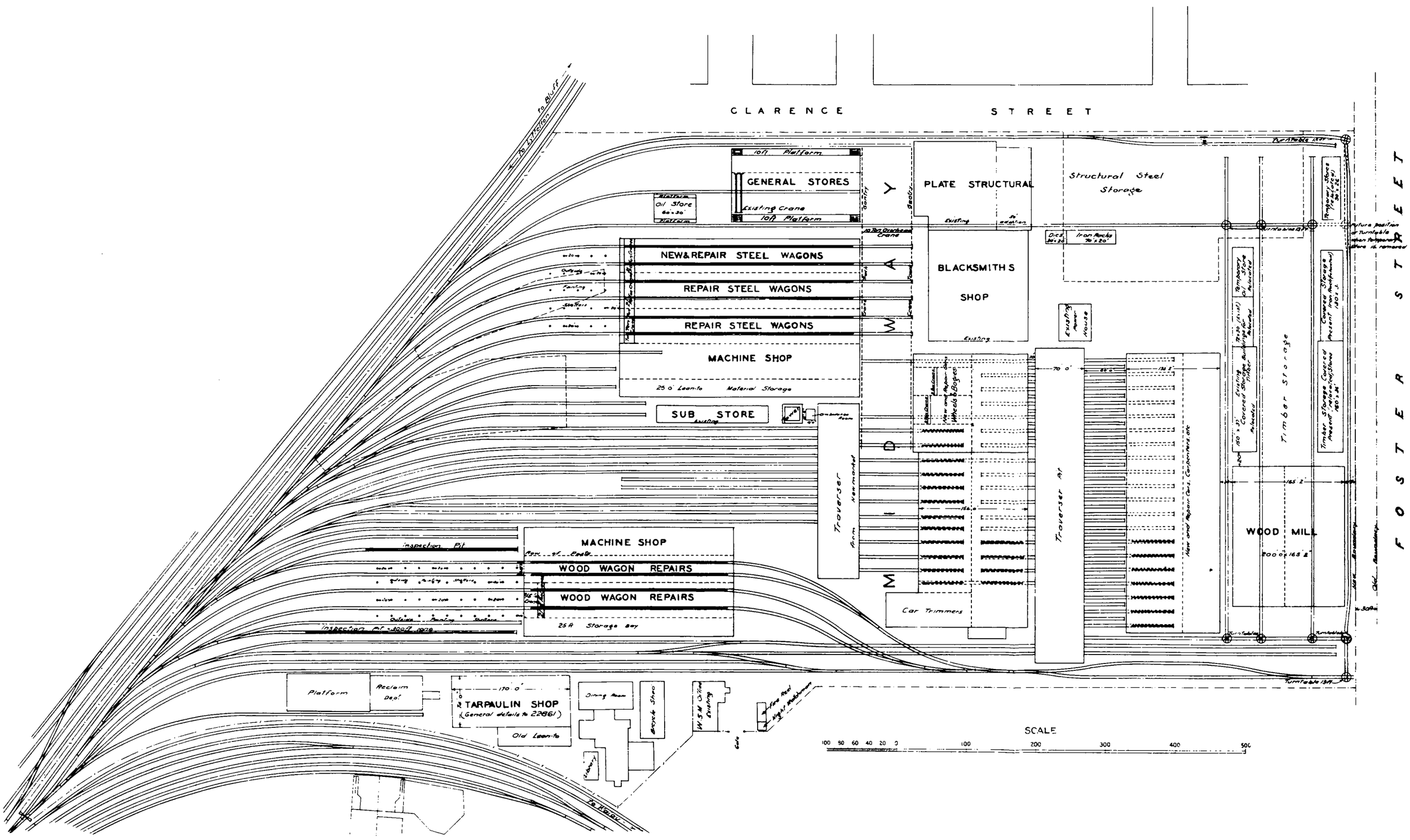
GENERAL PLAN OF LAYOUT SHOWING SIDINGS

SCALE

100 80 60 40 20 0 100 200 300 400 500

ADDINGTON JUNCTION

CARS AND WAGONS WORKSHOPS

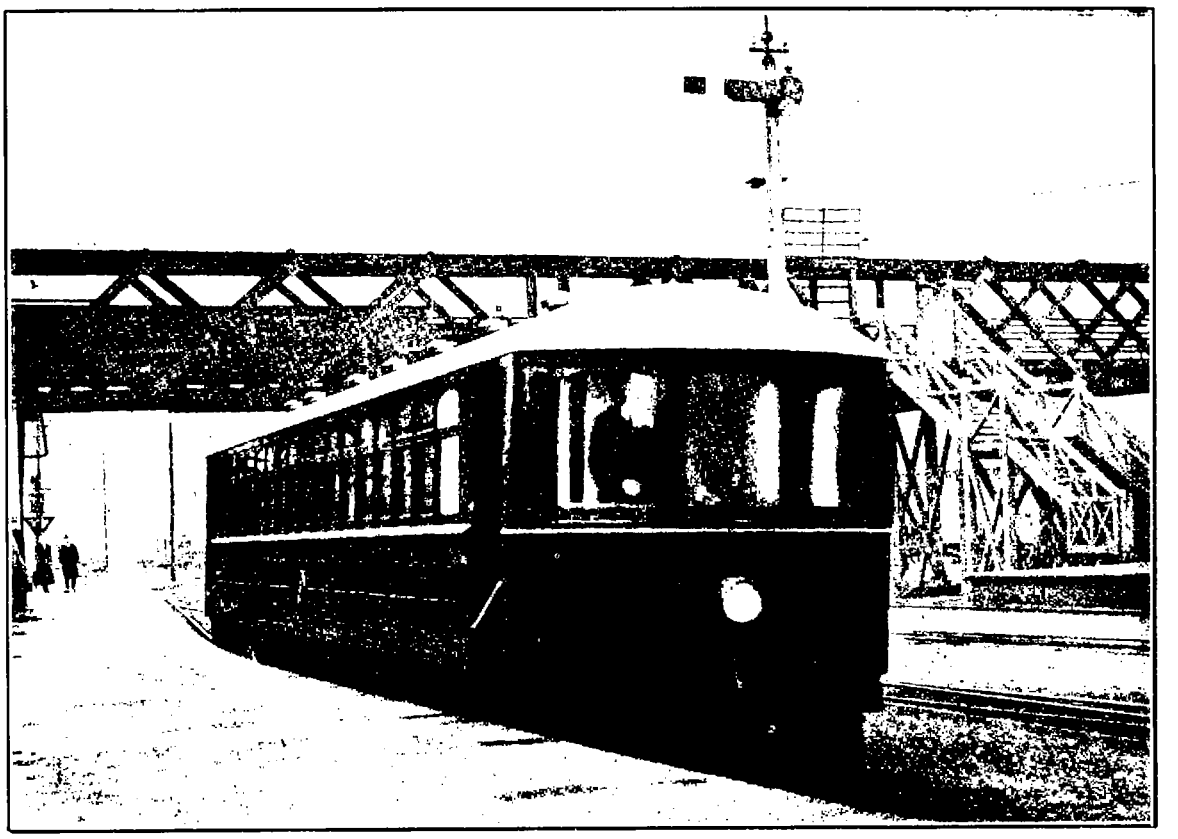


HILLSIDE WORKSHOPS

REARRANGEMENT FOR LOCOMOTIVE SHOPS

SCALE

100 80 60 40 20 0 100 200 300 400 500



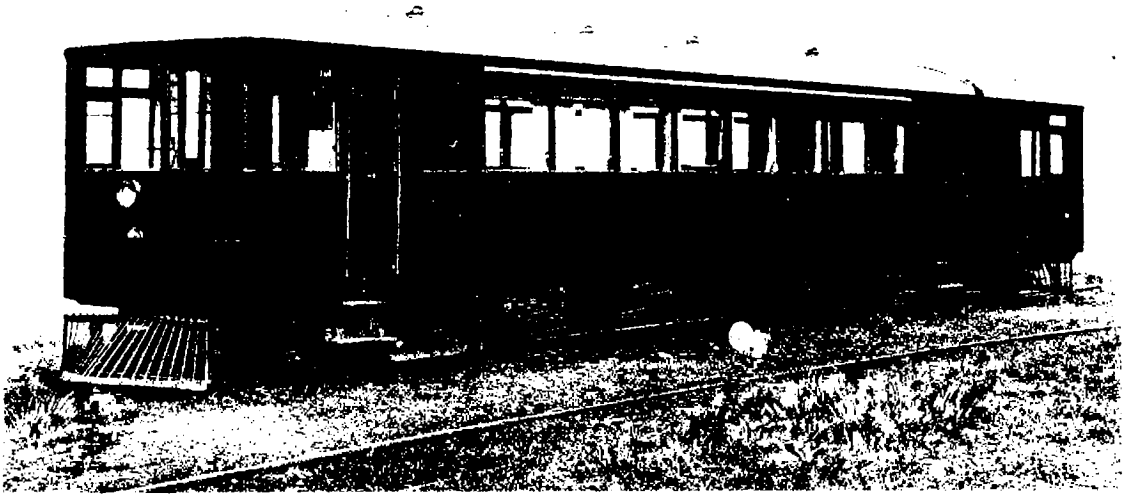
EDISON ELECTRIC RAIL-CAR. *Weekly Press, photo.*

Seating-capacity, 60. Length, 55 ft. 6 in.; width, 8 ft. 5 in. Motors (four), 30 h.p. each. Capacity storage battery, 45 kw. Tare, 32 tons.

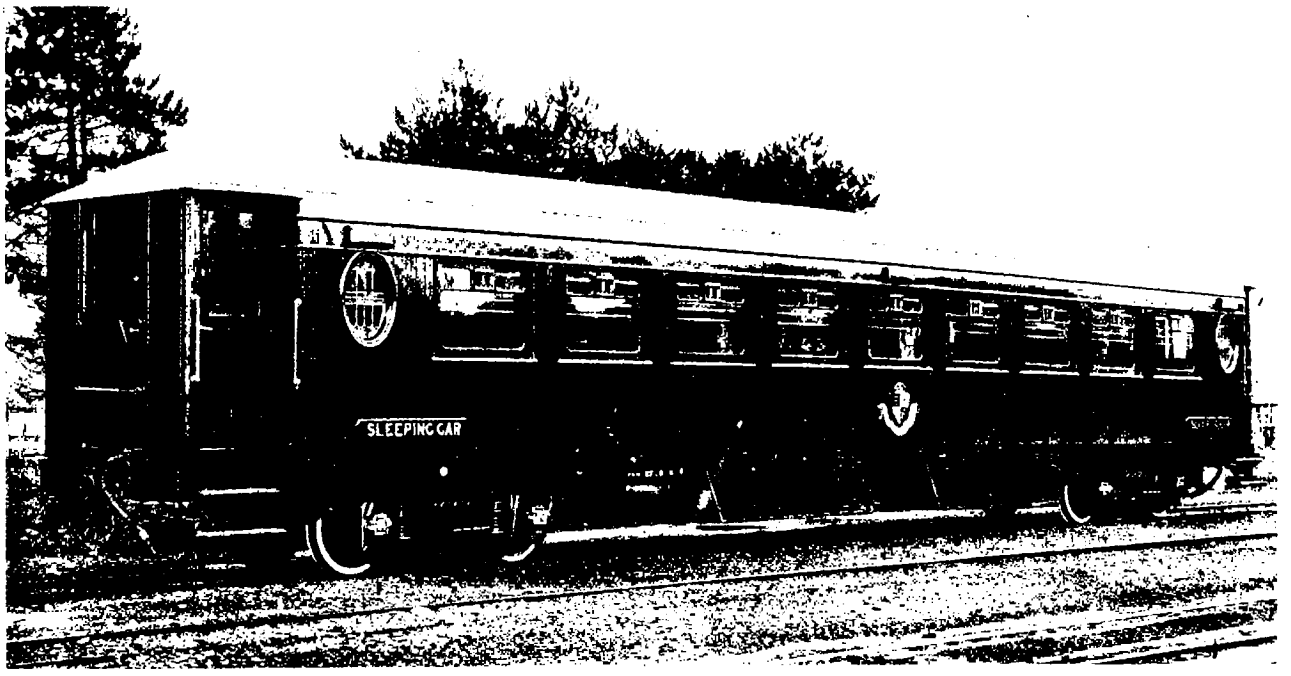


CLAYTON STEAM RAIL-CAR.

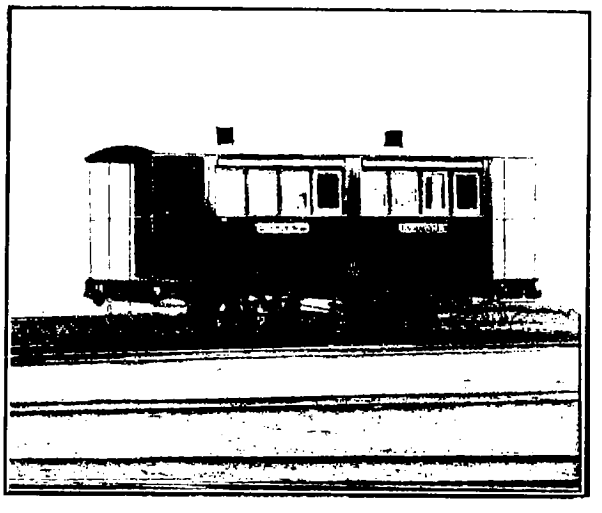
Seating-capacity, 54. Length, 58 ft. 2 in.; width, 8 ft. 2½ in. Tare, 24 tons 3 cwt.



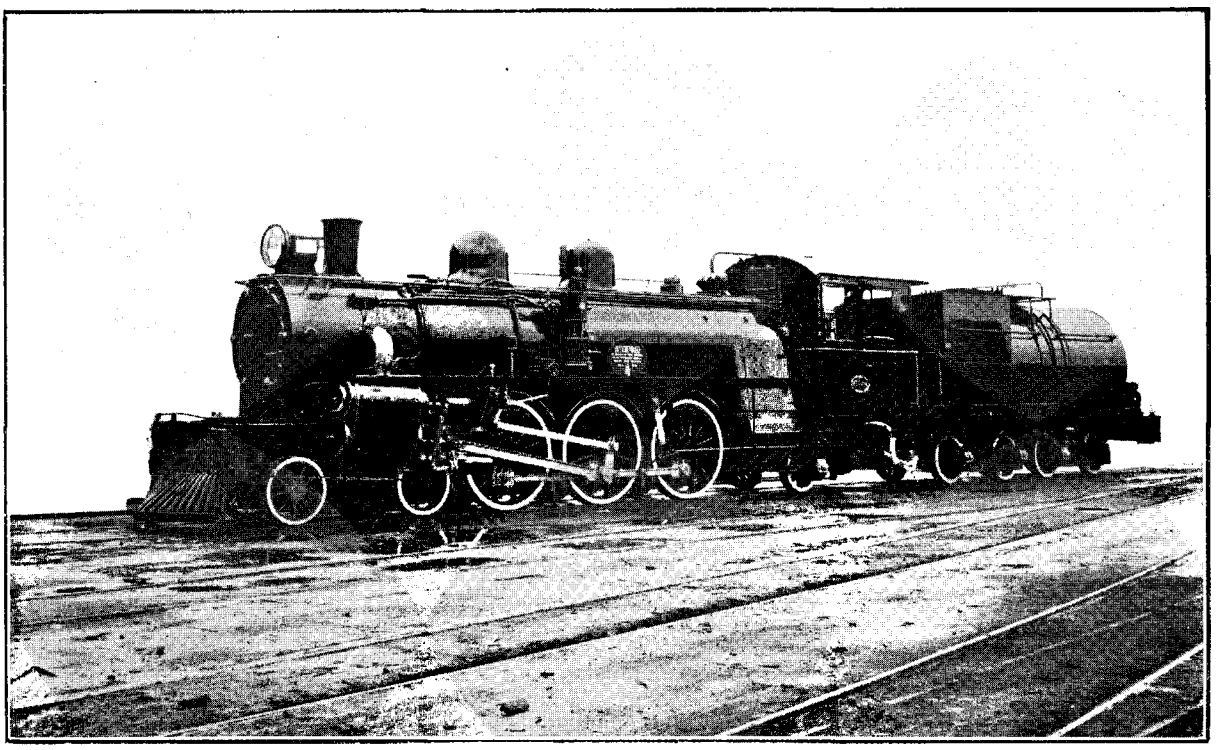
SENTINEL STEAM RAIL-CAR.
Seating-capacity, 48. Length, 56 ft. 5 in.; width, 8 ft. Tare, 18 tons 5 cwt. 3 qrs.



CLASS "AA" SLEEPING-CAR.
Length, 56 ft.; width, 8 ft. 9 in. Tare, 27 tons. Accommodation, 9 two-berth compartments.

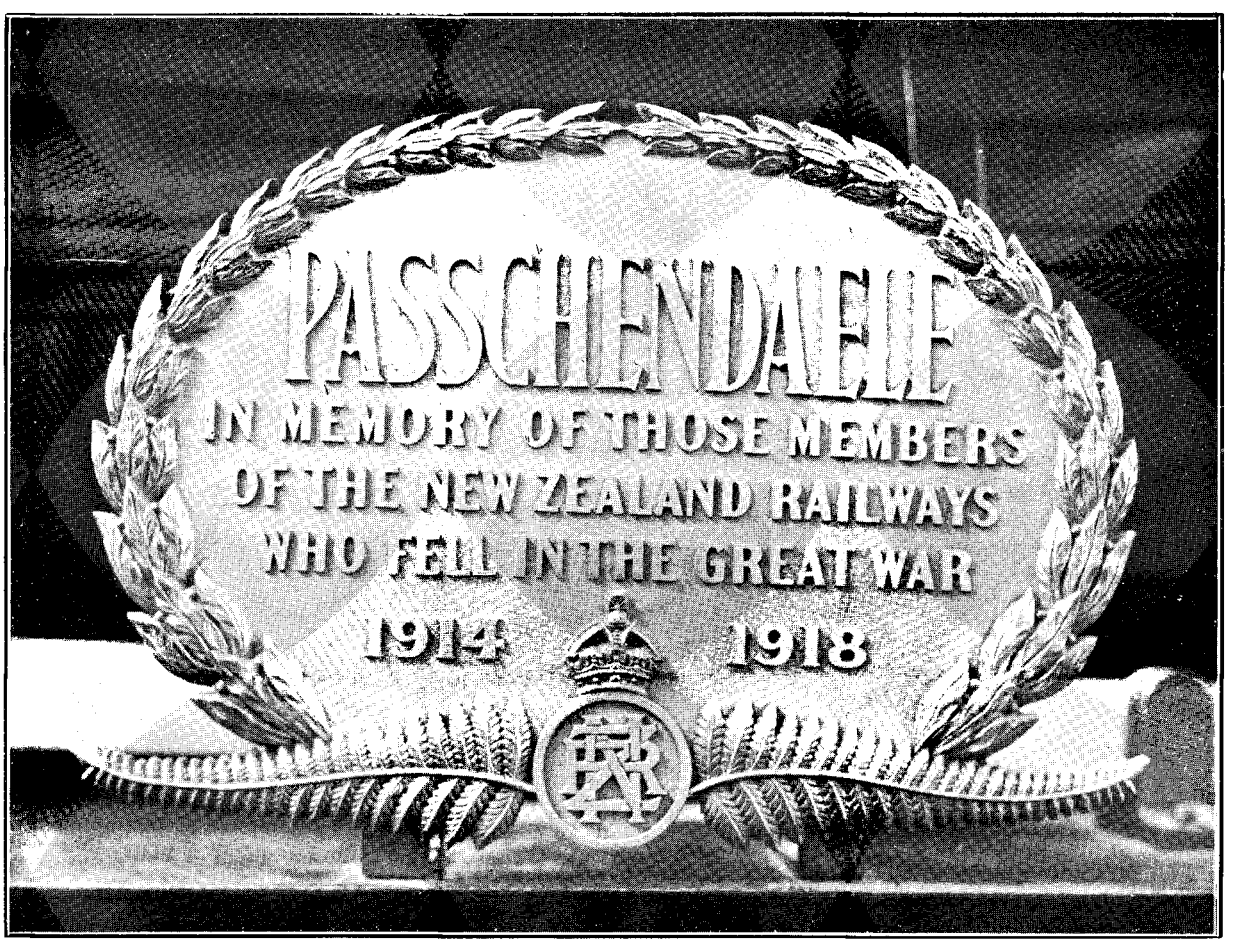


OLD CLASS "D" CAR.
Length, 20 ft.; width, 6 ft. 10 in. Tare, 5 tons. (As rebuilt, 1885.)



"Ab" No. 608, "Passchendaele," 4-6-2, Simple Superheated Locomotive, "Pacific" Type.

Diameter coupled wheels, 4 ft. 6 in.; cylinders, 17 in. by 26 in.; water capacity, 3,500 gallons; working-pressure, 180 lbs. per square inch. Tractive power, 20,000 lbs. Weight in working-trim, 84 tons 15 cwt. "Ab" 608 was exhibited at the New Zealand and South Seas Exhibition, Dunedin, after running 309,544 miles in service on the South Island main lines.

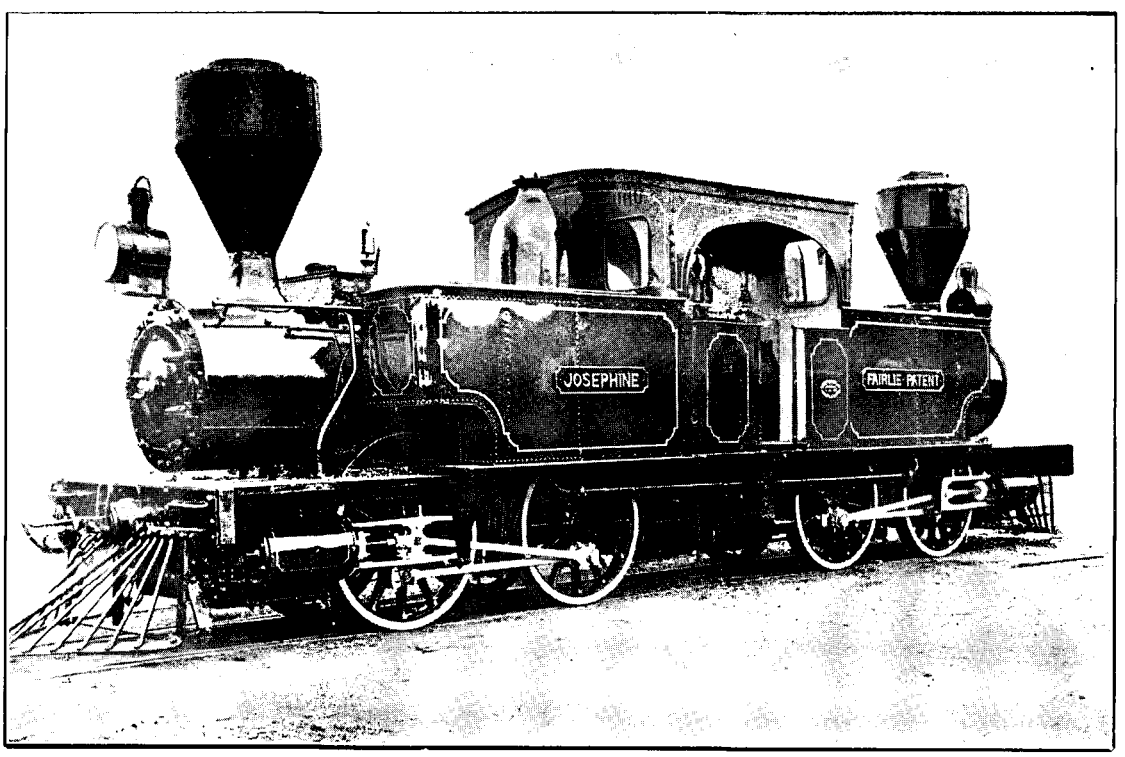


Name-plate of Engine "Ab" 608.

441 members of the Department's service paid the supreme sacrifice in the Great War.



THE DEPARTMENT'S ADVERTISING SECTION AT THE NEW ZEALAND AND SOUTH SEAS EXHIBITION, DUNEDIN.



THE "JOSEPHINE," WHICH HAULED THE FIRST TRAIN ON THE PORT CHALMERS DUNEDIN LINE, 18TH SEPTEMBER, 1872.

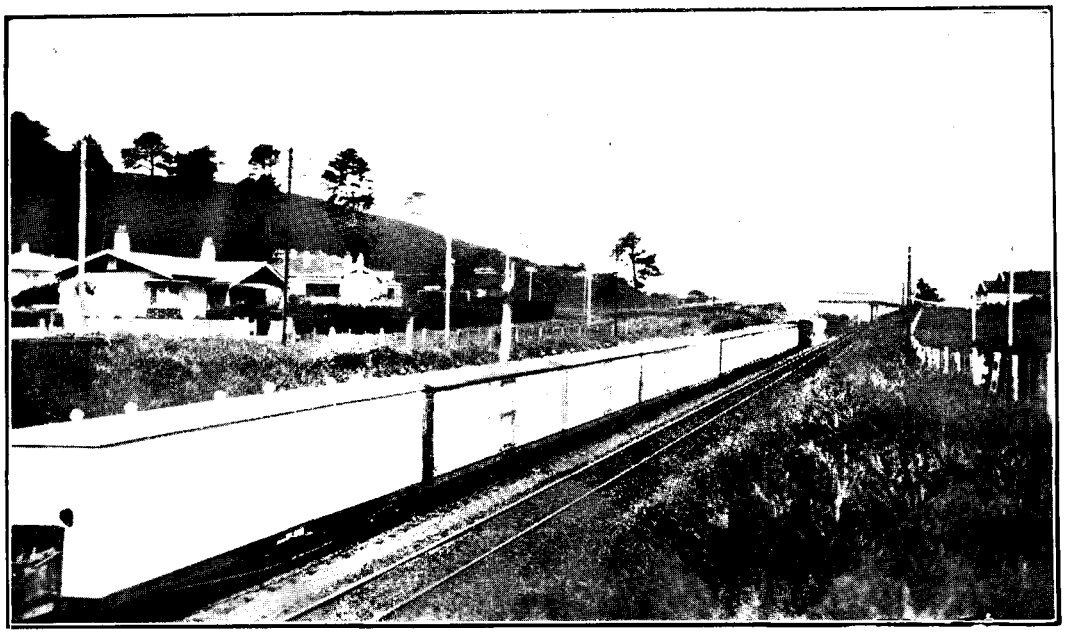
The "Josephine" was built by the Vulcan Foundry Company at Newton-le-Willows, England. Cylinders, 18 in. by 10 in.; wheels diameter, 3 ft. 9 in.; heating-surface, 829 sq. ft.; water capacity, 800 gallons. Weight in working-trim, 26 tons.

The "Josephine" was exhibited at the New Zealand and South Seas Exhibition.



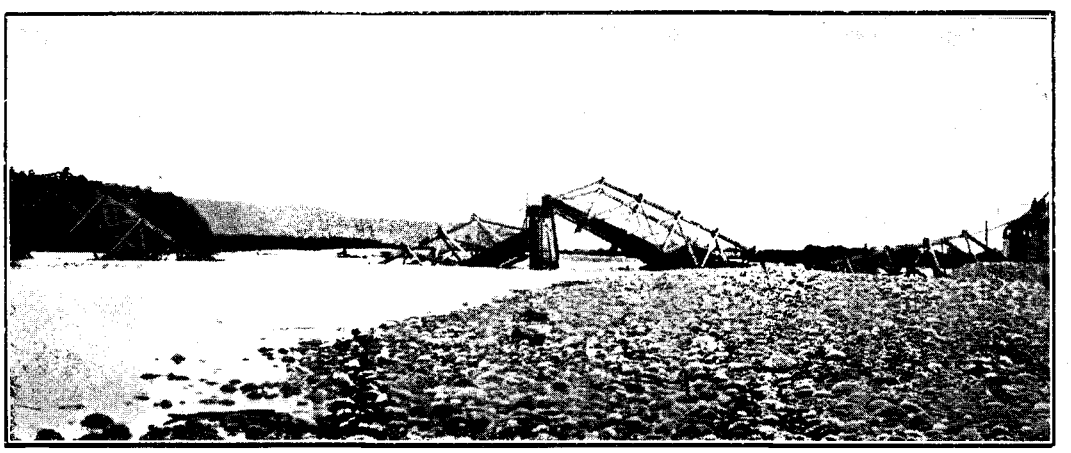
[*W. Stewart, photo.*

Auckland-Rotorua Express crossing Waikato River at Hamilton.



[*W. Stewart, photo.*

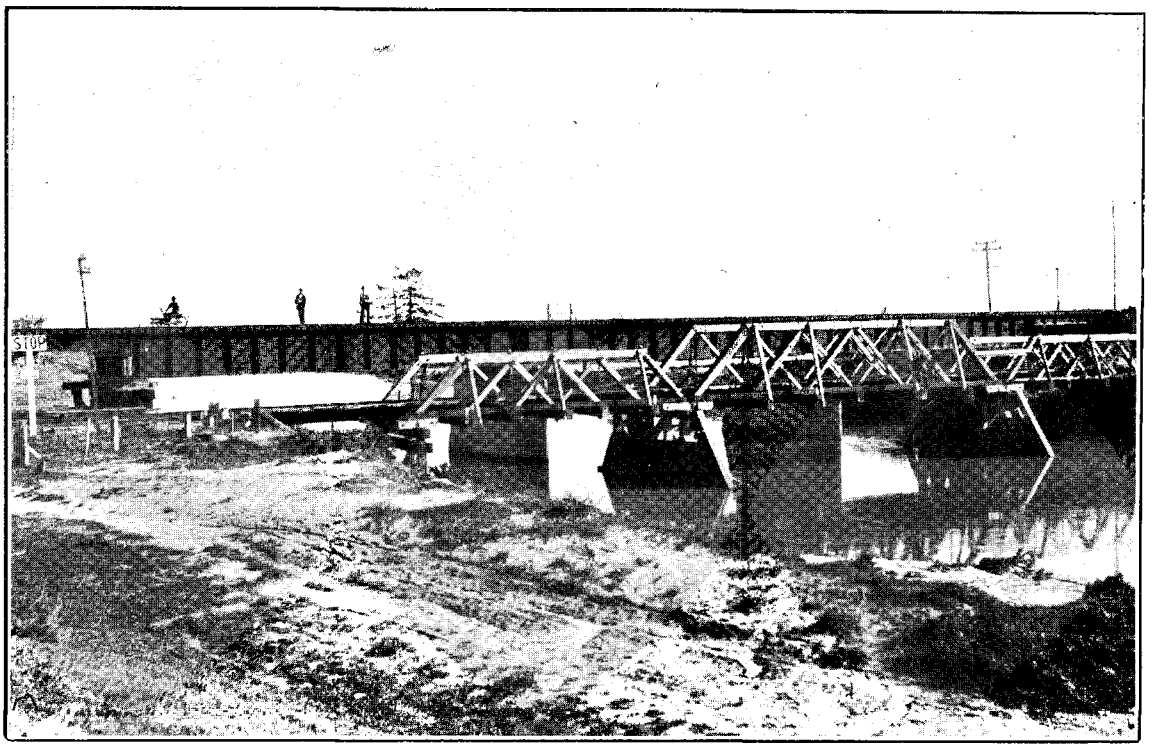
Frozen Meat Special on Remuera Bank, Auckland.



Bridge over the Grey River at Blackball.

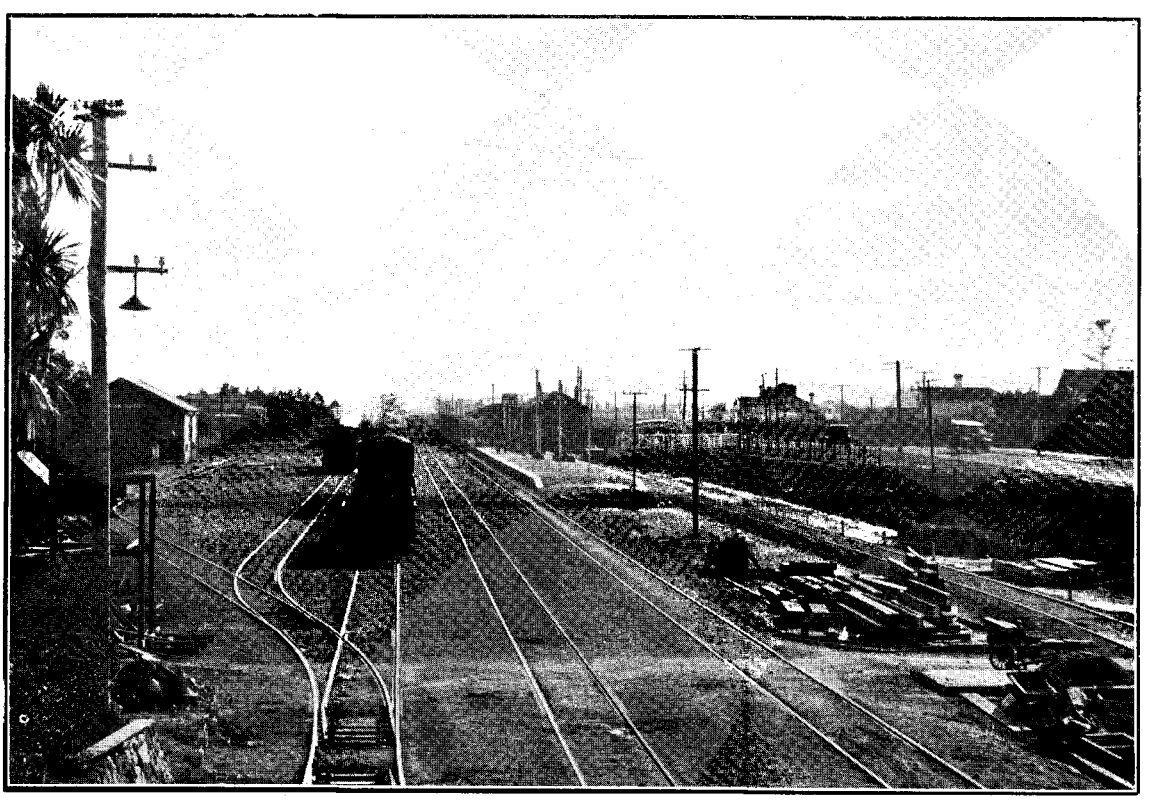
Damaged by floods on 4th December, 1925. Communication was restored on 3rd January, 1926.

NEW WORKS.



NEW DOUBLE-TRACK STEEL-PLATE GIRDER BRIDGE (3/50′ SPANS) OVER THE OHINEMURI RIVER AT PAEROA.

Replacing old single-track truss bridge of 2/40′ and 1/60′ spans.



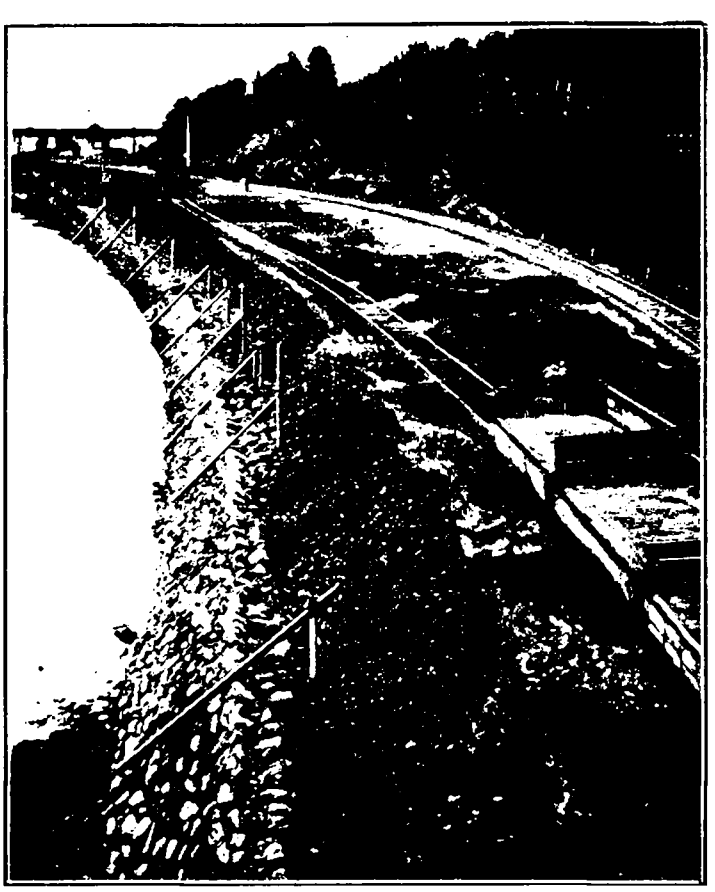
PAEROA: NEW STATION-YARD.

NEW WORKS.





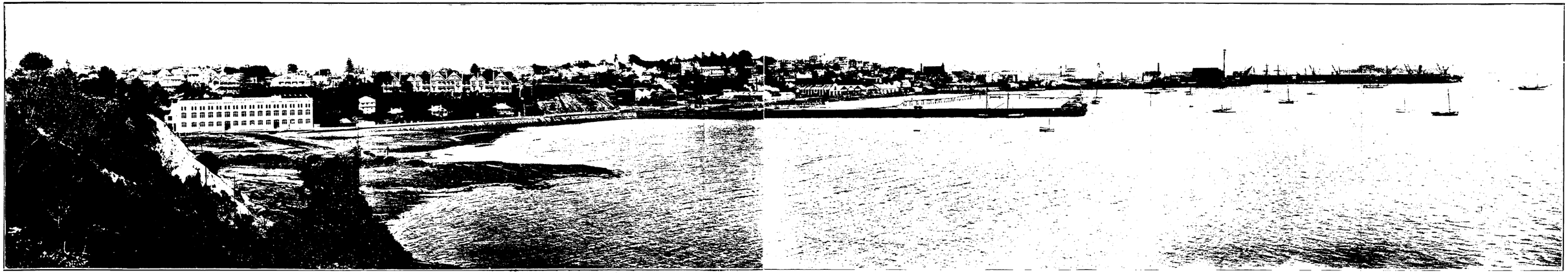
Commencement of Work on the New Hump Shunting Yard at Middleton (Christchurch).



Ravensbourne Burke's Duplication (Dunedin).



WHANGAREI: NEW STATION-YARD.



1913.



1926, SHOWING NEW STATION YARD IN COURSE OF CONSTRUCTION.

MAP OF NEW ZEALAND,

SHOWING

RAILWAY AND STEAMER ROUTES, AND ROAD CONNECTIONS.

STATISTICS.

Government Railways open for traffic on 31st March, 1926	.	*3,138 miles.*
Capital cost of Government Railways open on 31st March, 1926	..	*£47,608,676*
Revenue from Government Railways, year ending 31st March, 1926		*£8,460,762*
Expenditure on „	„ „	*£6,468,428*
Gauge „		*3'6"*
Passengers carried on „	*, year ending 31st March, 1926*	*11,813,480*
Number of season tickets issued,	„ „	*600,292*
Live-stock, tonnage carried,	„ „	*447,539*
Goods, tonnage carried,	„ „	*6,808,603*
Number of miles travelled by trains,	„ „	*10,319,407*
Number of locomotives,	„ „	*704*
Number of passenger-carriages,	„ „	*1,602*
Number of wagons and brake-vans,	„ „	*26,767*
Area of Dominion, square miles		*103,861*
Population, estimated, at 31st March, 1926 (including Maoris) ..		*1,407,165*
Chief Cities:—		
Auckland	.. ..	*192,176*
Wellington — *Population with Suburbs (approximate)*	.. ..	*121,324*
Christchurch	.. ..	*118,408*
Dunedin	.. ..	*85,103*

Scale of English miles.

0 10 20 30 40 50 60 70 80 90 100

REFERENCE.

Government railways shown thus :

Road connections „

Steamer routes „

Auckland to Sydney 1278 m

Wellington to Sydney 1236 m.

Auckland to Suva 1148m

Auckland to Vancouver 6358m

Auckland to Plymouth via Panama 11074m

298m

143m

145m

177 m.

286 m.

238m

173m

192m.

211m.

Wellington to San Francisco 6082 m

Wellington to London via Panama 11373 m.

Bluff to Hobart 931m.

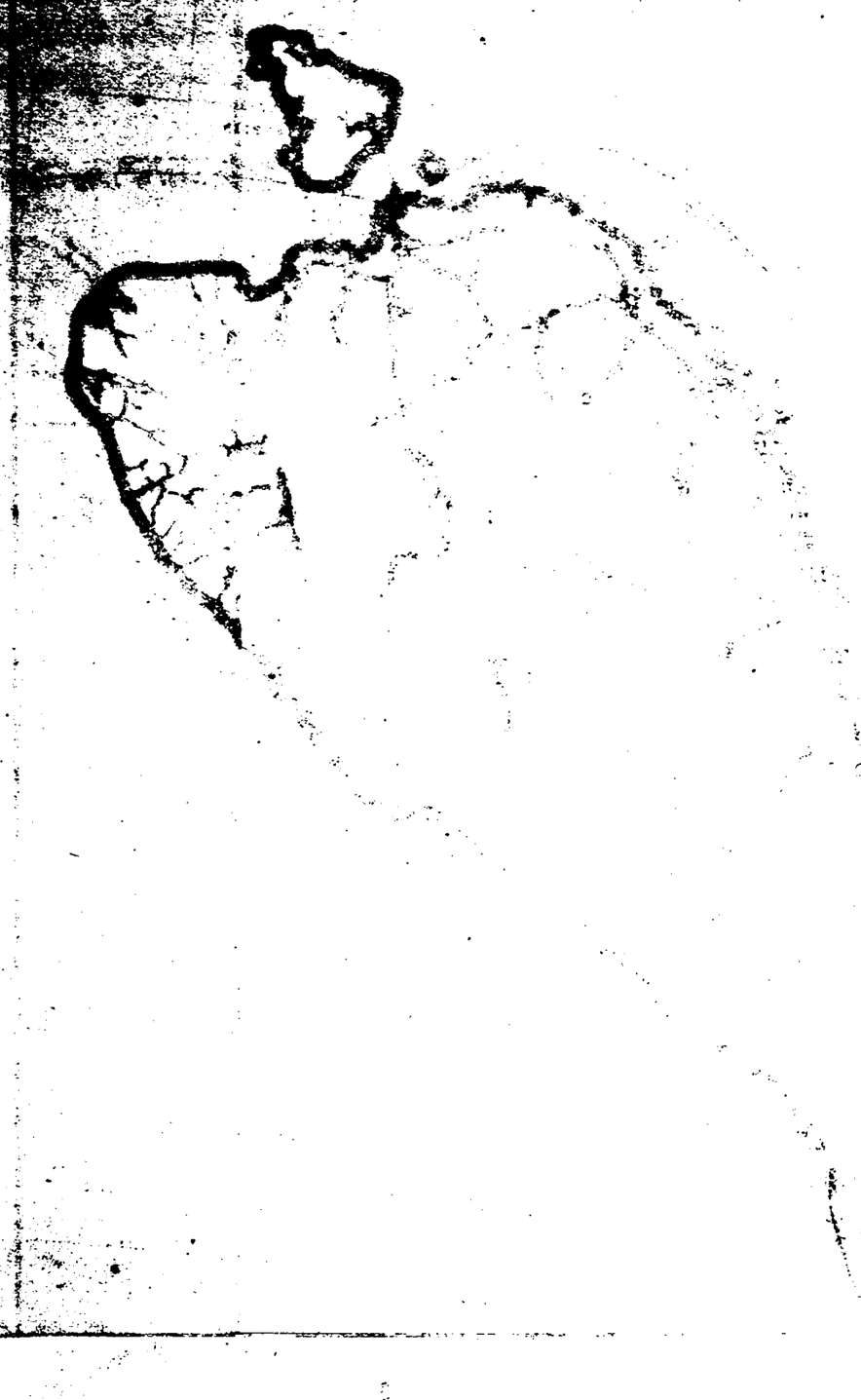
Melbourne 1211m.

NORTH ISLAND

SOUTH ISLAND

DISTANCES BY RAILWAY.

	Miles.
Auckland to Opua	*184*
„ *Whangarei*	*131*
„ *Rotorua*	*171*
„ *Thames*	*148*
„ *Wanganui*	*344*
„ *New Plymouth*	*445*
„ *Napier*	*451*
New Plymouth to Wanganui	*107*
„ *Napier*	*276*
„ *Rotorua*	*447*
„ *Wellington (via Manawatu)* ..	*251*
„ *Wellington (via Wairarapa)* ..	*296*
Napier to Wellington (via Manawatu)	*199*
„ *(via Wairarapa)*	*210*
Wellington to Rotorua	*428*
„ *Auckland*	*426*
Picton to Blenheim	*18*
„ *Wharanui*	*56*
Nelson to Glenhope	*59*
Inangahua Jn. to Greymouth	*66*
Greymouth to Hokitika	*24*
Hokitika to Ross	*15*
Christchurch to Waiau	*82*
„ *Culverden*	*69*
„ *Parnassus*	*85*
„ *Arthur's Pass*	*87*
„ *Greymouth*	*145*
„ *Hokitika*	*170*
„ *Timaru*	*100*
„ *Dunedin*	*230*
„ *Invercargill*	*369*
Timaru to Oamaru	*53*
Oamaru to Dunedin	*78*
Dunedin to Cromwell	*155*
„ *Miller's Flat*	*87*
„ *Gore*	*100*
„ *Kingston (via Waimea line)* ..	*174*
„ *Kingston (via Invercargill)* ..	*226*
„ *Invercargill*	*139*
Invercargill to Kingston	*87*
„ *Orawia*	*64*
„ *Bluff*	*17*
Kingston to Queenstown (by steamer)	*25*
Queenstown to Head of Lake (by steamer) ..	*35*



APPENDICES.

Appendix.	Annexure.	—	Page
A	...	Report of Commission of Inquiry into the Cause of the Derailment of the Wellington–Napier Express Train near Opapa, 22nd September, 1925	1
B	...	Messrs. Merz and McLellan's Report on the Electrification of New Zealand Railways	7
B	*(A)*	Review by Messrs. F. T. M. Kissell, B.Sc., A.M.I.C.E., M.I.E.E. (Chief Electrical Engineer, Public Works Department), and R. P. Sims (Assistant Chief Mechanical Engineer, Railway Department), of the Section of the Report dealing with the Electrification of the Line between Lyttelton and Christchurch	41
B	*(B)*	Report of Messrs. F. T. M. Kissell, J. E. L. Cull, A. S. Wansbrough, and G. W. Wyles, on the Electrification of the Line between Lyttelton and Christchurch	46
C	...	Report of the Board of Inquiry into the Suitability of New Zealand Coals for Consumption in Locomotive Engines run upon the New Zealand Government Railways	49
D	...	Proposed Train-ferry, Wellington–Picton ... . Completion of South Island Main Trunk Railway.	61
E	...	Report of the Board of Inquiry into the Conditions of Work of Shunters in the Government Railways Department	79
E	*(A)*	Report on Stations inspected, covering all Matters referred to in the Order of Reference	87
E	*(B)*	Analysis of Shunting Accidents for Ten Years (June, 1915, to June, 1925)	117
E	*(C)*	Lighting of Shunting-yards	118
E	*(D)*	Alterations to Shunting-yards	118
E	*(E)*	Report of Special Public Inquiry into the Work and Conditions of Shunters at Palmerston North, together with Investigations into various Allegations made against Officers at Palmerston North. Also Investigations into the Circumstances surrounding the Death of the late Shunter Carmichael	119
..	...	Evidence and Addresses by Advocates before the Board ...	183

APPENDIX A.

Report of Commission of Inquiry into Cause of the Derailment of the Wellington-Napier Express Train near Opapa, 22nd September, 1925.

APPENDIX A.

REPORT OF THE COMMISSION OF INQUIRY INTO THE CAUSE OF THE DERAILMENT OF THE WELLINGTON-NAPIER EXPRESS TRAIN NEAR OPAPA STATION ON THE 22ND SEPTEMBER, 1925.

COMMISSION.

To all to whom these presents shall come, and to WILLIAM GLENDINNING RIDDELL, Esquire, of Wellington; JAMES MARCHBANKS, Esquire, of Wellington; WILLIAM DUFFUS HUNT, Esquire, of Wellington.

WHEREAS the Wellington-Napier express train was derailed near Opapa Station on the 22nd September, 1925: And whereas in consequence of such derailment some passengers who were travelling in the said train were killed, and other passengers injured to a greater or less extent, and serious damage was done to the rolling-stock comprising the said train: And whereas it is desirable that inquiries should be made into the cause of the said accident:

Now, therefore I, Joseph Gordon Coates, Minister of Railways, in pursuance of the power vested in me by section 9 of the Government Railways Amendment Act, 1921-22, and of all other powers and authorities in that behalf, do hereby constitute and appoint you, the said

WILLIAM GLENDINNING RIDDELL,
JAMES MARCHBANKS, and
WILLIAM DUFFUS HUNT

to be a Board of Inquiry to inquire into and report to me upon the following matters, namely:—

(1.) What was the cause of the derailment of the Wellington-Napier express train near Opapa Station on the 22nd September, 1925?

(2.) Are there any circumstances in connection with the said derailment which in your opinion call for comment?

And you, the said WILLIAM GLENDINNING RIDDELL, are hereby appointed Chairman of the said Board of Inquiry.

And for the purpose of better enabling you the said Board to carry these presents into effect you are hereby authorized and empowered to make and conduct any inquiry under these presents, at such times and places in the Dominion of New Zealand, as you deem expedient, with power to adjourn from time to time and place to place as you think fit, and to call before you and examine on oath or otherwise as may be allowed by law such person or persons as you may think capable of affording you any information in the premises.

And you the said WILLIAM GLENDINNING RIDDELL, JAMES MARCHBANKS, and WILLIAM DUFFUS HUNT are hereby required to enter upon and pursue the said inquiry with all due diligence and to report to me under your hands your opinion on the matters aforesaid not later than the 31st day of October, 1925.

And it is hereby declared that these presents shall continue in force notwithstanding that the said inquiry may be adjourned from time to time and place to place.

And it is lastly hereby declared that these presents are issued under and subject to the provisions of section 9 of the Government Railways Amendment Act, 1921-22.

As witness my hand this 23rd day of September, 1925.

J. G. COATES.
Minister of Railways.

To all to whom these presents shall come, and to WILLIAM GLENDINNING RIDDELL, Esquire, of Wellington; JAMES MARCHBANKS, Esquire, of Wellington; WILLIAM DUFFUS HUNT, Esquire, of Wellington.

WHEREAS by warrant under the hand of the Minister of Railways dated the 23rd day of September, 1925, you, the said

WILLIAM GLENDINNING RIDDELL, Esquire, of Wellington,
JAMES MARCHBANKS, Esquire, of Wellington,
WILLIAM DUFFUS HUNT, Esquire, of Wellington,

were appointed to be a Board of Inquiry under and subject to the provisions of section 9 of the Government Railways Amendment Act, 1921-22, for the purposes set out in the said warrant: And whereas by the said warrant you were required to report to me under your hands your opinion as to the aforesaid matters not later than the 31st day of October, 1925: And whereas it is expedient that the said period should be extended as hereinafter provided:

Now, therefore, I, Francis Henry Dillon Bell, acting for the Minister of Railways, in pursuance of the powers vested in me by the aforesaid section 9 of the Government Railways Amendment Act, 1921–22, do hereby extend the period within which you shall report to me as by the said warrant provided to the 31st day of December, 1925.

And in further pursuance of the powers vested in me as aforesaid, I do hereby confirm the said warrant as altered by these presents.

As witness my hand, this 23rd day of October, 1925.

F. H. D. BELL,
Acting for Minister of Railways.

To all to whom these presents shall come, and to WILLIAM GLENDINNING RIDDELL, Esquire, of Wellington; JAMES MARCHBANKS, Esquire, of Wellington; WILLIAM DUFFUS HUNT, Esquire, of Wellington.

WHEREAS by warrant under my hand dated the 23rd day of September, 1925, you, the said

WILLIAM GLENDINNING RIDDELL, Esquire, of Wellington;
JAMES MARCHBANKS, Esquire, of Wellington,
WILLIAM DUFFUS HUNT, Esquire, of Wellington,

were appointed to be a Board of Inquiry under and subject to the provisions of section 9 of the Government Railways Amendment Act, 1921–22, for the purposes set out in the said warrant: And whereas by the said warrant you were required to report to me under your hands your opinion as to the aforesaid matters not later than the 31st day of October, 1925: And whereas such period has been extended to the 31st day of December, 1925: And whereas it is expedient that the said period should be further extended as hereinafter provided:

Now, therefore, I, Joseph Gordon Coates, Minister of Railways, in pursuance of the powers vested in me by the aforesaid section 9 of the Government Railways Amendment Act, 1921–22, do hereby further extend the period within which you shall report to me as by the said warrant provided to the 31st day of March, 1926.

And in further pursuance of the powers vested in me as aforesaid I do hereby confirm the said warrant as altered by these presents.

As witness my hand, this 6th day of December, 1925.

J. G. COATES,
Minister of Railways.

REPORT.

To the Hon. the Minister of Railways, Wellington.

SIR,— Wellington, 23rd March, 1926.

In pursuance of your warrant directed to us, dated the 23rd day of September, 1925, and extended on the 7th December, 1925, whereby we were appointed Commissioners and authorized to inquire into and report to you upon the following matters, namely—

(1.) What was the cause of the derailment of the Wellington–Napier express train near Opapa Station on the 22nd September, 1925?

(2.) Are there any circumstances in connection with the said derailment which in your opinion call for comment?

We, William Glendinning Riddell, Esq., Stipendiary Magistrate; James Marchbanks, Esq., M.Inst.C.E.; and William Duffus Hunt, Esq., have the honour to report as follows:—

1. On the 27th September, 1925, Messrs. Riddell and Marchbanks proceeded to Napier, and on the 28th September inspected the track at the scene of the derailment near Opapa, and also examined the damaged locomotive, which had been towed to Napier after the accident.

2. Early in October last Professor Robert Julian Scott, late Professor of Engineering at Canterbury College, was requested to proceed to Napier for the purpose of making an examination of the damaged locomotive and permanent-way and track in proximity to the accident. He subsequently gave evidence before the Commission on the 12th October, and submitted a report setting out the result of his investigations.

3. Sittings of the Commission were held at Wellington and evidence taken on the 8th, 9th, 10th, and 12th October, 1925. As Engine-driver Lavin, the driver of the derailed train, was unable to be present owing to injuries received in the accident, it was deemed advisable not to hear evidence as to the speed of the train at the time of the derailment until after his recovery and ability to appear at the hearing. The evidence taken at these earlier sittings was therefore confined solely to the condition of the permanent-way and track, the locomotive, and the Westinghouse brake, and the schedule times of the running of the Wellington–Napier express. The following witnesses were examined on oath:—

Frederick Charles Widdop, Chief Engineer, Railway Department, Wellington.
Charles Theodore Jeffreys, District Engineer, Railway Department, Wellington.
Alexander Smillie Wansbrough, Designing Engineer, Railway Department, Wellington.
William Alexander Gordon, Inspector of Permanent-way, Railway Department, Palmerston North.
Oscar Richard Savage, Ganger, Railway Department, Opapa.
Donald Martin Robertson, Train-examiner, Railway Department, Waipukurau.
Richard William Joseph Dickson, Brake Inspector, Railway Department, Petone.
Alfred Kinsella Harris, General Superintendent of Transportation, Railway Department, Wellington.
Eugene Casey, Inspecting Engineer, Railway Department, Wellington.
George Streeter, Inspector of Permanent-way, Railway Department, Waipukurau.
George John Bryce, Locomotive Foreman, Railway Department, Napier.
James Forester Mackley, Locomotive Engineer, Railway Department, Auckland.
Robert Julian Scott, of Dunedin, late Professor of Engineering at Canterbury College.

4. On the 12th October, 1925, the hearing was adjourned *sine die*, the intention being to proceed as early as possible after the engine-driver's recovery, and in due course arrangements were made to resume the sittings of the Commission at Napier on the 17th November, 1925. However, prior to the date mentioned a charge of manslaughter arising out of Lavin's conduct as driver of the engine was preferred against him by the police, and in November, 1925, he was committed for trial to the Supreme Court at Napier. In these circumstances the Commission decided to postpone its sittings until the criminal proceedings pending against him were disposed of by the Supreme Court. The result of that trial was Lavin's conviction for manslaughter and sentence on the 1st March, 1926. The jury having found that Engine-driver Lavin had failed to exercise reasonable care and skill in driving the engine prior to and at the time of the derailment, and that excessive speed was the primary cause of the derailment, the main object of the inquiry was then determined.

The Commission resumed its sittings at Wellington on the 11th March, 1926, and to save needless expense it was decided to accept a copy of the evidence of the following witnesses who were called at the trial of Lavin at Napier, viz.:—

Maurice Ryan, police-constable, stationed at Hastings.
Alexander Duncan Shakyns Whyte, medical practitioner, Hastings.
Cecil Romaine Wright, medical practitioner, Hastings.
Percy William Peters, director of McGruars Limited, Napier.
Maurice Begley, slaughterman, Hastings.
Kathleen Begley, married woman, Hastings.
William Henry Jones, monumental sculptor.
Susan Ellen Rutter, of Wellington.
Clara Edith Cross, married woman, Wellington.

John Wilton Nixon, licensed jockey, Gisborne.
Ivy Camille Nixon, married woman, Gisborne.
Horace Lindsay, clerk in holy orders.
Andrew Stewart, commercial traveller.
Murdo Bayne McDonald, organizer for the South Seas Exhibition, Dunedin.
Charles Fenton Manning, barman, Clarendon Hotel, Napier.
Arthur Ernest Renouf, company secretary, Napier.
David Jones, cook, Napier.
William Marven, motor-driver, Havelock North.
Alfred Frank Hook, master butcher, Havelock.
Huia Badger, nurse, Napier Hospital.
Charles Smith, foreman, Dannevirke Power Board.
Maud Edith Smith, married woman, Settlers' Arms Hotel, Ormondville.
William Barnes, labourer, Ormondville.
James Mackie Smith, licensee, Settlers' Arms Hotel, Ormondville.
Harold Onslow Baines, farmer, Ormondville.
Charles William Edward France, jockey, Palmerston North.
Ida Maud Mary France, married woman, Palmerston North.
David Irwin Wilson, postal cadet, Ormondville.
Richard Henry Edward Stillwell, railway ganger, Kopua.
Wilfred Alexander Wackrow, engine-driver, New Zealand Government Railways, Palmerston North.
Albert Ernest Waters, railway surfaceman, Waipukurau.
John Gardner, Borough Inspector, Waipukurau.
Matthew Henry Walter Good, railway porter, Waipukurau.
Frederick Joseph Arlidge, contractor for cleaning trucks, Waipukurau.
John Wright, sheep-farmer, Hastings.
Charles Owen Genet, railway clerk, Waipawa.
Richard Knight, contract shearer, Rotorua.
James Smith Gray McKenzie, Boiler Inspector for New Zealand Government Railways, North Island.
Alexander Gray, surfaceman, Opapa.
Oscar Richard Savage, railway ganger in charge at Opapa.
George Streeter, Inspector of Permanent-way, Waipukurau.
Eugene Casey, Inspecting Engineer for New Zealand Government Railways, Wellington.
George John Bryce, Locomotive Foreman, Napier.
James Forester Mackley, Locomotive Engineer for North Island.
Robert Julian Scott, Professor of Engineering at Canterbury College.
Alfred Kinsella Harris, General Superintendent of Transportation, Railway Department, Wellington.
Donald Martin Robertson, Train-examiner, Railway Department, Waipukurau.
Richard William Joseph Dickson, Brake Inspector, Petone.
Robert Foster Laing, engine-driver on New Zealand Railways, Napier.
Keith John Davidson, signal-adjuster, Hastings.
Gilbert Roland Abbott, clerk, Port Ahuriri.
Herbert Thomas, in charge of Opapa Station, New Zealand Railways.
Wallace Edwin Yates, grocer, Waipawa.
Edward Malcolm Langley, director of E. M. Langley and Co., grain-merchants.

The following exhibits were also produced at the hearings:—
"A"—Plan 36651, showing measurements taken on the curve after the accident.
"B"—Plan 36645, showing cant and slack on the curve after the accident.
"C"—Plan 36660, showing cant on the curve to the point of accident.
"D"—Plan 36646, showing track-renewals after the accident.
"E"—Plan 36658, showing track and train after the accident.
"F"—Plan 2395, showing alignment and longitudinal section.
"G"—Two photographs showing the engine and debris after the accident.
"H"—Section of rail, showing wear.
"J" and "K"—Section of rail and template, showing wear allowable on a 7-chain curve.
"L"—Cocks off Westinghouse brake.
"M"—Working time-table.
"N"—Diagram No. 1, showing make-up of train.
"O"—Gauges, showing full tire and minimum tire allowed.
"P"—Professor Scott's report.

QUESTION 1: *What was the cause of the derailment of the Wellington-Napier express train near Opapa Station on the 22nd September, 1925?*

With regard to this question we find that when the train was descending the Opapa grade the engine left the rails at a point approaching the lower end of a curve having a radius of about 7 chains. The engine and tender were totally derailed to the outside of the curve, and eventually came to rest against the side of the cutting. The first car was also derailed to the outside of the curve. The second car appears to have kept the rails until obstructed by the derailed vehicles, when its couplings

parted and it became derailed on the inside of the curve, and continued on to a point 77 ft. beyond the front of the derailed engine. The rest of the train followed in line, the third, fourth, and fifth cars being totally derailed. The third and fourth cars were stripped off their bogies and all the draw-gear broken. The leading bogie of the sixth car was also derailed, but the trailing bogie of that car and the remaining vehicles were left on the track practically undamaged.

Gas escaping from damaged cylinders caught fire and destroyed the five derailed cars.

There was nothing to indicate that any obstruction had been placed on the track prior to the derailment.

The derailed locomotive had brought the express to Woodville, and was on the return run to Napier when the accident happened. It was received from the workshops on the 20th December, 1924, after a complete overhaul, and the Locomotive Foreman at Napier had inspected the wheels and running-gear before the run was commenced on the 22nd September, 1925.

The Westinghouse brakes were tested at Waipukurau, and the wheels and undergear of the vehicles also examined and found to be in good order.

The track was inspected on the morning of the date of the derailment, and the usual weekly inspection of the track had also been made.

Speed-boards indicating the radius of each curve were in position at different points on the grade.

The departmental records show that on the date of the accident the train ran to schedule time at Woodville and Dannevirke, but was four minutes late at Makotuku, three minutes late at Ormondville, and one minute late at Waipawa. This train does not stop at Otane.

With regard to the question of speed and other factors, which must be considered in arriving at the cause of the derailment, your Commissioners are satisfied to accept the conclusions arrived at by Professor Scott, namely:—

(1.) That the locomotive was in first-class running-order, and to no defect in upkeep can the derailment be attributed.

(2.) That the track was substantial in character, and in excellent order.

(3.) That twenty-five miles per hour, the limiting speed on this portion of track, was a safe speed for the train as constituted.

(4.) That oscillation primarily set up by the varying curvature of the track, together with the lateral thrust upon the bogie wheels, might readily prove a source of danger at speeds exceeding thirty-three miles an hour, which are considered the extreme limit of safe speed for an "A" engine over this portion of the track.

(5.) That the position of the wreck indicates that at the moment of derailment the train was travelling at the rate of at least forty miles per hour.

This evidence as to excessive speed was supported by witnesses who were passengers on the train at the time of the accident.

We find that the derailment of the Wellington–Napier express train on the Opapa bank on the 22nd September, 1925, was due to excessive speed, and that this was the result of the engine-driver failing to take precautions to reduce speed when approaching the curves near which the derailment took place, in accordance with the regulations which are issued to engine-drivers and others.

We also find that the presence of a third person on the engine, and the taking of liquor on to the engine by that person during the journey, were factors which helped to bring about the derailment.

QUESTION 2: *Are there any circumstances in connection with the derailment which in your opinion call for comment?*

1. The Commissioners are satisfied that the present curves on the grade, where the derailment occurred, can be safely negotiated by all trains if the maximum speed of twenty-five miles per hour fixed by regulations is not exceeded.

2. The fact that five of the carriages were destroyed by fire, which started immediately after the accident, leads us to believe that the fire was occasioned by the escape of Pintsch gas liberated by the rupture of the cylinders and their connections. This gas would be quickly ignited from the locomotive firebox, and it is clear that the derailment, serious as it was, might have been much more disastrous in its consequences. In view of this fact we recommend that the equipment of express-train carriages with electric lighting be expedited and completed as speedily as possible.

3. On inspecting the scene of the derailment it appeared to the Commissioners that the location of the railway on this incline could be slightly altered and the curvature improved without much difficulty, and we recommend that the Department investigate the possibility of this improvement.

4. We would also recommend that the Department consider the advisability of increasing the maximum superelevation now ruling on curves, with the view of giving greater safety in running and providing increased comfort to passengers.

5. The Commissioners are of opinion that the reduced time allowed on the run between Wellington and Napier, as compared with the time taken prior to March, 1925, did not affect the safe running of the train. It is clear from the evidence that the difference is mainly made up of time saved by the elimination of nineteen stops at small stations between the terminal points, and reducing the time allowed for stops at certain other stations. On no part of the run is the maximum speed per hour allowed under the earlier time-table increased, and the speed restriction of twenty-five miles per hour at the curve on which the derailment occurred is that which has obtained for many years past.

6. That the presence of a third person (one Marshall) on the engine, and the fact that liquor was taken on to the engine by him in breach of the regulations, contributed to the engine-driver's failure to exercise the care required to properly carry out his duty as driver prior to the time of the accident. Under these regulations provision is made for dealing with misconduct on the part of members or

train-men on duty which affects the safety of the public or the interests of the service. In addition to these provisions, we think it should be made a statutory offence, punishable by fine or imprisonment, for any person to place intoxicating liquor in the possession of, or offer such liquor for consumption to, any member or trainman while on duty. Taking into consideration the number of engine-drivers and trainmen daily employed by the Department, and the few cases of misconduct connected with liquor, the Commissioners are of opinion from this and their other inquiries in the matter that the occurrence was the result of unusual circumstances. The disaster, however, points to the necessity of all engine-drivers and trainmen being strictly sober and trustworthy officers who recognize their responsibilities not only to the Department but also to the public.

In conclusion the Commissioners desire to thank Mr. Myers, K.C., counsel for the Railway Department, and Mr. M. Dennehy, Secretary to the Commission, for their assistance in the conduct of the inquiry, and also all witnesses who gave evidence at the hearing.

Warrant of appointment is returned herewith.

In witness whereof we have hereunto set our hands, this 23rd day of March, 1926.

W. G. Riddell, Chairman, Commission of Inquiry.
J. Marchbanks, M.Inst.C.E., Commissioner.
W. D. Hunt, Commissioner.

APPENDIX B.

Messrs. Merz and McLellan's Report on Electrification of New Zealand Railways.

ANNEXURE *(A)*.

PAGE

Review by Messrs. F. T. M. Kissell, B.Sc., A.M.I.C.E., M.I.E.E. (Chief Electrical Enginer, Public Works Department), and R. P. Sims (Assistant Chief Mechanical Engineer, Railway Department), of the Section of the Report dealing with the Electrification of the Line between Lyttelton and Christchurch 41

ANNEXURE *(B)*.

Report of Messrs. F. T. M. Kissell, J. E. L. Cull, A. S. Wansbrough, and G. W. Wyles on the Electrification of the Line between Lyttelton and Christchurch ... 46

APPENDIX B.

REPORT ON ELECTRIFICATION OF NEW ZEALAND RAILWAYS.

To the Hon. J. G. COATES, M.C., Prime Minister of the Dominion of New Zealand,
Wellington, New Zealand.

SIR,— August, 1925.

New Zealand Railways.—Report on Electrification.

In accordance with your request we have prepared the following report dealing with the proposed electrification of certain suburban sections of the New Zealand Railways. The areas included are those of Auckland, Wellington, Christchurch, and Dunedin. The report deals with capital cost and operating-expenses, and is based upon our study of statistics, documents, and plans submitted to us by the Railway Department, and upon the investigations of our representative, Mr. E. P. Grove, who visited New Zealand for this purpose. The information supplied to us referred both to suburban trains and to through trains in the suburban zones, and both classes of traffic are included in the report. No figures as to shunting in main yards, as distinct from shunting by train-engines in wayside stations, were supplied to us, and we understand that for the present no such electrification is contemplated.

The report is arranged in five parts. The first deals with the general question of the application of electric working; the remaining four deal with the four centres mentioned above, and include tables showing details of our estimates, and maps.

It appears to us that three factors in the situation are of particular importance—namely, the mountainous nature of the country, the need for increased suburban passenger facilities, and the low cost of electric power relative to the cost of coal.

The first of these applies particularly to the suburban zones of Auckland, Wellington, and Christchurch, where the railways are handicapped by adverse grades or difficult tunnels, and where very costly measures to afford relief are already sanctioned. In these three cases we have, as a preliminary step, compared the cost of working the existing traffic by steam with the cost of working the same traffic electrically, showing at the same time to what extent electrification would render these other proposed works unnecessary.

The principal figures are as follows :—

CAPITAL COST AND ANNUAL SAVING DUE TO ELECTRIFICATION.—EXISTING SERVICE.

	Auckland.	Wellington.	Christchurch.
	£	£	£
Gross capital outlay on electrification	815,700	830,800	428,400*
Credit for steam locomotives released	97,500	38,000	10,800
Net capital outlay	718,200	792,800	417,600*
Annual saving in working-expenses due to electrification (including depreciation)	27,700	26,700	1,400
Return on capital	3·86%	3·37%	0·3%

* Includes whole line, Rangiora to Lyttelton. Cost of Christchurch–Lyttelton only—Gross, £203,100; net, £198,300.

We have shown in our report that if these lines were electrified certain alternative works could be postponed, possibly for many years to come. These are the Westfield* deviation (£450,000), the Tawa Flat deviation (£950,000), and the new Lyttelton Tunnel (£265,000), as well as certain smaller works. The figures in the above table contain no allowances for possible credits on this score.

The saving shown in annual working-expenses due to electrification of the existing service is attributable mainly to the lower cost of power as compared with coal and the lower cost of locomotive repairs. At Auckland and Wellington the savings are sufficient to pay between 3 per cent. and 4 per cent. on the net capital outlay, apart from any of the savings in capital expenditure mentioned in the preceding paragraph. At Christchurch, where the traffic is small, the saving is only sufficient to pay a fraction of 1 per cent. on the capital outlay, and in this case the only justification for electrification is that it would completely eliminate the discomforts due to smoke and fumes in the existing tunnel and so render the construction of a second tunnel unnecessary. We have suggested in the report that in this case it will only be necessary to electrify the line from Lyttelton to Christchurch, and not the whole line from Lyttelton to Rangiora.

The second factor to which we have referred is the need, which has already been expressed in the report of the Royal Commission of Inquiry and elsewhere, for an improvement in the suburban service, and particularly for the elimination of mixed trains. We have assumed that these changes will in any case be made, and we have prepared a set of estimates for all the sections on the basis of an

* The Westfield deviation may, however, be considered desirable in any case, since it opens up new suburban territory, and also provides an easy access to the new Auckland yard.

improved service. In this estimate the annual mileage run by passenger-trains shows an increase of approximately 50 per cent. over that run at present by mixed and passenger trains. We have given very careful consideration to the arrangement of the trains proposed, and we have been guided in this by the existing time-table and by provisional time-tables prepared by the Railway Department. The increase in mileage is, we think, a reasonable one.

In the table which follows we have set out the actual cost involved in providing electrical equipment to run the new service, and the annual saving in working-costs as compared with the cost of working the same traffic by steam.

CAPITAL COST AND ANNUAL SAVING DUE TO ELECTRIFICATION.—NEW SERVICE.

—	Auckland.	Wellington.	Christchurch–Lyttelton.	Dunedin.
	£	£	£	£
Gross capital outlay on electrification	840,900	846,200	203,100	374,600
Credit for steam locomotives released	168,400	113,600	12,300	20,600
Net capital outlay	672,500	732,600	190,800	354,000
Annual saving in working-expenses due to electrification (including depreciation)	66,200	61,900	4,200	12,600
Return on capital	9·85%	8·45%	2·2%	3·56%

Apart from credits which may result from the postponement of the other capital works referred to, the annual saving in working-expenses due to the electrification of this increased service is sufficient to pay approximately 10 per cent. on the net capital expenditure in the case of Auckland, and 8½ per cent. in the case of Wellington. For the Christchurch–Lyttelton Section the return is approximately 2 per cent., and for Dunedin 3½ per cent. For reasons which are set out in Part V, paragraph 4, this latter figure does not include the electrical operation of through trains within the suburban zone.

In these figures the cost of working the increased service electrically has been compared with the cost of working it by steam, assuming that the improved service would have to be provided in any case. Whether the increase is in itself financially justifiable will depend on the extent to which the public respond to the improved service. It is the general experience that increased receipts have followed an increase in facilities, and in Part I of the report we have quoted numerous instances, including Melbourne. It is not possible for us to say what the increase is likely to be in the case of the four centres now being considered, but it is reasonable to assume that it will not be less than elsewhere, particularly since electrification would considerably reduce the timing of some of the present suburban trains, and would, in the case of Christchurch, completely remove the discomforts of the Lyttelton Tunnel.

The third factor referred to at the beginning of this letter is the cost of power in New Zealand relative to the cost of locomotive coal. The question of power-supply is dealt with at some length in the report, but we may repeat that it is evident from our calculations that where it has been possible to spread the cost of power over a sufficient range of traffic to obtain a good load-factor, or where the conditions of steam operation are particularly difficult, the saving in the cost of power as compared with the cost of coal is very marked. This fact, together with the difficult nature of the country through which many of the lines pass, exerts a considerable influence on the question of electrification not only of suburban areas, but possibly also of some sections of the main line.

We have endeavoured to make the report as complete as possible, and, although it is necessarily a broad survey of the position based on the information received rather than a final and detailed estimate, we have aimed at presenting our analysis in such a way that the main features of the situation may be fully appreciated. We trust that the arrangement will prove convenient and clear.

We wish to express our thanks to yourself, your staff, and the officers of the Railway and Public Works Departments for the courtesy extended to our representative, and for the assistance rendered in preparing plans and other information for our use.

We are, &c.,
MERZ AND MCLELLAN.

REPORT.

PART I.—GENERAL PRINCIPLES OF ELECTRIFICATION.

Fundamental differences between steam and electric locomotives.

1. The advantages to be obtained from the electrification of railways arise from fundamental differences between the steam locomotive and the electric-power unit, whether it be locomotive or motor-coach. The limitations of the steam locomotive, which are due to the fact that it is a complete prime mover, affect the weight, dimensions, and general design, the operating efficiency, utility, cost of repairs, and maintenance. The electric locomotive and the electrically equipped coach are free from many of these restrictions by reason of the fact that they are designed only for the purpose of converting electric power to tractive power, the production of electric energy being concentrated in a power-station from which current is distributed to the trains.

Power-station efficiency.

2. The power-station for the operation of an electric railway may be either steam or hydro-electric. A steam station, with large boilers and large generating-units, works at an efficiency which is unattainable with individual locomotives, and it is more economical to burn coal in a central station and distribute power to the trains than to burn coal in the locomotive firebox. Large stationary boilers can be fired on inferior coal which is quite unsuitable for a locomotive; but, apart from this, experience has shown that the fuel-consumption in a locomotive is from three to four times the consumption in a power-station for the same work on the track. If coal is dear, the saving on this item alone may be a big inducement towards electrification, even if a steam-power station has to be specially built. The advantages of electrification are still greater if, as in the case of New Zealand, cheap hydro-electric power is already available.

Main line and suburban traffic.

3. The advantages arising from the electrification of railways are numerous, and are to a certain extent different according to the class of traffic handled. This may be divided into two classes: (*a*) Main-line passenger and freight traffic; (*b*) suburban passenger traffic.

(*a.*) Main-line Passenger and Freight Traffic.

4. Electrification may be carried out in two ways: Firstly, it is possible to substitute electric locomotives for steam locomotives while maintaining the character and composition of the train as before, and, secondly, it is possible to equip a certain number of coaches in the train with driving-equipment, in which case no locomotive will be required. The locomotive system is usually employed for main-line passenger-trains, and the motor-coach or multiple-unit system for suburban passenger-trains, although this distinction between the two systems is not absolute. Freight traffic is, for obvious reasons, always handled by locomotives.

Economy of main-line electrification.

5. The advantages of main-line electrification for freight and passenger traffic are for the most part due to economy in operating-costs and to increase in the capacity of the line, although increased ability to maintain punctual schedules and to vary loads is also important.

6. The reductions in operating-costs are in general due to the saving in fuel, in wages of train-crews, and in the cost of repairs and general maintenance of locomotives. These advantages are to be expected in all main-line electrification schemes. In special cases other advantages are obtainable, such as the possibility of working single trains over steep gradients over which they have previously been worked in two or more sections.

Characteristics of the electric locomotive.

7. These results of electrification are solely attributable to the inherent characteristics of the steam and electric locomotive. In designing an electric locomotive it is possible to provide motors of any power required, without exceeding the usual limitations of weight per axle, space restrictions, &c., since the number of driving-axles can be chosen at will. A single locomotive may have four, six, or eight driving-axles, and two or more locomotives may be coupled together electrically and controlled by a single driver. This adaptability is generally taken advantage of by designing electric locomotives, especially those intended for goods-train working, to produce the maximum drawbar pull which the drawbars will stand with the usual margin of safety. As the power available is practically unlimited the motors are designed to exert this pull at as high a speed as the limitations of track and rolling-stock will permit. As a result, the main-line traffic can be speeded up, the passenger-trains to a moderate extent from 10 to 20 per cent., depending upon the length and steepness of the gradients, and the freight traffic to a greater extent, the increase in some special cases being as much as 100 per cent. At the same time heavier trains can be worked, and the number of trains required for any given volume of traffic is thereby reduced.

Electric-locomotive operation.

8. These alterations in working have a direct bearing on the operating-costs in respect of train wages, partly by reducing the number of train-crews and partly by raising the speed of travel and cutting down traffic delays due to goods-trains waiting to allow passenger-trains to pass. These advantages are specially marked on single-track lines, but are also very appreciable on double-track lines where there is much traffic.

Cost of electric-locomotive repairs.

9. The simplicity of the electric locomotive leads to a substantial reduction in the costs of repairs and maintenance, and experience shows that these costs are reduced to one-third, and in some cases one-quarter, of those of the steam locomotive. Similarly, engine-shed expenses are much reduced, as electric locomotives can be kept in service continuously for long periods without requiring more than occasional attention to lubrication.

Financial results of main-line electrification.

10. Whether these operating economies are sufficient to justify electrification depends largely on the cost of locomotive coal as compared with the cost of electric energy. If coal is cheap and the

volume of traffic small, the saving effected may not be sufficient to pay for the capital charges and working-expenses of the electrical installation, unless there are other special circumstances in favour of electrification. If locomotive coal is expensive, and especially if water-power is available for the production of electric energy, and if the traffic is moderately dense, the reduction in operating-costs is generally sufficient to provide for all the capital charges and the working-expenses of the electrical equipment, with a satisfactory margin of profit.

11. In arriving at a final estimate of the value of electrification in any particular case it is necessary to take account of several factors in addition to those referred to above. In some instances these other factors are of sufficient importance in themselves to justify electrification.

Increase in track capacity due to electrification.

12. Where a railway is carrying a large amount of traffic and is approaching the point at which additional tracks and other facilities are necessary, the possibility of increasing the capacity of the existing lines by electrification will often enable the cost of doubling or quadrupling to be postponed for many years.

Regenerative braking.

13. The use of the regenerative system, whereby on a falling gradient the motors on the locomotives are converted into generators and exert a retarding force while returning electric energy to the distribution system, effects a marked increase in the efficiency of working as compared with the method of operation on a steam railway, where the potential energy of the descending train is wasted in brake-block friction. This is especially important in those instances where loaded traffic travels down the gradients and the trains travelling up the gradients consist mostly of empty wagons. There is also a substantial reduction in the cost of brake-block renewals.

Saving in wagons.

14. The speeding-up of the freight-trains results in a better use of the rolling-stock, enabling each wagon to do more journeys in the year. For any given volume of traffic, therefore, fewer wagons are needed, and in some cases the saving on this account is large. There is also a saving on account of wagons released from the haulage of locomotive coal.

Additional economies due to electrification.

15. The reduction in the number of locomotives required for any given service, and the small amount of shed-work necessary with electric locomotives, may make it possible to abolish certain engine-sheds altogether. Similarly, coal-handling plant, pumping-stations, and water-columns can be removed and sold or used elsewhere. Compensation for damage done by wayside fires due to sparks thrown off by steam locomotives is eliminated by the substitution of electric locomotives. The value of these various factors naturally depends on the particular circumstances of each case investigated.

(*b.*) Suburban Passenger Traffic.

The multiple-unit system.

16. For the electrical operation of suburban passenger traffic it is usually convenient to eliminate locomotives and to employ coaches fitted with driving-motors and the necessary control equipments. Each train is made up of one or more of these coaches and several trailers, according to the size of train required. The control equipments are designed for operation by means of master controllers and train-wires from any point on the train which may be a driving-point, whether this is on a motor-coach or on a trailer, so that there is no need to make up the train with the motor-coach leading. The arrangement is now well known as the multiple-unit system, and has the following advantages: The train can be driven equally well from either end; the number and proportion of motor-coaches and trailers can be varied as desired; the average speed of travel can be substantially increased.

Relief afforded at terminal stations.

17. The possibility of driving any train from either end eliminates shunting at terminal stations. The reduction of train and engine movements on this account has a beneficial effect on the working of the traffic at these points, and increases the capacity of the terminal station to such an extent that in many cases a large expenditure on alterations or extensions which would otherwise be inevitable is avoided.

Frequency of electric service.

18. On the London and North-eastern Railway electric trains are now despatched at two-minute intervals during the rush hours from terminal platforms at Newcastle Central Station. On the London, Brighton, and South Coast Railway, prior to electrification, the number of trains in and out per day on the lines now electrified at Victoria terminus was 496; immediately after electrification this was increased to 739. Similarly at the London Bridge terminus the number was increased from 663 to 991. On the Pennsylvania Railroad the result of electrifying the main- and branch-line suburban services out of Broad Street Station, Philadelphia, was that in 1922 the station, which was originally designed for 160 trains per day, accommodated 600 trains per day. Due to this electrification, expensive additions to the station were rendered unnecessary.

Alterations in make-up of train to suit traffic.

19. The possibility of varying the number and proportion of motor-coaches and trailers is important, as it enables the make-up of a train to be altered to suit the traffic conditions. During the rush hours each train will probably be made up to the full size, but during the slack periods short trains can be run—consisting of, say, one motor-coach and one trailer—at times when it would not pay to run a steam locomotive with a full-size train. For example, on the Buenos Aires suburban lines of the Central Argentine Railway the make-up of trains on a typical day varies from four motor-coaches and two trailers to one motor-coach and one trailer. As the result of this, although the train-mileage was increased when electric working started by about 40 per cent., the coach-mileage was reduced by 5 per cent.

Increased acceleration and schedule speed.

20. A great advantage of the multiple-unit system for short-stop service is the possibility of increasing the average speed of travel. This is due to the higher acceleration which can be obtained by using several motor-coaches instead of a single locomotive. The increase in the acceleration and the consequent increase in the average speed can be as much as desired, within obvious limits, but it is usual for commercial reasons to work with an acceleration of about 1 mile per hour per second, in some cases rather more. This in general enables the average speed of an electric train to be increased by 20 to 30 per cent. as compared with a steam train working under similar conditions in regard to station stops and average distance between stations.

Economies in operating-costs.

21. Instead of the driver and fireman required on a steam locomotive, a single driver or motorman is all that is necessary for any electric multiple-unit train, the safety of the train being assured by means of a special fitting on the master controller called the "dead man's handle," whereby, in the event of the driver being suddenly incapacitated, the power is cut off and the brakes are applied. It is also possible to provide an automatic train-stop to prevent the driver overrunning his signal. The cost of repairs and general maintenance of the motor equipments on an electric train is much less than the corresponding cost for a steam locomotive, and there are minor economies to be effected in the lighting and heating or ventilating of the trains.

Financial results of suburban electrification.

22. These reductions in operating-costs must be considered together with the other items of working-expenses, particularly the cost of locomotive coal and water and the cost of electric power. In addition, the cost of electric working must include operating-costs and the depreciation of the complete electrical installation, which usually consists of the necessary equipment of track, the substations from which power is delivered to the track conductors, and in some cases the power-station and the high-tension transmission-system connecting it to the substation.* If electrification is to be financially justified, the saving due to electric working as compared with steam must be at least sufficient to pay interest charges on the net capital outlay.

Increase in revenue as a result of suburban electrification.

23. In many cases, however, the inducement to electrify suburban systems has been not so much the ability to reduce operating-costs as the probability of a large increase in revenue. The advantages offered to the public of a quicker, cleaner, and a more frequent service lead to an increase in the use of the railway, and a corresponding increase in the revenue. This applies especially to large cities where the population is growing and the residential quarters are being developed at an increasing distance from the business centres. Experience shows that when electrification is undertaken under these conditions the traffic grows rapidly. A few examples will make this clear.

Central Argentine Railway.

24. On the Central Argentine Railway the number of passengers on the electrified section increased from about 5,500,000 during the year ending 24th August, 1918, to about 9,100,000 during the year ending 23rd August, 1921.

Brighton Railway.

25. On the Victoria to Crystal Palace and the London Bridge to Crystal Palace and Streatham Hill line of the London, Brighton, and South Coast Railway, the number of passengers during the last year of steam working was about 14,770,000, and during 1919, with electric working, about 34,900,000. The increase in receipts for the year 1919 as compared with steam working was £265,623.

Tyneside lines.

26. On the Tyneside lines of the London and North-eastern Railway the receipts increased by about 30 per cent. in four years following electrification. Prior to electrification the receipts were gradually decreasing on account of tramway competition.

Melbourne suburban lines.

27. On the Melbourne suburban lines the results of electrification have been remarkable. Mr. W. D. Bracher, Secretary to the Railways Electrification Committee, in giving evidence recently before the Railways Standing Committee, stated that, after making allowance for a normal increase, the railway electrification system produced in the financial year ended 30th June, 1923, additional traffic amounting to 21,000,000 passenger journeys, equivalent to a revenue of £325,000.

* In the tables contained in this report the operating-costs and the depreciation and interest charges on the power-station and high-tension transmission-system are included in the cost of power, which is based on a quotation supplied by the Public Works Department.

Additional economies due to electrification.

28. Apart from the various matters referred to above, there are other incidental advantages of railway electrification which cannot easily be brought into a balance-sheet of operating-costs or revenue. The removal of the steam locomotive must necessarily have a favourable effect on the comfort of travel. Coal-handling plant, water-columns, and pumping plant are reduced in number if not altogether eliminated; and, due to the absence of smoke, savings can be effected in the painting of stations, overbridges, and rolling-stock.

Some Factors affecting New Zealand as a Whole.

29. Before examining in detail the application of electric working to the four cities of Auckland, Wellington, Christchurch, and Dunedin it may be advantageous to draw attention to one or two factors which affect all centres equally, and, indeed, the New Zealand railways as a whole. These are the questions of power-supply, of regrading, and of the choice of the system of electrification which would be most suitable for the conditions.

Power-supply.

The use of natural resources.

30. The water-power resources of New Zealand are considerable, and are being developed on national lines. It is obviously desirable, not only from the point of view of the railways but on general economic grounds, to utilize a natural source of power which would otherwise be running to waste, rather than to import locomotive coal at high prices. This has been one of the principal factors in the electrification of the railways in France, Switzerland, Italy, Sweden, and elsewhere.

The effect of load-factor.

31. A large proportion of the cost of power from any supply undertaking, and particularly an hydro-electric undertaking, is made up of the charges on capital and certain charges such as salaries and wages. It is therefore desirable to use the plant to the greatest possible extent in order that these so-called "fixed" charges may be spread over a greater number of units, and the price per unit be thereby reduced. From the point of view of both the consumer and the supplier it is desirable, therefore, within the capacity of the generating plant, that the maximum possible load should be obtained, and, in general, that the average load throughout the twenty-four hours should be well maintained.

Improvement in load-factor by combination of load.

32. The ordinary domestic load and the ordinary industrial load are both characterized by peaks at certain hours of the day—that is, their load-factor is low, although a combination of the two tends to an improvement on the total load-factor of the station, since their maxima do not occur simultaneously. The railway load combined with the other two tends to a still further improvement, and thus to a better utilization of the capital already invested in hydro-electric schemes, with consequent advantages not only to the railway and other consumers but to the country as a whole.

Railway load-factor inherently high.

33. From the Railways point of view, since the whole of the charges are based on maximum demand, it is obviously advantageous to take as uniform a supply as possible throughout the day. The maximum demand may be expected to occur during the suburban-passenger rush-hour periods. The charge for current will be fixed by this demand, and will not be increased by running a steady service of goods and passenger trains throughout the day, provided that no new limit of maximum demand is thereby set up. This principle is of particular advantage since from the very nature of the case it is necessary that railway traffic should be spread as far as possible over the whole twenty-four hours of the day in order to make the best use of tracks and rolling-stock. It is possible, therefore, to bring the costs of power per train-mile to an attractively low figure by extending electrification over as wide a range of traffic as possible.

Cost of power.

34. The figures for power-supply rates have been supplied to us by the Public Works Department, which makes two alternative offers: (1) to supply the central point in each area, after which the responsibility for transmission would rest with the Railway Department, and (2) to supply to each substation as required. Our estimate of the cost of power is based on the second proposal. We assume that such supplies would be given in duplicate, and that satisfactory arrangements can be come to with the Public Works Department to run these lines in a manner which would be satisfactory to the Railway Department. The cost of current is shown separately under the various sections of the report.

Electrification as an Alternative to Regrading or Increasing the Number of Tracks.

Regrading and track alterations.

35. The growth of traffic on the railways has made it necessary to consider what means can be adopted to provide increased facilities, and a number of schemes for regrading and doubling tracks are now under consideration not only in the four towns which are the immediate object of this report, but in other places in the Islands. In all parts of the world electrification has proved itself capable of increasing the capacity of existing tracks, and it is now usual to consider electrification as an alternative in all such cases. On the other hand, we are aware that the provision of additional

track capacity is sometimes only an incidental advantage of such schemes, and that there are other reasons, such as the opening-up of new territory, which have to be given their proper value. Such cases will arise in our examination of the four towns, and we will confine ourselves to pointing out to what extent the capacity of the existing tracks would be increased by electrification.

General Considerations affecting the Choice of a System for New Zealand.

Choice of system for railways.

36. If it is decided to proceed with the electrification of all or any of the suburban areas it is obviously desirable that the system chosen should be suitable not only for the area selected, but for other schemes elsewhere, including, possibly, difficult sections of the main line.

Existing system of power-supply.

37. New Zealand, in common with other countries, has adopted a three-phase system of supply with a frequency of 50 cycles, experience having shown that this frequency is most suitable for a universal system to supply a variety of needs. This step already taken will have an important bearing on the system to be adopted for the electrification of the railways.

Alternating current, single phase.

38. Railway electrification can be carried out either by the alternating-current system or by the direct-current system. In the first instance it is usual to employ single-phase alternating current at a frequency of 25 or less cycles per second, and it has not so far proved practicable to build an alternating-current traction-motor for any higher frequency. The chief advantage of the alternating-current system—namely, that no rotating substation machinery is required—therefore disappears unless it is possible to generate and distribute at 25 or less cycles. The use of the single-phase alternating-current system for railway electrification has therefore been associated with power-stations set aside solely for traction purposes, and the advantages to be obtained from combining various classes of loads in one power-station have, as a rule, been lost. Various schemes are now being proposed to admit of a 25-cycle locomotive being driven from a 50-cycle transmission-system, but these schemes merely remove the rotating converting machinery from the substation to the locomotives. Little experience has been gained with these systems in service, and, as they are really only applicable to heavy locomotives, they would be unsuitable for suburban working.

Alternating current, three-phase.

39. Another alternating-current system, the three-phase, can be utilized for traction purposes. In this case also a low frequency is desirable for the motors, and the system therefore cannot be used in conjunction with a 50-cycle supply except through rotating converters. The principal disadvantage, however, is that two overhead conductor-wires are required, and the necessity of these being insulated from one another involves special difficulties in construction. The system has only been used to any extent in Italy, and there are indications that it will not be extended, but that the direct-current system will be used in that country for new construction.

Direct-current system.

40. In the direct-current system power is converted in substations placed beside the track from alternating current to any suitable direct-current voltage. Apart from purely suburban electrification with very dense traffic, such as exists in very large cities, it is safe to say that there are only two standard D.C. voltages which would be employed for new construction at the present day—namely, 1,500 and 3,000 volts. In general it may be said that for long distances with sparse traffic, or for exceptionally heavy trains, the 3,000-volt system would be used. On the other hand, the 1,500-volt system is more suitable for suburban areas. This system is a good general system for both suburban and moderate lengths of main-line working, and has been adopted as the standard construction in a number of countries. It was adopted in France after a prolonged investigation of the various alternatives, and a considerable mileage of both main-line and suburban track is already electrified, while other sections previously operated on other systems are being changed over. It was also recommended by the Advisory Committee appointed by the British Minister of Transport to advise as to the standard system for the electrification of the British railways, and has been adopted since in Holland and Belgium. It is also the system already adopted on the Otira Tunnel section of the New Zealand railways.

Track conductor; third rail or overhead.

41. With 1,500-volt direct current it is possible to use either a third rail or an overhead conductor for supplying the current to the trains. Various technical considerations are involved as between the two systems, but we think that the balance of advantage, if the system may be ultimately extended to main-line working, lies with the overhead construction.

Most suitable system.

42. Before coming to a final decision on this point it might be well to consider to what extent electrification may be extended in the future to the main line. In working out our various figures we have, however, assumed the use of the 1,500-volt direct-current system with overhead construction.

PART Ia.—SUPPLEMENTARY REPORT.

(January, 1926.)

SUPPLEMENTARY report forwarded through the High Commissioner, London, in reply to a request for further information on the following points :—

(1.) Details of costs of operation.
(2.) Details of substations and all other equipment proposed.
(3.) Details showing how capital costs made up.
(4.) Annual ton-miles estimated for all services.
(5.) Average current consumption estimated per ton-mile at pantograph and maximum demand.
(6.) Details proposed special terminal facilities.

1. DETAILS OF COST OF OPERATION.

Cost of Coal and Water.—The figures for cost of coal and water were supplied by the Railway Department, and are as follows :—

Water : All centres, 0·5d. per engine-mile.

Coal : Auckland, 13·66d. per engine-mile ; Wellington, 13·58d. per engine-mile ; Christchurch, 12·02d. per engine-mile ; Dunedin,* 16·79d. per engine-mile.

Cost of Power.—The cost of power has been calculated from a quotation supplied by the Public Works Department, who offer to give a supply at each substation at the following rates :—

For the first 200 kw. maximum demand at each substation a charge of £2 10s. per quarter per kilowatt.

For the remainder of the maximum demand at each substation up to 5,000 kw., a charge of £2 per quarter per kilowatt.

The maximum demand is defined as the maximum load averaged over half an hour.

Locomotive Repairs, Running-shed Charges and Renewals.—The figures for the cost of locomotive repairs and running-shed charges for steam locomotives were supplied by the Railway Department and amount to 9·4d. per engine-mile. The same items for electric locomotives are estimated at 2d. per engine-mile at Auckland and Wellington, and 3d. per engine-mile at Christchurch and Dunedin, where the number of locomotives employed would be small. For the electrical equipment of motor coaches the cost is estimated to be 1d. per coach-mile. The figures are based on results obtained with similar equipment elsewhere.

The cost of depreciation or contribution to the Renewals Fund is estimated as a percentage on the purchase-price, the figures taken being 4 per cent. per annum for steam locomotives and 3 per cent. for electric locomotives.

Train Wages.—These are as follows :—

(1.) Driver, fireman, and guard for steam trains, 11·78d. per engine-mile.
(2.) Driver, assistant, and guard for electric locomotive trains, 11·78d. per engine-mile.
(3.) Driver and guard for electric multiple-unit trains, 5·21d. per engine-mile.
(4.) Driver, fireman, and guard for steam trains in similar service to multiple-unit trains, 9·89d. per engine-mile.

The figure in (1) was supplied by the Railway Department, and was used in the report for both steam- and electric-locomotive trains in the same service. In Sections B of the Auckland and Wellington sections a part of the service was provided by multiple-unit electric trains, and for these trains the figures in (3) were employed. For the corresponding service carried out by steam trains the figure in (4) was used. Figures (3) and (4) were calculated from the mileage worked per shift and and from the hourly rates of pay (*i.e.*, driver, 2s. 6d. per hour), and an allowance of 15 per cent. was added to cover privileges.

Substation Maintenance and Depreciation.—The estimate for the substation provides for automatic equipment, and no operating wages are therefore included. The amount included for inspection and maintenance is £1,000 for each area, plus £400 per rotary set per annum, and for depreciation 1½ per cent. of the capital cost per annum.

Overhead-line Maintenance and Renewals.—The amount included for repairs and renewals is at the rate of £70 per mile of single track per annum.

2. DETAILS OF SUBSTATIONS AND OTHER EQUIPMENT PROPOSED.

Substations.—The estimates make provision for automatic rotary converters, together with buildings, cranes, sidings, step-down transformers, switch-gear, and auxiliary plant. The prices are based on "traction" rotaries with high overload capacity. The number of substations required and the total installed capacity are as follows :—

	Number of Sub-stations.	Total Capacity installed. Kilowatts.
Auckland, Sections A and B	4	13,500
Wellington, Section A	5	15,000
Wellington, Section B	5	16,500
Christchurch, Section A	3	9,000
Christchurch, Section B	1	3,000
Dunedin, Sections A and B	2	6,000

* For the section of the Dunedin report, which deals only with trains originating within the suburban zone, a lower figure has been taken—*i.e.*, 14·8.

Locomotives.—The locomotive proposed weighs approximately 52 tons, and is equipped with four 225 horse-power motors. Further particulars are given in the report.

The motor-coach equipment proposed would have four motors of approximately 130 horse-power each. Each motor-car could haul two trailers, so that the six-car train would consist of two motor-cars and four trailer-cars.

On account of the electrical equipment the motor-coaches will require rather stiffer underframes and somewhat heavier bogies; but, apart from this and the equipment, there is little difference between steam and electric stock, and if suitable stock is available it could be converted for electric working. Alternatively, it would probably be more convenient to purchase new stock for the motor-coaches and to convert existing stock into trailers. We have assumed that this course would be adopted, and we have allowed in our estimate a price sufficient to cover the cost of the complete electrical equipment, and the difference in cost between underframes and bogies for steam stock and those for electric motor-coaches. The cost of the coaches, apart from the equipment and the modifications mentioned, was not included in our estimate, as some additional stock would in any case be required to work the proposed increased service either electrically or by steam.

Electrical Equipment of Track.—The estimate of the cost of overhead equipment of track is based on a study of the plans sent to us, upon the report of our representative, Mr. Grove, and on the ascertained cost of similar work which we have carried out in other parts of the world. The construction would be that known as "catenary construction," and we suggest that for the most part it would be economical to use wooden poles. The estimate makes provision for all material and labour, including conductors, track structures or poles and foundations. The cost of bonding the running-rails is also included.

3. Details showing how Capital Cost is made up.

The estimates of capital cost contained in the report are based on recent contracts for similar material, and on prices specially obtained from leading manufacturers. The prices include an allowance for freight to New Zealand and for erection on site, but not for Customs duty, as we understand that none is levied on material for the Government Railways. An allowance for spare parts has been made in all cases.

Taking the items in the order in which they appear in the tables, we would comment as follows:—

Locomotives and Rolling-stock.—Details are set out in Tables III, IX, XV, XXI.

Substations.—The estimate of cost includes rotary converters, switch-gear, and complete equipment from the H.T. terminals to the 1500-volt direct-current feeders, and also the cranes, sidings, and buildings. Details as to the number of substations and capacity of plant are given in answer to question 2 herewith.

Overhead Equipment.—Please see answer to question 2. The lengths of line included in the estimates are given in Tables II, VIII, XIV, XX.

Locomotive-sheds.—We were informed by the Railway Department that in the event of the electrification of the suburban zones it would be necessary to provide new locomotive-sheds at Henderson, Papakura, and Upper Hutt to deal with the steam locomotives which would terminate at these points. The estimate of the cost of these sheds was supplied by the Railway Department.

Alterations to Existing Sheds, Telegraph, and Telephones, &c.—This is a provisional sum included for alteration to existing sheds to adapt them for the maintenance of the electric stock, and for possible modifications in the run of telegraph and telephone wires to suit the layout of the overhead equipment of track.

Contingencies and Engineering Expenses.—This is an allowance of 15 per cent. on the total expenditure to cover engineering expenses, charges made by the High Commissioner's Department, store charges, supervision, and contingencies.

Interest on Capital during Construction.—This sum is intended to cover the interest on the money expended in carrying out the work up to the time of commencement of electric running.

4. Annual Ton-miles.

The annual ton-mileage is approximately as follows:—

Auckland—		Christchurch—	
Section A traffic	138 millions.	Section A traffic	46 millions.
Section B traffic	175 millions.	Section B traffic	32 millions.
Wellington—		Dunedin—	
Section A traffic	125 millions.	Section A traffic	62 millions.
Section B traffic	189 millions.	Section B traffic	93 millions.

5. Average Current-consumption and Maximum Demand.

The current-consumption per ton-mile varies with different classes of trains, with the gradients, and with the distance apart of stations on the various lines. The estimated average of the watt-hours per ton-mile measured at the pantograph is from 60 to 55 in the case of Auckland, Wellington, and Dunedin, and rather lower—*i.e.*, 50–55—in the case of Christchurch. An efficiency of 79 per cent. has been assumed from pantograph to the high-tension terminals at the substations.

Maximum Demand.—The estimated maximum demands at the high-tension bus-bars of the substations is as follows:—

	Section A. Kilowatts.	Section B. Kilowatts.
Auckland	2,740	3,850
Wellington	2,440	3,800
Christchurch	1,375	725
Dunedin	1,210	1,740

Each of these figures is the sum of the maximum half-hourly loads taken individually at the various substations in any one area. It will be appreciated that the momentary and short-period demands may be much higher.

6. Details of proposed Special Terminal Facilities.

We are not altogether clear as to what information is desired. As compared with those required for steam working, no additional facilities would be required for electric working.

PART II.—THE ELECTRIFICATION OF THE AUCKLAND ZONE.

Present conditions.

1. The railway situation in Auckland is one of considerable difficulty not only on account of the small number of tracks available, but owing to the presence of a steep summit immediately outside the town. The grades to the summit are approximately 1 in 40 against both up and down trains, and are some 2½ to 3 miles long. The goods traffic is steadily growing, additional passenger facilities, such as the abolition of mixed trains, are under consideration, and it is anticipated that existing arrangements for handling traffic will shortly be inadequate. A map of the area is included with the tables at the end of this part of the report (Fig. 1).

Proposed improvements.

2. To overcome existing difficulties and to made provision for future development various schemes have been proposed. These include a new station and yard at Auckland, a new deviation from Westfield to Auckland, the northern outlet, and sundry additional tracks. It will be seen that the number of alternatives is large—so large, indeed, as to tend to obscure the problem, more particularly since all the principal works mentioned above have some other object in addition to an increase in the capacity of the line.

Arrangement of this section of the report.

3. It is beyond doubt that electrification would increase the capacity of existing tracks, and to that extent it may be considered as a further alternative to the works detailed above. The situation is therefore complex, and we propose, as a first example and in order to fix ideas, to estimate the cost of working the existing service electrically, maintaining the character of the service as at present, after which we shall go on to deal with further developments of traffic. This part of the report will therefore be divided into two sections: Section A, electrification of existing traffic; section B, proposals to provide increased facilities by electrification.

Section A.—Electrification of existing Traffic.

The advantage of using locomotives for suburban traffic in some cases.

4. We have already pointed out that main-line electrification is carried out by means of locomotives, whereas in suburban electrification multiple-unit stock consisting of motor and trailer cars is usually employed. One of the greatest advantages of the motor-coach train, in addition to increased speed for short-stop service, is its ability to enter and leave a terminal station without any shunting and to do so in the shortest possible time. On the other hand, where no tracks are specially set aside for suburban passenger-trains, and where in consequence freight traffic must to some extent cease during the rush hours of passenger traffic, there may be some advantage in using locomotives for both passenger and goods trains if the same type of locomotive can be used for both. With the present arrangement of traffic (which is the basis of this section of the report) multiple-unit suburban stock could not be continuously or economically employed, and we therefore propose to assume the use of electric locomotives for all trains. The electric locomotives would thus be utilized to the best advantage. There is no difficulty in constructing a locomotive suitable for both goods and suburban passenger-trains, with consequent reduction in the number required.

Traffic and Mileage Figures on which the Estimate is based.

5. The traffic figures which have been adopted were prepared for us by the Railway Department, and show the number of trains per day on each section of the track and the total tonnage per day. The figures include all trains, goods, mixed and passenger, both through and suburban, and are presumably based on the average for a number of years. In any case, however, within a reasonable margin, a slight divergence from these figures would not affect the conclusion, provided that the comparison between steam and electric working is made on the same basis. If these figures of traffic are exceeded the annual working-costs and possibly the number of locomotives required would have to be amended accordingly. The estimate for track equipment and substations is, however, sufficiently large to deal with some increase over the assumed figures, and any increase in train-miles will therefore give a better return on capital outlay than that shown.

Goods-train mileage and increased weight of electric goods-trains.

6. With electric working, under the conditions assumed, the passenger- and mixed-train miles will be the same as with steam working, but the goods-train miles will be less. It is not possible to decide exactly what the average goods-train loads would be, as the present average loads for steam trains have developed partly from the maximum load which it is convenient to haul and partly from the method of working this traffic, since the weight, except for through goods-trains, must necessarily depend on the amount of traffic which has to be picked up or left at intermediate stations. At a conservative estimate, however, it should be possible to increase the average weight of electric goods-trains as compared with steam by the additional adhesive weight of the electric locomotive—namely, 33 per cent.—since the average weight on the various sections will still be well below the maximum weight that the locomotive can haul.

Mixed trains.

7. The possible increase of average weight would also apply to the mixed trains, and would thus tend to reduce the quantity of goods to be hauled by goods-trains proper. It is not possible for us to estimate to what extent it would be practicable to increase the proportion of goods hauled by mixed trains, and we have therefore ignored this possible saving and have assumed that the total daily tonnage which has to be hauled in goods-trains would be the same for steam and electric working. The final figures are given in Table I.

Engine-mileage, &c.

8. With regard to engine-miles we are instructed that for steam trains an allowance of one-seventh should be added to suburban train-mileage to cover light mileage, assisting mileage and shunting by train-engines—*i.e.*, excluding yard shunting. The standard allowance for through trains is rather higher, but since we are considering through trains only insofar as they come into the suburban area we have added one-seventh in this case also. We have made the same allowance in calculating the electric-locomotive mileage, although with electric working the light engine and assisting mileage should be substantially reduced.

Mileage of lines included in the estimate.

9. In this estimate we have included only those lines which are at present in service, together with all sidings in wayside stations and sufficient sidings in Auckland yard to enable trains to be worked in and out. The figures are given in Table II.

Locomotives.

Limits of drawbar and axle-loading.

10. We have already drawn attention to the fundamental differences between steam and electric locomotives, and to the fact that the design of steam locomotives is frequently limited by space and weight considerations which do not obtain in the case of the electric. In the present instance there is no difficulty in designing an electric locomotive which can be used equally for goods, mixed, or passenger traffic up to the maximum strength of the drawbars without exceeding the permissible axle-load. We understand that the nominal ultimate strength of the drawbars is 125,000 lb. and that a factor of safety of 6 is usually assumed, but that steam locomotives have been used with a tractive effort of 30,000 lb. We have confined outselves to these limits. The maximum load per axle has been taken at 13 tons.

Horse-power and capacity of locomotives.

11. The maximum drawbar pull could be provided by a four-axle two-bogie locomotive of a total weight of 52 tons equipped with four motors. The accommodation of a suitable motor within the gauge presents no difficulties, motors of as much as 300 h.p. being already in use on the 3 ft. 6 in. gauge elsewhere. In the present case we would suggest four motors of approximately 225 h.p. each, making a total of 900 h.p. per locomotive. This is the nominal rating of the motors, and it will be understood that the locomotives could exert a tractive effort at starting up to the limits of adhesion without injury to any part of the equipment. Up a grade of a few miles in length, such as that from Auckland to Remuera, one locomotive would be able to haul a load of at least 260 tons under all conditions of track, and would be able to start this train on the steepest portion. We estimate that the time taken by such a train between these two stations would be nine to ten minutes. The locomotives can be arranged for multiple-unit operation, so that if, as we understand is possible, the capacity of the drawgear is increased in the future, two locomotives can be coupled together and operated from one cab with one crew.

Regularity of running.

12. The electric locomotive is not adversely affected by certain factors which are of importance in steam operation, such as some conditions of weather or length of time since cleaning or overhaul, and it can and does haul its maximum rated loads day after day in regular service. There should therefore be no difficulty in increasing the present average load and speed of goods-trains by a substantial amount, particularly over the heavy gradients.

Regenerative braking.

13. We have considered the possibility of regenerative braking, but, in view of the low cost of power and the fact that all stock is continuously braked, it is not clear that there will be any great advantage to be gained on the section at present being considered, since the grades, though steep, are comparatively short.

Number of locomotives required.

14. Our estimate of the number of locomotives required has been based on the present time-table, and a liberal margin has been allowed for spares and for overhaul. The number included in the estimate is twenty.

Substations and Track Equipment.

Substations.

15. The best positions for the substations would have to be finally considered when the decision as to which lines should be electrified has been made. It would seem, however, that four substations would probably be sufficient, and we have allowed an ample margin of machinery in each. If electrification is proceeded with it might be worth while considering whether the substations, although

constructed by the Railway, could not be operated and perhaps owned by the Public Works Department, power being sold to the Railway as direct current at 1,500 volts. Such arrangements are already in existence elsewhere, the advantage being that the Railway is relieved of maintaining a staff to deal with a comparatively small amount of plant.

Track equipment.

16. In our estimate of the cost of equipping the necessary number of tracks we have assumed that for the most part wooden poles would be used, the greater part of the line being single or double track. The structures would be light, and the number of special structures would be reduced to a minimum.

Estimate of Cost and Financial Results.

Capital expenditure.

17. In Table IV we have set out our estimate of capital expenditure for this section of the report. The prices are estimated on the basis of recent contracts for similar plant, and include freight and erection, and a liberal margin for interest during construction, for contingencies, and other expenses. No Customs duties have been included. The total net capital outlay, after deducting the value of steam locomotives displaced, amounts to £718,200.

Working-expenses.

18. In preparing a table of working-expenses under the two systems we have not included such items as are common to both. The figures for steam operation are those supplied to us by the Railway Department. The maintenance figures for the electric service are based on experience with similar plant in railway service elsewhere. The costs of power are obtained as stated under "Power-supply." Details of the annual costs are given in Table V, from which it will be seen that the total annual saving due to electric operation, including depreciation, but excluding interest charges, is £27,700.

Return on capital.

19. This annual saving in working-costs would be sufficient to pay about 4 per cent. on the capital outlay. It must be pointed out again that the traffic conditions assumed are those at present obtaining under steam, and that with the reorganization of the traffic to suit electric working more favourable results would be obtained. There are certain other financial advantages which have not been evaluated. For instance, the added speed of the trains, and the greater weight which can be hauled over the grades, should make it possible to run the service for some time to come without increasing track facilities, except possibly for double-tracking between Penrose and Otahuhu. These questions are more fully discussed in the opening paragraphs of Section B.

Section B.—Proposals to provide Increased Facilities by Electrification.

Other Capital Works considered as Alternatives.

20. Before dealing with our suggestions for the rearrangement of traffic with electric working it may be desirable to examine briefly the proposals contained in the "Programme of Improvements and New Works," with a view to determining to what extent electrification can be considered as an alternative, and conversely to what extent these new works would render electrification unremunerative or unnecessary.

21. The principal new works under contemplation are as follows: (*a*) The new station and yard at Auckland; (*b*) the Westfield deviation; (*c*) the northern outlet; (*d*) certain track-doubling.

The new station and yard at Auckland.

22. We understand that work in connection with the new station and yard at Auckland is already well in hand. While electrification would relieve platform working to some extent, the decision to proceed with the new station would probably not be affected, since the approach to the old station and yard, and the layout of the yard, are inadequate for the increased traffic. The construction of the new yard and station does not therefore affect the issue as between steam and electric working.

The Westfield deviation.

23. We understand that the primary object of the Westfield deviation is to cut out the grades on the old line between Westfield and Auckland, but that in addition to this the new line will give easy access to the new yard, and will at the same time open up new territory for suburban traffic, although the district served is but little developed at present.

24. In so far as the grades on the old line are concerned we are of the opinion that electrification would make it possible to postpone the Westfield deviation until the present volume of traffic has greatly increased. The cost of the Westfield deviation is estimated at £450,000, which would go a long way towards providing electric equipment for the whole of the Auckland zone. No credit for this possible saving has been made in our estimate of capital expenditure, as it is possible that the deviation might still be considered necessary on account of the two secondary objects which it would achieve, notwithstanding that the primary difficulty can be overcome by electrification.

25. We have already pointed out that the relative prices of locomotive coal and water-power in New Zealand are advantageous to electric working, and, even although the Westfield deviation is practically flat, economies due to the elimination of coal and to the lower cost of maintenance and repairs of locomotives may be expected. Apart from this it is not possible to consider one section alone without reference to other sections of the Auckland zone on which steep gradients would still exist. For instance, a certain proportion of the trains, including all the suburban passenger

traffic from Onehunga, Penrose, and Remuera, would still have to pass over the old line, and would derive no benefit from the new deviation. This passenger traffic would undoubtedly increase if provided with a good service. Similarly, the elimination of the grades between Auckland and Westfield would not provide a better service on the Henderson line. It is clear, therefore, that the Westfield deviation cannot be looked upon as an alternative to electrification of the whole of the Auckland zone, although it may be justifiable on other grounds. If constructed it could be electrified at comparatively small expense, since sufficient substations are included in our estimate, and the only additional cost would be that for track equipment amounting to approximately £87,000.

The northern outlet.

26. In dealing with suburban passenger traffic the Auckland railway system is at a disadvantage as compared with other systems of transport in that the present station is not conveniently situated with regard to the business portion of the city. The new Auckland station will provide little improvement in this respect; and, indeed, access to the city itself is not possible by a surface railway. To meet this difficulty it has been suggested that a new line, partly in tunnel, should be constructed from the new Auckland Station to Morningside, with an underground station in the centre of the town. It is proposed that this new line should link up with the Westfield deviation by way of the new Auckland yard, thus giving access to the city station from both north and south lines. As an additional advantage the distance from Morningside to Auckland would be reduced by approximately 2 miles.

27. Such a tunnel would clearly be of great value to passengers from the Henderson line and to passengers approaching on the Westfield deviation. Passengers from Onehunga, Penrose, and Remuera would not obtain such a direct advantage, as it would be necessary to shunt trains at the new Auckland Station or to require passengers to change. It might be worth while considering if means could be adopted for passing trains from the present line direct in to the northern outlet, in addition to the means already shown on the plan in the "Programme of Improvements and New Works" for passing them into the new Auckland Station.

28. It is evident that a frequent service of steam trains could not be worked through so long a tunnel as the northern outlet without grave inconvenience to passengers and to train crews. If, therefore, this new line is constructed, electric working would be advisable, and this would probably involve electrification of the whole suburban area. Apart from this, the provision or otherwise of this tunnel does not vitally affect the comparison of steam and electric working one way or the other.

Certain track-doubling.

29. In addition to the above works there are proposals for doubling tracks over certain sections. In drawing up the proposed rearrangement of traffic with electric working we have assumed that the track is doubled between Penrose and Otahuhu. The greater tonnage which electric trains can haul, and their higher speed, give them an advantage in track capacity over steam locomotives, particularly in a service requiring frequent stops. We have, however, assumed that it would be possible to work the steam service equivalent to the electric service with the same track-mileage, and no allowance has been made in our estimate for any possible credit on this score.

Basis of the New Service.

30. The general experience all over the world in dealing with suburban electrification has been that, within limits, an increase of traffic will follow an increase in facilities. It is the increased passenger receipts rather than a reduction in working-expenses which in many cases has made suburban passenger electrification profitable. We have already quoted several instances, and these could be multiplied. It is, however, essential to provide a fast and frequent service.

Mixed trains.

31. In some respects the present arrangement of passenger traffic in Auckland falls short of these desiderata, as has already been pointed out in the Programme of Improvements and in the report of the Royal Commission. Reference was made in particular to the practice of carrying passengers in mixed trains, and it would appear that no great improvement can be expected until such trains are replaced by passenger-trains.

Mixed trains and electrification.

32. If all mixed trains were replaced with passenger-trains the mileage of goods-trains would obviously have to be increased: this is inevitable under either steam or electric conditions; but it will be apparent from what has gone before that the increase in goods-train mileage will be less with electric working than with steam, owing to the greater train-weight which will be hauled. What is still more important is that since the goods-train mileage will necessarily be hauled during the off-peak period, the cost for power will be negligible or non-existent, since the power charge is fixed wholly on a maximum-demand basis. At the same time, as we shall point out later, a great deal of the passenger-train mileage could then be worked by multiple-unit trains in a more economical way than would be possible with steam trains. In preparing this section of the report we have therefore assumed that mixed trains are eliminated, and we have aimed at carrying the same total tonnage of goods as is at present carried by both goods and mixed trains, while providing greater facilities for suburban passengers.

The use of multiple-unit trains.

33. The multiple-unit system has already been described (Part I, paragraphs 16 to 21). It was again referred to in paragraph 4 of this part of the report, where we pointed out that there were difficulties in applying the system in an economical manner to the existing arrangements of traffic

in Auckland. The elimination of mixed trains would, however, necessitate an increase in the number of passenger-trains, and this, together with the further increase in service which we suggest, would make it possible to keep the train sets more fully employed than they are at present. For the increased service we therefore recommend that a certain number of trains should be equipped as multiple-unit trains, and that they should be employed in maintaining a uniform service throughout the day. We have already pointed out that trains running at other than the peak hours would not increase the annual charge for power, and this, in conjunction with the other low operating-costs of the multiple-unit type of train, would make it possible to provide the additional train-miles required in the most economical manner. A sufficient number of trains would be required to provide a service of reasonable frequency throughout the whole of the day. This would be a skeleton service, and would, of course, require reinforcement at the rush hours. We estimate that the time taken by a multiple-unit train between Auckland and Papakura would be fifty-five minutes, between Auckland and Otahuhu twenty-six minutes, and between Auckland and Henderson forty minutes, stopping at every station.

Additional trains hauled by locomotives.

34. The additional trains required in the rush hours could be provided either by additional multiple-unit trains or by means of ordinary stock hauled by electric locomotives. There are advantages in both courses. Multiple-unit trains would in some respects provide a better service, but they would, on the other hand, be standing idle for a considerable portion of the day. If ordinary trains are employed they could be hauled by locomotives which during the remainder of the day could be usefully employed in hauling goods and through passenger-trains. The speed of the locomotive-hauled suburban stopping trains would be rather slower than the speed of multiple-unit trains in the same service, but this is not a matter of great importance, since a number of these additional trains would in any case be arranged to pass certain stations, leaving the purely stopping service to be run by the multiple-unit stock. Such arrangement would tend to a fuller use of locomotives and equipments, and thus to a lower capital cost.

35. We have been supplied with figures showing the present daily number of trains, divided into goods, passenger, and mixed, and also the total daily passenger and goods tonnage. These figures have been very carefully considered with a view to seeing how the revised service can be run.

Increased service (electric): Passenger service by multiple-unit trains.

36. As a skeleton service we have assumed that there would be throughout the day a half-hour service between Auckland and Papakura, and a half-hour service between Auckland and Otahuhu. Over the northern line we have taken a one-hour service as far as Swanson. This service would require five train sets, and, as these would be continuously employed throughout the day, we suggest that multiple-unit trains should be used. The normal composition of these trains would be two motor-cars and four trailers, but at times of light traffic they could be reduced to half, thus facilitating the inspection of stock during daylight hours. In addition, one three-coach set might be employed on the Onehunga Branch. With reasonable allowance for spares we estimate that fifteen motor-coaches and thirty trailer-coaches would be required.

Increased service (electric): Additional passenger-trains in rush hour by locomotives.

37. The additional trains required during the rush hour would consist of ordinary "steam" stock hauled by electric locomotives, normally employed on goods traffic throughout the rest of the day. The slow passenger-trains from beyond Papakura and Henderson would also be hauled by electric locomotives of the same type in the suburban zone. The total number of passenger-trains, both multiple-unit and locomotive, provided during the rush hour would be some 30 per cent. greater than the total number of passenger and mixed trains provided by the present service, while the total train-miles run throughout the day by the same classes of trains would be some 47 per cent. greater.

Increased service (electric): Goods-trains.

38. For reasons which we have already explained in paragraph 6, we have assumed that with electric working the average weight of goods-trains could be increased by 33 per cent. The average weight for the various sections will still be well below the maximum weight that the locomotive can haul. The number of trains has been arrived at by dividing the total goods tonnage of each section, including that at present hauled in mixed trains, by the average weight of trains. On the northern line Henderson has been taken as the limit of operation for electric goods-trains, since there are already sidings and a steam-locomotive depot at this point.

Increased service (steam): Passenger and goods trains.

39. In order to make a comparison between the cost of running this service and the cost of running a steam service to handle the same traffic, we have adopted the same passenger train-miles for both systems, but the goods mileage has been obtained by dividing the same total tonnage as was used for the electric figures by the average weight hauled in the present goods-trains on the various sections. The figures adopted for the two systems are shown in Table I.

Rolling-stock.

Electric rolling-stock required.

40. We have already described the general characteristics of the electric locomotives under Section A. We estimate that to work the service detailed above with a reasonable margin for spares and for special trains some fourteen locomotives will be required. We have already dealt with the number of multiple-unit trains required. The coaches for these trains would be in general similar

to those at present in use, and if suitable stock is available it could be adapted for electric working at comparatively small expense in so far as the coaches themselves are concerned. In comparing steam and electric working it is therefore proper to charge against the electrification account the increased cost of completely equipped multiple-unit stock as compared with steam stock, this increased cost including the electrical equipment and the additional strength of motor-bogies, and being comparable with the cost of locomotives which would otherwise be required to haul the trains.

Steam locomotives released and additional steam locomotives required.

41. We are informed that the value of the locomotives which would be displaced if the present service were electrified is £97,500, and it is evident that additional new steam locomotives would be required to provide a service equal to the proposed electric service. We have assumed an average figure for new steam locomotives of £4,500. The various figures for rolling-stock required are summarized in Table III.

Substation and Track Equipment.

42. The substation estimate contained in the first section of the Auckland report would still be applicable, the plant included in that estimate having sufficient capacity to deal with the proposed increase of traffic. The track-equipment estimate has been increased to provide for the double track from Penrose to Otahuhu and for the extension to Swanson.

Capital Expenditure and Financial Result.

Capital expenditure.

43. The capital expenditure necessary to work the increased service electrically as compared with that required to work it by steam is set out in Table IV. The net capital outlay after deducting the value of steam locomotives is £672,500. This figure is rather lower than the corresponding figure for Section A of the report, although the traffic to be dealt with is greater. This is due principally to the fact that the proposed service has been drawn up to make the best possible use of the electric rolling-stock.

Working-costs.

44. In drawing up the working-costs we have adopted the same principle as in the first section of this report—that is to say, we have not included items which are common to both services.

45. The item for electric power has been calculated from a provisional time-table for the increased service. Locomotive wages have been calculated on the assumption that there will be a driver and an assistant on each locomotive, as at present. In the case of multiple-unit trains we have assumed that one driver only would be employed. We have already explained that this is the arrangement universally adopted, and we have referred to the safeguards which are introduced in the equipment to make this possible.

Financial results.

46. The various items are detailed in Table VI, from which it will be seen that with the increased service the saving in operating-costs due to electric working, including depreciation but excluding interest on the capital involved, would be of the order of £66,000 per annum as compared with the cost of working the same service by steam. This saving is sufficient to pay a return of 9·8 per cent. on the net capital cost of electrification.

TABLES RELATING TO THE ELECTRIFICATION OF THE AUCKLAND ZONE.

TABLE I.—TRAFFIC.

Section.	Scheme A.—Existing Service.					Scheme B.—Proposed Service.				
	Passenger and Mixed Traffic.		Goods Traffic.			Passenger Traffic.		Goods Traffic.		
	Trains per Day.	Train-miles per Annum.	Trains per Day.	Tons per Day.	Train-miles per Annum.	Trains per Day.	Train-miles per Annum.	Trains per Day.	Tons per Day.	Train-miles per Annum.
Steam Working.										
Auckland–Newmarket ..	98	64,420	46	7,503	30,260	128	91,800	73	11,882	48,000
Newmarket–Penrose ..	61	69,510	37	6,490	42,150	88	109,200	54	9,423	61,600
Penrose–Otahuhu	46	39,580	25	4,850	21,550	80	74,900	30	5,803	25,800
Otahuhu–Papatoetoe ..	38	29,800	21	4,982	16,490	42	35,800	35	8,334	27,300
Papatoetoe–Papakura ..	29	73,500	15	4,180	38,000	38	104,800	26·5	7,398	67,100
Newmarket–Henderson ..	39	138,100	6	1,028	21,200	40	154,200	19	3,257	68,000
Henderson–Swanson ..	..	..	..	..	..	34	39,000	..	..	..
Penrose–Onehunga ..	22	13,780	6	723	3,760	40	27,800	15	1,810	9,400
Totals	..	428,690	..	..	173,410	..	637,500	..	..	307,200
Electric Working.										
Auckland–Newmarket ..	98	64,420	34·5	7,503	22,850	*L+MU 26+102	91,800	54	11,882	35,500
Newmarket–Penrose ..	61	69,510	27·8	6,490	31,510	20+68	109,200	40	9,423	45,500
Penrose–Otahuhu	46	39,580	18·7	4,850	16,150	12+68	74,900	22	5,803	19,000
Otahuhu–Papatoetoe ..	38	29,800	15·8	4,982	12,370	8+34	35,800	26	8,334	20,400
Papatoetoe–Papakura ..	29	73,500	11·3	4,180	28,400	4+34	104,800	19	7,398	48,200
Newmarket–Henderson ..	39	138,100	4·5	1,028	15,900	6+34	154,200	14	3,257	49,700
Henderson–Swanson ..	..	..	..	..	..	34	39,000	..	..	..
Penrose–Onehunga ..	22	13,780	4·5	723	2,820	6+34	27,800	11	1,810	6,900
Totals	..	428,690	..	..	130,000	..	637,500	..	..	225,200

* Locomotive and multiple-unit trains.

Table II.—Lines to be equipped.

Section.	Section A.—Existing Service.				Section B.—Proposed Service.			
	Route-mileage.	Single-track Mileage of Running-lines equipped.	Single-track Mileage of Sidings equipped.	Total Single-track Mileage.	Route-mileage.	Single-track Mileage of Running-lines equipped.	Single-track Mileage of Sidings equipped.	Total Single-track Mileage.
Auckland–Newmarket ..	2·1	4·2	5·1	9·3	2·1	4·2	5·1	9·3
Newmarket–Henderson ..	11·4	11·4	8·3	19·7	11·4	11·4	8·3	19·7
Henderson–Swanson	..	..	..	..	3·5	3·5	0·5	4·0
Newmarket–Penrose	3·6	7·2	7·4	14·6	3·6	7·2	7·4	14·6
Penrose–Otahuhu	2·8	2·8	2·3	5·1	2·8	5·6	2·3	7·9
Otahuhu–Papakura	10·6	10·6	6·4	17·0	10·6	10·6	6·4	17·0
Penrose–Onehunga	2·7	2·7	3·1	5·8	2·7	2·7	3·1	5·8
Totals	33·2	38·9	32·6	71·5	36·7	45·2	33·1	78·3

Table III.—Electric Rolling-stock required.

Item.	Section A.—Existing Service.		Section B.—Proposed Service.	
	Number.	Cost.	Number.	Cost.
		£		£
Electric locomotives	20	204,000	14	142,800
Motor-coach equipments	..	..	15	57,000
Trailer-coach equipments	..	..	30	6,000
Spare parts	..	10,200	..	10,400
Totals	..	214,200	..	216,200

Table IV.—Capital Expenditure.

Item.	Section A. Existing Service.	Section B. Proposed Service.
	£	£
Electric locomotives and multiple-unit equipment from Table III	214,200	216,200
Substations	168,800	168,800
Overhead equipment of the tracks	225,000	244,000
Locomotive-sheds at Papakura and Henderson	60,000	60,000
Alterations to existing sheds, telegraph and telephone lines, &c.	14,000	14,000
Contingencies and engineering expenses	102,300	105,500
Interest on capital during construction	31,400	32,400
Gross capital outlay	815,700	840,900
Credits :—	£	£
Value of engines released	97,500	97,500
Value of new engines saved	..	70,900
Total credits	97,500	168,400
Net capital outlay	£718,200	£672,500

Table V.—Annual Working-expenses.

Item.	Section A. Existing Service.		Section B. Proposed Service.	
	Steam.	Electric.	Steam.	Electric.
	£	£	£	£
Coal and water	40,600	..	60,700	..
Electric power	..	23,500	..	32,400
Locomotive repairs, running-shed charges and renewals ..	32,000	11,800	48,100	13,700
Train-wages	32,700	30,200	48,400	32,300
Substation maintenance and depreciation	..	7,100	..	7,100
Overhead-line maintenance and depreciation	..	5,000	..	5,500
Total working-expenses	105,300	77,600	157,200	91,000

Table VI.—Financial Results of Electrification.

Item.	Section A. Existing Service.	Section B. Proposed Service.
Net capital outlay from Table IV	£718,200	£672,500
Reduction in annual expenses due to electric working	£27,700	£66,200
Return on net capital outlay	3·86%	9·85%

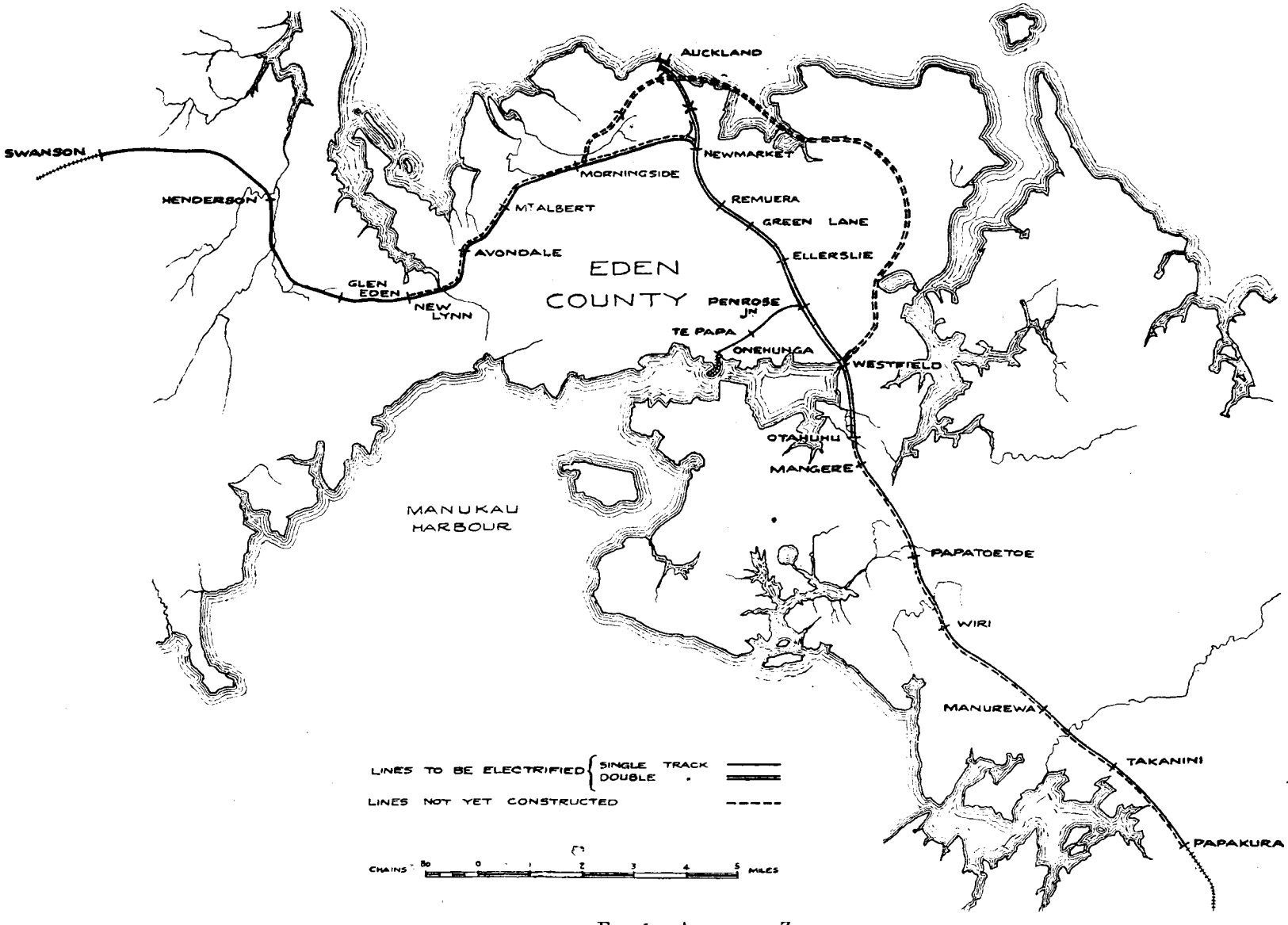


FIG. 1.—AUCKLAND ZONE.

PART III.—THE ELECTRIFICATION OF THE WELLINGTON ZONE.

1. The City of Wellington is served by two railways, the Wairarapa line and the Manawatu line. Both of these lines pass over heavy gradients and are for the most part single-track only. These two restrictions are being felt increasingly as the traffic grows, and we understand that proposals to provide alternative routes over certain sections are being considered. A map of the area is included with the tables at the end of this part (Fig. 2).

The Wairarapa line.

2. On the Wairarapa line the heavy gradients, including the Rimutaka incline, occur rather beyond the suburban area, and are therefore outside the scope of this report. It is obvious, however, that electrification of the suburban zone could not fail to have some influence on the question of regrading. If so decided, electrification could thereafter be extended to these gradients at comparatively small cost, and would undoubtedly lead to an increase in capacity and to lower working-costs. On the other hand, the presence of so steep an incline as 1 in 15 must necessarily always limit the capacity of the line, and the decision to proceed with the alternative route would probably not be affected by electrification, particularly if increased traffic is expected. Electrification would, however, permit of gradients greater than are apparently contemplated on the proposed deviation, and some economy in construction might be possible on this score, particularly on the section Upper Hutt to Mangaroa, where the existing grades could be worked without difficulty by electric locomotives.

The Manawatu line.

3. On the Manawatu line the track rises steeply to Khandallah, about 5 miles from Wellington, the grade being 1 in 40 for several miles. For the next 6 miles to Tawa Flat the line falls, the gradient varying from 1 in 56 to 1 in 70. From this point the line runs fairly level to Plimmerton, where it rises for about 3 miles to Pukerua, falling again beyond over the same distance, the grades varying from 1 in 57 to 1 in 66. From there to Paekakariki, the end of the suburban zone, the line is practically level. We understand that an immediate start is to be made with a new deviation, the Tawa Flat deviation, to eliminate the first of these gradients, and that, later, the second may have to be similarly treated.

Electrification as an alternative to deviation.

4. These new works on the Manawatu line are, we understand, being considered simply as a means of eliminating gradients, and there are no additional advantages to be gained such as the opening-up of new territory. In view of what has already been said with regard to the advantages of electric working on steep gradients, and in view also of the timings given in paragraph 17 of this part, it would appear possible to postpone the construction of these deviations if electrification is proceeded with.

5. It may be noted that in the event of the traffic growing in the future to such an extent that an increase in the number of tracks had again to be considered, the capital expended on electrification would still be usefully employed. The figures in the tables show that, apart from any questions of grades, the saving in the cost of fuel and maintenance of locomotives would render electrification remunerative. Furthermore, the electric equipment of the railway could be laid out in such a way that these two deviations, if constructed in the future, could be electrified at small cost. No new substations would be required, and the overhead equipment of the new track would be comparatively a simple matter. In view also of the fact that the new deviations involve long tunnels on comparatively steep grades, electrification would be desirable. The old track would still be available in emergency, and a great part of it, from Wellington to Johnsonville and possibly beyond, would still be in constant use for suburban passengers.

6. The cost of the Tawa Flat deviation is estimated at £950,000, and it will be seen from the tables which follow that this is a considerably greater sum than is required for the electrification of the whole of the Wellington area. No credit has been taken in our estimate for the postponement of this deviation, but the point is clearly worth bearing in mind if a right perspective of the whole problem is to be obtained.

7. While these remarks apply particularly to the first or Tawa Flat deviation, they are in general true of the proposed alternative route to avoid the second or smaller summit. The grades here are less than the grade up to Johnsonville, and it is more than probable that electrification would not only postpone this second deviation but would render it altogether unnecessary.

The new Hutt Valley railway.

8. With a view to the development of a new suburban area, a new line is being laid from Petone to Te Naenae. This line, which is being built at first as a spur, runs parallel to the existing Upper Hutt line but on the north-east side of the valley, and it is the intention as traffic develops to continue the new line to join the old one at Silverstream. There are no severe gradients on either of these lines, and the construction of the new branch is being undertaken solely from the point of view of providing railway facilities to a district at present unserved.

The new Wellington Station and yard.

9. In addition to the foregoing proposed works we understand that a new yard is being provided at Wellington, and that it is the intention eventually to combine the two existing stations into one.

This question is not directly affected by electrification, but we have, in drawing up the revised service which forms the basis of the second section of this part of the report, worked on the assumption that the new joint station is constructed.

Arrangement of this part of the report.

10. In preparing our report and estimates for the Wellington Section we have followed the plan already adopted in Part II, and have put forward two alternatives. These are as follows: Section A—electrification of the existing traffic; Section B—proposals to provide increased facilities by electrification.

Full details of the estimates will be found in Tables VII to XII at the end of this part of the report. In the general discussion on these tables which follows we have, in order to avoid needless repetition, referred from time to time to more detailed arguments which have already been made in previous sections.

Section A.—Electrification of Existing Traffic.

Trains hauled by locomotives.

11. This section of the report is based on the assumption that the change from steam to electric working is made in the simplest possible manner—namely, that electric locomotives are substituted for steam locomotives, and that the character of the trains is maintained as at present, the number and tonnage of passenger and mixed trains and the total tonnage of goods-trains remaining as before. This procedure has already been discussed in the 4th paragraph of Part II.

Traffic and Mileage Figures on which the Estimate is based.

12. Our estimate is based on figures supplied by the Railway Department, showing the numbers of goods, passenger, and mixed trains per day, and also the total tonnage of each of these three classes of trains. Some variation in these figures would not vitally affect the comparison between steam and electric working, the general tendency being that the greater the traffic the greater the saving due to electric working.

Train-mileage.

13. On the basis of the existing traffic the passenger and mixed-train mileage would be the same with electric working as with steam, but the goods-train mileage would be less, since the electric locomotives would be able to haul a greater average load. For reasons which we have already explained (Part II, paragraph 6) we have assumed that the average weight of the electric goods-trains would be increased by 33 per cent. A similar increase would also be possible in the case of mixed trains, and this would tend to reduce the total tonnage of goods to be hauled in goods-trains proper. This possible saving has, however, been ignored, and the total tonnage hauled in each of the three classes of trains has been assumed to be the same under both steam and electric conditions. We have assumed that the Te Naenae Branch is completed, and we have made provision for a service of passenger-trains. The final figures are given in Table VII.

Engine-mileage, &c.

14. In order to provide for assisting mileage, light mileage, and shunting by train-engines it is usual to allow a definite addition to the train-mileage. In general, for reasons which have already been touched upon, this additional mileage is less with electric traction than with steam. We have, however, increased both steam and electric figures in the same proportion, using for this purpose the standard allowance made by the Railway Department for suburban trains—*i.e.*, one-seventh.

Mileage of lines included in estimates.

15. The estimates make provision for equipping all running-tracks from Wellington to Paekakariki, Wellington to Upper Hutt, and Petone to Te Naenae, for all sidings at wayside stations, and for sufficient sidings in Wellington yard to allow of trains being worked in and out. Details are given in Table VIII.

Locomotives.

Type of electric locomotive.

16. In the Auckland section of this report we have already described a type of electric locomotive suitable for both goods and suburban passenger traffic. This type of locomotive would be entirely suitable for the Wellington area, and, indeed, for general use throughout the Islands. The locomotive would have two four-wheel bogies and would weigh approximately 52 tons. Four motors would be used, each with a nominal rating of 225 horse-power. More complete details have already been given in Part II, paragraphs 10 and 11. We estimate that seventeen of these locomotives would be required for the Wellington area, including a margin for spares and overhaul.

Operation of electric locomotives.

17. With these locomotives it would be possible to increase the average speed of trains by a substantial amount, particularly on the up grades. At present the time allowed in the Working Time-table for a non-stop goods-train between Wellington and Johnsonville is 31 minutes. We estimate that one electric locomotive would make the same run in approximately 21 minutes with its full load of 230* tons, the average speed up the grade being about 18 miles per hour. Similarly, a

* The average weight hauled in the present steam goods-trains between these two points is 111 tons. In calculating the electric goods-train miles we have taken an average trailing-load of 147 tons, so that there is ample margin between the maximum and average loads.

suburban passenger-train is at present allowed an average time of 27 minutes from Wellington to Johnsonville, with two intermediate stops, and we understand that banking is required with certain trains. This same journey could be accomplished by one electric locomotive with a passenger-train* in 20 to 21 minutes. We may point out here that this timing could be reduced to 16 or 17 minutes by the use of multiple-unit trains as suggested in the second section of this part of the report dealing with the revision of traffic.

Regenerative braking.

18. The grades around Wellington are longer than those in the Auckland District, and we have therefore given further consideration to the question of regenerative braking. In view of the low cost of power we are of the opinion that, unless real difficulty is at present being experienced in braking trains, the additional cost and maintenance of regenerative equipment is not warranted.

Substations and Track Equipment.

Substations.

19. In considering the arrangement of substations we have paid special attention not only to the present conditions, but to the possibility of future development, and the whole scheme can be readily extended as traffic grows. As we have already stated, no additional substations would be required in the event of any of the proposed deviations being constructed.

Track equipment.

20. The estimate of track equipment provides for the electrification of all tracks set out in Table VIII, and this equipment would be able to carry a greatly increased traffic without additional capital expenditure.

Estimate of Cost and Financial Results.

Capital cost.

21. The estimate of the capital cost of the electrification of the Wellington area is set out in Table X. The prices are based in some cases on quotations specially obtained from leading manufacturers, and in others on recent contracts for plant of a similar nature. Freight, erection, and a liberal margin for contingencies and other expenses have been included, but no allowance has been made for Customs duty. The estimate of the value of steam locomotives released was supplied to us by the Railway Department. The total net capital outlay after deducting the value of these steam locomotives amounts to £792,800.

Working-expenses.

22. A comparison of the annual cost of steam and electric service is given in Table XI. Costs which are common to both systems have not been included. The cost of power has been calculated from the quotations furnished by the Public Works Department, the maximum demand for power on which it is based being estimated from the present time-table. The costs of steam operation were supplied by the Railway Department. The costs of electric operation, apart from the cost of power, are based on experience with similar plant elsewhere, and include depreciation but not interest on capital. It will be seen that the cost of working the service electrically is £26,700 per annum less than the cost of working it by steam.

Return on capital.

23. This annual saving due to electrification is sufficient to pay approximately 3·4 per cent. on the net capital outlay involved. The arrangement of traffic at present is not particularly favourable to electrification, and it will be seen from the second section of this part of the report that with reorganization to suit electric working a better return on capital would be obtained. There are also advantages which have not been taken into account, such as the possibility of postponing the proposed deviations, the increased attractiveness of the service to suburban passengers due to higher schedule speeds, and sundry minor economies.

Section B.—Proposals to Provide Increased Facilities by Electrification.

Basis of the New Service.

The use of multiple-unit trains.

24. In Section B of Part II, dealing with the Auckland area, we have set out at some length our proposals for the revision of traffic so as to take advantage of the special facilities offered by electrification for the working of suburban trains. The basis of the revision was, first, the elimination of mixed trains; and, secondly, the provision of a regular service of multiple-unit trains throughout the day, reinforced by a few locomotive passenger-trains during the peak hours.

Increased frequency of service by multiple-unit trains.

25. The revision of the service which we have adopted for this section of the Wellington report follows closely on the lines set out in the preceding paragraph. The timings of the electric trains on the various sections have been carefully considered, and a scheme drawn up accordingly. We have endeavoured to give a passenger service of reasonable frequency throughout the day, being guided

* The average composition of a suburban passenger electric train during the rush hours has been taken as eight fully loaded coaches of a total trailing-weight of 174 tons.

as far as possible by the proportion of trains at present running to the various suburbs. Local knowledge of the traffic conditions in Wellington may suggest adjustments as between the various branches. The general object of the scheme is to obtain the greatest possible mileage from the more economically operated multiple-unit trains, and to build up a service of such frequency that traffic will be developed while at the same time keeping the number of trains required to a reasonable figure.

Electric-service passenger-trains.

26. The service we suggest will require four train sets, each set consisting of two motor-cars and four trailer-cars. With a reasonable allowance for spares a total of 11 motor-cars and 22 trailers would be required. This number of trains would provide a two-hourly service to Upper Hutt, an hourly service to Te Naenae, a forty-five minute service to Lower Hutt, and a forty-minute service to Johnsonville. All passenger-trains to Paekakariki (seven each way per day) and all through trains on the Upper Hutt line (five each way per day) would be hauled by electric locomotives. There would also be a number of extra locomotive trains to the nearer suburbs during the busy hours. Including both types of trains, there would be between 4 p.m. and 6 p.m. seven trains to Johnsonville (including three to Paekakariki), four to Upper Hutt, four to Te Naenae, and three to Lower Hutt.

Electric-service goods traffic.

27. The total weight to be hauled in goods-trains includes not only the present goods tonnage, but also that at present hauled in mixed trains. As previously explained, the average weight of an electric goods-train is taken at 33 per cent. greater than the weight at present hauled by steam. We estimate that twelve electric locomotives would be required in addition to the multiple-unit stock.

Steam service, passenger and goods.

28. For the purpose of comparing the cost of running this service electrically or by steam we have adopted the same passenger-train mileage for both systems. In the case of goods-trains, although we have used the same figures for total tonnage in both cases, the electric mileage will be less than the steam mileage, owing to the heavier load which can be hauled.

Additional track facilities required.

29. It seems probable that, owing to the lower speed of steam trains, particularly on the section Wellington to Johnsonville, it would be necessary to provide additional passing-places and other track facilities if the service were being worked by steam. If so, the cost of these alterations would have to be credited to the capital cost of electrification in order to obtain a proper comparison between the two systems, but nothing has been allowed in our estimate for this.

Steam locomotives displaced, &c.

30. The value of the locomotives which would be displaced if the present service is electrified is £38,000. It is evident that additional new steam locomotives would be required to provide a service equal to the proposed electric service. We have assumed that these would not be of the heaviest type, and we have allowed an average price of £4,500 per locomotive.

Substations and Track Equipment.

31. The estimate for track equipment contained in Section A would still be applicable to Section B traffic. In view of the largely increased mileage run by suburban trains we have, however, somewhat increased the provision for substation plant.

Capital Expenditure and Financial Result.

Capital cost.

32. In Table X we have set out details of the capital expenditure required to work the new service electrically as compared with the cost of working it by steam. The net capital outlay, after deducting the value of steam locomotives, is £732,600. Nothing has been included in this sum for duty on imported material, but freight is included, and a liberal margin for contingencies and other expenses.

Working-costs.

33. The wages for electric operation have been calculated on the basis of the current rates of pay on the New Zealand Railways. A driver and an assistant have been allowed to each locomotive train and one motorman to a motor-coach train, guards being allowed in both cases. The cost of electric power has been calculated from a provisional time-table for the increased service. The costs of steam operation are based on figures supplied by the Railway Department. It will be seen from the figures set out in Table XI that the cost of working the revised traffic electrically is less than the cost of working the same traffic by steam by £61,900 per annum. These costs include depreciation, but do not include interest on capital.

Financial results.

34. The saving due to electrification is sufficient to pay a return of 8½ per cent. on the net capital outlay. If, as suggested in paragraph 29 above, track alterations would have to be made to allow of this traffic being worked by steam, then the net capital outlay properly debitable to electrification would be less and the return on capital greater.

TABLES RELATING TO THE ELECTRIFICATION OF THE WELLINGTON ZONE.

TABLE VII.—TRAFFIC.

SECTION.	SCHEME A—EXISTING SERVICE.					SCHEME B—PROPOSED SERVICE.				
	Passenger and Mixed Traffic.		Goods Traffic.			Passenger Traffic.		Goods Traffic.		
	Trains per Day.	Train-miles per Annum.	Trains per Day.	Tons per Day.	Train-miles per Annum.	Trains per Day.	Train-miles per Annum.	Trains per Day.	Tons per Day.	Train-miles per Annum.
Steam Working.										
Wellington–Petone ..	57	118,500	11	1,970	22,800	117	264,000	18	3,271	37,300
Petone – Lower Hutt ..	57	25,000	11	1,970	4,900	76	36,100	18	3,271	7,900
Petone – Te Naenae ..	20	29,400	..	..	..	41	65,600	..	..	..
Lower Hutt – Upper Hutt ..	25	91,000	5	937	18,200	28	110,600	7	1,356	25,400
Wellington–Johnsonville ..	51	96,500	20	2,214	37,900	70	144,000	36	4,018	68,400
Johnsonville–Paekakariki ..	17	108,000	10	1,890	63,500	14	96,500	17	3,160	108,000
Totals	..	468,400	..	..	147,300	..	716,800	..	..	247,000
Electric Working.						*L+MU				
Wellington–Petone ..	57	118,500	8·3	1,970	17,200	15+102	264,000	13·7	3,271	28,400
Petone – Lower Hutt ..	57	25,000	8·3	1,970	3,700	10+66	36,100	13·7	3,271	6,100
Petone – Te Naenae ..	20	29,400	..	..	..	5+36	65,600	..	..	..
Lower Hutt – Upper Hutt ..	25	91,000	3·8	937	13,800	10+18	110,600	5·4	1,356	19,600
Wellington–Johnsonville ..	51	96,500	15	2,214	28,400	18+52	144,000	27·1	4,018	51,400
Johnsonville–Paekakariki ..	17	108,000	7·5	1,890	47,500	14	96,500	12·7	3,160	81,100
Totals	..	468,400	..	..	110,600	..	716,800	..	..	186,600

* Locomotive and multiple-unit trains.

TABLE VIII.—LINES TO BE EQUIPPED.

Sections.	Route Mileage.	Single Track Mileage of Running-lines equipped.	Single Track Mileage of Sidings equipped.	Total Single-track Mileage equipped.
Wellington–Petone	6·6	13·2	10·8	24·0
Petone – Lower Hutt	1·3	2·6	2·2	4·8
Petone – Te Naenae	4·7	4·7	2·0	6·7
Lower Hutt – Upper Hutt	11·8	11·8	6·9	18·7
Wellington–Paekakariki	27·0	27·0	8·1	35·1
Totals	51·4	59·3	30·0	89·3

TABLE IX.—ELECTRIC ROLLING-STOCK REQUIRED.

Item.	Section A—Existing Service.		Section B—Proposed Service.	
	Number.	Cost.	Number.	Cost.
		£		£
Electric locomotives	17	173,400	12	122,400
Motor-coach equipments	..	..	11	41,800
Trailer-coach equipments	..	..	22	4,400
Spare parts	..	8,600	..	8,400
Totals	..	£182,000	..	£177,000

TABLE X.—CAPITAL EXPENDITURE.

Item.	Section A: Existing Service.	Section B: Proposed Service.
	£	£
Electric locomotives and multiple-unit equipment from Table IX	182,000	177,000
Substations	192,700	210,500
Overhead equipment of the tracks	295,000	295,000
Locomotive-shed at Upper Hutt	10,000	10,000
Alterations to existing sheds, telegraph and telephone lines, &c.	15,000	15,000
Contingencies and engineering expenses	104,200	106,100
Interest on capital during construction	31,900	32,600
Gross capital outlay	830,800	846,200
Credits :—	£	£
Value of engines released	38,000	38,000
Value of new engines saved	..	75,600
Total credits	38,000	113,600
Net capital outlay	£792,800	£732,600

TABLE XI.—ANNUAL WORKING-EXPENSES.

Item.	Section A: Existing Service.		Section B: Proposed Service.	
	Steam.	Electric.	Steam.	Electric.
	£	£	£	£
Coal and water	41,200	..	61,800	..
Electric-power	..	21,500	..	32,400
Locomotive repairs, running-shed charges and renewals	30,100	11,000	46,800	13,000
Train wages	33,400	31,300	50,500	36,900
Substation maintenance and depreciation	..	7,900	..	8,600
Overhead-line maintenance and depreciation	..	6,300	..	6,300
Total working expenses	104,700	78,000	159,100	97,200

TABLE XII.—FINANCIAL RESULTS OF ELECTRIFICATION.

Item.	Section A: Existing Service.	Section B: Proposed Service.
Net capital outlay from Table X	£792,800	£732,600
Reduction in annual expenses due to electric working	£26,700	£61,900
Return on net capital outlay	3·37%	8·45%

(For map showing proposed electrification of the Wellington zone see Fig. 2, page 30.)

PART IV.—THE ELECTRIFICATION OF THE CHRISTCHURCH ZONE.

Lines included in the report.

1. Christchurch is approached by three separate railway routes—the main line from the south, the main line from the north, and the line from Lyttelton Harbour. The first of these carries little if any suburban traffic, and does not therefore come within the scope of this report, the only lines which do so being the north line as far as Rangiora and the Lyttelton line. A map of the area will be found at the back of this part (Fig. 3).

Comparison with Auckland and Wellington.

2. The conditions on these lines differ in some important respects from those obtaining on the two sections already examined in Parts II and III of this report. In general the grades are easy and the track-capacity is sufficient to deal with existing traffic and with any reasonable increase in traffic which can be foreseen. The principal difficulty is that on the Lyttelton line all trains must pass through a long tunnel, with consequent discomfort to passengers and crews from smoke and fumes.

The north line.

3. The north and south lines leave Christchurch by the same route, deviating at Addington, a short distance outside the city. From this point the line to Rangiora is single-track, the distance being some 19 miles. There are no severe grades, and the average daily number of trains in each direction is nine. Of these six are booked to carry passengers.

The Lyttelton line.

4. The distance from Lyttelton to Christchurch is rather more than 6 miles. The line for the first two miles is single-track, and passes through the Lyttelton Tunnel to Heathcote, the grade of the tunnel being 1 in 287. Fron this point to Christchurch and on to Addington the line is double-track. The average daily number of trains over this line is twenty-nine in each direction, from which it will be seen that insofar as the track-capacity is concerned there is no great difficulty in working. The discomfort of travelling in the tunnel under present conditions is, however, a factor to which due consideration must be given, and we understand that it has been decided to construct a new double-track tunnel as an alternative route at a cost of £265,000. Before arriving at this decision two other proposals were considered, the first being the widening of the existing tunnel at a cost of £200,000, and the second the construction of a new single-track tunnel at a cost of £165,000. None of these three alternatives would entirely overcome the difficulty of tunnel fumes and smoke, and indeed the only way in which this can be achieved is by electrification.

Steam working in tunnels.

5. With steam working the number of trains which can be passed through a tunnel, and particularly a long tunnel, is dependent rather on the resultant conditions of the atmosphere than on ordinary considerations of track-capacity. The atmospheric conditions of the Lyttelton Tunnel is at present a source of discomfort only, but as traffic increases it will tend to become progressively worse until it becomes a deciding factor with regard to the number of trains which can be worked. These discomforts and the final limitations which they involve would be entirely eliminated by electrification, and the line would be equivalent to an equal section of open track.

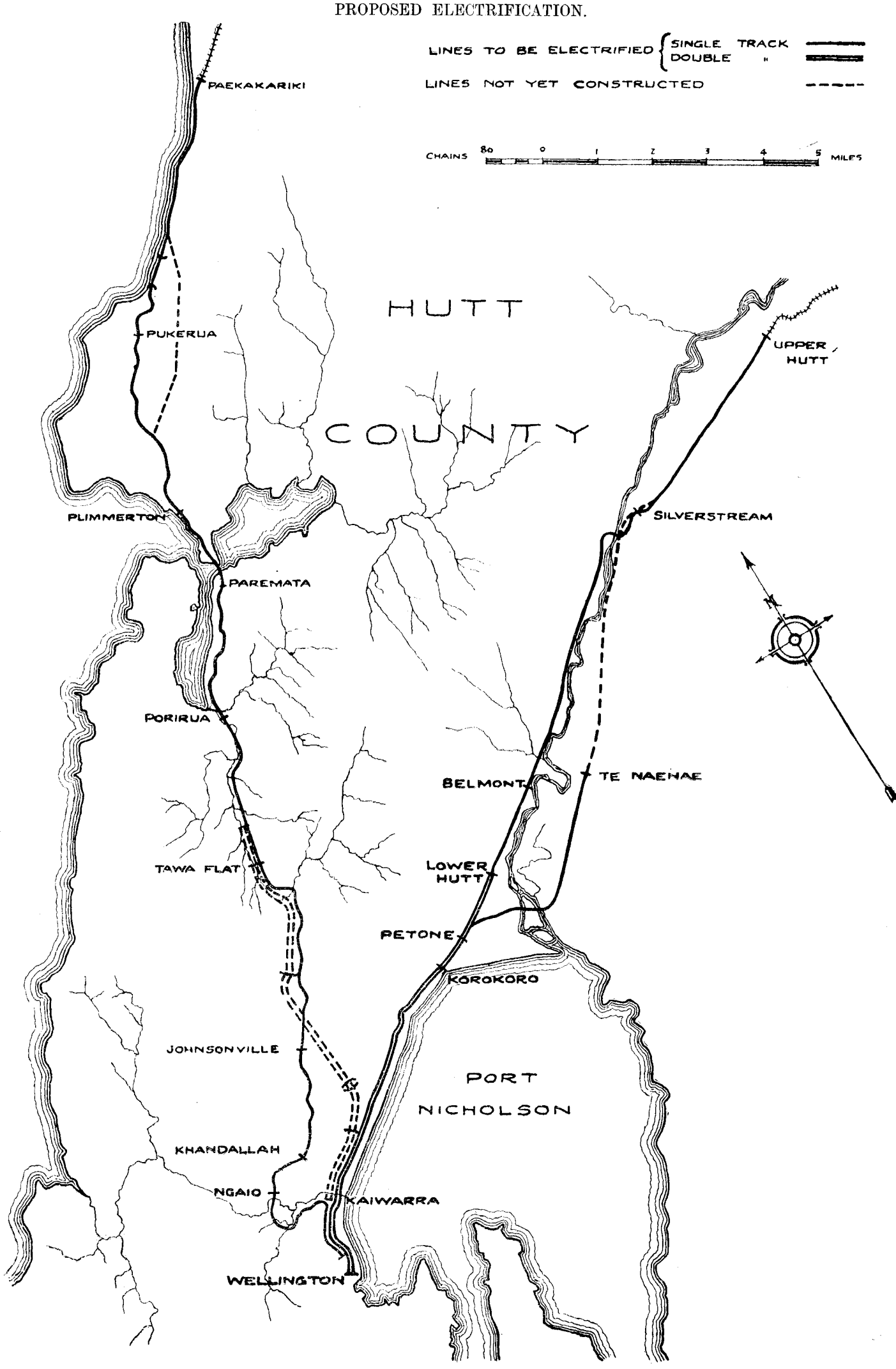


FIG. 2.—WELLINGTON ZONE.

Electrification as an alternative to duplication.

6. It is not possible for us to estimate to what extent a second tunnel with steam working would prove to be an alternative to electric working on the existing line. Much depends on local conditions, particularly on the class of coal used. The capacity of the present single-track tunnel, if freed from restrictions by electric working, is, however, sufficient for a traffic greatly in excess of that at present offering, and it would appear that if electrification were adopted duplication could be indefinitely postponed, while at the same time the service would be rendered much more attractive to suburban passengers. We have therefore based our estimate on the assumption that electrification is undertaken on the existing line as an alternative to duplication.

Other capital works.

7. There are certain other works which it is proposed to carry out in this area—namely, the reconstruction of Christchurch and Addington Stations, and a new sorting-yard at Woolston. These do not appear to affect the question of electrification one way or the other, but in preparing the figures of train-mileages which are the basis of Section B we have assumed that the yard at Woolston is completed.

Arrangement of this Part of the Report.

8. In preparing our estimates for the electrification of this area we have followed generally the scheme already adopted in Parts II and III. We have in the first case estimated the cost of dealing with the present traffic electrically in order to show a clear comparison between the alternatives of duplication and electrification, and we have then gone on to estimate the cost of working an increased service. The two sections are as follows: Section A—Electrification of the existing traffic; Section B—proposals to provide increased facilities by electrification.

Section A.—Electrification of the existing Traffic.

9. This section of the report is based as far as possible on the existing arrangement of the traffic. Electric locomotives are substituted for steam locomotives, but otherwise the character of the trains, the number of passenger-trains, and the total tonnage of goods is maintained as at present.

Traffic and Mileage Figures on which the Estimate is based.

Train and engine mileage.

10. Our figures for annual train and engine mileage are based on figures which have been supplied to us showing the average number of trains per day at present being worked, including through trains. The figures for passenger-trains and for mixed trains will be the same under both steam and electric working, but we have assumed, as already explained in Part II, paragraph 6, that the electric goods-locomotives will haul a 33-per-cent. greater load and the electric goods-train mileage will therefore be correspondingly less, although the total annual tonnage hauled is the same in both instances. An allowance of one-seventh of the train-mileage has been added to cover shunting, other than yard shunting, light and assisting mileage. As previously explained, this is the standard allowance made by the Railway Department for suburban trains, and we have applied it to both steam and electric working, although experience shows that in the case of electric working it should be substantially less than in the case of steam. The figures are set out in Table XIII.

Mileage of lines included in estimates.

11. Provision is made in the estimate for equipping all running-tracks from Rangiora to Lyttelton, together with all sidings in wayside stations, and sufficient sidings in terminal yards to admit of electric trains being worked in and out. The figures are set out in Table XIV.

Locomotives.

Type of locomotive.

12. Owing to the absence of severe grades the existing locomotives employed at Christchurch are lighter than those used in the North Island. We have therefore considered whether it would be worth while providing a somewhat smaller electric locomotive for this area than has been described in the previous sections of our report. In view, however, of the small number required, we have thought it best to retain the same general design, considering that the advantages of so doing will probably outbalance the slight additional capital cost. We need not, therefore, describe these locomotives further, as a full description has already been given in Part II, paragraphs 10 and 11.

Number of locomotives required.

13. It will be appreciated that when traffic is comparatively small and the runs short it is not easy to arrange locomotive-working in such a way that locomotives will be continuously employed. The number of locomotives required must necessarily be determined by the maximum number in use at any one time, and we estimate that to work the traffic set out in Table XIII, including a reasonable margin for spares and overhauls, eight locomotives will be required.

Substations.

14. For the electrification of the line from Rangiora to Lyttelton three substations will be required, two of these being between Christchurch and Rangiora, and one between Christchurch and Lyttelton.

Estimate of Cost and Financial Results.

Capital cost.

15. In Table XVI is set out the capital cost of electrification of the sections considered. The prices are made up in the same way as in Parts II and III—that is to say, freight, erection, and a margin for contingencies have been included, but no allowance for Customs duty. The total capital outlay, after deducting a figure supplied to us by the Railway Department for the value of locomotives released, amounts to £417,600.

Working-expenses.

16. A comparison of the annual cost of steam and electric services is given in Table XVII. We have already described the basis on which these costs have been estimated, and have pointed out that they include depreciation but not interest on capital. It will be seen that the cost of working the service electrically is £1,400 less than the cost of working it by steam.

Electrification versus tunnel duplication.

17. It is apparent that so small a saving in working-expenses would not in itself justify the expenditure of the capital required for electrification. On the other hand, we have shown that electrification is an alternative to the costly operation of enlarging or duplicating the tunnel, and, indeed, that in some respects it provides a more complete solution of the difficulties. The question then arises as to what is the minimum expenditure for which such electrification can be carried out.

Electrification from Lyttelton to Christchurch only.

18. Electrification of the tunnel only, with consequent change of engines at Heathcote, is not desirable, particularly on account of the suburban service to Christchurch. On the other hand, there would be no necessity to extend electrification beyond Christchurch, since there is little, if any, inter-running between the Lyttelton and the Rangiora lines. We have therefore estimated the capital cost of electrification between Christchurch and Lyttelton only, but including the equipments of tracks to Addington to allow locomotives to run to the repair shops. We estimate that the number of electric locomotives required would be five, and that the net capital cost of electrification, after deducting the value of locomotives released, would be £198,300. This sum is less than that set aside for the duplication of the tunnel—*i.e.*, £265,000.

Section B.—Proposals to provide Increased Facilities by Electrification.

Proposed electrification of Christchurch–Lyttelton line only.

19. We have already shown that there is no immediate financial justification for electrification in the Christchurch area, unless the existing difficulties with regard to the tunnel are taken into account; and, further, that to overcome these difficulties it is only necessary to electrify the Christchurch–Lyttelton line. We propose, therefore, to exclude the Rangiora line from further consideration, and in this section of our report to deal only with the line between Christchurch and Lyttelton, and to estimate the cost of providing thereon an increased passenger service in addition to the existing goods traffic.

Basis of the New Service.

No immediate use for multiple-unit trains.

20. In Parts II and III we recommend the development of suburban passenger traffic by means of multiple-unit trains. We have considered the same system for the Christchurch–Lyttelton line, but it is doubtful if the service required in the immediate future is sufficient to warrant the purchase and maintenance of a small quantity of special equipment. We have therefore confined our proposals to the use of locomotive trains for all purposes. If, as may well be the case, traffic develops in the future to the extent that several multiple-unit trains could be fully employed, the system could be readily adopted.

Passenger-trains.

21. The present time-table provides an average of eighteen passenger-trains each way per day. We have allowed in our estimate for an increase to twenty-nine trains, the increase being spread generally over the day. The frequency of service during the morning and evening rush hours, and at midday, would be approximately every twenty minutes, and, during the remainder of the day, every fifty minutes up to midnight. These figures include two through trains a day.

Goods-trains.

22. The freight traffic on this section is at present being dealt with solely by goods-trains, no mixed trains being run. The number of goods-trains per day passing in and out of Lyttelton will therefore be the same as that included in Section A of this part of the report. We understand, however, that it has been decided to proceed with the new yard at Woolston, and that in future a proportion of the goods-trains will be marshalled at this point. We have therefore, in calculating train-mileage, assumed that, while all goods tonnage would be hauled between Woolston and Lyttelton electrically, only one-half of that from Christchurch to Woolston would be hauled in this manner. The remaining goods traffic between Christchurch and Woolston is assumed to be to or from places beyond the electrified zone; and, since it is doubtful if a change of locomotive could be justified within four miles of the sorting-yard, it will probably be hauled by steam. For purposes of comparison this additional mileage has been excluded from both steam and electric figures. Figures will be found in Table XIII. In accordance with the standard practice of the Railway Department, we have added one-seventh to that train-mileage to cover light and assisting mileage and shunting, other than that in main yards.

Locomotives.

23. We estimate that the number of electric locomotives required to work the traffic would be three, and we have added two spares. To work an equivalent service by steam the number of steam locomotives at present in use would have to be increased, and we have allowed a sum of £7,500 for this.

Capital Expenditure and Financial Results.

24. Details of capital expenditure and of the annual working-costs involved in working the increased service electrically as compared with working it by steam are set out in Tables XVI and XVII. The figures are made up in the same way, and contain the same allowances, as in the previous sections. The net capital outlay, after deducting credit for steam locomotives, is £190,800. The annual saving in working-costs due to electrification is £4,200, which is equivalent to a return of 2·2 per cent. on the net capital outlay.

Effect of further increase in traffic.

25. The return on capital is small, and it is evident that, apart from the question of the tunnel, electrification in this area would not be financially justifiable even with the increased service assumed. With further increase, particularly to such an extent that multiple-unit trains could be economically employed, the situation would improve. It is possible that the removal of the present discomforts of the tunnel would speedily attract an increased number of passengers, but this is a matter which can only be decided by those having expert knowledge of the local conditions. We have therefore, in the estimate, confined ourselves to a moderate increase in the number of trains, an increase generally in proportion to that which we have assumed for the other centres.

TABLES RELATING TO THE ELECTRIFICATION OF THE CHRISTCHURCH ZONE.

TABLE XIII.—TRAFFIC.

SECTION.	SECTION A—EXISTING SERVICE.					SECTION B—PROPOSED SERVICE.				
	Passenger and Mixed Traffic.		Goods Traffic.			Passenger Traffic.		Goods Traffic.		
	Trains per Day.	Train-miles per Annum.	Trains per Day.	Tons per Day.	Train-miles per Annum.	Trains per Day.	Train-miles per Annum.	Trains per Day.	Tons per Day.	Train-miles per Annum.
Steam Working.										
Lyttelton–Heathcote ..	36	23,100	22	3,426	14,200	58	40,500	22	3,426	14,200
Heathcote–Christchurch ..	36	48,400	22	3,429	29,400	58	83,600	22*	3,429	21,300
Christchurch–Addington ..	33	13,800	31	4,023	13,000	..	..	..	..	..
Addington–Rangiora ..	12	70,200	6	784	35,100	..	..	..	..	..
Totals	..	155,500	..	..	91,700	..	124,100	..	..	35,500
Electric Working.										
Lyttelton–Heathcote ..	36	23,100	16·5	3,426	10,600	58	40,500	16·5	3,426	10,600
Heathcote–Christchurch ..	36	48,400	16·5	3,429	22,000	58	83,600	16·5*	3,429	16,000
Christchurch–Addington ..	33	13,800	23·2	4,023	9,800	..	..	..	..	..
Addington–Rangiora ..	12	70,200	4·5	784	26,300	..	..	..	..	..
Totals	..	155,500	..	..	68,700	..	124,100	..	..	26,600

* Half these trains go to Woolston only.

TABLE XIV.—LINES TO BE EQUIPPED.

Section.	Section A—Existing Service.				Section B—Proposed Service.			
	Route Mileage.	Single-track Mileage of Running-lines equipped.	Single-track Mileage of Sidings equipped.	Total Single-track Mileage equipped.	Route Mileage.	Single-track Mileage of Running-lines equipped.	Single-track Mileage of Sidings equipped.	Total Single-track Mileage equipped.
Lyttelton–Heathcote ..	2·1	2·1	3·2	5·3	2·1	2·1	3·2	5·3
Heathcote–Christchurch ..	4·3	8·6	5·6	14·2	4·3	8·6	5·6	14·2
Christchurch–Addington ..	1·3	2·6	..	2·6	..	..	2·6	2·6
Addington–Rangiora ..	18·7	18·7	5·8	24·5	..	..	..	..
Totals	26·4	32·0	14·6	46·6	6·4	10·7	11·4	22·1

TABLE XV.—ELECTRIC LOCOMOTIVES REQUIRED.

Item.	Section A—Existing Service, Lyttelton–Rangiora.		Section B—Proposed Service, Lyttelton–Christchurch.	
	Number.	Cost.	Number.	Cost.
		£		£
Electric locomotives	8	81,600	5	51,000
Spare parts	..	4,100	..	2,600
Totals	..	85,700	..	53,600

TABLE XVI.—CAPITAL EXPENDITURE.

Item.	Section A—Existing Service. Lyttelton–Rangiora.	Section B—Proposed Service. Lyttelton–Christchurch.
	£	£
Electric locomotives	85,700	53,600
Substations	117,300	49,200
Overhead equipment of the tracks	147,500	61,000
Alterations to existing sheds, telegraph and telephone lines, &c.	8,000	6,000
Contingencies and engineering expenses	53,500	25,500
Interest on capital during construction	16,400	7,800
Gross capital outlay	428,400	203,100
Credits :—	£	£
Value of engines released	10,800	4,800
Value of new engines saved	..	7,500
Total credits	10,800	12,300
Net capital outlay	£417,600	£190,800

TABLE XVII.—ANNUAL WORKING-EXPENSES.

Item.	Section A—Existing Service, Lyttelton–Rangiora.		Section B—Proposed Service, Lyttelton–Christchurch.	
	Steam.	Electric.	Steam.	Electric.
	£	£	£	£
Coal and water	14,600	..	9,600	..
Electric power	..	12,200	..	6,200
Locomotive repairs, running-shed charges and renewals ..	11,900	5,800	7,800	3,700
Train wages	13,300	12,000	8,700	8,200
Substation maintenance and depreciation	..	5,200	..	2,300
Overhead line maintenance and depreciation	..	3,200	..	1,500
Total working-expenses	39,800	38,400	26,100	21,900

TABLE XVIII.—FINANCIAL RESULTS OF ELECTRIFICATION.

Item.	Section A. Existing Service, Lyttelton–Rangiora.	Section B. Proposed Service, Lyttelton–Christchurch.
Net capital outlay from Table XVI	£417,600	£190,800
Reduction in annual expenses due to electric working	£1,400	£4,200
Return on net capital outlay	0·3%	2·2%

PROPOSED ELECTRIFICATION.

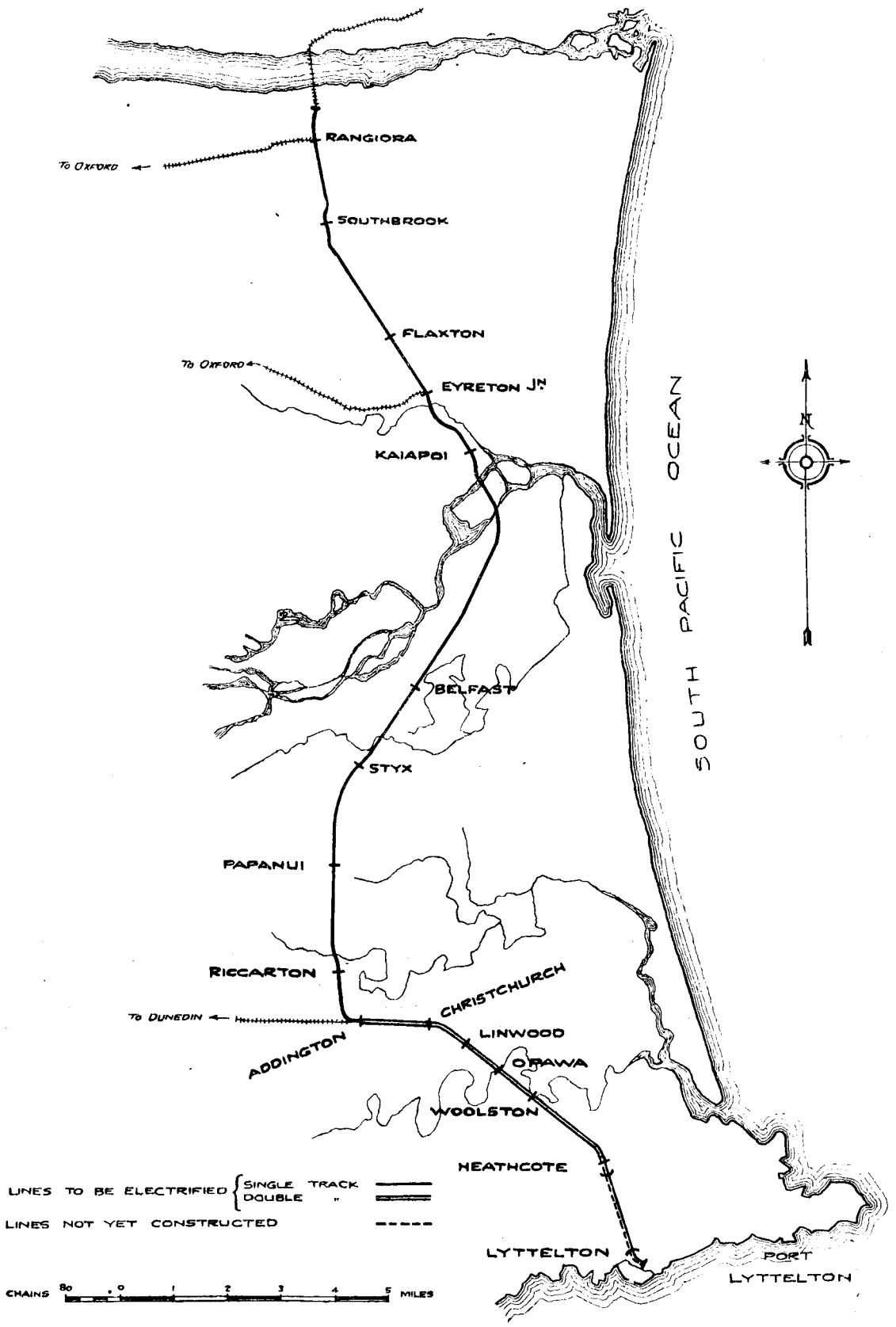


FIG. 3.—CHRISTCHURCH ZONE.

Part V.—The Electrification of the Dunedin Zone.

Lines included in the report.

1. Dunedin is served by three main lines—one running in a northerly direction to Christchurch via Palmerston, one in a southerly direction to Invercargill via Balclutha, and a third in an easterly direction to Cromwell, branching from the Invercargill line at Wingatui. The Dunedin suburban lines consist of the line to Mosgiel, and a short section of the Palmerston line as far as Sawyer's Bay. From this point a spur runs through a short tunnel to Port Chalmers. The distance from Dunedin to Mosgiel is about 9½ miles, and from Dunedin to Port Chalmers about 8½ miles. Within the actual suburban zone the lines are generally level, but beyond the zone there are severe grades, particularly on the Palmerston line, where the track rises immediately beyond Sawyer's Bay on an average grade of 1 in 57 for about 4 miles, with a ruling grade of 1 in 50, the grade including the Milnwaka Tunnel, which is, we understand, one of the most difficult tunnels for steam operation in the whole of New Zealand. A map of the area is included with the tables at the end of this part (Fig. 4).

Extension of electrification beyond suburban zone.

2. We have previously in our report referred to the particular advantages of electrification on steep grades, and it would appear that if electrification is to be adopted it would be worth while considering whether it should not be extended beyond the suburban zone to include the severe grades on either side, particularly on the Palmerston line.

Present Traffic Conditions.

Small present traffic and proposed electric service.

3. Within the actual suburban zone the conditions are quite different from those obtaining at any of the other centres. The tracks are not congested, and in the absence of severe grades or bad tunnels there is no special difficulty in working the present traffic by steam. In view of the smallness of this traffic it is unlikely that the saving in working-expenses would be sufficient to pay an adequate return on the capital involved in electrification. Since there are no other alternative works contemplated, such as regrading, there is no justification for considering electrification of the existing traffic, as was done in the earlier sections. We appreciate, however, the desirability of providing a better passenger service than at present, and we have drawn up a scheme for an increased service and shown the cost of operating it by steam and electrically.

Operation of through trains and arrangement of report.

4. Another factor which requires consideration is the operation of through trains over the proposed electrified area. This area is small, and it is open to question whether it is practicable or desirable to change engines at the edge of the zone in order to haul through trains electrically over so short a distance, particularly as there are no adverse grades to be encountered. It will be seen that in this respect the conditions are quite different from those at Auckland and Wellington, where the proposed electrified zone extends for some 20 to 25 miles and where the most severe grades over which through trains must pass occur within the suburban area. We have therefore, in the case of Dunedin, considered it desirable to give two estimates, one covering the electrification of a suburban traffic only, and the other including the operation of through trains. Our report is therefore divided into two sections: Section A—electric operation of a proposed suburban service; Section B—electric operation of all trains within the suburban area.

Section A.—Electric Operation of a Proposed Suburban Service.

Use of electric locomotives.

5. We have considered here, as in other centres, the possibility of using multiple-unit stock for maintaining a uniform service throughout the day, supplementing it at rush hours by trains hauled by locomotives, these locomotives being normally employed during the rest of the day on other services. Multiple-unit trains are more suitable for suburban passenger work, but at the same time it is not economical to purchase and maintain a small quantity of special equipment, and we have therefore assumed that in the case of Dunedin, where the number required would be very small, electric locomotives would be used to haul all trains.

Basis of the New Service.

Passenger-trains.

6. In drawing up our scheme for the revision of traffic we have assumed in the first place that mixed trains would be replaced by passenger-trains, and, further, we have assumed an increase in the number of passenger-trains. Table XIX shows the number of trains we propose to run over the two lines, and it will be seen that this number shows a reasonable increase over those shown in the present time-table, the actual increase in passenger-train miles as compared with existing passenger- and mixed-train miles being just over 50 per cent. This number of trains is based upon running a uniform service approximately every seventy minutes between Mosgiel and Dunedin and between Dunedin and Port Chalmers throughout the day, supplemented by extra trains during the rush hours. Excluding the steam-hauled through passenger-trains, which have been left out of both the steam and electric figures, this would allow for thirty-six trains per day over the Port Chalmers line and thirty-two over the Mosgiel line. The Railway Department's standard allowance of one-seventh for light mileage and shunting mileage, exclusive of main yards, has been added in both cases.

Goods-trains.

7. The figures of goods traffic which we have adopted assume that the total suburban goods tonnage at present being carried in mixed and goods trains would be hauled by electric locomotives. The goods-train miles run under electric operation are less than those worked by steam, on account of the 33-per-cent. increase in weight which has been assumed for the electric goods-trains, as explained in Part II, paragraph 6. The engine-mileage for each system includes the same proportional allowance for light mileage as mentioned above.

Locomotives required.

Number of electric locomotives required.

8. Our estimate of the number of electric locomotives required has been based upon a provisional time-table which we have drawn up, and a liberal margin has been allowed for spares and for overhaul. We estimate that eight locomotives would be sufficient.

Steam-engines displaced and new steam-engines required.

9. As the proposed service constitutes an increase over the present, we have estimated the number of new steam locomotives additional to those at present in use which would be necessary to work the increased traffic by steam, in order to compare the electric and steam services on the same basis, and we have assumed an average cost for a new steam locomotive of £4,500.

Track equipment.

10. Our estimates provide for equipping the tracks shown in Table XX, and are based upon the use for the most part of wooden poles as for the other centres. We have allowed for equipping sufficient tracks at Dunedin yard to permit of the trains being worked in and out.

Capital Expenditure and Working-expenses.

Capital expenditure.

11. The estimate of capital expenditure is set out in Table XXII. The prices are estimated upon the same basis as for the other centres, and do not include any allowance for Customs duty. The total net capital outlay after deducting the value of new and displaced locomotives amounts to £354,000.

Annual working-expenses.

12. In preparing our estimate of the working-expenses of the two systems we have not included items that are common to both, such as the working-expenses of the steam-hauled through trains. The Railway Department have supplied us with a figure of 16·79d. as the cost of coal per engine-mile at Dunedin, but, as we are only dealing, in this section of the report, with trains originating within the suburban area, which would consequently be worked by the lighter type of steam-engine, we have used an average figure for this area of 14·8d. per engine-mile obtained from the Railways Statement. Details of the annual costs are given in Table XXIII, from which it will be seen that the total annual saving due to working the increased service electrically, including depreciation but excluding interest charges, amounts to £12,600.

Financial Results.

Return on net capital outlay.

13. This annual saving is sufficient to pay about 3½ per cent. interest on the net capital cost of electrification. This financial result refers only to the operation of suburban traffic, and does not include the electrical operation of through trains within the suburban zone.

Section B.—Electrical Operation of all Trains within the Suburban Area.

Traffic Basis.

Passenger-trains.

14. This section of the report may be considered as an extension of the previous one, the extension being the addition to the suburban traffic of all slow passenger and goods trains running in the suburban area. The suburban passenger service which formed the basis of the previous section has been left unchanged, but the number of passenger-trains shown in Table XIX is greater for this section than for Section A, since it includes through passenger-trains. The figures are the same for both steam and electric operation. This section consequently does not deal with a further increase in the travelling facilities, but the additional electrical operation of all through trains which previously would be worked by steam.

Goods-trains.

15. We have been supplied by the Railway Department with figures of the total goods tonnage at present being hauled over these sections, both in mixed and in goods trains, and this tonnage has been adopted as the basis of the goods traffic. All goods-trains within the suburban zone would be hauled by electric locomotives, and it would be necessary to change the engines of the through trains at Mosgiel and Sawyer's Bay. The weight, and consequently the number, of through goods-trains is fixed by the weight which can be hauled by steam locomotives over the grades on the main line, and would not be affected by electrification of the short section of line within the suburban zone. The train-mileage of through trains will consequently be the same under electric and steam operating

conditions. This does not apply to goods-trains operating solely in the suburban zone, and for these we have adopted the figures already used in Section A. The standard allowance of one-seventh for light mileage and shunting mileage, other than that in main yards, has been added to both the steam and electric figures.

New Steam-engine Sheds.

Amount included for new steam-engine sheds.

16. We have included in our estimates a provisional sum of £20,000 to allow for two steam-engine sheds at Mosgiel and Sawyer's Bay.

Locomotives required.

Number of electric and steam locomotives.

17. We estimate that in order to work this service electrically twelve locomotives will be required, among which are included a sufficient number for overhaul and for repair. With regard to steam locomotives the number required to work the suburban trains will be the same as that included in Section A. The steam locomotives at present used on the through trains would probably not be diminished in number, even if these trains were hauled electrically in the suburban zone, since the mileage in that zone is only a small proportion of the working section.

Capital Outlay and Working-expenses.

Total capital expenditure.

18. The total expenditure is set forth in Table XXII, from which it will be seen that the net expenditure, after deducting the value of steam locomotives released and new steam locomotives saved, amounts to £429,100. These figures have been made up in the same way and contain the same allowances as for the previous sections.

Annual working-expenses.

19. In Section A we alluded to a figure supplied to us by the Railway Department of 16·79d. as the cost of coal per engine-mile at Dunedin, and explained why, owing to the light type of steam-engine used for suburban service, we had used a smaller figure in estimating the cost of coal. In this case, however, these reasons no longer apply, as a heavier type of steam locomotive is used for the through goods traffic, and consequently the unit cost of coal over the suburban zone would be higher. We have therefore used the figure of 16·79d. in calculating the cost of coal for the steam operation of this scheme. We have already described the basis on which the working-expenses have been estimated, and Table XXIII shows a comparison between the costs of steam and electrical operation. These figures, as before, include depreciation, but do not include any interest charges.

Financial Results.

Return on the net capital outlay.

20. The saving of £21,900 per annum due to electric working is sufficient to pay about 5 per cent. on the net capital cost of electrification. This increase in the return over that obtained in Section A is mostly due to the saving in the cost of coal and water as a result of displacing the heavy type of steam locomotive necessary for the haulage of through goods-trains by electric locomotives, and to the fact that the capital expenditure necessary for the equipment of the track and substations is used in working a bigger traffic. It must be pointed out, however, that, in order to place a correct value upon this increased return, the fact of having to change engines at Mosgiel and Sawyer's Bay must not be overlooked. Although we have allowed a provisional amount to provide for small engine-sheds at these two points, there still remains the expenses incidental to changing engines. It is difficult to place an exact monetary value upon this without further knowledge of local conditions.

TABLES RELATING TO THE ELECTRIFICATION OF THE DUNEDIN ZONE.

TABLE XIX.—TRAFFIC.

SECTION.	SECTION A.—PROPOSED SERVICE. Suburban only.					SECTION B.—PROPOSED SERVICE. Including Through Traffic.				
	Passenger Traffic.		Goods Traffic.			Passenger Traffic.		Goods Traffic.		
	Trains per Day.	Train-miles per Annum.	Trains per Day.	Tons per Day.	Train-miles per Annum.	Trains per Day.	Train-miles per Annum.	Trains per Day.	Tons per Day.	Train-miles per Annum.
Steam Working.										
Dunedin – Sawyer's Bay ..	36	86,600	12	1,398	26,700	46	111,000	22	4,332	48,900
Sawyer's Bay – Port Chalmers	36	15,900	12	1,398	4,900	36	15,900	12	1,398	4,900
Dunedin–Mosgiel	32	104,000	18	3,700	53,700	37	120,000	34	7,046	101,500
Totals	..	206,500	..	..	85,300	..	246,900	..	..	155,300
Electric Working.										
Dunedin – Sawyer's Bay ..	36	86,600	9	1,398	19,900	46	111,000	22	4,332	48,900
Sawyer's Bay – Port Chalmers	36	15,900	9	1,398	3,700	36	15,900	9	1,398	3,700
Dunedin–Mosgiel	32	104,000	13·5	3,700	40,300	37	120,000	29·7	7,046	88,900
Totals	..	206,500	..	..	63,900	..	246,900	..	..	141,500

TABLE XX.—LINES TO BE EQUIPPED.

Sections.	Route Mileage.	Single-track Mileage of Running-lines equipped.	Single-track Mileage of Sidings equipped.	Total Single-track Mileage equipped.
Dunedin–Ravensbourne	2·8	5·6	4·6	10·2
Ravensbourne - Port Chalmers	5·7	5·7	2·0	7·7
Dunedin–Mosgiel	9·4	18·8	10·5	29·3
Totals	17·9	30·1	17·1	47·2

TABLE XXI.—ELECTRIC LOCOMOTIVES REQUIRED.

—	Section A. Proposed Service, Suburban only.		Section B. Proposed Service, including Through Traffic.	
	Number.	Cost.	Number.	Cost.
		£		£
Electric locomotives	8	81,600	12	122,400
Spare parts	..	4,100	..	6,100
Totals	..	85,700	..	128,500

TABLE XXII.—CAPITAL EXPENDITURE.

Item.	Section A. Proposed Service, Suburban only.	Section B. Proposed Service, including Through Traffic.
	£	£
Electric locomotives from Table XXI	85,700	128,500
Substations	75,400	75,400
Overhead equipment of the tracks	144,300	144,300
New engine-sheds at Mosgiel and Sawyer's Bay	..	20,000
Alterations to existing sheds, telegraph and telephone lines, &c.	7,800	7,800
Contingencies and engineering expenses	47,000	56,400
Interest on capital during construction	14,400	17,300
Gross capital outlay	374,600	449,700
Credits :—	£	£
Value of engines released	11,100	11,100
Value of new engines saved	9,500	9,500
Total credits	20,600	20,600
Net capital outlay	£354,000	£429,100

TABLE XXIII.—ANNUAL WORKING-EXPENSES.

Item.	Section A. Proposed Service, Suburban only.		Section B. Proposed Service, including Through Traffic.	
	Steam.	Electric.	Steam.	Electric.
	£	£	£	£
Coal and water	21,300	..	33,200	..
Electric power	..	10,500	..	14,700
Locomotive repairs, running-shed charges and renewals ..	14,200	6,500	19,100	9,500
Train wages	15,800	14,700	21,800	21,000
Substation maintenance and depreciation	..	3,700	..	3,700
Overhead line maintenance and depreciation	..	3,300	..	3,300
Total working-expenses	51,300	38,700	74,100	52,200

TABLE XXIV.—FINANCIAL RESULTS OF ELECTRIFICATION.

Item.	Section A. Proposed Service, Suburban only.	Section B. Proposed Service, including Through Traffic.
Net capital outlay from Table XXII	£354,000	£429,100
Reduction in annual expenses due to electric working	£12,600	£21,900
Return on net capital outlay	3·56%	5·11%

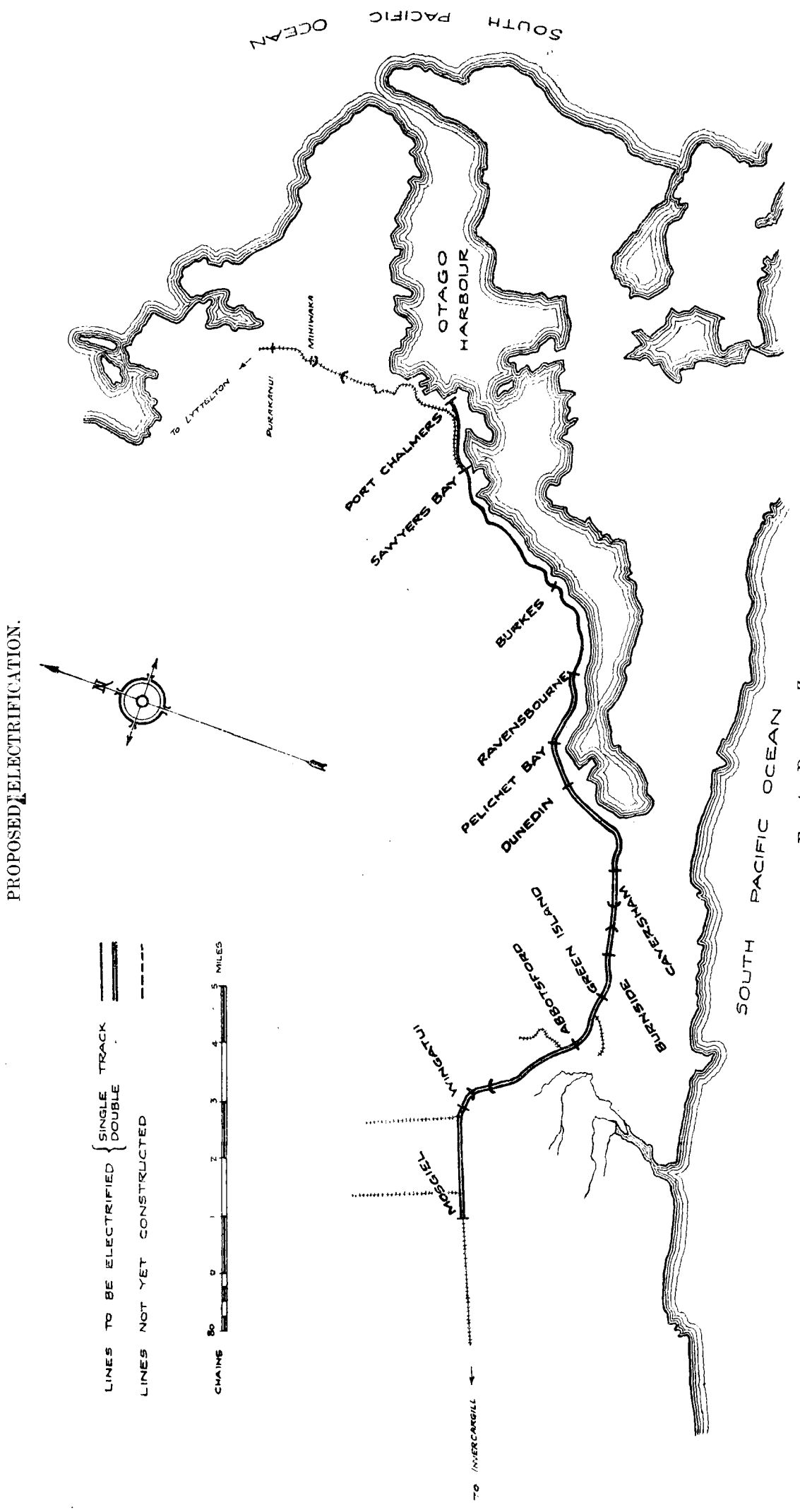


FIG. 4.—DUNEDIN ZONE.

ANNEXURE *(A)* to APPENDIX B.

REVIEW BY MESSRS. F. T. M. KISSELL, B.Sc., A.M.I.C.E., M.I.E.E. (CHIEF ELECTRICAL ENGINEER, PUBLIC WORKS DEPARTMENT), AND R. P. SIMS (ASSISTANT CHIEF MECHANICAL ENGINEER, RAILWAY DEPARTMENT), OF THE REPORT OF MESSRS. MERZ AND McLELLAN ON THE ELECTRIFICATION OF THE LINE BETWEEN LYTTELTON AND CHRISTCHURCH.

THE RIGHT HON. THE MINISTER OF PUBLIC WORKS AND RAILWAYS.

Merz and McLellan Report on Electrification, August, 1925.

In compliance with your request, we submit herewith for your consideration our conclusions on the above.

The report, covering the investigation made by Messrs. Merz and McLellan on the proposed electrification of the suburban areas respectively operated from the Cities of Auckland, Wellington, Christchurch, and Dunedin, is disappointing inasmuch as it deals more with generalities than with detail; in fact, where figures or estimates of cost, traffic operation, &c., are given there is no information as to how these estimates are arrived at.

However, it is only intended to deal in this review with that section of the suburban area between Christchurch and Lyttelton, upon which an expression of our opinion is required on the following points:—

(1.) Whether the Government would be justified in deciding to electrify the section on the contents of the report; or

(2.) Should a separate report be compiled by the committee to ascertain whether the finding of Messrs. Merz and McLellan is substantially correct; or whether

(3.) The firm should be asked to submit further information in support of its conclusions.

ITEM (1).

There is no doubt whatsoever that the Government would not be justified in deciding to electrify the section on the contents of this report alone, for the reason that the report is much too incomplete so far as all the necessary details are concerned on which to arrive at a proper decision. The estimates of cost, traffic, operation, &c., given by Messrs. Merz and McLellan may be sound and correct, but, without evidence of the method by which these estimates have been calculated, it would be unwise to act on them. The report does, however, support conclusions which may be arrived at on other general considerations discussed later, and which indicate the desirability of electrification.

ITEM (2).

Unless Messrs. Merz and McLellan are prepared to furnish a very considerable amount of additional information and detail in regard to the work covered by their report it will be necessary for proper investigation to be made and another report prepared to show whether the findings of Messrs. Merz and McLellan are substantially correct. In any case a great deal of work on detail designs of complete scheme must be carried out before any actual work could be commenced or any specifications issued.

ITEM (3).

Messrs. Merz and McLellan have been asked by cable to furnish full information on the following, in connection with each section of their report:—

(1.) Details of costs of operation;

(2.) Details of substations and all other equipment proposed;

(3.) Details showing how capital cost made up;

(4.) Annual ton-miles estimated for all services;

(5.) Average current-consumption estimates per ton-mile at pantograph and maximum demand;

(6.) Details of proposed special terminal facilities.

On account of the delay which will result in this request for additional detailed information, we have made a preliminary investigation into—

(*a.*) The existing service as operated by steam locomotives;

(*b.*) The existing service if operated by electric locomotive;

(*c.*) The proposed improved service by Messrs. Merz and McLellan operated by electric locomotives;

(*d.*) The proposed improved service operated by steam locomotives.

In the report there is no mention of duty expressed in "ton-miles," and it is almost impossible to determine on the feasibility of the electrification of main-line railway without data as to the ton-mile duty. Below is given the estimate of the annual ton-miles for each of the above services, and the method by which these have been calculated:—

Present Service (Steam Operation).

36 passenger-trains per day (34 local and 2 mail) for average of 310 days per annum; 22 goods-trains per day for average of 305 days per annum. Average gross weights of trains: Local, 142 tons; mail, 271 tons; goods, 260 tons.

Passenger (142 × 34 + 271 × 2) × 310 × 6·4	=	10,654,080 ton-miles per annum.
Goods (260 × 22) × 305 × 6·4 ..	=	11,165,808 ,,
Total		21,819,888 ,,

Present Service (Electric Operation).

36 passenger-trains per day (34 local and 2 mail) for average of 310 days per annum; 22 goods-trains per day for average of 305 days per annum. Average gross weights of trains: Local, 140 tons; mail, 254 tons; goods, 258 tons.

Passenger (140 × 34 + 254 × 2) × 310 × 6·4	=	10,451,712 ton-miles per annum.
Goods (258 × 22) × 305 × 6·4 ..	=	11,079,552 ,,
Total		21,531,264 ,,

Proposed Augmented Service (Electric Operation).

58 passenger-trains per day (56 local, 2 mail) for average of 310 days per annum; 16·5 goods-trains per day for average of 305 days per annum. Average gross weights of trains: 40 local at 100 tons, and 16 at 140 tons; mail, 254 tons; goods, 347 tons.

Passenger (100 × 40 + 140 × 16 + 254 × 2) × 310 × 6·4	=	13,388,032 ton-miles per annum.
Goods (347 × 16·5) × 305 × 6·4	=	11,165,808 ,,
		,,
Total		24,553,840 ,,

Proposed Augmented Service (if Steam Operation).

58 passenger-trains per day (56 local, 2 mail) for average of 310 days per annum; 22 goods-trains per day for average of 305 days per annum. Average gross weights of trains: 40 local, at 105 tons and 16 at 142 tons; mail, 271 tons; goods, 260 tons.

Passenger (105 × 40 + 142 × 16 + 271 × 2) × 310 × 6·4	=	13,915,776 ton-miles per annum.
Goods (260 × 22) × 305 × 6·4	=	11,165,808 ,,
Total		25,081,584 ,,

It will be noted that in the augmented service we have allowed for increasing the size of goods-trains, with electric traction to 347 tons, as tending to more economical operation. This may necessitate improvements in Lyttelton yard, which we understand are now under consideration.

Power-supply.

Messrs. Merz and McLellan have allowed for the power being supplied by the Public Works Department to a substation half-way along the line and operated by the Railway Department. We think it quite likely, particularly if the electric service is limited to Lyttelton–Middleton, as discussed later, that it will be found more economical that the substation should be located at the present Public Works substation at Addington and the conversion to D.C. power controlled by the Public Works staff already there. Basing the cost of A.C. power at 0·5d. per unit, as quoted the Christchurch Tramway Board, we estimate the D.C. power could be supplied from the substation at 0·85d. per unit. The number of units consumed is very dependent on the distance between stops on the electrified section increasing considerably as the distance between the stops is decreased. Allowing for express passenger-trains and 85 per cent. of the goods-trains running through, and for local trains stopping at all stations, the average distance between stops would be 3·4 miles. For this type of service, practice on other operating lines indicates a consumption of 57 to 65 watt-hours per ton-mile as being usual output from the substations, this figure including average lighting and shunting. For purposes of this report we have allowed 76 watt-hours per ton-mile for average consumption. This figure would be somewhat reduced if the electrification were extended to include the marshalling-yard at Middleton, as heavy goods-trains would then have a somewhat longer average run between stops.

The capital cost of overhead copper feeders would be increased somewhat if the substation were located at Addington, but it is considered that this would be more than offset in the saving in substation cost and substation operation, particularly if the electrification is extended to Middleton.

Operating Comparative Costs.

The following figures show the estimated operating-costs of the different services under steam and electric operation. These figures include locomotive, &c., cost, but do not include repairs, &c., to carriages and wagons, which are only to a minor extent dependent on the form of motive power, although electrification could certainly be credited with a saving in the cost of cleaning carriages, &c.

Present Service (Steam Operation).

Annual mileage, 115,100 (passenger, 71,500; goods, 43,600), approx. Annual ton-miles, 21,819,888 (passenger, 10,654,080; goods, 11,165,808).

	Amount per Annum. £	Pence per Train-mile. d.	Pence per 100 Ton-miles. d.
Wages	4,981	10·3864	5·479
Fuel	8,373	17·4592	9·209
Stores	284	0·5931	0·313
Repairs, &c.	5,706	11·8973	6·273
Miscellaneous	155	0·3239	0·179
Totals	£19,499	40·6599	21·453

Present Service (Electric Operation).

Annual mileage, 115,100 (passenger, 71,500; goods, 43,600), approx. Annual ton-miles, 21,531,264 (passenger, 10,451,712; goods, 11,079,552).

	Amount per Annum. £	Pence per Train-mile. d.	Pence per 100 Ton-miles. d.
Wages	4,981	10·3864	5·479
Electric power	5,796	12·0768	6·456
Stores	275	0·5734	0·307
Repairs, &c.	3,650	7·6108	4·067
Overhead and track	1,750	3·6490	1·951
Totals	£16,452	34·2964	18·260

Proposed Augmented Service (Electric Operation).

Annual mileage, 150,700 (passenger, 124,100; goods, 26,600). Annual ton-mileage, 24,553,840 (passenger, 13,388,032; goods, 11,165,808).

	Amount per Annum. £	Pence per Train-mile. d.	Pence per 100 Ton-miles. d.
Wages	5,440	8·6629	5·317
Electric power	6,609	10·5253	6·46
Stores	286	0·4555	0·279
Repairs, &c.	3,700	5·8925	3·617
Overhead and track	1,850	2·9462	1·808
Totals	£17,885	28·4824	17·481

Proposed Augmented Service (if Steam-operated).

Annual mileage, 159,600 (passenger, 124,100; goods, 35,500). Annual ton-miles, 25,081,584 (passenger, 13,915,776; goods, 11,165,808).

	Amount per Annum. £	Pence per Train-mile. d.	Pence per 100 Ton-miles. d.
Wages	5,440	8·1798	5·205
Fuel	9,524	14·3214	9·113
Stores	316	0·4762	0·303
Repairs, &c.	6,222	9·3647	5·959
Miscellaneous	186	0·2797	0·178
Totals	£21,688	32·6218	20·758

From the above locomotive running-costs it will be seen that the present service would cost £3,847 less per annum to operate if electrified, and the proposed improved electrical service would cost £3,803 per annum less than the equivalent if steam-operated. It should be noticed that the total locomotive cost in our calculations is shown as respectively £17,885 and £21,688 for the improved services by electric and steam operation, as against £21,900 and £26,100 by Messrs. Merz and McLellan; but part of this additional cost probably covers the wages of the guards and others on the trains, in which case our calculations for the electrical operation come very close to the estimate in the report.

On page 11, clause 23, Messrs. Merz and McLellan state: "In many cases, however, the inducement to electrify suburban systems has not been so much the ability to reduce operating-costs as the probability of a large increase in revenue. The advantages offered to the public of a quicker, cleaner, and a more frequent service lead to an increase in the use of the railway and a corresponding increase in the revenue." Although this may apply to the other three main suburban centres in this Dominion, especially in Auckland and Wellington, yet it does not apply to the Christchurch–Lyttelton line. So far as Lyttelton itself is concerned, it is doubtful whether there will be any considerable increase in traffic with electrical operation over that with the present steam operation, even with the great discomfort of the tunnel; the traffic between these two points is divided between the ordinary interurban traffic and that traffic caused by the arrival and departure of steamers, and, as it is the only present

means of regular transportation between the two places, it is obvious that the nature of the train service will not affect the extent of the traffic (goods and passenger) to a great extent. So far as the steamer traffic is concerned, there is to be expected the ordinary normal annual increase, but the interurban passenger traffic increases very slowly, and there is no particular reason to expect any considerable increase due to electrification or a better service, as the situation and the conditions at Lyttelton are not sufficient attraction to induce an influx of population. There is the suburban traffic between Christchurch and Linwood, Opawa, Woolston, and Heathcote; it is possible that a slight increase in the passenger traffic between these stations may result from the improved electric service, but, as these places are at present served by a good tramway service, which, further, collects and sets down at each end more conveniently for the average passenger than the railway, the rail service would have to be made much more attractive than the tramway service to induce much change-over of traffic. In order to show the rate of increase in passenger and goods traffic through the Lyttelton Tunnel the following table is given, for the year ending 31st March, 1908 to 1923 inclusive:—

Traffic through Lyttelton Tunnel, 1908–1923.

Year.	Passengers.		Goods Tonnage.		
	Per Annum.	Per Day.	Gross Total per Annum.	Average per Day.	Net Tonnage per Annum.
1908	1,347,937	3,693	1,212,816	3,976	504,230
1909	1,344,394	3,683	1,263,581	4,143	525,336
1910	1,288,285	3,530	1,332,252	4,368	553,886
1911	1,385,188	3,795	1,443,523	4,733	600,147
1912	1,459,653	4,000	1,365,657	4,478	567,774
1913	1,530,305	4,193	1,505,462	4,936	625,898
1914	1,561,404	4,278	1,391,660	4,562	578,585
1915	1,527,673	4,185	1,507,102	4,941	626,580
1916	1,617,466	4,432	1,423,766	4,668	591,933
1917	1,727,623	4,733	1,155,541	3,789	480,418
1918	1,487,403	4,075	1,102,735	3,616	458,464
1919	1,476,095	4,044	1,021,331	3,349	424,620
1920	1,671,347	4,579	1,252,002	4,105	520,522
1921	1,905,559	5,221	1,431,713	4,694	595,237
1922	1,870,503	5,125	1,294,932	4,246	538,370
1923	1,839,570	5,040	1,397,409	4,582	580,975

The figures for operating-costs given in this review do not include anything for interest, sinking fund, and depreciation on capital expenditure.

We have not been able, owing to limited information given, to check the estimated capital given in Messrs. Merz and McLellan's report, but it is probable, after allowing for omission of substation and after providing for the extra weight of feeders and for extension to Middleton, that the figure of £190,800 given by them will be approximately correct. Annual charges on this at 8½ per cent. (5½ per cent. interest, 1 per cent. sinking fund, and 2 per cent. depreciation) would amount to £16,218.

It is obvious, therefore, that unless a similar amount can be saved in operating-costs, or a corresponding increase in revenue can be obtained, from a railway-operation economic point of view only, the electrification of the line would not be justified; but there are other considerations which must have some weight. There is no doubt that the atmospheric conditions throughout the Lyttelton Tunnel are extremely uncomfortable, both for passengers and crew, and for many years there has been a consistent demand by the general public for some action to be taken by the Government to alleviate these bad conditions, and, if possible, remove them. The "Programme of Improvements and New Works" (D.–2A, 1924) shows that the Government is alive to this situation, and that the sum of £515,000, spread over a period of six years, is allotted to the proposed Woolston marshalling-yard, Christchurch–Lyttelton works, and Lyttelton double-line tunnel, of which about £265,000 is that proportion set aside for the tunnel. We are of the opinion that this duplication of the tunnel will not satisfactorily deal with the situation. It is true it will reduce the nuisance which now exists, by halving the number of trains passing through the tunnel, but the nuisance will continue, and the demand of the general public will continue until it may be found expedient to electrify both tunnels. As a matter of fact, the present tunnel is ample to deal with the present traffic and a very considerable increase in addition, and with electrical operation it could be still further increased; the need, therefore, for a second tunnel from a traffic point of view is not warranted. The net capital cost of electrification will, as given in the report of Messrs. Merz and McLellan, amount to about £190,800, which is £74,200 less than the estimated cost of the duplication of the tunnel, and duplication would not remove the cause of the public complaint which has been going on so long. We have not been able to analyse or verify this amount of net capital cost, due to the lack of detailed information in the report of Messrs. Merz and McLellan, but it is not likely to be very far from the correct figure. Therefore, although from a railway economic point of view electrification is not justified, yet from a broader or national point of view it may be fully justified. In such cases, however, it may be asked whether the Railway Department should be compelled to assume any burden or loss which may directly accrue from the change-over to electrification, or whether such burden should be met by a grant from the Consolidated Fund: on this point we offer no recommendation. We are assuming the capital value of existing locomotive rolling-stock for this line at £20,600, and the annual capital

charges on that at £1,750. Assuming that there is no increase of revenue over the present amount, this annual burden will amount to the difference in annual interest and sinking fund on the respective capital costs, less the gain on operating the present service electrically as against the present service with steam, but without the duplication of the tunnel, or, roughly, £11,421. As the revenue increases so will this burden decrease.

If, however, the annual interest and sinking fund on the estimated cost of tunnel-duplication is added to the steam service it reverses the position. The estimated cost of duplication is given as £265,000. Annual capital charges on this at 6½ per cent. (5½ per cent. interest and 1 per cent. sinking fund) would amount to £17,225, and in this case there would be no compensating reduction in operating-costs, and little improvement in comfort. Compared with duplication of the tunnel electrification therefore means an annual saving of £5,804 and removal of discomfort to passengers.

There are, of course, advantages and disadvantages on both electric and steam operation of railways, but it is generally admitted that, where the relative operating-costs are approximately equal, the advantages of electric operation far outweigh those of steam operation. The chief advantages of electric operation, compared purely as a tractor with its steam rival, leaving out of account all question of the cost of fuel or energy supplied for a given service, are :—

(1.) Capacity for almost continuous service in traffic ;
(2.) Low cost of repairs ;
(3.) High tractive capacity per unit ;
(4.) Low weight per continuous draw-bar horse-power available ;
(5.) Reliability in service ;
(6.) Complete independence of weather conditions ;
(7.) Even turning-moment ;
(8.) High mechanical efficiency and large range of maximum efficiency ;
(9.) Possibility of operation as a unit or in multiple by minimum crew ;
(10.) Reduction of signal movements and occupation of tracks, due to elimination of necessity for turning and movements for obtaining coal and water, and daily visits to sheds ;
(11.) Much greater flexibility of wheel-base ;
(12.) Large overload capacity available instantaneously.

The chief disadvantages of electric operation are the number of units which may be immobilized by a failure of energy-supply, and the dependence of each unit for mobility on contact with the electrical distribution-system of the track. In a mixed system of electric and steam traction, such as would be the case under review, a further disadvantage is the necessity for changing from steam to electric traction, or *vice versa*, at the connecting-points of the two systems. Although it does not here apply, in many cases the economic length of run for electric traction may not coincide with the natural economic length of run for a steam locomotive.

As the above report is in the nature of a commentary on the report submitted by Messrs. Merz and McLellan, we have confined consideration to the Lyttelton–Christchurch section. In view of the fact, however, that it has been decided to proceed with the marshalling-yards at Middleton, we are emphatically of opinion that the electrification should be extended to Middleton, so that the goods traffic could proceed direct from Lyttelton to Middleton and *vice versa* without the necessity of changing at Christchurch. The section between Christchurch and Middleton should, of course, be operated either under steam or electric operation, so that passenger and local goods-trains from south and north to Christchurch could proceed direct to their destination without changing locomotives. The additional capital cost with the substation located at Addington would not be very considerable, being confined to overhead and track work.

Diesel Electric Locomotives.

As an alternative to complete electrification, a great measure of success in other countries has attended the introduction of Diesel electric locomotives, particularly in the United States and Canada. The machine consists of a direct-connected Diesel engine and D.C. generator on the locomotive, transmitting power to the electric motors on the axles of the locomotives as in the case of ordinary electric propulsion.

An examination of operating-costs and results elsewhere indicates a very considerable saving in operating-costs over the ordinary steam locomotive. As compared with complete electrification there should be a considerable reduction in capital cost, and also the advantage that the expenditure could be spread over a longer period, and the system tried out by purchasing successive oil-electric locomotives after the first one had been given complete trials.

There would be an almost complete elimination of the smoke difficulty in the tunnel, but we are not assured as to the effect of the exhaust gases from the engine on the comfort of the passengers, and the possible consequent necessity of ventilation. We would suggest that it would be advisable to fully investigate the possibilities of this type of locomotive before deciding on electrification or duplication.

Ventilation.

In reference to the correspondence from Christchurch advocating ventilation, we have looked into the possibilities of this generally, but have not been able in the time available to get out a complete scheme. It would appear, however, that the troubles of the present tunnel discomfort could be got over to some extent by ventilation. It is estimated that the capital cost of a suitable mechanical ventilating-system would be very considerably less than either electrification or duplication, but the annual cost of operating such ventilation system would mean at least £4,000 per annum, in addition to the cost of steam traction. As steam traction is already more expensive than electric, this extra cost for ventilating plant would not appear justified, especially as it would not altogether remove the discomfort which is the main reason for consideration of any alteration to the present arrangements.

F. T. M. Kissell.
25th January, 1926. R. Percy Sims.

ANNEXURE *(B)* to APPENDIX B.

REPORT OF MESSRS. F. T. M. KISSELL, J. E. L. CULL, A. S. WANSBROUGH, AND G. W. WYLES, ON THE ELECTRIFICATION OF THE LINE BETWEEN LYTTELTON AND CHRISTCHURCH.

ORDER OF REFERENCE.

1. How far should electrification extend.
2. What sidings at the various stations should be electrified.
3. What power plant (locomotives) would be required.
4. Whether locomotives from Otira would be suitable, having in view the fact that they were designed for heavy grades and are of limited speed.
5. Whether passenger-cars should be on multiple-unit system.
6. If electrification taken to Middleton, whether Linwood locomotive-depot should be shifted to Middleton.
7. Generally to indicate the rough outlines of a complete scheme, with estimated costs.
8. When can work be started in view of yard alterations necessary.
9. Which Department should carry out the various branches of the work.
10. Whether a contract should be let for fabricated material and plant only, or whether this should include construction.
11. What amount of money per year will be required during the period of construction.

1. To decide the limit of the proposed electrification if has been necessary to investigate the traffic conditions operating over the section, considered in conjunction with the new Middleton marshalling-yard and the effect it will have on the method of operating traffic.

The method of working the traffic when the Middleton yard is completed has been fully considered and decided upon by the Railway Department, and will be briefly as follows :—

Trains from south will go to Middleton and there be marshalled with the Christchurch load in front and the Lyttelton load in the rear. After marshalling, the train will proceed to Christchurch, being hauled by a train-engine due to return to the shed. At Christchurch the Christchurch portion will be shunted off, and the Lyttelton load will proceed, either as a complete train or as part of a train of Christchurch loads for Lyttelton.

Trains leaving Lyttelton for south will be marshalled at Lyttelton with Christchurch loads in front, and on arrival at Christchurch will have these loads cut off, leaving the wagons for beyond Christchurch to go on to Middleton for station marshalling.

The position summarized is therefore that all goods-trains will require to stop at Christchurch for removal of loads and making up trains with loads ex Christchurch from Lyttelton or Middleton, as the case may be. This method of working eliminates, therefore, consideration of through goods-trains as far as Christchurch is concerned.

In regard to passenger traffic, Christchurch is the terminal for all local trains and the starting-point for main-line traffic, and through working for this class of traffic need not be considered. In any case, all trains would require to stop at Christchurch.

It will therefore be apparent that all trains will stop at Christchurch, and in the case of goods some shunting operation will be necessary, and in the case of passenger-trains the starting-point is Christchurch, and therefore no delay to traffic will result by changing engines at Christchurch.

The Committee considered the extending of electrification to Middleton, but, in view of the method of working traffic, as explained, have come to the conclusion that no additional advantage would be gained by so doing, and recommend that the limit of the electrification area be confined to certain sidings in Lyttelton, Christchurch, and intermediate stations, the main line between Lyttelton and Christchurch, and certain roads in Christchurch yard, as indicated on the attached plan.

The Committee have also considered the question of providing electrification from Christchurch to Addington to allow of engines going to Addington shops for repairs, but are of the opinion that the cost and upkeep of this work is not justified, as electric engines can be easily hauled to the shops by steam locomotives when necessary for major repairs, and minor repairs can be carried out in the engine-depot.

2. The extent of the electrification necessary on sidings is governed by the fact that provision must be made for the electric locomotives working over the section to pick up and put off wagons on sidings throughout the section. (Generally, electrification will be required to be carried out to enable this shunting to be done, and it may be necessary in some cases to isolate sections of the sidings to enable the overhead to be deadened when loading operations are taking place. Alternatively, these arrangements may be obviated by slewing the overhead so as to bring it out of the way of loading operations.) The extent of electrification recommended is shown on the attached plan.

3. From the existing time-table, with which must be considered the special goods traffic, five locomotives appear to be the minimum to carry out the service. At very busy periods it is probable that the whole five locomotives will be in use, although at slacker periods one will probably be spare. One spare locomotive will be required, making a total of six. It is recommended that one class of engine be provided capable of speeds to suit the various classes of traffic on the section.

4. In regard to the question as to whether the locomotives from Otira would be suitable for the Lyttelton-Christchurch service, the Committee are of the opinion that these would not be satisfactory in view of the fact that the Otira locomotives were designed for comparatively low speeds on heavy grades, and could not be worked at the higher speeds necessary for the Christchurch-Lyttelton service without considerable expenditure being incurred to render the locomotives suitable for the different type of service.

5. The Committee recommend that the traffic be worked by electric locomotives. The multiple-unit system would involve building special stock; and, while this is probably the best method of dealing with heavy suburban traffic, it would be an unnecessary expenditure for the Christchurch-Lyttelton section, where the traffic is mixed and all types can be handled by electric locomotives. The Committee therefore do not recommend the multiple-unit system for this section.

6. The Committee do not recommend the electrification being extended to Middleton, or the removal of the Linwood engine-depot, on account of the electrification proposals. In order to save light running to Linwood the Committee considered the provision of an electric-engine shed at Christchurch, but, as this would involve keeping a second engine-supervising staff, the Committee are of the opinion that it would be more economical to use the Linwood engine-depot. An extension to the present engine-shed will probably be necessary to accommodate locomotives running in with pantographs up, and a section of the present shed could be used as a workshop for running maintenance and repair. The plan indicates the proposed extension to the shed and necessary siding alterations.

7. After investigation, the following scheme is recommended by the Committee:—

The tractive voltage be 1500, D.C., to be supplied from a substation situated in the vicinity of Woolston. Power to be supplied to the substation at 11,000 volts, A.C., from the Public Works substation at Addington.

The railway substation to be automatically controlled, and to be equipped with two units of about 1000 kw., and the switching arranged so that the second unit will come into operation automatically under peak-load condition.

It is recommended that alternative tenders should be called for rotary converters and mercury arc rectifiers, and that in either case the units must be so arranged to reduce interference with communication circuits to a minimum.

The overhead should be of the single catenary type, with copper catenary throughout, in order to reduce feeder cables to a minimum. The use of a copper catenary throughout also has advantages in that it is not subject to deterioration by electroloysis.

Very full investigation has been made in regard to the method to be adopted in the tunnel. The problem is complicated, as a considerable portion of the tunnel is unlined and has a very irregular section, the smoke conditions are bad, and with a normal time-table only five or six hours in the twenty-four are clear of traffic.

The installation of a third rail was considered in preference to overhead, but this would complicate the locomotive design unless the whole scheme were made third-rail, which is not recommended. In view of the simplification of modern overhead construction, the conclusion has been reached that the overhead should be continued through the tunnel. It will be necessary to modify the suspension to some extent to suit varying sections, and tentative proposals are shown in Appendix II.

Tunnel-lighting.—This is not included in the order of reference, but, as part of the general scheme, must be given consideration. The installation of tunnel-lighting would be expensive, and necessitate cables and cable-brackets being installed. The Committee are of the opinion that electric lighting would be an unnecessary expense, and that the present lighting by means of acetylene-lamps for maintenance work should be retained after the tunnel is electrified.

Approximate estimate of work:—

	£
Electric locomotives	61,200
Substation at Woolston	30,000
Overhead equipment, 22 miles of single track	60,000
Alterations to engine-shed at Lyttelton—telegraph and telephone requirments, &c.	10,000
Contingencies, &c., at 20 per cent.	32,240
	£193,440

8. Work in connection with overhead, engine-shed facilities, and substation can be started as soon as detailed designs are prepared and materials received. It is anticipated that the detailed designs and preparation of specification will take three months. Some preliminary work can be commenced preparatory to the arrival of materials. It is estimated that the whole work can be completed in two years. Some overhead work will be dependent on yard alterations at Christchurch and Lyttelton, but it would be possible to install temporary arrangements and alter these to suit the progress of the yards. There is no reason why the work should not be started immediately in regard to plans and specification.

9. The Committee have considered the question of which Department should carry out the various branches of the work, and recommend as follows:—

The substation arrangements for the supply of power should be carried out by the Public Works Department, who should supply the Railway with power at 1,500 volts from the substation. It is recommended that the complete cost of the substation should be a charge against the Railway Department, but the operation should be by Public Works Department. The design generally of the whole work should be carried out jointly by the Public Works and Railway Departments.

Pending the allocation of the work to a branch of the Railway Department to deal with all problems of railway electrification, a branch should be definitely defined before tenders are received, and should be in a position to deal with these and carry out the work.

10. The Committee have considered the question in regard to the letting of contracts, and are of the opinion that contracts should be let for the supply of fabricated material and plant.

11. The estimated amount of money required during the progress of the work is as follows:—

——	Locomotives.	Substation.	Overhead.	General.	Contingencies.	Total.
	£	£	£	£	£	£
First six months	..	3,000	5,000	1,000	7,000	16,000
Second six months	..	7,000	18,000	3,000	8,000	36,000
Third six months	30,100	12,000	19,000	3,000	8,000	72,100
Fourth six months	31,100	8,000	18,000	3,000	9,240	69,340
	61,200	30,000	60,000	10,000	32,240	193,440

F. T. M. Kissell,
Chief Electrical Engineer, Public Works Department.

J. E. L. Cull,
Designing Engineer, Public Works Department.

A. S. Wansbrough,
Designing Engineer, New Zealand Railways.

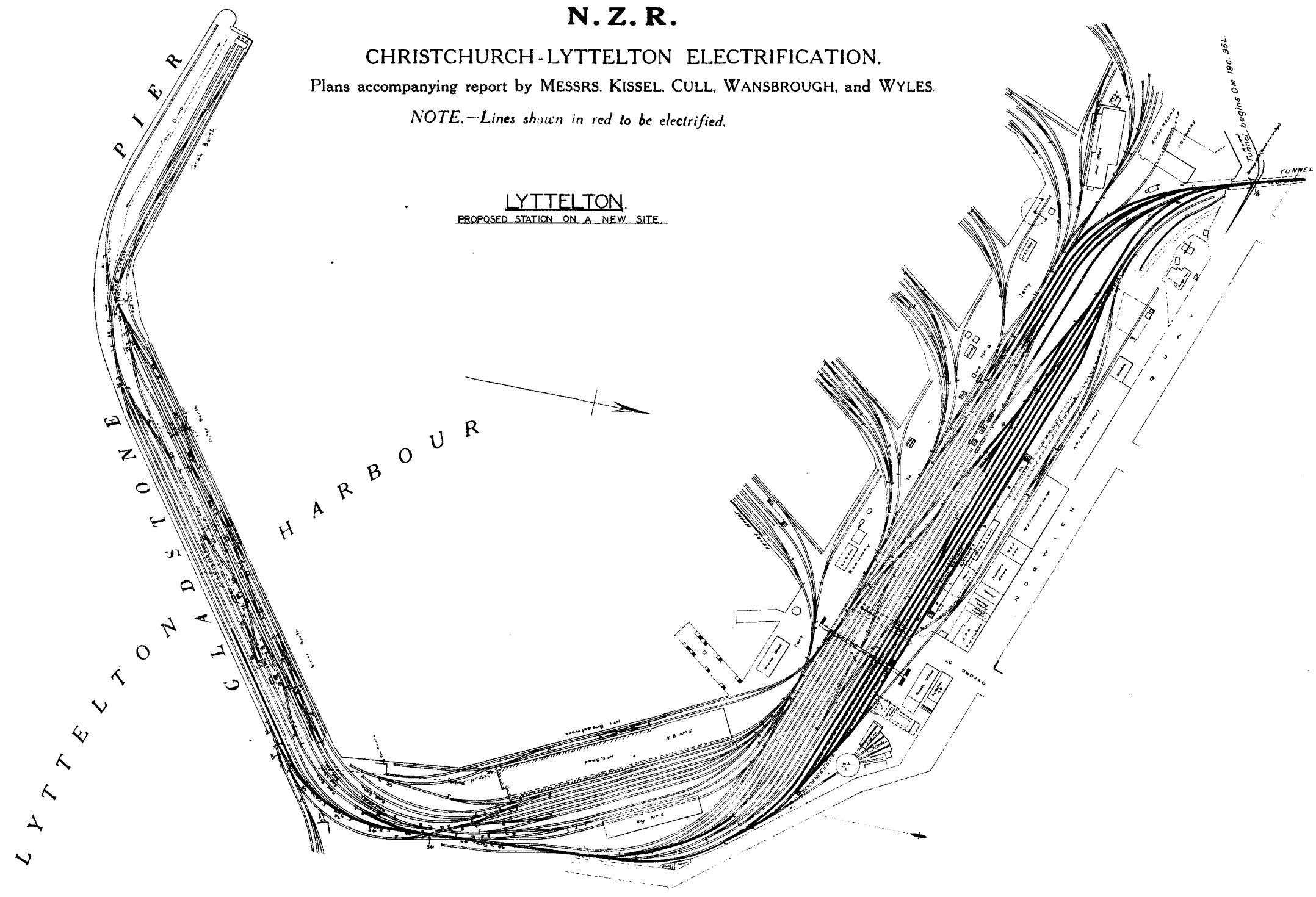
G. W. Wyles,
Assistant Signal and Electrical Engineer, New Zealand Railways.

N.Z.R.

CHRISTCHURCH-LYTTELTON ELECTRIFICATION.

Plans accompanying report by MESSRS. KISSEL, CULL, WANSBROUGH, and WYLES.

NOTE.—Lines shown in red to be electrified.



CHRISTCHURCH ELECTRIFICATION

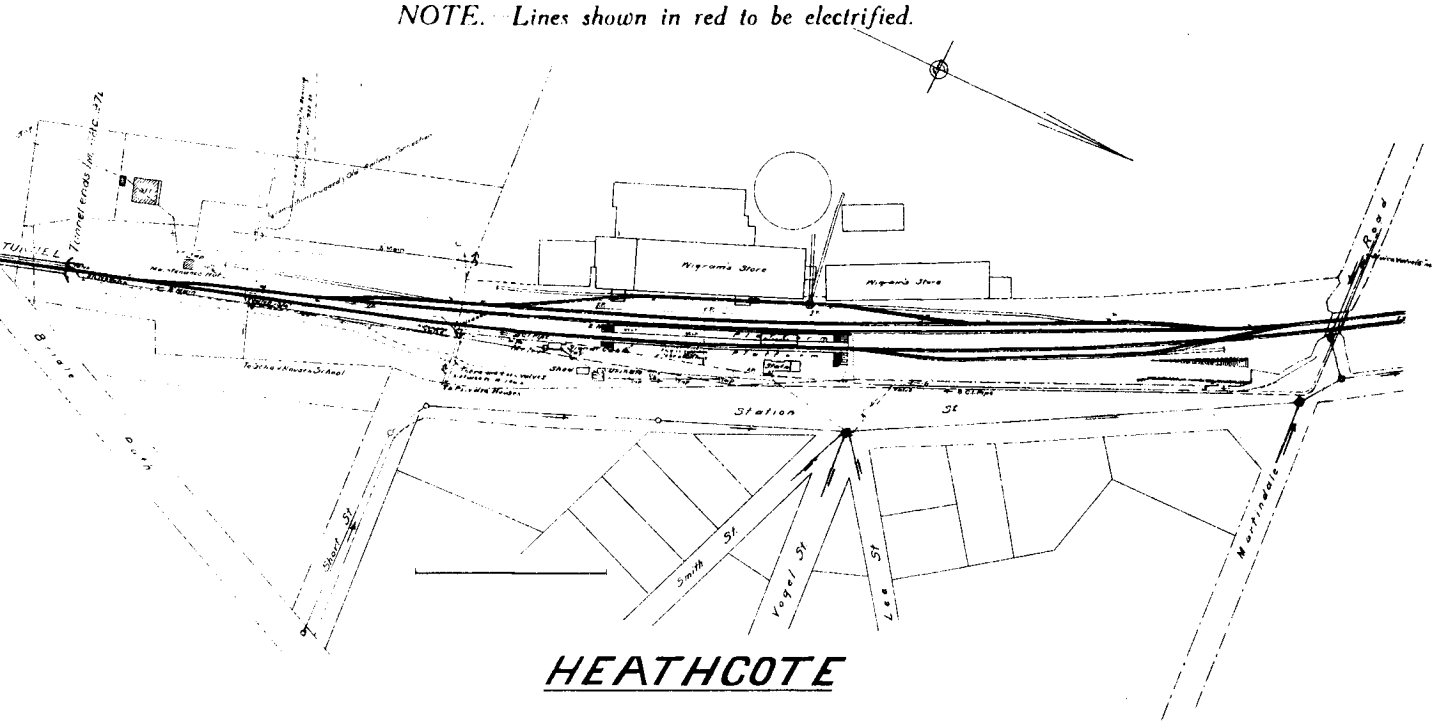
N. Z. R.

CHRISTCHURCH-LYTTELTON ELECTRIFICATION.

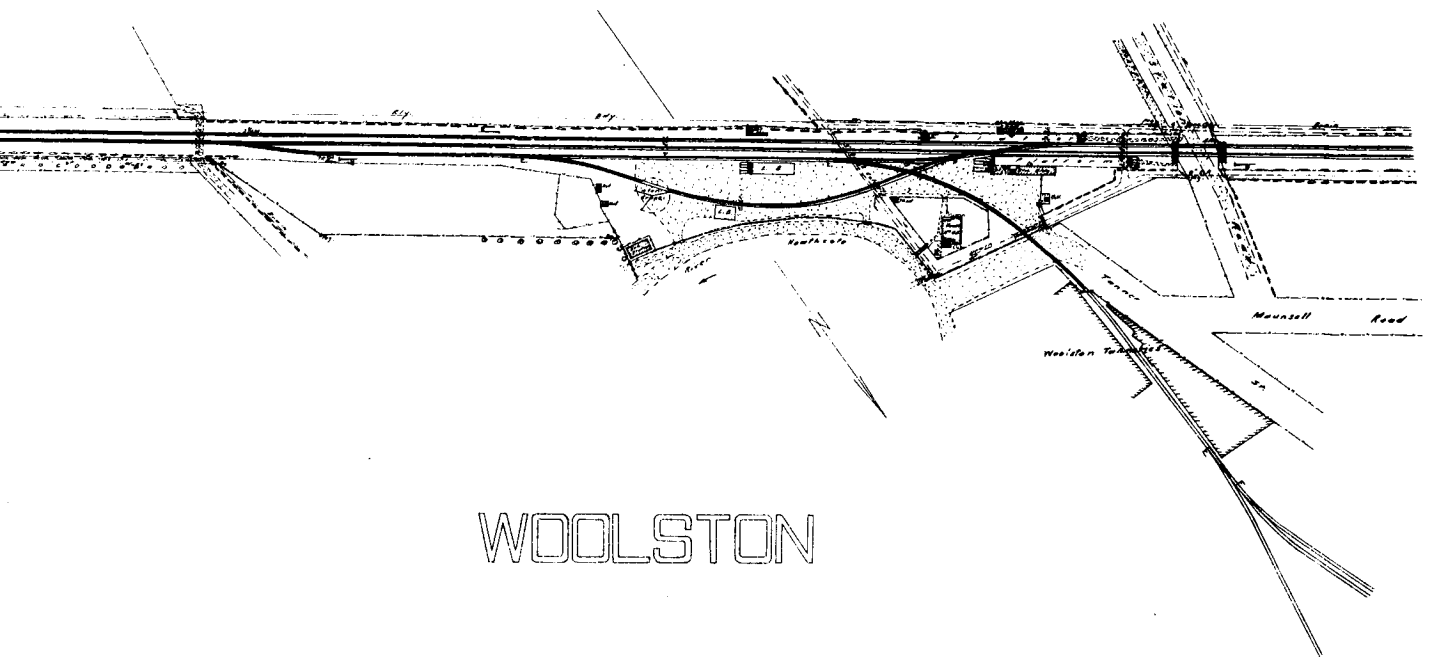
D—2.

Plans accompanying report by MESSRS. KISSEL, CULL, WANSBROUGH, and WYLES

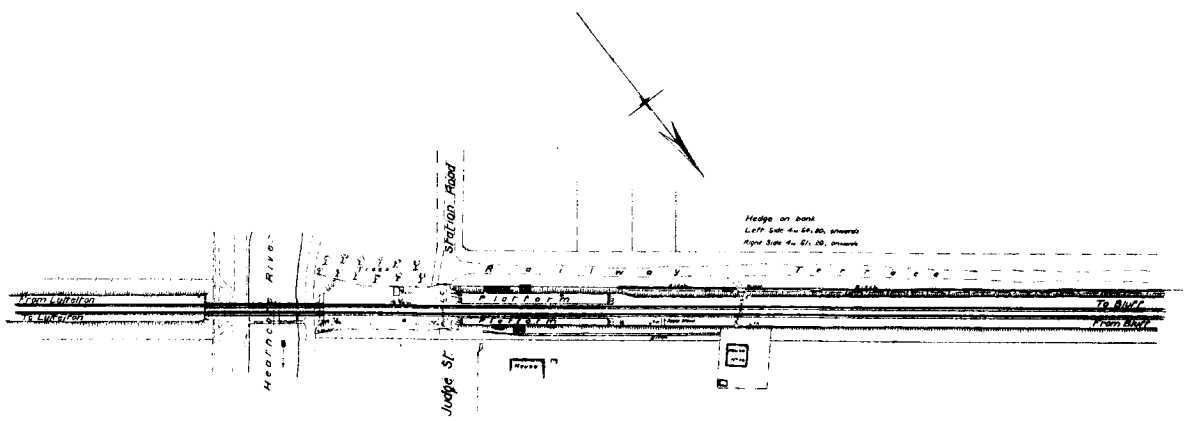
NOTE. *Lines shown in red to be electrified.*



HEATHCOTE



WOOLSTON



OPAWA

CHRISTCHURCH-LYTTELTON ELECTRIFICATION.

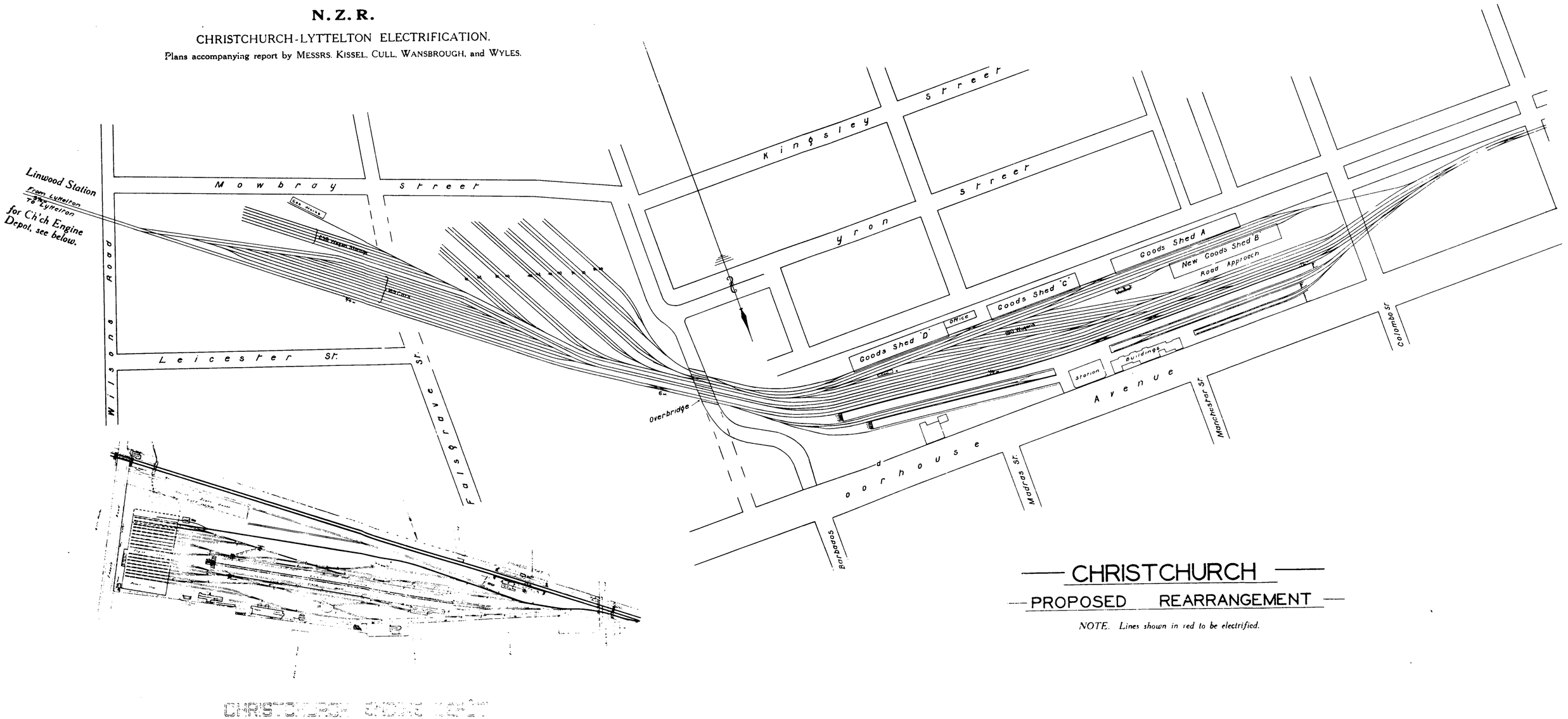
Plans prepared by Messrs Kissel, Cull, Wansbrough, and Wyles

HEATHCOTE

N.Z.R.

CHRISTCHURCH-LYTTELTON ELECTRIFICATION.

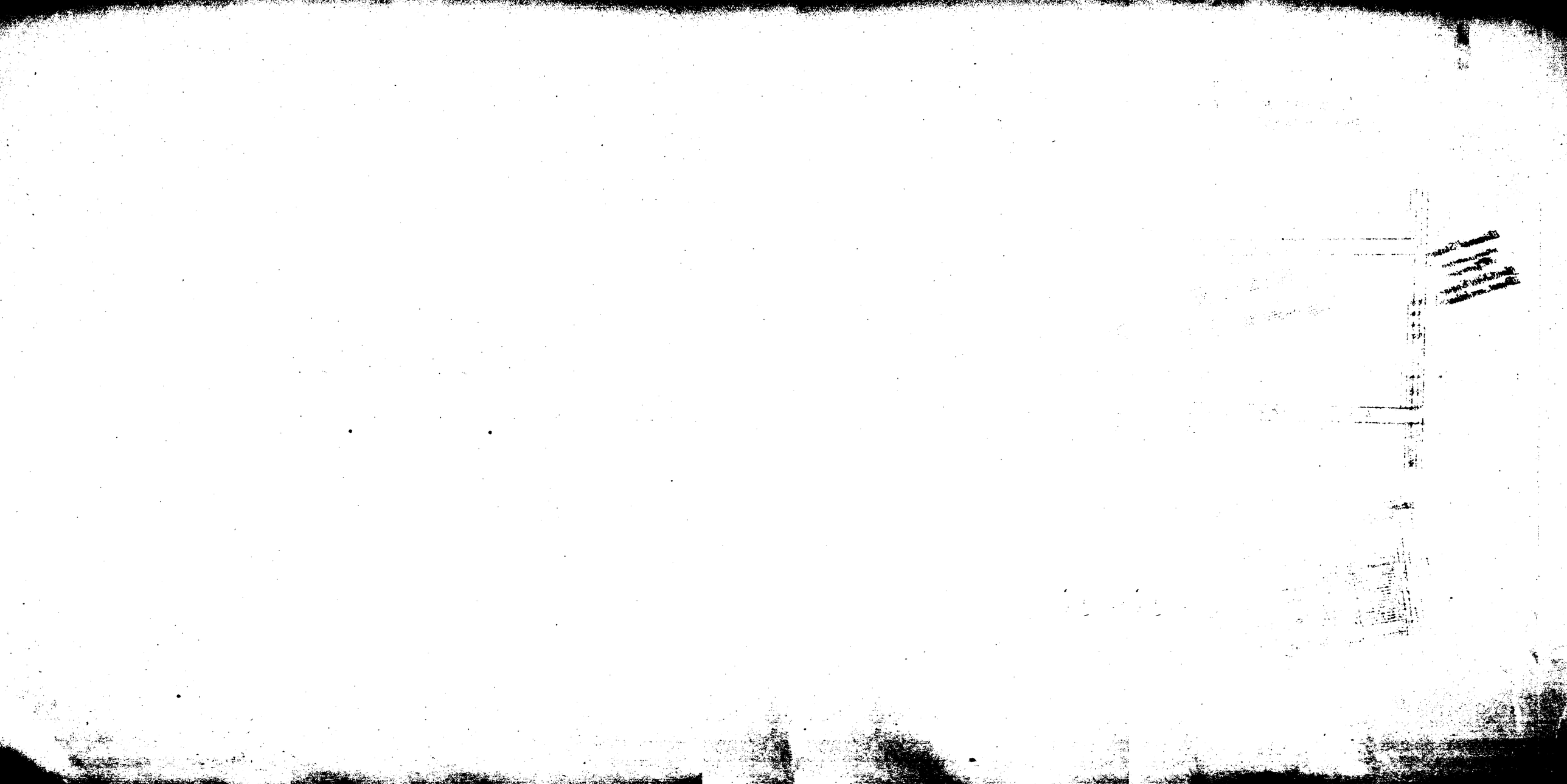
Plans accompanying report by MESSRS. KISSEL, CULL, WANSBROUGH, and WYLES.



CHRISTCHURCH

PROPOSED REARRANGEMENT

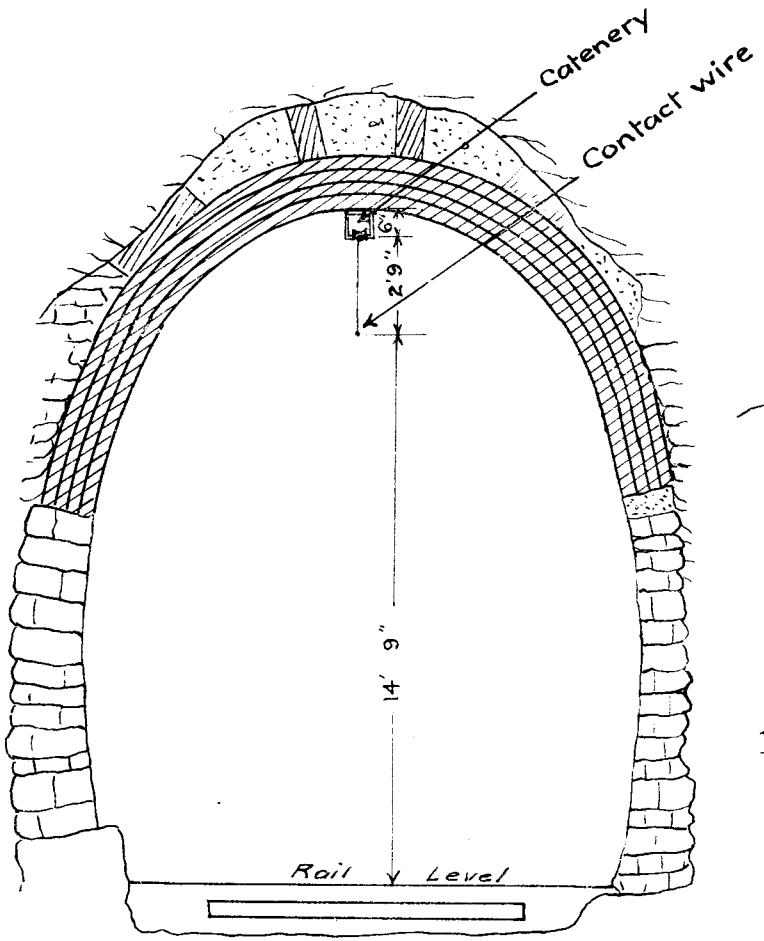
NOTE. Lines shown in red to be electrified.



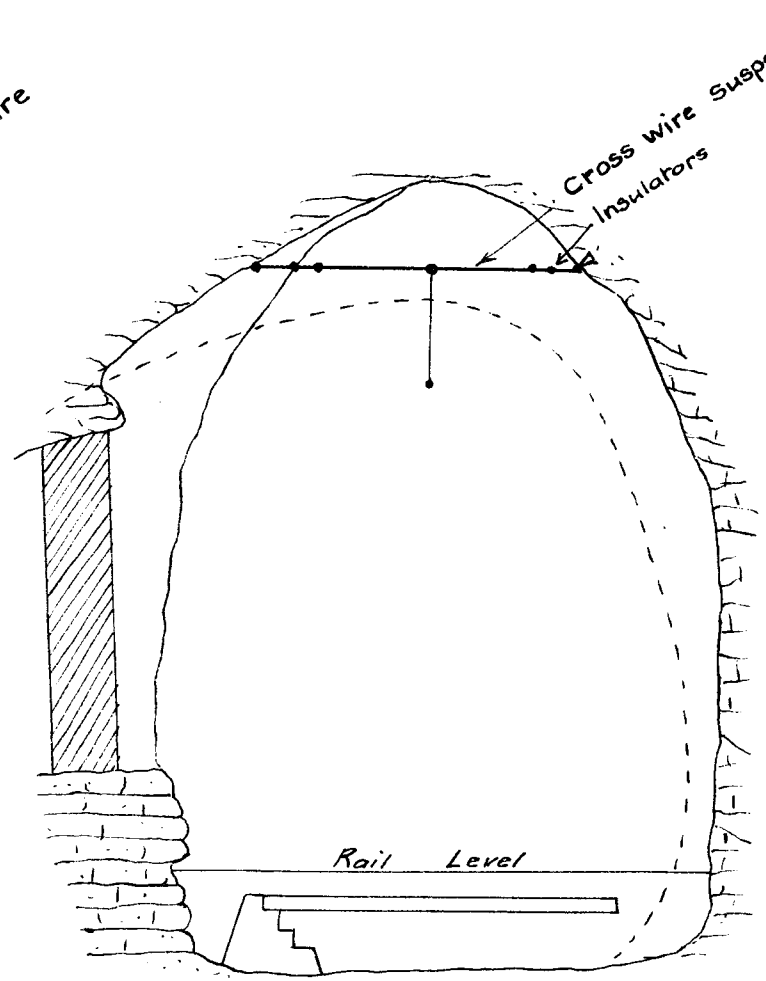
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CHRISTCHURCH-LYTTELTON ELECTRIFICATION.

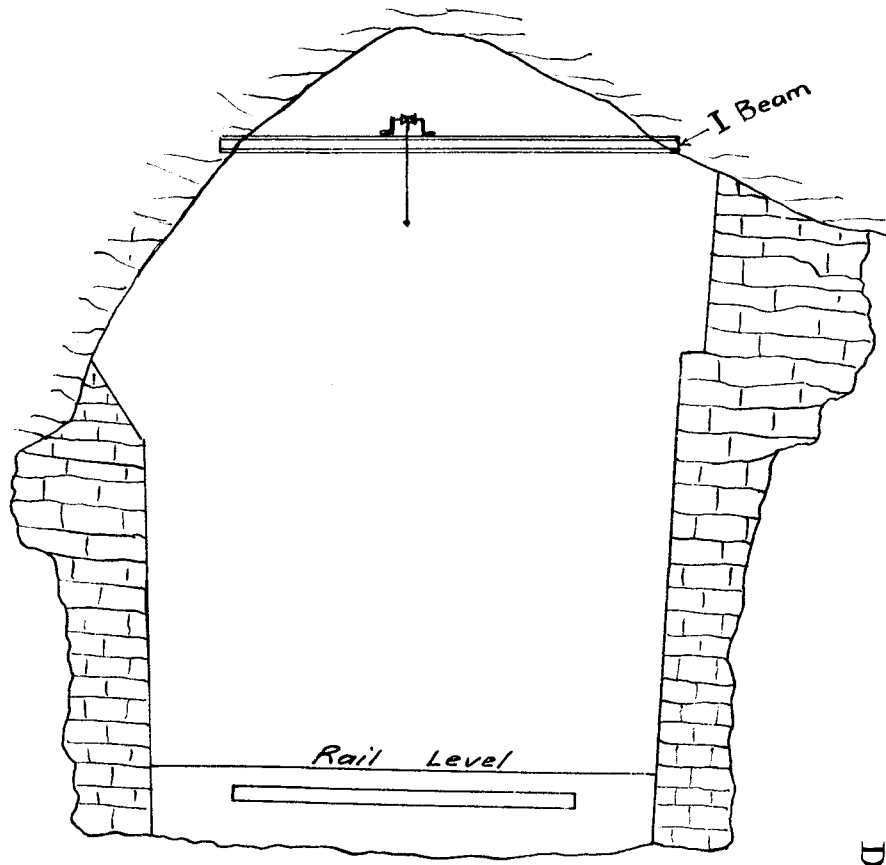
Plans accompanying report by MESSRS. KISSEL, CULL, WANSBROUGH, and WYLES.



Arrangement for suspension in lined portion of tunnel.



Wire suspension



I Beam suspension.

D—2.

PROPOSED METHODS OF OVERHEAD CONSTRUCTION

LYTTELTON TUNNEL.

PATTERSON TUNNEL

PROPOSED METHOD OF OVERHEAD CONSTRUCTION

CHANNELLING AND EXCAVATION

Figure accompanying report of Messrs. Russell, Cory & Appleton and Waters

M.W.K.

APPENDIX C.

Report of the Board of Inquiry into the Suitability of New Zealand Coals for Consumption in Locomotive Engines run upon the New Zealand Government Railways.

APPENDIX C.

REPORT OF THE BOARD OF INQUIRY INTO THE SUITABILITY OF NEW ZEALAND COAL FOR CONSUMPTION IN LOCOMOTIVE ENGINES RUN UPON THE NEW ZEALAND GOVERNMENT RAILWAYS.

COMMISSION

TO INQUIRE INTO AND REPORT ON THE QUESTION OF UTILIZING NEW ZEALAND COAL ON THE NEW ZEALAND RAILWAYS.

To Frederick William Furkert, Esquire, of Wellington; Randolph Percy Sims, Esquire, of Wellington; Sidney Hartley Jenkinson, Esquire, of Wellington; William McArley, Esquire, of Wellington; John Archibald Campbell Bayne, Esquire, of Wellington; Thomas Otto Bishop, Esquire, of Wellington; Ernest Patrick Lock, Esquire, of Millerton.

Whereas by Warrant under my hand dated the 20th day of January, 1925, you were constituted and appointed a Board of Inquiry as and for the purposes set forth in the said Warrant: And whereas it is desirable to cancel and determine such constitution and appointment, and to constitute and appoint you a Board of Inquiry as hereinafter appearing:

Now, therefore, I, Joseph Gordon Coates, Minister of Railways, in pursuance of the powers vested in me by section 9 of the Government Railways Amendment Act, 1921–22, and of all other powers and authorities in that behalf, do hereby cancel and determine the said Warrant, and in further exercise of the said powers do hereby constitute and appoint you, the said

Frederick William Furkert,
Randolph Percy Sims,
Sidney Hartley Jenkinson,
William McArley,
John Archibald Campbell Bayne,
Thomas Otto Bishop, and
Ernest Patrick Lock,

to be a Board to inquire into and report to me upon the following matters, namely:—

(1.) Whether, and, if so, to what extent, New Zealand coals are suitable for consumption in locomotive engines run upon the New Zealand Government railways, having regard to—
  (*a.*) The quality of such coals for steaming purposes;
  (*b.*) The economic working of the railway;
  (*c.*) The safety of property on the railway or on any land adjoining the railway;
  (*d.*) The possibility and likelihood of the Railway Department obtaining continuous and adequate supplies of such coals;
  (*e.*) Any other consideration which in your opinion may be relevant to the question of such suitability.

(2.) Whether it is necessary to alter the construction of the locomotive engines at present in use to adapt them for efficient work using New Zealand coals, and, if so, what would be the approximate cost of such alterations and the time required to complete the same.

(3.) Whether new locomotives can conveniently be designed and used with New Zealand coal, having regard to the same considerations.

(4.) As to the extent of the advantages to New Zealand in finance and employment of labour, or otherwise, assuming that it is possible at reasonable cost to utilize New Zealand coal either partially or entirely on the railways.

And for the purpose of better enabling you, the said Board, to carry these presents into effect you are hereby authorized and empowered to make and conduct any inquiry under these presents, at such times and places in the Dominion of New Zealand as you deem expedient, with power to adjourn from time to time and place to place as you think fit, and to call before you and examine, on oath or otherwise, as may be allowed by law, such person or persons as you think capable of affording you any information in the premises; and you are also hereby empowered to inquire of and concerning the premises by all lawful means whatsoever, and in particular to call for and examine such books, papers, plans, writings, documents, records, or returns as you deem likely to afford you the fullest information on the subject-matter of the inquiry hereby directed to be made, and (subject to my approval to be first had and obtained in each case) to carry out such research or practical experimental work as may in your opinion be found necessary to enable the foregoing questions to be answered, and for the purpose of carrying out such research and experimental work to employ (subject as aforesaid) engineers or such other persons as may in your opinion be necessary or desirable.

And you, the said

FREDERICK WILLIAM FURKERT,

are hereby appointed Chairman of the said Board of Inquiry.

And you, the said Frederick William Furkert, Randolph Percy Sims, Sidney Hartley Jenkinson, William McArley, John Archibald Campbell Bayne, Thomas Otto Bishop, and Ernest Patrick Lock, are hereby required to enter upon and pursue the said inquiry with all due diligence, and to report to me under your hands your opinion on the matters aforesaid not later than the 30th day of June, 1925.

And it is hereby declared that these presents shall continue in force notwithstanding that the said inquiry may be adjourned from time to time and place to place.

And it is lastly hereby declared that these presents are issued under and subject to the provisions of section 9 of the Government Railways Amendment Act, 1921–22.

As witness my hand, this 2nd day of March, 1925.

J. G. COATES,
Minister of Railways.

Approved in Council.

F. D. THOMSON,
Clerk of the Executive Council.

REPORT.

The Hon. J. G. Coates, Minister of Railways, Wellington.

SIR,—

Your Warrant dated 20th January, 1925, as amended by Warrant dated 2nd March, 1925, appointed us to be a Board to inquire and report upon the following matters respecting the utilization of New Zealand coal on the New Zealand railways:—

(1.) Whether, and, if so, to what extent, New Zealand coals are suitable for consumption in locomotive engines run upon the New Zealand Government railways, having regard to—
  (*a.*) The quality of such coals for steaming purposes;
  (*b.*) The economic working of the railway;
  (*c.*) The safety of property on the railway or on any land adjoining the railway;
  (*d.*) The possibility and likelihood of the Railway Department obtaining continuous and adequate supplies of such coals;
  (*e.*) Any other consideration which in your opinion may be relevant to the question of such suitability.

(2.) Whether it is necessary to alter the construction of the locomotive engines at present in use to adapt them for efficient work using New Zealand coals, and, if so, what would be the approximate cost of such alterations and the time required to complete the same.

(3.) Whether new locomotives can conveniently be designed and used with New Zealand coal, having regard to the same considerations.

(4.) As to the extent of the advantages to New Zealand in finance and employment of labour, or otherwise, assuming that it is possible at reasonable cost to utilize New Zealand coal either partially or entirely on the railways.

The Board held its first meeting in Wellington on the 23rd January, 1925, when it was decided to visit the principal coal-mining districts of the Dominion for the purpose of inspecting the mines and mining townships and taking the necessary evidence. With this object the Board visited the Grey Valley and Buller Valley coalfields, Kaitangata, Huntly, and Hikurangi, and took evidence at Greymouth, Reefton, Westport, Dunedin, Huntly, Whangarei, and Hikurangi. Evidence was also received at Auckland and Wellington from representatives of mining companies in regard to the cost of their operations, the steaming-value of their product, and the effect of the importation of foreign coal. At the Board's sitting in Wellington the Under-Secretary, Department of Immigration, was examined as to the number of miner immigrants coming to New Zealand, and the Government Statistician was questioned as to the economic benefit that would accrue to the Dominion by the utilization of New Zealand coals on the railways as against imported coal. At Dunedin representatives of the Southland coal-mines attended and gave evidence, and, although the Board as a whole did not visit the Southland coalfields, almost all the members of the Board are quite familiar with the conditions there.

In all, seventy-eight witnesses were examined by the Board—fifteen at Greymouth, four at Reefton, twelve at Westport, ten at Dunedin, six at Huntly, ten at Auckland, eleven at Whangarei, five at Hikurangi, and five at Wellington. The witnesses comprised mining engineers; the president of the New Zealand Locomotive Engineers', Firemen's, and Cleaners' Association; locomotive engine-drivers and firemen; locomotive foremen; locomotive road foremen; mine-managers; representatives of coal-miners' industrial organizations; coal-miners; general managers, managers, and secretaries of coal-mining companies; representatives of

local Progress Leagues, Chambers of Commerce, Coal-mine Owners' Association, and railway and coal companies.

A verbatim note of the evidence was taken, and each member of the Board was furnished with a copy; a copy of the evidence is attached hereto [not printed]. We do not find it necessary to present a detailed analysis of the evidence, but desire to refer to one or two matters which were dealt with by witnesses. First, it was shown that New Zealand mines formerly supplied a much larger proportion of the coal used by the railways than they have done during the last five years, and the coal so supplied did what was required of it at that time. Secondly, conclusive evidence was given that the New Zealand mines are at present unable to market their whole output, and consequently in all districts most of the mines are working only part time.

Coal Trials.

Although a great deal of information was obtained as a result of the inspections and of the hearing of the evidence referred to above, and the perusal of the reports of previous trials made by the Railway Department, it was felt by the Board that it was necessary that definite trials under as nearly as possible working-conditions should be made of all the coals which appeared to promise any likelihood of giving satisfaction. The North Island trials were conducted with locomotives drawing passenger-trains from New Plymouth to Aramoho and back, and with locomotives hauling special test trains from New Plymouth to Hawera and back. The South Island trials were conducted between Christchurch and Springfield, and between Christchurch and Arthur's Pass. The trials were devised to simulate working-conditions as closely as possible, quite a number of them being made on ordinary time-table trains. In addition to using the various coals alone, certain mixtures were tried which were suggested in evidence and were thought by the members of the Board to be likely to give good results.

The trials were placed under the direction of Mr. J. E. L. Cull, Designing Engineer, Public Works Department, who was assisted by technical officers of the Railway Department; and, particularly with a view to obtaining the advice and assistance of absolutely practical men, the Board appointed and associated with Mr. Cull two retired locomotive officers, Messrs. J. McNeely and J. H. Cameron, who had occupied every position from cleaner to locomotive foreman. The Board realized that, in addition to ascertaining the relative quantities of various coals burned, it was necessary also to judge of the difficulty or otherwise which would be imposed upon the men operating the engines as a result of the use of some of the coals with which the experiments were made, and that it was therefore desirable to have a man engaged on the trials on behalf of the Board who had—to put it colloquially—"gone through the mill" himself.

The attached diagrams and records of these trials indicate that the following points were considered: The question as to whether the engine steamed freely or otherwise; the method of firing; the use of firing-tools; the type of fire used (whether light or heavy); the effect of the weather; the condition of the rail; the general condition of the engine and boiler; the effect of any delays on the road; the condition of the furnace, tubes, and smoke-box at the beginning and at the end of the run; and the date on which the boiler was washed out and the tubes swept. A note was also made as to whether any adjustments to the engine were necessary, and as to the work of the engine-men—whether this was satisfactory, and whether the coal was economized as far as possible.

It can be said that throughout the trials all the officers of the Railway Department assisted the Board to the utmost; and, although the firemen had to manipulate coal of very varying qualities, they did the very best they could in order to ensure that each class of coal received impartial treatment.

The trials have been very protracted, because such a large number of coals had to be tested, and because it was necessary to work in the trials with the ordinary time-table and the ordinary hours of the staff.

The Board does not claim that the results of these trials are conclusive on all points, because the testing of coals under working-conditions is not a matter which can be disposed of by one or two trials, but must be the work of years of trial

and experimentation by those actually engaged in the service, in order that the maximum results may be obtained with any particular type of coal and locomotive. However, the trials conducted by the Board have been more extensive than any series of trials previously undertaken in New Zealand, and sufficient information has been obtained to enable general conclusions to be arrived at.

Coming now to the questions in the order of reference :—

(1.) *Whether, and, if so, to what extent, New Zealand coals are suitable for consumption in locomotive engines run upon the New Zealand Government railways.*

The tests have proved that quite a number of New Zealand coals are suitable for consumption in New Zealand railway locomotive engines, because—

(*a.*) The quality of these coals for steaming is excellent.

(*b.*) The use of certain New Zealand coals would be more economical than the use of imported coals, because little, if any, more of such coals would be required than would be necessary if Newcastle coal were used. The cost of these classes of coal to the Railway Department is generally sufficiently lower than that of the imported article to outweigh any disadvantages which may be attributable to the domestic coal, and while this difference in cost continues economy in working must result from the use of New Zealand coal. (See table of comparative coal costs, Appendix.)

(*c.*) Experience with the bituminous coals goes to show that there is little, if any, more danger to property on the railway, or on land adjoining the railway, than would result from the use of imported coals. With the brown coals there is greater danger, especially during certain seasons of the year, if such coals are used under the present existing conditions (see note below).

(*d.*) It is possible and likely that the Railway Department would be able to obtain continuous and adequate supplies of New Zealand coal. Our reason for saying this is that there was evidence that the mining facilities on nearly every coalfield were adequate for the production of much more coal than is now being won, and the number of miners engaged in the industry was greater than was warranted by the present output. The large percentage of slack coal at present produced at the mines militates against the use of New Zealand coal on the railways, and if any means could be devised whereby a greater percentage of round coal could be produced, or if slack coal could be made suitable for use on the railways, this would still further strengthen the position. It was found that the removal of all material below $\frac{1}{4}$ in. from the unscreened samples submitted greatly improved the result.

(*e.*) While we are of opinion that certain New Zealand coals could be successfully and economically used for practically all railway purposes, we think that the Railway Department should maintain in stock a supply of coal sufficient to meet all requirements for not less than three months. All coal deteriorates when kept in the open air, but Newcastle coal deteriorates less than New Zealand coals, and is therefore most suitable for reserve stock. As even Newcastle coal cannot be kept indefinitely there must be some movement of these stocks, which would mean a certain constant consumption of Newcastle coal.

During the trials it was conclusively shown that favourable results could be obtained by the use of mixtures of various New Zealand coals, and that New Zealand coals which by themselves would be unsuitable gave fair results when mixed. Further, mixtures of Newcastle coals with New Zealand coals gave excellent results. We consider that this is a promising avenue for investigation which should be followed up.

Though trials might indicate that a locomotive would burn no more of a cheaper coal than of a more expensive one, this is not everything that has to be considered. The use of some coals brings about difficulties of a more or less obscure nature in locomotive practice, affecting the life and repairs of the boiler and firebox, which are not disclosed as the result of short-period tests, and these factors must be given due consideration by the Railway officers responsible for the locomotive services when placing orders for coal. There is, further, the effect upon the personnel to be considered. The use of highly sulphurous coals in tunnels is most objectionable. Some of the coals tried enabled the trains to be run to time with the test load, and with the consumption of an amount of coal which appeared to indicate that that particular type of coal was economical, but the use of the coal involved a strain upon the locomotive men which would not be justified by the comparatively small advantage otherwise gained. The duties of a locomotive crew do not consist only of keeping up steam and hauling a certain load, and if the purely mechanical operations are so strenuous as to prevent the crew giving that attention to signals and the general safety of the train under their charge which is desirable and necessary, then the pecuniary advantage which might result from the burning of such coal would be very dearly bought.

(2.) *Whether it is necessary to alter the construction of the locomotive engines at present in use to adapt them for efficient work using New Zealand coals, and, if so, what would be the approximate cost of such alterations and the time required to complete the same.*

All the above answers under the heading No. 1 refer particularly to the use of coals on what are commonly known as wide-firebox engines. Satisfactory results were not obtained with the narrow-firebox engine placed at the disposal of the Board by the Railway Department. In view of the fact that evidence given at Westport indicated that no difficulty was experienced in train-running with the narrow-firebox engine there in use while burning the local coal, and of the fact that when only narrow-firebox engines were in use on the New Zealand railways New Zealand coal was also then almost exclusively used, it seems reasonable to suppose that more favourable results might have been obtained with another type of narrow-firebox engine. However, as the wide-firebox engine is now practically the standard in the Railway service, as it now runs a considerable proportion of the train-mileage and hauls practically all the important trains, and, moreover, as the proportion of wide-firebox engines is continually increasing, it does not appear necessary to enter upon any extensive policy of altering the construction of the locomotives at present in use. As the present narrow-firebox engines wear out there is little doubt that the other type will be adopted, and that automatically the necessity on this ground for using any but New Zealand coals will decrease. In this connection the following return shows the increase in the proportion of engine-miles run by wide-firebox engines, the tractive force and number of such engines, from 1915 to 1925 (with estimated figures for 1927), and the corresponding decrease in the figures of the narrow-firebox engines :-

Year ended 31st March,	Percentage.				Locomotives.			
	Engine-miles.		Tractive Force (Miles).		Number.		Tractive Force (Tons).	
	Wide.	Narrow.	Wide.	Narrow.	Wide.	Narrow.	Wide.	Narrow.
1915	21	79	25	75	97	464	876	2,376
1918	25	75	33	67	126	499	1,135	2,783
1921	28	72	35	65	126	482	1,135	2,770
1924	39	61	47	53	201	458	1,815	2,690
1925	41	59	50	50	210	452	1,898	2,675
1927 (estimated) ..	46	54	55	45	235	422	2,139	2,556

In further reference to heading No. 1 (*c*) above, good results were also obtained by the use of brown coals; and, considering the very cheap rate at which these coals can be obtained in the districts where they are mined, they might be used to a very large extent if the sparking difficulty could be overcome. It would have been quite impossible, without delaying the preparation of this report indefinitely, for the Board to have itself gone into the question of spark-arresting—this is a work for locomotive engineers and other experts to undertake; and, in view of the large financial benefit that would result to the Railway service by the successful use of the cheap coal referred to, we are of the opinion that considerable expenditure in investigation is justified in a further endeavour to arrive at a method whereby the coal in question can be used without danger of fire to railway or adjoining property. The fact that railway systems in other countries, where the climate is more difficult from the special point of view in question, are operated almost entirely with soft coals of an even lighter nature than the New Zealand brown coals under discussion, would appear to indicate that this problem is worthy of further investigation. In some districts, and during certain seasons, this danger from sparking is not very manifest.

In all countries the cost of coal is an important item in railway expenditure, and this is particularly so in New Zealand owing to the relatively high price of coal. The whole question of the coal-supply for the New Zealand railways is of such magnitude and complexity, and the financial aspect so important, that we strongly recommend that this branch of Railway management should be placed under the control of a technically trained and qualified Fuel Engineer, who should be responsible for the purchase and economic use of all coal necessary; and we are of the opinion that if such an officer were instructed to use every endeavour to overcome any difficulties met with in utilizing New Zealand coals it would be found within a very short time that very little coal need be imported, and that a great economy in the fuel bill would be effected. We are further of the opinion that the maximum economy in the use of coal cannot be attained unless this recommendation is carried out.

(3.) *Whether new locomotives can conveniently be designed and used with New Zealand coal, having regard to the same considerations.*

As the New Zealand locomotives now being built can and do use New Zealand coal, having regard to the above considerations we naturally reply in the affirmative to the question as to whether new locomotives can be conveniently designed and used with New Zealand coal.

(4.) *As to the extent of the advantages to New Zealand in finance and employment of labour, or otherwise, assuming that it is possible at reasonable cost to utilize New Zealand coal either partially or entirely on the railways.*

It would be a difficult, if not impossible, task to endeavour to express in pounds shillings and pence the extent of the advantages to New Zealand in finance and the employment of labour, or otherwise, assuming that it is possible at reasonable cost to utilize New Zealand coal either partially or entirely on the railways, but it can be said in a general way that the advantages to New Zealand would be undeniable. At the present time the balance of trade with Australia is against us, and the continual importation of large quantities of Australian coal does not improve this position. As previously noted, the miners in the Dominion are not working full time, except in one or two favoured mines. If no coal were imported it is not likely that any more men would be employed in the coal-mining industry, but those already engaged would have less unemployment, and would consequently have a greater spending-power, which would tend to improve business, both State and private, in every direction. The mines would be able to turn out this extra coal with little or no additional facilities. Their overhead expenses would therefore be lessened, and consequently the cost of winning the coal might reasonably be expected to recede. Imported coal involves the employment of less labour in New Zealand because, apart from the labour involved in winning it, it is usually

delivered to the ports where it will be used, whereas New Zealand coal has to be carried by rail, loaded into New Zealand ships with New Zealand labour, and then transported and unloaded at the port of consumption. Thus the utilization of New Zealand coal in place of imported coal would result in a general improvement in the labour and financial situation, and is consequently an object to be aimed at, provided it can be achieved without a compensating loss in the operation of the railways. Moreover, as indicated by the trials, and referred to more particularly in our answer to question No. 1, the use of New Zealand coal will, in many cases, result in an actual direct saving to the Railway management. Every centre, however, must be considered separately, because the cost of transporting, storing, possibly mixing, and the requirements of the varied traffic must all be considered by the Fuel Engineer previously referred to, in order that the proper solution of each phase of the problem may be obtained.

Copies of the reports on the coal trials made by the officers engaged thereon are attached hereto.

We have the honour to be,
Sir,
Your obedient servants,

F. W. Furkert, Chairman.
R. Percy Sims
S. H. Jenkinson
W. McArley
J. A. C. Bayne
T. O. Bishop
E. P. Lock
} Members of Board.

Dated at Wellington, this 21st day of December, 1925.

ANNEXURE TO APPENDIX C.

Table showing Comparative Costs of Coals at various Depots in the Dominion.

	Newcastle.	Waikato.	Westport.	State.	Blackball.	Kaitangata.	Waronui.	Taratu.	Southland.
Auckland ..	42/3	30/8	42/6	..	..	..	..	..	..
Frankton ..	54/	25/-	54/3	..	..	..	..	..	..
Palmerston North	54/-	37/6	50/9	..	..	..	..	..	..
Taihape ..	55/11	35/9	52/8	..	..	..	..	..	..
Christchurch ..	47/2	..	45/5	38/7	36/11	..	..	..	..
Dunedin ..	42/3	..	43/6	..	..	29/-	23/9	24/10	..
Invercargill ..	49/7	..	48/7	..	..	..	..	..	33/3

Locomotive Coal Trials: New Plymouth to Hawera and Return.

(Loco. Ab. 708.—Special Test Train.)

Date.	Class of Coal.	Gross Trailing-load.	Coal burnt.		Water consumed during Day.	Pounds of Water per Pound of Coal.	Ash.			Remarks.
			During Night.	During Day.			Smoke-box.	Ash-pan.	Firebox.	
		Tons.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	
20/5/25	Denniston (screened) ..	265	988	4,273	34,776	8·14	43·5	96	91	
21/5/25	Denniston (screened) ..	264	974	4,228	33,688	7·97	39	85	91	
22/5/25	Denniston (unscreened) ..	264	887	4,265	33,800	7·92	40·5	76·5	64·5	
23/5/25	Denniston (unscreened) ..	264	995	4,183	32,935	7·87	52	75	126	
25/5/25	Denniston (unscreened) ..	264	809	4,072	33,015	8·11	41	90·5	80	
26/5/25	Millerton (screened) ..	264	909·5	3,894	32,600	8·37	33·5	73	107·5	
27/5/25	Millerton (screened) ..	264	794·5	3,806	32,900	8·64	32	61·5	69	
30/5/25	Millerton (unscreened)* ..	264	957	4,016	32,400	8·07	45	77·5	176	
1/6/25	Millerton (unscreened) ..	264	851	4,173	32,480	7·78	56·5	111	137·5	
26/6/25	Millerton (screened) 1 Millerton (unscreened) 1	264	930	3,872	32,850	8·48	50	71	178	
18/6/25	Millerton (unscreened) 1 Pelawmain .. 1	264	848	3,958	31,350	7·92	35	62	195	
2/6/25	Stockton (screened) ..	264	998	4,024	31,600	7·85	37	78·5	48	
3/6/25	Stockton (screened) ..	264	893·5	4,236	33,200	7·84	41·5	48	52·5	Moderate southerly wind. Estimated 20 m.p.h. at times.
9/6/25	Stockton (unscreened) ..	264	330†	4,315	32,850	7·61	49	63	94	
10/6/25	Stockton (unscreened) ..	264	636†	4,362	31,950	7·32	53	46	60·5	Coal adjusted (56 lb.) for traffic delay.
28/5/25	Aberdare	264	711	3,695	30,450	8·24	7·5	35	156	
29/5/25	Aberdare	264	589	3,684	29,500	8·01	14	50	179	
4/6/25	Aberdare ..	264	787	3,786	30,600	8·08	18	34	175	Moderate southerly wind.
13/6/25	Pelawmain	264	634	4,099	30,900	7·54	33	38	291	Strong south-westerly wind.
15/6/25	Pelawmain	264	757	4,086	31,700	7·76	3	31	240	Strong south-westerly wind, New Plymouth to Stratford; light afterwards. Coal adjusted (112 lb.) and water (1,000 lb.) for traffic delay.
25/6/25	Pelawmain	264	Not weighed	3,660	30,550	8·35	12	32	151	Pelawmain coal was unloaded from a mixed cargo without special supervision, and engineer reported this day's truck to be superior to previous days'.
5/6/25	Welsh	264	794	3,557	29,350	8·25	31	44	281	
11/6/25	Welsh	264	614	3,898	31,250	8·02	43	45·5	307	Firing interfered with by attempt to force superheat.
16/6/25	Waikato	264	1,542	5,644	32,100	5·69	25	65	220	Strong south-westerly wind, New Plymouth to Stratford; light afterwards.
17/6/25	Waikato	264	1,376	5,457	30,700	5·63	32	43	207	
7/7/25	Stockton (run of mine) 1 Waikato .. 1	263	Not weighed	4,783	3,240	6·77	34	26	105	Light north-easterly breeze; effect nil.
8/7/25	Stockton (run of mine) 2 Waikato .. 1	263	1,177 (1 to 1)	4,582	3,195	6·97	36	40	85	Moderate south-westerly wind.
9/7/25	Stockton (run of mine) 1 Waikato .. 2	263	1,044 (2S. to 1W.)	5,023	3,210	6·39	17	44	144	Moderate south-westerly wind.
10/7/25	Millerton (run of mine) 2 Waikato .. 1	263	1,055 (1S. to 1W.)	4,453	3,165	7·11	44	36	130	Light southerly wind.
11/7/25	Millerton (run of mine) 2 Waikato .. 1	263	792 (approx.) (Newcastle.)	4,354	3,190	7·33	39	32	232	Light to very light southerly wind.
13/7/25	Millerton (screened) ..	263	1,020	4,039	3,320	8·22	20	142	43	Moderate north-easterly wind. Air-spaces between bars $\frac{5}{16}$ in.
14/7/25	Millerton (screened) ..	263	811	3,945	3,120	7·91	36	132	118	Light south-westerly wind. Air-spaces between bars $\frac{5}{16}$ in.
15/7/25	Millerton (run of mine, with all under $\frac{1}{4}$ in. screened out)	263	533†	3,678	3,150	8·56	48	77	83	Calm.

* See special report *re* steaming of engines, page 60. † And some wood.

Note.—Overflow from injector not weighed; water consumed is therefore high by an amount estimated at 1 per cent.

Note.—Trials from 9/6/25 to 13/6/25 possibly affected by condition of tubes, as locomotive was away in shops from 6/6/25 to 8/6/25 and tubes were not cleaned.

Locomotive Coal Trials: New Plymouth to Aramoho and Return.

(Loco. Ab. 708.—Passenger-train.)

Date.	Class of Coal.	Gross Trailing-load. New Plymouth to Hawera.	Gross Trailing-load. Hawera to Aramoho.	Gross Trailing-load. Aramoho to Hawera.	Gross Trailing-load. Hawera to New Plymouth	Coal burnt during Day.	Water consumed during Day.	Pounds of Water per Pound of Coal.
		Tons cwt. qr.	Tons cwt. qr.	Tons cwt. qr.	Tons cwt. qr.	lb.	lb.	
20/6/25	Denniston (unscreened) ..	165 13 2	165 13 2	164 17 0	164 17 0	8,212	63,100	7·68
22/6/25	Millerton (screened) * ..	163 17 2	163 17 2	181 15 2	162 18 0	7,964	64,200	8·06
19/6/25	Pelawmain	162 13 0	162 13 0	164 15 3	164 15 3	7,771	60,300	7·76
23/6/25	Waikato	165 19 2	184 17 0	165 8 0	165 8 0	11,492	61,850	5·38
24/6/25	Pelawmain .. 1 Stockton (unscreened) 2	162 10 1	162 10 1	165 12 0	165 12 0	8,031	60,150	7·49

* See special report on steaming of engine, page 60.

Remarks.—Loads are tare of train plus 2 tons for each vehicle. Ash not weighed. Wind—Light air only throughout. Overflow from injector not weighed. Water consumed is therefore high by an amount estimated at 1 per cent.

Locomotive Coal Trials.—Linwood to Springfield and Return.

(Loco. Ab. 776.—Special Test Train.)

Date	Class of Coal.	Gross Trailing-load.	Coal burnt. During Day. During Night.	Coal burnt. During Day. Linwood to Springfield.	Coal burnt. During Day. Springfield to Linwood.	Coal burnt. During Day. Total (Day).	Water consumed (Day only). Linwood to Springfield.	Water consumed (Day only). Springfield to Linwood.	Water consumed (Day only). Total.	Pounds of Water per Pound of Coal.	Ash. Smoke-box.	Ash. Ash-pan.	Ash. Firebox.
		Tons.	lb.	lb.	lb.	lb.	lb.	lb.	lb.				
*25/8/25	Waronui	400	..	..	..	..	..	..	36,450	..	38	257	285
*26/8/25	Kaitangata	400	1,090	..	..	7,921	29,850	6,850	36,700	4·63	47	165	686
27/8/25	Newcastle	400	898	3,714	727	4,441	28,990	6,000	34,990	7·88	20	98	144
28/8/25	Kaitangata	370	1,039	6,324	1,218	7,592	26,210	6,910	33,120	4·39	23	98	701
29/8/25	Kaitangata	370	1,036	5,704	1,324	7,028	26,130	6,660	32,790	4·67	24	128	647
31/8/25	Waronui	370	1,051	7,930	1,218	9,148	26,020	6,650	32,670	3·57	51	385	149
1/9/25	Taratu	370	986	6,774	1,542	8,316	24,940	6,670	31,610	3·80	46	172	58
2/9/25	Taratu	370	1,007	5,916	1,297	7,213	24,010	6,170	30,180	4·18	31	188	40
3/9/25	Southland	370	883	4,582	1,008	5,590	24,680	5,760	30,440	5·45	25	115	138
4/9/25	Southland	370	932	4,443	995	5,438	25,030	6,210	31,240	5·74	19	112	81
7/9/25	Kaitangata	370	676	6,511	957	7,468	27,040	4,670	31,710	4·25	24	429	589
8/9/25	Newcastle	370	620	2,951	1,071	4,022	26,160	6,540	32,700	8·13	7	25	109
9/9/25	Waronui	370	1,090	8,306	1,233	9,539	25,220	6,050	31,270	3·28	74	159	226
10/9/25	Paparoa	370	524	3,564	492	4,056	25,550	5,830	31,380	7·74	47	73	288
11/9/25	Paparoa	370	352	3,335	628	3,963	24,770	6,010	30,780	7·77	48	50	276
14/9/25	Paparoa .. 1 Waronui .. 1	370	972	4,569	917	5,486	24,510	5,970	30,480	5·56	39	78	228
15/9/25	Blackball (screened) ..	370	631	3,477	605	4,082	25,270	5,620	30,890	7·57	14	64	82
16/9/25	Blackball (unscreened) ..	370	665	3,674	854	4,528	25,130	5,650	30,780	6·80	16	65	144
17/9/25	Blackball (unscreened) ..	370	338	3,708	734	4,442	24,950	6,050	31,000	6·98	17	57	121
18/9/25	Blackball (unscreened) 1 Paparoa .. 1	370	509	3,287	910	4,197	25,210	5,620	30,830	7·35	29	22	177
21/9/25	Dobson	370	410	3,191	727	3,918	24,720	6,410	31,130	7·95	40	24	176
22/9/25	Dobson	370	351	3,259	698	3,957	25,180	5,570	30,750	7·77	23	25	218
24/9/25	Dobson .. .. 1 Taratu 1	370	..	3,971	849	4,820	25,580	5,580	31,160	6·46	30	55	89
25/9/25	Dobson .. .. 1 Waronui .. 1	370	297	3,909	778	4,687	24,980	5,480	30,460	6·50	28	44	167
26/9/25	Dobson .. .. 1 Blackball (unscreened) 1	370	407	3,345	792	4,137	25,230	5,530	30,760	7·44	29	41	238
30/9/25	Smith and party	370	463	3,856	765	4,621	24,550	5,960	30,510	6·60	22	49	217
12/10/25	Burke's Creek	370	549	3,927	707	4,634	25,720	5,700	31,420	6·78	30	79	37
16/10/25	Sparks and party ..	370	589	3,356	549	3,905	24,770	5,200	29,970	7·67	36	11	468
19/10/25	Mount Torlesse	370	669	4,681	1,255	5,936	24,930	6,970	31,900	5·37	23	21	679
22/10/25	Baddeley and party ..	370	484	3,800	855	4,655	26,100	5,350	31,450	6·76	23	15	338
23/10/25	Moody Creek	370	941	3,292	778	4,070	25,080	5,530	30,610	7·52	26	32	252
24/10/25	State	370	536	3,008	698	3,706	24,520	5,710	30,230	8·16	18	27	208
28/10/25	Morrisvale (screened) ..	370	713	3,768	707	4,475	24,300	5,790	30,090	6·72	14	85	32

* Incomplete.

Note.—Overflow from injector weighed and excluded from total water consumed.

Locomotive Coal Trials.—Linwood to Springfield and Return.

(Loco. Ba 552.—Special Test Train.)

Date.	Class of Coal.	Gross Trailing-load.	Coal burnt.				Water consumed (Day only).			Pounds of Water per Pound of Coal.	Ash.		
			During Night.	During Day.									
				Linwood to Springfield.	Springfield to Linwood.	Total (Day).	Linwood to Springfield.	Springfield to Linwood.	Total.		Smoke-box.	Ash-pan.	Fire-box
		Tons.	lb.	lb.	lb.	lb.	lb.	lb.	lb.		lb.	lb.	lb.
6/11/25	Newcastle.. ..	346	530	4,084	778	4,862	24,950	4,650	29,600	6·09	190	85	120
7/11/25	Newcastle.. ..	346	619	3,910	664	4,574	27,720	5,350	33,070	7·23	188	30	118
9/11/25	Blackball (screened)	346	948	4,583	437	5,020	26,560	4,980	31,540	6·28	262	80	119
14/11/25	Newcastle.. ..	346	700	3,299	829	4,128	26,550	5,170	31,720	7·68	129	20	131
16/11/25	Blackball (screened)	346	479	4,426	796	5,222	29,020	6,180	35,200	6·74	353	93	81
17/11/25	Moody Creek ..	346	590	3,909	881	4,790	25,950	6,600	32,550	6·80	237	49	219
18/11/25	Baddeley and party	346	596	4,707	728	5,435	25,780	6,500	32,280	5·94	379	61	257
19/11/25	State	346	496	..	..	4,107	25,100	6,250	31,350	7·63	202	87	269
20/11/25	Sparks and party ..	346	362	Trial stopped at Kirwee.									
23/11/25	Allan and party ..	346	432	3,834	500	4,334	25,240	4,630	29,870	6·89	332	79	57
24/11/25	Paparoa	346	474	Trial stopped at Rolleston.									
25/11/25	Blackball (unscreened)	346	666	4,254	540	4,794	25,660	4,700	30,360	6·33	373	79	108
26/11/25	Morrisvale ..	346	727	4,860	760	5,620	24,880	5,200	30,080	5·35	535	154	14
27/11/25	Southland ..	346	837	Trial stopped at Kirwee.									

Note.—Overflow from injector weighed and excluded from total water consumed.

Locomotive Coal Trials.—Christchurch to Arthur's Pass and Return.

(Loco. Ab. 776.—Passenger-train.)

Date.	Class of Coal.	Gross Trailing-load.*				Coal burnt (Day only).	Water consumed (Day only).	Pounds of Water per Pound of Coal.	Ash.		
		Christchurch to Springfield.	Springfield to Arthur's Pass.	Arthur's Pass to Springfield.	Springfield to Christchurch.				Smoke-box.	Ash-pan.	Firebox.
		Tons.	Tons.	Tons.	Tons.	lb.	lb.		lb.	lb.	lb.
29/9/25	Southland ..	175	175	157	157	9,976	57,320	5·75	53	198	258
1/10/25	Newcastle ..	157	157	155	155	5,964	53,320	8·94	22	45	167
3/10/25	Blackball (unscreened)	155	155	157	157	7,291	55,070	7·55	29	59	222
10/10/25	Smith and party ..	156	156	190	190	8,562	56,720	6·62	42	18	473
13/10/25	Burke's Creek ..	195	195	161	161	9,620	60,170	6·25	21	29	131
15/10/25	Dobson	156	156	155	155	6,186	55,670	9·00	52	49	266
17/10/25	Newcastle ..	155	155	156	156	5,915	51,730	8·75	23	27	203
20/10/25	Mount Torlesse ..	156	156	155	168	9,901	54,800	5·53	56	41	1,047
27/10/25	State	175	155	195	215	6,859	59,380	8·66	42	26	336

*Loads are tare of train plus 2 tons for each vehicle.

Note.—Overflow from injector weighed and excluded from total water consumed.

SPECIAL REPORTS *RE* STEAMING OF ENGINES.

New Plymouth, 30th May, 1925.

Memorandum for Engineer to Coal Inquiry Board.

In connection with to-day's trial of Millerton unscreened coal, I have to report as follows:—

The engine left New Plymouth with the train at 10.10 a.m. with a body of fire as well burnt through as possible, full steam-pressure 180 lb., and correct quantity of water in boiler.

Shortly after leaving station-yard steam-pressure dropped to 160 lb., where it remained until Smart Siding was reached, although every endeavour was made by the fireman to increase the pressure to 180 lb. by firing frequently and raking up the fire. Injector to supply water to the boiler was not used until train was drifting into Smart's Road Siding, consequently water-level in boiler was low, which made it necessary during the standing-time at the station (fifteen minutes) to frequently fire up and also rake fire over for the purpose of increasing steam-pressure and filling boiler. This was done with the assistance of steam blower. After leaving Smart's Road it was only possible to reach destination by paying constant attention to fire, the fire-rake having to be used, on an average, every five minutes, due to the uneven manner in which the fire burnt, part of the fire-box showing patches of black coal surrounded by other parts showing bare grate, through which cold air was drawn to firebox and boiler-tubes.

The fire was skilfully fired and handled throughout the whole trip.

J. McNeely.

New Plymouth, 25th June, 1925.

Memorandum for Engineer to Coal Inquiry Board.

Running of Nos. 507 and 610 Express Trains between New Plymouth – Aramoho and Aramoho – New Plymouth, 22/6/25.

In connection with trials made with screened Millerton coal on above-mentioned trains, I have to report as follows:—

Engine steamed very freely between New Plymouth – Aramoho and Aramoho–Hawera on the home journey. After leaving Hawera full steam-pressure was maintained with difficulty up to Stratford, but after leaving there serious trouble was experienced on the way to Inglewood for the want of steam and water, the steam-pressure falling to 120 lb., water in boiler reaching near the danger-point. This was caused through the air-spaces between the firebars becoming blocked with clinker which could not be removed while fire was hot. On arriving at Inglewood some pieces of clinker were broken away by using pinch-bar. Sufficient steam was afterwards raised with the assistance of steam blower (while engine was drifting on down grade) to fill boiler and work train on to New Plymouth.

The blocked air-spaces between firebars also caused smoke-box to be filled quickly on the run from Stratford to New Plymouth.

J. McNeely.

APPENDIX D.

Proposed Train-ferry, Wellington - Picton.

Completion of South Island Main Trunk Railway.

APPENDIX D.

PROPOSED TRAIN-FERRY WELLINGTON-PICTON: COMPLETION OF SOUTH ISLAND MAIN TRUNK RAILWAY.

The Hon. the Minister of Railways. Wellington, 19th August, 1925.

FOR your information I attach copy of report by Messrs. Fay and Casey in connection with above.

Investigations have been made into the possibility of providing a through connection between the North and South Islands by connecting up the rail-heads at Parnassus and Wharanui, and the provision of a train-ferry between Picton and Wellington.

The matter has been dealt with from three standpoints:—

(1.) Through route via train-ferry carrying both goods and passengers.
(2.) Through route via train-ferry carrying passengers only.
(3.) Through railway, Christchurch to Picton, but no train-ferry.

The capital cost of the works is as follows: Train-ferry steamer, £195,000; terminal embarking facilities, £155,000; construction of railway, Parnassus to Wharanui, £2,176,000.

1. GOODS TRAFFIC.

Investigations show that it would be impossible to compete with direct sea freight for goods between Wellington and Christchurch. The quantity handled annually by present ferry service, Wellington–Christchurch, is 58,000 tons. Present rate per ton, £2 2s. 6d. Rate by rail and train-ferry would be £5 16s. 11d. Time by railway and train-ferry would exceed twenty hours, as against a much less time under present conditions.

Conditions.—As the proposed conditions of transport would be both more costly and slower, it is considered the goods offering for a train-ferry service would be practically negligible.

So far as the interchange of rolling-stock is concerned, as the seasonal traffic in the two Islands practically synchronizes, and the length of dead haulage would be so great, no advantage worth consideration can be expected.

2. THROUGH ROUTE VIA TRAIN-FERRY CARRYING PASSENGERS ONLY.

The Canterbury Progress League estimates the annual number of passengers by this route at 60,000. The departmental officers consider that 20,000 would be a full figure to take.

A comparison of the fares at present rates is:—

	£	s.	d.
Railway per train-ferry, first class	2	3	4
Steamer, saloon	1	6	3
Difference in favour of sea	0	17	1
If sleeping-cars provided and charged at 15s.	0	15	0
The difference in favour of sea would be	£1	12	1

The report of Messrs. Fay and Casey gives the financial results in some detail. They compute interest at 4⅛ per cent. For future loans it is not wise to anticipate that the money will be obtained at less than 5 per cent.

Leaving out of consideration the present losses on the Christchurch–Parnassus and Picton–Blenheim lines, and the additional costs necessary to bring the lines to standard, the working results would place additional annual costs on the railway system as follows:—

	£
For through route with ferry, if 20,000 passengers annually—	
Revenue	58,871
Expenditure	316,130
Loss	257,259
Same with 60,000 passengers annually—	
Revenue	127,260
Expenditure	316,130
Loss	188,870
Completion of trunk line only without train-ferry—	
Revenue	38,107
Expenditure	197,703
Loss	£159,596

In view of the information disclosed in the report the Board is of opinion that the provision of a train-ferry, or even the through connection between Parnassus and Wharanui, is not justified at the present time.

F. J. JONES, Chairman, Railway Board.

PROVISION OF TRAIN-FERRY BETWEEN WELLINGTON AND PICTON.

COMPLETION OF SOUTH ISLAND MAIN TRUNK RAILWAY.

The Railway Board. Wellington, 4th August, 1925.

As instructed, we have investigated the economic aspect of the above project, and have to report as follows :—

The estimated cost of a train-ferry steamer is £195,000. This estimate is based on a vessel of the following dimensions : Length, 370 ft. ; breadth, 50 ft. ; depth, 22 ft. ; draft, 16 ft. 6 in. ; gross tonnage, 3,000 ; register tonnage, 1,150 ; speed (ordinary), 15 knots ; carrying-capacity, two tracks each 300 ft. long capable of holding six passenger-cars each ; propelling-machinery, triple-expansion engines, and marine boilers burning oil fuel. The provision of terminal ferry facilities at Wellington and Picton is estimated to cost £155,000, on the following basis in each case :—

	£
Wharf and approaches	55,000
Railway-track connections and signalling	4,000
Steel bridge and lifting-towers	11,000
Contingencies	7,500
Total	£77,500

The estimated annual running-costs of the ferry, based on 312 round voyages per annum, Wellington to Picton and back, are as follows :—

	£
Oil fuel	18,770
Wages (crew, 53)	10,565
Provisions	4,270
Engine-room stores	260
Repairs and maintenance	9,000
Depreciation	9,000
Insurance	7,000
Total	£58,865

Probable Passenger Traffic.—This is difficult to estimate, and, as the ferry would be run at night as part of a through system, it could hardly be expected to compete with a fast daylight ordinary steamer service for purely local traffic.

For through passengers for Christchurch and south thereof the three factors which might be relied upon to attract passenger traffic are speed, comfort, and cheapness.

Speed : The present service, Wellington to Christchurch via Lyttelton, takes about eleven hours and a half. The time taken on new route would be at least thirteen hours : Terminal embarkation and disembarkation, one hour ; Wellington to Picton, three hours and a half ; Picton to Christchurch, eight hours and a half. In actual working the eight hours and a half between Picton and Christchurch may have to be increased, on account of steep gradients and difficult alignment.

Comfort : Investigation has shown that a day service as part of a through system is impracticable. For a night service the length of the sea journey (three hours and a half) and the unsuitability of arrival and departure times in the South Island make the provision of sleeping-cars necessary. The great inconvenience of lavatory accommodation, and the probability of having to travel for very considerable distances in the seasick atmosphere of a sleeping-car, would not prove an attraction to passengers as compared with the present Wellington–Lyttelton service.

Cheapness : The first-class fare from Wellington to Christchurch, taking the whole distance at railway tariff rates, would be £2 3s. 4d., as against £1 6s. 3d., the saloon fare, Wellington to Christchurch via Lyttelton, making the existing route cheaper by 17s. 1d. This excludes the sleeping-car supplement, which, in view of the luxurious cars necessary to combat competition, would not be less than 15s. Including this, the difference would then be £1 12s. 1d.

In view of these facts it appears to us that the figure (60,000 per annum) estimated by the Canterbury Progress League's committee is considerably in excess of what may be anticipated, and that after the novelty wore off the number would more probably be less than 20,000 per annum.

Goods Traffic on Train-ferry.—The physical configuration of New Zealand has resulted in the establishment of harbours to serve almost every part of the Dominion. It is universally admitted that sea-borne traffic is cheaper than transport by rail. The establishment of a goods-ferry between the southernmost centre of the North Island and a harbour on the north of the South Island means the sea portion of transport is reduced to a minimum, and the long rail journey in either Island to reach the ferry makes it impossible to compete with the existing low rates for coastal transport. This conclusion is based on the figures attached to this report.

The present Wellington–Lyttelton ferry service handles approximately 58,000 tons per annum (Lyttelton Harbour Board's annual report, 1924), but this consists mainly of general merchandise, which for the most part is carried by the railway at the highest rates as follows : Wellington to Christchurch via Lyttelton, £2 2s. 6d. per ton ; Wellington to Christchurch via Picton train-ferry, £5 16s. 11d. per ton.

Even at this higher rate we could not hope to compete on the ground of a more rapid goods-delivery. The bulk of any goods offering would require to travel on goods or mixed trains, with numerous stops for local traffic, and the time would probably exceed twenty hours between Wellington

and Christchurch. The reduction of terminal handling usually associated with a train-ferry would not be so great in the Wellington–Picton service as might be anticipated. In order to obtain full truck-loads on the ferry-steamer concentration of goods would have to take place at Wellington and Picton, involving rehandling. We are of the opinion that the goods offering for a ferry service would be practically negligible, and that the establishment of a ferry for goods traffic is not economically feasible.

In view of the fact that a goods-ferry is not feasible, we have allowed in our estimate for providing only one ship, a passenger-ferry, making one return trip, Wellington–Picton, daily.

We estimate that the financial position would be as follows :—

	£
Annual interest on capital at 4⅛ per cent.	14,450
Annual running-expenses	59,000
Total annual expenditure	£73,450
Estimated annual revenue, 20,000 passengers	7,333
Net loss on working	£66,117

If 60,000 passengers per annum were carried, as per Canterbury Progress League's estimate, the revenue would be £22,000, and net loss on working £51,450.

We have looked into the possibilities of advantages accruing to the interchange of rolling-stock between the two Islands as a result of the provision of a train-ferry. The graph attached shows that the seasonal traffic in the two Islands practically synchronizes. Further, the length of dead haul between the centres of wagon activity in the North and South Islands would militate against any slight advantage that might appear probable. With regard to weather conditions in Cook Strait, the size of boat suggested should prove suitable to maintain the service except under most exceptional conditions. It would be necessary, however, to secure the cars to the deck by specially designed screws and screw-jacks placed under the cars to relieve the car-springs. In rough weather a further screw attachment from the tops of cars to the fore-and-aft girders of the vessel would also be necessary.

COMPLETION OF SOUTH ISLAND MAIN TRUNK RAILWAY.

With Train-ferry Service.

At the present time between Picton and Christchurch the line is constructed from Picton to Wharanui, 56 miles ; from thence to Parnassus there is a gap of 81 miles ; from Parnassus to Waipara, 44 miles, the line connects with the existing main north line ; the distance from Waipara to Christchurch is 41 miles, making a total of 222 miles, Picton to Christchurch.

For the year ending 31st March, 1925, there was a loss on the Picton Section of £27,908, and a loss on the Parnassus–Waipara Section of £16,973, making a total, including interest at 3¾ per cent., of £44,881.

The construction of the line between Wharanui and Parnassus is estimated at £2,176,000. This line would not pass through Kaikoura, owing to natural difficulties ; but a branch line connecting Kaikoura (approximately 5 miles) with station facilities, &c., will cost about £60,000. In these days of motor competition it is not thought desirable to include this additional capital cost.

In estimating train services, Picton–Christchurch, we have provided for a through daily express each way and one daily mixed train each way. In addition to present train-mileage a further mileage of 218,042 miles will be required ; based on 12s. per train-mile the additional running-cost per annum will be £130,826. Further, to this an amount of £89,760, being interest at 4⅛ per cent. on capital expenditure of £2,176,000, has to be included, making a total additional expenditure of £220,586 as the result of the completion of this line. An additional amount of £10,000 will be required for bridge-strengthening ; also, the relaying of existing 55–56 lb. rails with 70 lb. metals to permit of fast through running, at an estimated cost of £300,000, will have to be considered.

Estimated Revenue.—A very considerable volume of passenger and goods traffic will, of course, be necessary to meet this expenditure. We have given this matter careful thought, and have also analysed the estimates of the Canterbury and Marlborough Progress Leagues. Our remarks in connection with the train-ferry regarding through passenger traffic are equally applicable to through passenger traffic between Picton and Christchurch, estimated at 20,000 per annum under a handicap of dearer fares, longer travelling-time, and additional discomfort. To this must be added the local passenger traffic as estimated by the Progress League at 5,200 passengers, making a total traffic of 25,200 passengers, the estimated revenue being £31,749.

The goods traffic between Marlborough and Canterbury is all that need be considered. The figure shown in the Canterbury Progress League's report in this connection forms a reasonable basis for estimating additional goods traffic due to the completion of the line. The estimated revenue, based on the gross receipts per ton-mile, 1924–25, is £19,789.

Revenue and Expenditure.—The additional annual expenditure will be—Interest on capital, £89,760 ; train-mileage expenditure for providing increased services, £130,826 ; total expenditure, £220,586. The additional annual revenue will be—Passenger, £31,749 ; goods, £19,789 : total revenue, £51,538

As a result of the completion of the line between Picton and Christchurch the net annual loss will be £169,048. To this must be added present losses of the Picton–Wharanui and Parnassus–Waipara Sections, of £44,881. The gross annual loss on the system will therefore be £213,929.

In the circumstances we consider the completion of the South Island Main Trunk Railway is not at present a sound economic proposition.

The figures are based on the assumption that a train-ferry will be run between Picton and Wellington. The annual loss on the combined schemes is estimated at £280,046.

If 60,000 passengers per annum were carried, as per the Canterbury Progress League's estimate, the estimated revenue, train-ferry and railway combined, would be £127,260, and the net loss on working £211,522.

Without Train-ferry Service.

We have also considered the completion of the South Island Main Trunk Railway without the provision of a train-ferry. By this route it would take approximately a day and a half, including a night in Picton, to travel between Christchurch and Wellington.

First-class fare, Christchurch–Picton, is £1 14s. 1d.; steamer fare, Picton–Wellington, £1; making a total of £2 14s. 1d. In addition to this, hotel expenses and transport at Picton must be added.

As previously stated, the fare by the existing ferry, Christchurch–Wellington via Lyttelton, is £1 6s. 3d. On the score of expense and loss of time travelling it is not likely that the route Wellington–Christchurch via Picton would commend itself to more than a very small proportion of through passengers. With this in view we estimate that the probable through traffic will be 10,000 per annum. To meet this and to provide other facilities for local passengers three through trains per week, and for the purely local passenger and goods services a mixed train each way per day, will be necessary.

Revenue and Expenditure.—Additional annual expenditure will be—Interest on capital, £89,760; train-mileage expenditure for providing increased services, £88,903: total expenditure, £178,663. The additional annual revenue will be—Passengers, £18,318; goods, £19,789: total revenue, £38,107.

As the result of the completion of the line between Picton and Christchurch the net annual loss will be £140,556. To this must be added the present losses on the Picton–Wharanui and Parnassus–Waipara Sections, of £44,881, making a total loss of £185,437.

Attached to this report please find copies of—

(*a.*) Public Works Department's report and estimates on the construction of the line Wharanui–Parnassus.
(*b.*) Specimen of operative goods rates for alternative sea and ferry routes between various points in the two Islands.
(*c.*) Notes on estimates of revenue and expenditure.
(*d.*) Graphs showing extent of seasonal traffic.
(*e.*) Diagram showing possible time-table between Auckland and Invercargill via the train-ferry.

S. Ernest Fay, Operation and Equipment Assistant.
E. Casey, Inspecting Engineer.

(*A.*) PUBLIC WORKS DEPARTMENT'S REPORT AND ESTIMATES ON THE CONSTRUCTION OF THE LINE, WHARANUI–PARNASSUS.

Engineer-in-Chief, Public Works Department.

In accordance with your instructions herewith please find estimated cost of completing the gap in the South Island Main Trunk between Wharanui and Parnassus. For convenience I have divided it into four sections—namely, Wharanui to Hapuka, 37 miles; Hapuka to Greenhills, 22 miles; Greenhills to Conway, 26 miles; and Conway to Parnassus, 16 miles 40 chains. The alternative route, which passes close to Kaikoura and then skirts the coast, as surveyed by Mr. Dobson, involves very much heavier construction, and did not seem to warrant further investigation at the present stage of affairs.

The best location for station serving Kaikoura would appear to be after the crossing of the Hapuka, from which point the line branches away to the west. If it is desired to give Kaikoura a better service it would be necessary to run a branch line from the Hapuka for a distance of about 5½ miles, at an extra cost of about £17,000 per mile.

In arriving at the estimate for this line quantities have been taken out as nearly as possible, both on the regular surveyed line and on the trial lines. It must, however, be remembered that the surveyed lines are possibly subject to alteration, and the trial lines certainly so. The route estimated on may not be finally adopted, but the estimate now made is, I think, a reasonable criterion of the eventual cost of the line, and is at any rate as near to it as it is possible to get with the available data.

My information does not show the classes of material which will have to be excavated, but quantities have been taken out on a 1-to-1 batter throughout, and priced at 4s. per cubic yard, which is assumed to be a reasonable overall price for the clay and papa country. Where rock or other hard material is encountered it is assumed that the steepening of the batters will reduce the quantities, so that the higher cost of excavation per yard will be approximately balanced.

The following remarks will, together with the attached list, explain the general characteristics of the various sections:—

Wharanui, 56m., to Hapuka at 93m.—The permanent survey has been completed throughout this section. Formation is completed, and rails laid to 59m. 26ch., and construction was in hand to 60m. 45ch. From 60m. 45ch. to 76m. 0ch., at the Clarence Station, formation is comparatively easy.

A fair amount of road-diversion is necessary through this length, but it appears as if a great deal of this would be overcome by a little study and relocation, as was done farther back. From 76m. to the Hapuka River at 92m. the formation is, with one or two exceptions, not very heavy. From 76m. to 77m. the construction, which includes the Clarence Bridge, is expensive, and from 84m. to 85m., comprising the Ohau Bluff, some very heavy work will be required.

Hapuka to Greenhills, 93m., on next Section to 22m.—No permanent survey has been made here, but quantities have been roughly taken off Mr. Haskell's trial line, adopting centre-line depths, making allowance for estimated slopes, as no cross-sections were available. From 0m. to 7m. the cost would average about £12,000 per mile; 7m. to 8m. is heavy—estimated cost, about £33,000; 8m. to 10m. is very light. From 10m. to 14m. the country gets rougher and formation correspondingly heavier (£20,000 per mile). At 14m. the formation starts to get very expensive; the trial line shows a 1-in-50 grade from 15m. to 22m., with heavy curvature, uncompensated. This line is crossing the country all the way, involving heavy cuts, filling, and large bridges across the various streams. A permanent line pegged from the trial line and compensated would give too heavy a grade for present conditions, and this portion will have to be relocated. I have, however, estimated on the existing trial.

Greenhills to Conway, 22m. to 28m. (approximately).—From 22m. onwards there is 4 miles without any survey, but it is assumed that 22m. is the top of the grade and that from there the line drops into the Charwell, and proceeds down what is a comparatively easy sideling until it joins with Mr. Thompson's trial survey from the Charwell to Mr. Haskell's line at the junction of the Charwell and the Conway, a distance of 2 miles, of which 1 mile 5 chains is tunnel and the rest extremely rugged. The last 2 miles of line includes the Conway Bridge, and is quite the most difficult and expensive portion of the whole route.

Conway to Parnassus, 60m. 36ch. to 44m. (length, 16 miles 36 chains).—In this case the existing survey chainage has been adopted, although it is reversed as far as the through route is concerned. From 44m. to 45m. is practically the easiest mile on the whole route. To 51m. formation is not very heavy (average about £13,000 per mile). At 48m. 50ch. there is a very large gulch at the Hookam Shyrry Creek, 130 ft. deep and 500 ft. to 600 ft. across. Apart from this, up to 51m. 40ch. there are no particular obstacles. From 51m. 40ch. onwards to 60m. 36ch. the formation is extremely heavy, and includes 98 chains of tunnelling; estimated cost of this last 9 miles £528,000.

SOUTH ISLAND MAIN TRUNK RAILWAY.

Wharanui Southwards to Hapuka River, 59m. to 93m.

	£
Earthwork—654,200 cub. yd. at 4s.	130,840
Bridges—2,260 1 ft. at £12	27,120
820 1 ft. at £15	12,300
Clarence River, £36,000; Hapuka, £28,000	64,000
Culverts—12 in. concrete-pipe culverts, 688 1 ft. at 9s.	310
18 in. ,, 443 1 ft. at 12s.	266
24 in. ,, 139 1 ft. at £1	139
3 ft. arched concrete culverts, 58 1 ft.	210
4 ft. ,, 694 1 ft.	3,830
6 ft. ,, 190 1 ft.	1,675
8 ft. ,, 105 1 ft.	1,360
10 ft. ,, 106 1 ft.	2,001
4 2 ft. flat-top culverts at £140	560
18 4 ft. ,, £230	4,140
10 6 ft. ,, £300	3,000
1 8 ft. ,, £438	438
4 10 ft. ,, £625	2,500
Tunnels—1,644 1 ft. at £2,000 per chain	49,800
Level crossings—8 at £110	880
Road-deviations—557 chains at £10	5,570
Station-buildings	29,230
Platelaying and ballasting	168,750
Stream-diversions	2,000
Overbridges	900
Land—34 miles at £160	5,440
Fencing—34 miles at £2 a chain each side	10,880
Contingencies—10 per cent.	52,814
	£580,953

NOTE.—Wharanui Station Yard is at 56m., but formation is practically completed and rails laid to 59m.

Hapuka to Greenhills, 93m. to 115m.

		£
Earthwork—1,473,323 cub. yd. at 4s.		294,665
Bridges—1,540 1 ft. at £12		18,480
1,490 1 ft. at £15		22,350
Culverts—12 in. concrete-pipe culverts,	875 1 ft. at 9s.	394
18 in. ,,	1,193 1 ft. at 12s.	716
24 in. ,,	906 1 ft. at £1	906
3 ft. arched concrete culverts,	142 1 ft.	1,071
4 ft. ,,	1,639 1 ft.	9,035
6 ft. ,,	1,270 1 ft.	9,526
10 ft. ,,	1,422 1 ft.	24,588
2 4 ft. flat-top culverts at £230		460
Tunnels—1,948 1 ft. at £2,000 per chain		59,000
Level crossings—7 at £110		770
Road-deviations—22 chains at £10		220
Platelaying and ballasting—22 miles at £4,500		99,000
Water-drives—1,250 1 ft. at £2		2,500
Station-yards		30,635
Land—22 miles at £160		3,520
Fencing—22 miles at £2 per chain at each side		7,040
Contingencies—10 per cent.		58,488
		£643,364

Greenhills to Conway, 115m. to 121m. (6 miles partly surveyed).

		£
4 miles easy sideling; no survey, but estimated to cost £10,000 per mile		40,000
2 miles surveyed, details as under:—		
Earthwork—247,500 cub. yd. at 4s.		49,500
Conway River bridge		20,000
Culverts—18 in. pipes, 30 1 ft. at 12s.		18
24 in. ,, 494 1 ft. at £1		494
3 ft. arched concrete culverts, 173 1 ft.		554
4 ft. ,, 130 1 ft.		685
Tunnel—5,610 1 ft. at £2,000 per chain		170,000
Platelaying and ballasting—6 miles at £4,500		27,000
Land—5 miles at £160		800
Fencing—5 miles at £320		1,600
Contingencies—10 per cent.		31,065
		£341,716

Conway to Parnassus, 121m. to 137m. 5ch.

		£
Earthwork—1,019,388 cub. yd. at 4s.		203,878
Bridges—270 1 ft. at £15		4,050
Hookam Shyrry Creek, £4,000; Geldt Creek, £6,000		10,000
Culverts—12 in. concrete-pipe culverts,	1,324 1 ft. at 9s.	596
18 in. ,,	2,552 1 ft. at 12s.	1,531
24 in. ,,	141 1 ft. at £1	141
3 ft. arched concrete culverts,	662 1 ft.	2,161
4 ft. ,,	1,503 1 ft.	8,295
6 ft. ,,	1,929 1 ft.	15,594
10 ft. ,,	450 1 ft.	7,500
6 ft. flat-top culvert at £300		300
Tunnels—6,450 1 ft. at £2,000 per chain		195,440
Level crossings—5 at £110		550
Platelaying and ballasting—16 miles 40 chains at £4,500		74,250
Station-yards		22,000
Land—16·5 miles at £160		2,640
Fencing—16·5 miles at £2 per chain each side		5,280
Contingencies—10 per cent.		55,421
		£609,627

Summary showing Totals of all Sections.

	£	Average per Mile. £
Wharanui to Hapuka, 34 miles	580,953	17,087
Hapuka to Greenhills, 22 miles	643,364	29,244
Greenhills to Conway, 6 miles	341,716	56,952
Conway to Parnassus, 16·5 miles	609,627	36,947
	£2,175,660	
Average per mile for 78·5 miles		£27,715

H. H. Sharp, Inspecting Engineer.

(*B.*) COMPARISON OF INTER-ISLAND SEA AND RAIL-FERRY FREIGHTS.

For the purpose of this comparison the following points should be noted :—

Distances—

		M. Ch.
Wellington–Picton	53 nautical miles =	59·00 land miles.
Picton–Wharanui		55·79
Wharanui–Parnassus		81·00
		195·79
Parnassus–Christchurch		84·09
Wellington–Christchurch		280·08
Wellington–Sheffield		292·31

Cargo.—An addition of one-third is made to all rates chargeable on measurement (excepting timber) to bring the charges to same level as on dead-weight.

Cattle and Sheep.—Cattle and sheep are shown on rail at per head. Charge arrived at on an average of 7 cattle or 70 sheep to the truck. It should be noted that the sea freight on live-stock is that shown on shipping freight-lists. Contracts are arranged with shippers for large lines.

General Cargo.—Charges by sea routes are shown as correctly as possible with the information available. Shippers can obtain reductions in sea freights on large lines of certain commodities.

Christchurch to Wellington.

Service.	Miles.	Goods.	Wheat, per Ton.	Potatoes, per Ton.	Flour, per Ton.
Train-ferry	280	115/9	24/–	24/–	24/–
Wharfage, Wellington	..	2/3	2/3	2/3	2/3
		118/–	26/3	26/3	26/3
Rail and Steamer—					
Rail, Lyttelton–Christchurch	7	5/11	4/7	4/7	4/7
Wharfage, Lyttelton	..	1/11	–/8¼	–/8¼	–/8¼
Steamer, Lyttelton–Wellington ..	..	22/–	17/6	18/–	16/–
Wharfage, Wellington	..	4/–	4/–	4/–	4/–
Allowance, weight and measurement ..	..	8/8	..	..	..
		42/6	26/9¼	27/3¼	25/3¼

Ashburton to Palmerston North.

Service.	Miles.	Goods.	Wheat, per Ton.	Potatoes, per Ton.	Flour, per Ton.
Train-ferry	417	148/5	32/2	32/2	32/2
Wharfage, Wellington	..	2/3	2/3	2/3	2/3
		150/8	34/5	34/5	34/5
Rail and Steamer—					
Rail, Ashburton–Lyttelton	59	50/1	10/6	10/6	10/6
Wharfage, Lyttelton	..	1/11	–/8¼	–/8¼	–/8¼
Steamer, Lyttelton–Wellington ..	..	22/–	17/6	18/–	16/–
Wharfage, Wellington	..	4/–	4/–	4/–	4/–
Rail, Wellington – Palmerston North ..	87	64/2	12/10	12/10	12/10
Cartage, Wellington	..	4/–	4/–	4/–	4/–
Allowance, weight and measurement ..	..	10/–	..	..	..
		156/2	49/6	50/0¼	48/0¼

OAMARU TO WELLINGTON.

Service.	Miles.	Goods.	Wheat, per Ton.	Potatoes, per Ton.	Flour, per Ton.
Train-ferry	430	150/9	32/9	32/9	32/9
Wharfage, Wellington	..	2/3	2/3	2/3	2/3
		153/–	35/–	35/–	35/–
Steamer direct—					
Haulage, &c., Oamaru to Breakwater ..	..	2/10	2/6	2/6	2/6
Wharfage, Oamaru	..	2/–	2/–	2/–	2/–
Steamer, Oamaru–Wellington ..	..	22/–	17/6	20/–	16/–
Wharfage, Wellington	..	4/–	4/–	4/–	4/–
Allowance, weight and measurement ..	..	10/3	..	..	..
		41/1	26/–	28/6	24/6

OAMARU TO AUCKLAND.

Service.	Miles.	Wheat, per Ton.	Potatoes, per Ton.	Flour, per Ton.
Train-ferry	856	57/10	57/10	57/10
Wharfage, Wellington	..	2/3	2/3	2/3
		60/1	60/1	60/1
Steamer direct—				
Haulage, &c., Oamaru to Breakwater ..	..	2/6	2/6	2/6
Wharfage, Oamaru	..	2/–	2/–	2/–
Steamer, Oamaru–Auckland	..	20/6	26/–	20/6
Wharfage, Auckland	..	1/10½	1/10½	1/10½
		26/10½	32/4½	26/10½

TEMUKA TO MASTERTON.

Service.	Miles.	Insulators, Class C.	Wheat, per Ton.	Potatoes, per Ton.	Flour, per Ton.
Train-ferry	432	88/9	33/1	33/1	33/1
Wharfage, Wellington	..	2/3	2/3	2/3	2/3
		91/–	35/4	35/4	35/4
Steamer direct—					
Rail, Temuka–Timaru	12	10/2	{ 3/6 1/1	3/6 1/1	3/6 1/1
Wharfage, Timaru	..	2/–	2/–	2/–	2/–
Steamer, Timaru–Wellington	..	22/–	17/6	18/–	16/–
Wharfage, Wellington	..	4/–	4/–	4/–	4/–
Cartage, Wellington	..	4/–	4/–	4/–	4/–
Rail, Wellington–Masterton	66	38/9	11/4	11/4	11/4
Allowance, weight and measurement ..	..	10/–	..	..	..
		90/11	43/5	43/11	41/11

BLUFF TO WELLINGTON.

Service.	Miles.	Oysters, per Ton.
Train-ferry	663	57/10
Wharfage, Wellington ..	..	2/3
		60/1
Rail and Steamer—		
Rail, Bluff–Lyttelton ..	392	42/1
Wharfage, Lyttelton ..	..	–/7
Steamer, Lyttelton–Wellington	..	36/–
Wharfage, Wellington ..	..	4/–
		82/8

BEAUMONT TO WELLINGTON.

Service.	Miles.	Fruit, per Ton.
Train-ferry	579	62/3
Wharfage, Wellington ..	..	2/3
		64/6
Rail and Steamer—		
Rail, Beaumont–Lyttelton ..	..	38/8
Wharfage, Lyttelton ..	..	1/2
Steamer, Lyttelton–Wellington	..	22/–
Wharfage, Wellington ..	..	4/–
Allowance, weight and measurement	..	4/4
		70/2

NEW PLYMOUTH TO CHRISTCHURCH.

Service.	Miles.	Goods, per Ton, Class A	Wool, per Bale.	Cattle, per Head.	Sheep, per Head.
Train-ferry	531	175/3	15/5	31/9	3/2
Wharfage, Wellington	..	1/2	–/9	1/–	–/1
		176/5	16/2	32/9	3/3
Rail to Wellington and Steamer—					
Rail, New Plymouth – Wellington ..	251	109/11	10/1	17/9	1/9
Wharfage, Wellington	..	2/–	1/–	1/–	–/1
Steamer, Wellington–Lyttelton ..	..	22/–	6/6	35/–	3/6
Wharfage, Lyttelton	..	1/11	1/–	2/–	–/1·2
Rail, Lyttelton–Christchurch	7	5/11	1/7	3/–	–/3·6
Allowance, weight and measurement ..	..	10/7	..	..	..
		152/4	20/2	58/9	5/9
Steamer direct—					
Haulage, New Plymouth Breakwater ..	..	4/2	1/3	1/6	–/1·8
Wharfage, Breakwater	..	3/–	1/–	2/6	–/3
Steamer, New Plymouth – Lyttelton ..	..	24/–	7/–	60/–	3/6
Wharfage, Lyttelton	..	1/11	1/–	2/–	–/1·2
Rail, Lyttelton–Christchurch	7	5/11	1/7	3/–	–/3·6
Allowance, weight and measurement ..	..	10/7	..	..	..
		49/7	11/10	69/–	4/4

WANGANUI TO CHRISTCHURCH.

Service.	Miles.	Goods, per Ton, Class A.	Wool, per Bale.	Timber, per 100 ft.	Cattle, per Head.	Sheep, per Head.
Train-ferry	430	150/9	13/3	8/6	26/6	2/8
Wharfage, Wellington ..	..	1/2	–/9	–/3	1/–	–/1
		151/11	14/–	8/9	27/6	2/9
Rail to Wellington and Steamer—						
Rail, Wanganui to Wellington	150	86/7	8/4	5/2	12/6	1/3
Wharfage, Wellington ..	..	2/–	1/–	–/3	1/–	–/1
Steamer, Wellington–Lyttelton ..	..	22/–	6/6	5/6	35/–	3/6
Wharfage, Lyttelton ..	..	1/11	1/–	–/3·85	2/–	–/1·2
Rail, Lyttelton–Christchurch ..	7	5/11	1/7	1/3·5	3/–	–/3·6
Allowance, weight and measurement	..	10/7	..	..	..	..
		129/–	18/5	12/6	53/6	5/3
Steamer direct—						
Wharfage, Wanganui ..	..	2/–	–/6	–/6	1/6	–/2
Steamer, Wanganui–Lyttelton ..	..	27/6	7/–	6/–	60/–	3/6
Wharfage, Lyttelton ..	..	1/11	1/–	–/3·85	2/–	–/1·2
Rail, Lyttelton–Christchurch	7	5/11	1/7	1/3·5	3/–	–/3·6
Allowance, weight and measurement	..	12/5	..	..	..	..
		49/9	10/1	8/1	66/6	4/1

WELLINGTON TO GREYMOUTH.

Service.	Miles.	Goods, Class A.
	†	
Train-ferry	401	144/11
Wharfage, Wellington ..	..	1/2
		146/1
Steamer direct—	..	22/–
Wharfage, Wellington ..	..	2/–
Wharfage, Greymouth ..	..	2/6
Haulage, Greymouth ..	..	4/3
Allowance, weight and measurement	..	10/3
† Via Sheffield.		41/–

BLACKBALL TO LEVIN.

Service.	Miles.	Coal, per Ton.
	†	
Train-ferry	459	38/1
Wharfage, Wellington ..	..	1/–
		39/1
Steamer and Rail—		
Rail, Blackball–Greymouth ..	..	3/6
Wharfage, Greymouth ..	..	–/9
Steamer, Greymouth–Wellington	..	15/6
Wharfage, Wellington ..	..	1/–
Labour, Wellington	..	1/–
Rail, Wellington–Levin ..	59	11/7
† Via Sheffield.		33/4

BRUNNER TO WELLINGTON.

Service.	Miles.	Coal, per Ton.	Timber, per 100 ft.
	†		
Train-ferry	393	33/7	7/11
Wharfage, Wellington ..	..	1/–	–/4
		34/7	8/3
Steamer direct—			
Rail, Brunner–Greymouth	8	2/7	1/3¼
Wharfage, Greymouth ..	..	–/9	–/3
Steamer, Greymouth–Wellington	..	15/6	5/6
Wharfage, Wellington ..	..	1/–	..
† Via Sheffield.		19/10	7/0¼

REEFTON TO WELLINGTON.

Service	Miles.	Coal, per Ton
	†	
Train-ferry	429	30/4
Wharfage, Wellington ..	..	1/–
		31/4
Steamer direct—		
Rail, Reefton–Greymouth ..	..	5/11
Wharfage, Greymouth ..	..	–/9
Steamer, Greymouth–Wellington	..	15/6
Wharfage, Wellington ..	..	1/–
† Via Sheffield.		23/2

NAPIER TO CHRISTCHURCH.

Service.	Miles.	Goods, per Ton, Class A.	Wool, per Bale.
Train-ferry	479	162/5	14/3
Wharfage, Wellington	..	1/2	–/9
		163/7	15/–
Rail and Steamer—			
Rail, Napier–Wellington	199	97/1	9/2
Wharfage, Wellington	..	2/–	1/–
Steamer, Wellington–Lyttelton	..	22/–	6/6
Wharfage, Lyttelton	..	1/11	1/–
Rail, Lyttelton–Christchurch	7	5/11	1/7
Allowance, weight and measurement	..	10/7	..
		139/6	19/3
Steamer direct—			
Extra cartage, Napier – Port Ahuriri	..	3/–	..
Wharfage, Port Ahuriri	..	2/–	1/6
Steamer, Port Ahuriri – Lyttelton	..	24/6	7/–
Wharfage, Lyttelton	..	1/11	1/–
Rail, Lyttelton–Christchurch	7	5/11	1/7
Allowance, weight and measurement	..	11/5	..
		48/9	11/1

PALMERSTON NORTH TO CHRISTCHURCH.

Service.	Miles.	Goods, Class A.	Wool, per Bale.	Cattle, per Head.	Sheep, per Head.
Train-ferry	367	136/9	12/1	23/6	2/4
Wharfage, Wellington	..	1/2	-/9	1/-	-/1
		137/11	12/10	24/6	2/5
Rail and Steamer—					
Rail, Palmerston–Wellington	87	64/2	6/7	9/1	-/11
Wharfage, Wellington	..	2/-	1/-	1/-	-/1
Steamer, Wellington–Lyttelton ..	..	22/-	6/6	35/-	3/6
Wharfage, Lyttelton	..	1/11	1/-	2/-	-/1·2
Rail, Lyttelton–Christchurch	7	5/11	1/7	3/-	-/3·6
Allowance, weight and measurement ..	..	10/7	..	..	..
		106/7	16/8	50/1	4/11

AUCKLAND TO CHRISTCHURCH.

Service.	Miles.	Sugar, per Ton.	Goods, per Ton, Class A.	Cement, per Ton.	Timber, per 100 ft.	Cattle, per Head.	Sheep, per Head.
Train-ferry	706	120/10	216/1	73/8	12/1	40/6	4/1
Wharfage, Wellington	..	1/2	1/2	1/2	-/3	1/-	-/1
		122/-	217/3	74/10	12/4	41/6	4/2
Rail and Steamer—							
Rail to Wellington	426	88/2	150/9	49/2	8/6	26/6	2/7·8
Wharfage, Wellington	..	1/2	1/2	1/2	-/3	1/-	-/1
Steamer to Lyttelton	175	22/-	22/-	18/6	5/6	35/-	3/6
Wharfage, Lyttelton	..	1/11	1/11	1/2	-/3·85	2/-	-/1·2
Rail, Lyttelton–Christchurch ..	7	5/11	5/11	5/3	1/3·5	3/-	-/3·6
Allowance, weight and measurement	..	..	10/4	..	..	..	..
		119/2	192/1	75/3	15/10	67/6	6/8
Steamer direct—							
Wharfage, Auckland	..	2/3	2/3	1/3	-/3·6	1/3	-/1·25
Sea freight	..	24/6	24/6	21/-	5/6	99/-	4/6
Wharfage, Lyttelton	..	1/11	1/11	1/2	-/3·85	2/-	-/1·2
Rail, Lyttelton–Christchurch ..	7	5/11	5/11	5/3	1/3·5	3/-	-/3·6
Allowance, weight and measurement	..	..	11/6	..	..	..	..
		34/7	46/1	28/8	7/5	105/3	5/-

(C.) NOTES ON ESTIMATES OF REVENUE AND EXPENDITURE.

REVENUE.

Details of Goods Revenue based on Canterbury Progress League's Figures of Probable Traffic.

	£	£
Christchurch–Parnassus (85 miles)—		
Fish—360 tons at 1·74d. per ton-mile	222	
General cargo—3,000 tons at 5·14d. per ton-mile	5,461	
Fish, butter, and general cargo—600 tons at 5·14d. per ton-mile	1,092	
Wool—800 bales = 160 tons at 4·7d. per ton-mile	266	
Timber—15,000 ft. at 450 ft. to 1 ton = 34 tons at 3·6d. per ton-mile	43	
Wool—3,600 bales = 720 tons at 4·7d. per ton-mile	1,198	
General cargo—220 tons at 5·14d. per ton-mile	400	
Cattle—750 head (3·3 head = 1 ton) = 227 tons at 3·17d. per ton-mile	255	
Sheep—41,300 (25 sheep = 1 ton) = 1,652 tons at 3·3d. per ton-mile	1,931	
	——	10,868
Parnassus–Kaikoura (44 miles)—		
Fish—360 tons at 1·74d. per ton-mile	115	
General cargo—3,000 tons at 5·14d. per ton-mile	2,827	
Fish, butter, and general cargo—600 tons at 5·14d. per ton-mile	566	
Wool—160 tons at 4·7d. per ton-mile	138	
Timber—34 tons at 3·6d. per ton-mile	23	
	——	3,669
Parnassus–Wharanui (81 miles)—		
Wool—700 tons at 4·7d. per ton-mile	1,110	
General cargo—220 tons at 5·14d. per ton-mile	382	
Cattle—227 tons at 3·17d. per ton-mile	243	
Sheep—1,652 tons at 3·3d. per ton-mile	1,840	
	——	3,575
Wharanui–Blenheim (38 miles)—		
Wool—700 tons at 4·7d. per ton-mile	521	
General cargo—220 tons at 5·14d. per ton-mile	179	
Cattle—227 tons at 3·17d. per ton-mile	114	
Sheep—1,652 tons at 3·3d. per ton-mile	863	
	—	1,677
Total goods revenue		£19,789

EXPENDITURE.

Train Service in connection with Train-ferry.

(Additional train services over and above those now running.)

	£	£
Christchurch–Parnassus (85 miles)—		
Two trains per day, at 12s. per train-mile	31,926	
Waipara–Parnassus (44 miles)—		
Two trains two days per week for six months, to complete weekly service	2,745	
	——	34,671
Parnassus–Wharanui (81 miles)—		
Four trains per day	60,848	
Interest at 4⅛ per cent. (£2,176,000, cost of construction, new line)	89,760	
	——	150,608
Wharanui–Picton (56 miles)—		
Two trains per day	21,034	
Blenheim–Wharanui (38 miles)—		
Two trains per day	14,273	
	——	35,307
Total annual expenditure		£220,586

Train Service if no Train-ferry is running.

(Additional services over and above those now running.)

	£	£
Christchurch–Parnassus (85 miles)—		
Two trains every other day, at 12s. per train-mile	15,912	
Waipara–Parnassus (44 miles)—		
Two trains two days per week, to complete weekly service	2,745	
	——	18,657
Parnassus–Wharanui (81 miles)—		
Two trains daily, two every other day	45,490	
Interest at 4⅛ per cent. (£2,176,000, cost of construction)	89,760	
	——	135,250
Wharanui–Picton (56 miles)—		
Two trains every other day	10,483	
Blenheim–Wharanui (38 miles)—		
Two trains per day	14,273	
	——	24,756
Total annual expenditure		£178,663

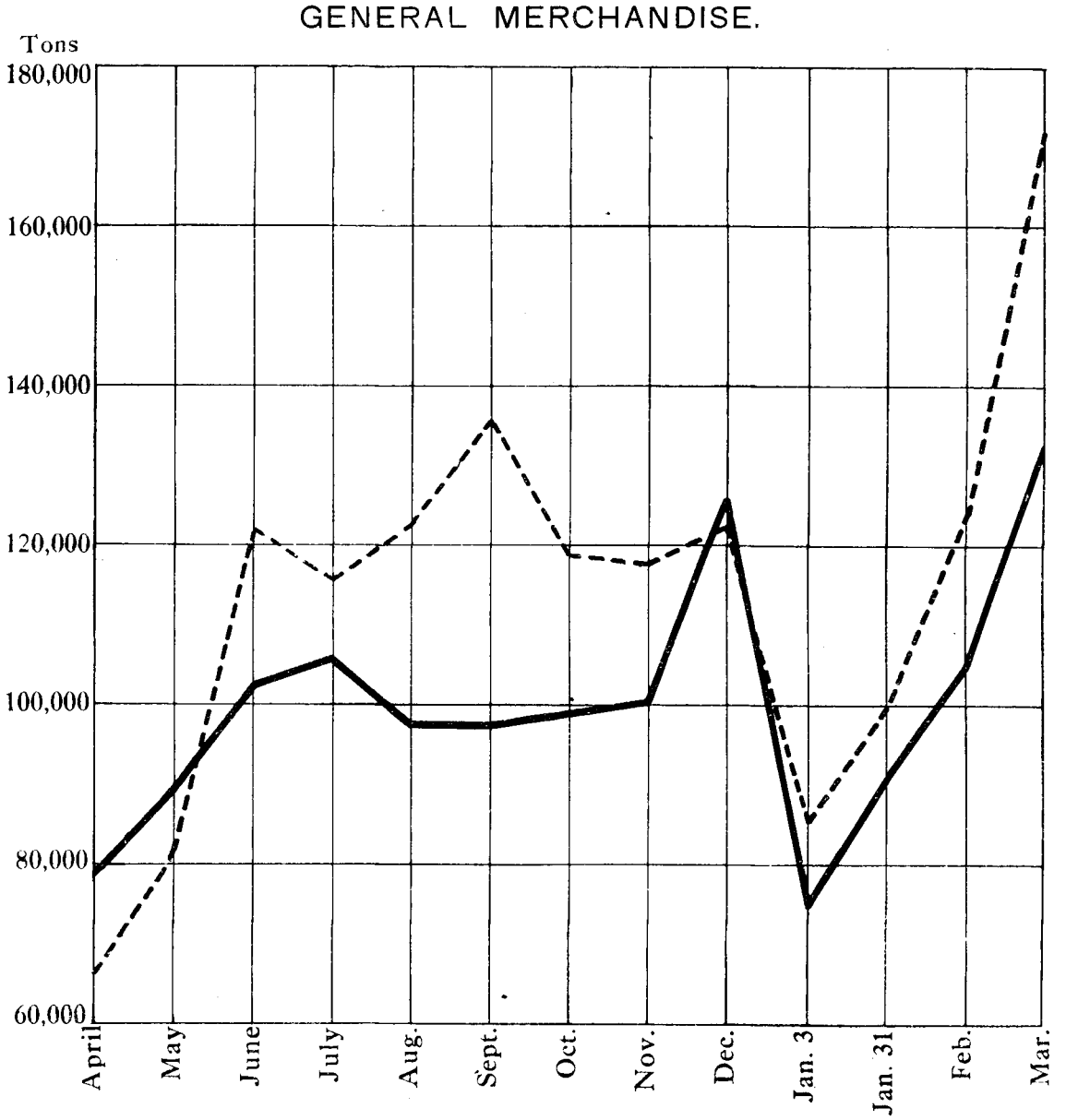
(D.)

SEASONAL TRAFFIC.

NORTH AND SOUTH ISLANDS, 1924-25.

(North Island—Full black; South Island—Dotted black.)

GENERAL MERCHANDISE.

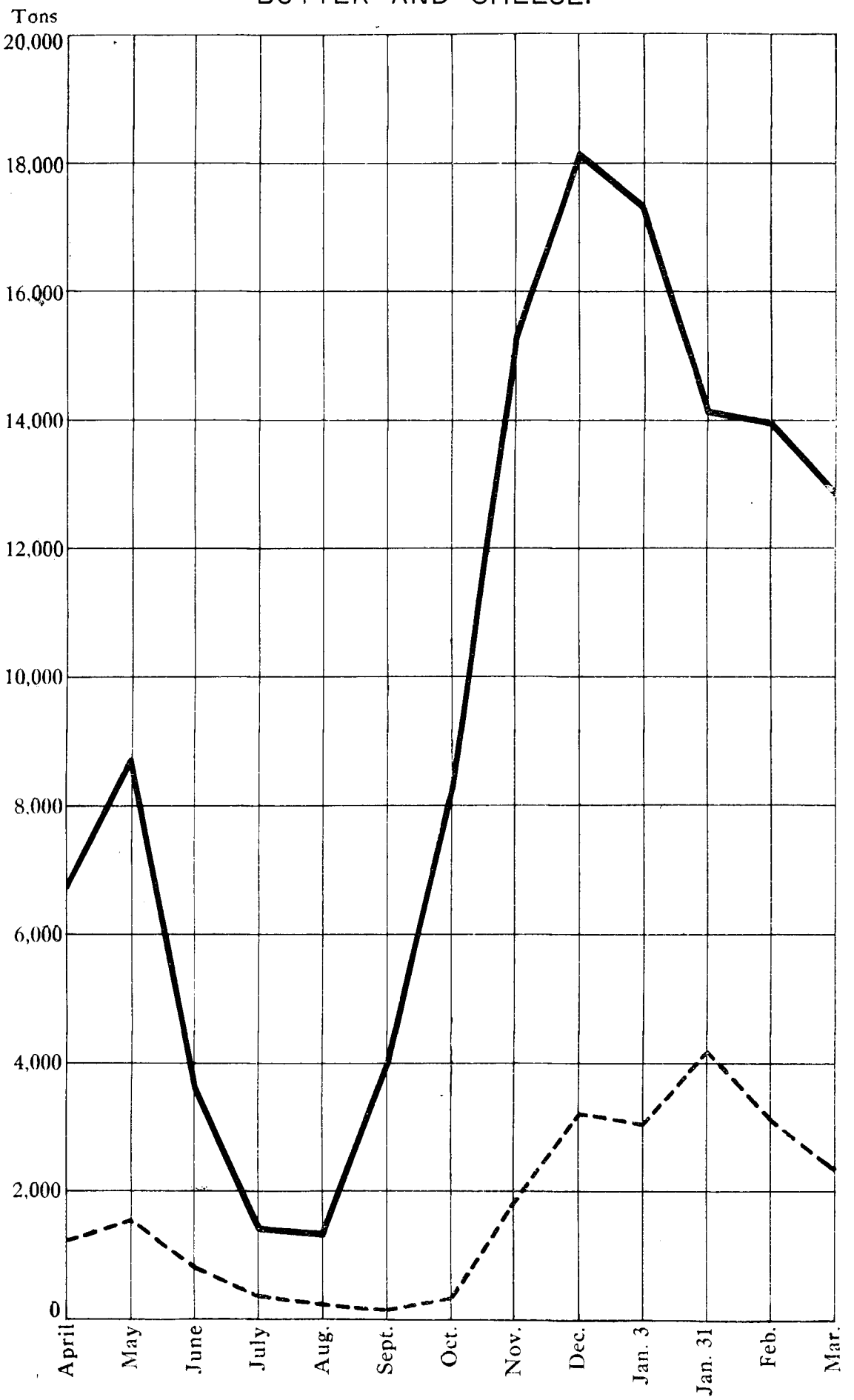


SEASONAL TRAFFIC.

NORTH AND SOUTH ISLANDS, 1924-25.

(North Island—Full black; South Island—Dotted black.)

BUTTER AND CHEESE.

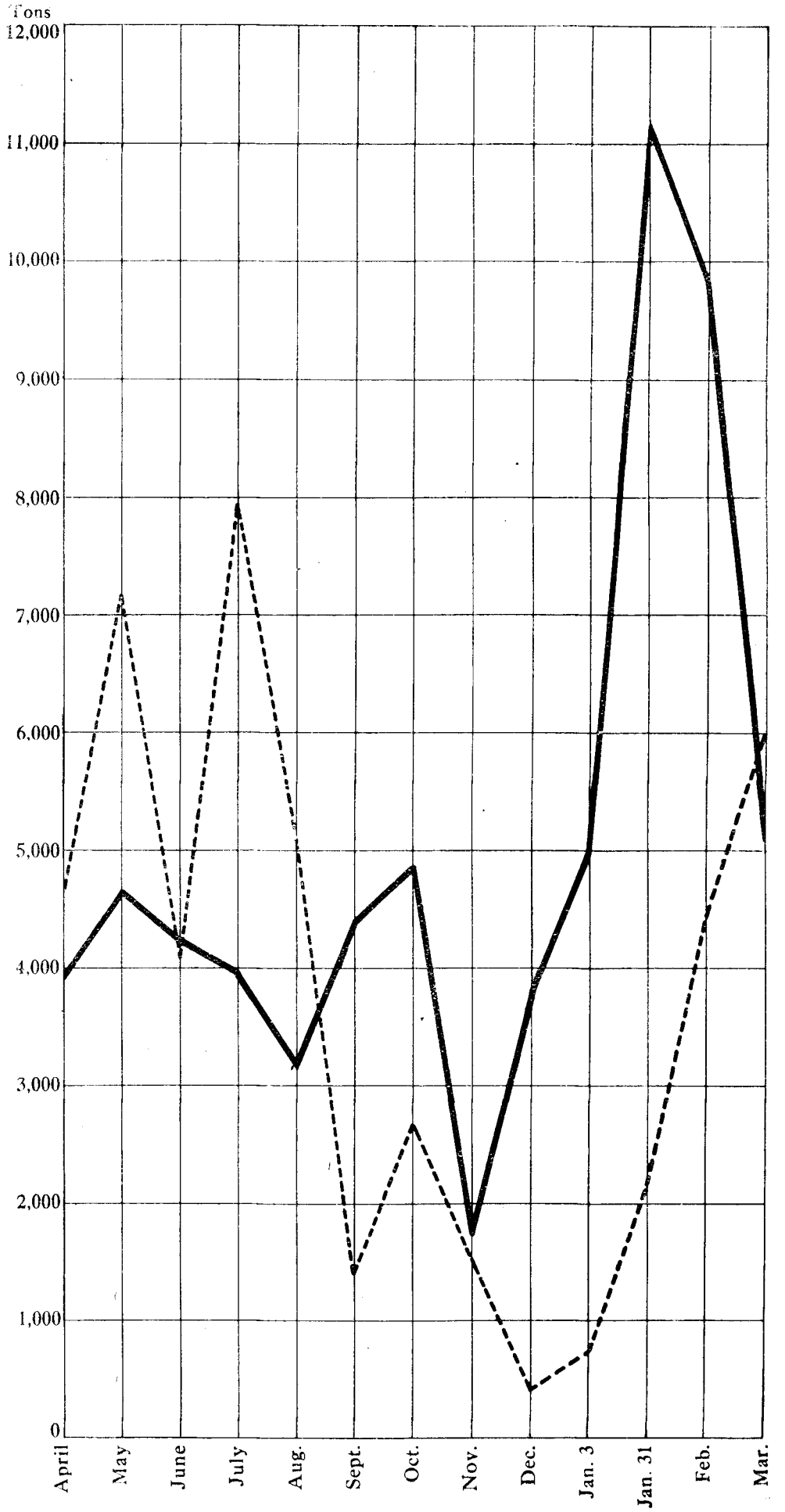


SEASONAL TRAFFIC.

NORTH AND SOUTH ISLANDS, 1924-25.

(North Island—Full black; South Island—Dotted black.)

FROZEN MEAT.

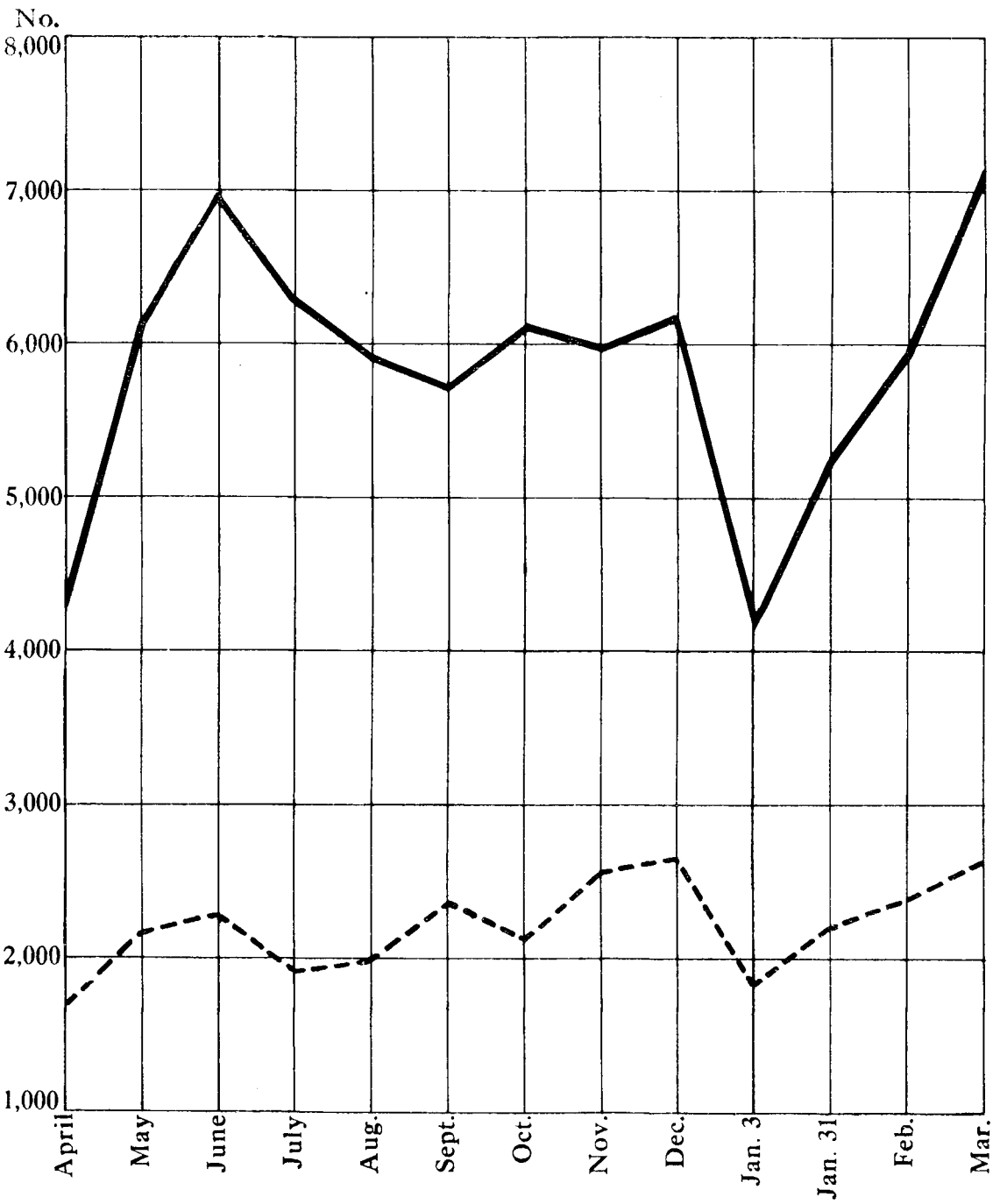


SEASONAL TRAFFIC.

NORTH AND SOUTH ISLANDS, 1924–25.

(North Island—Full black; South Island—Dotted black.)

CATTLE.

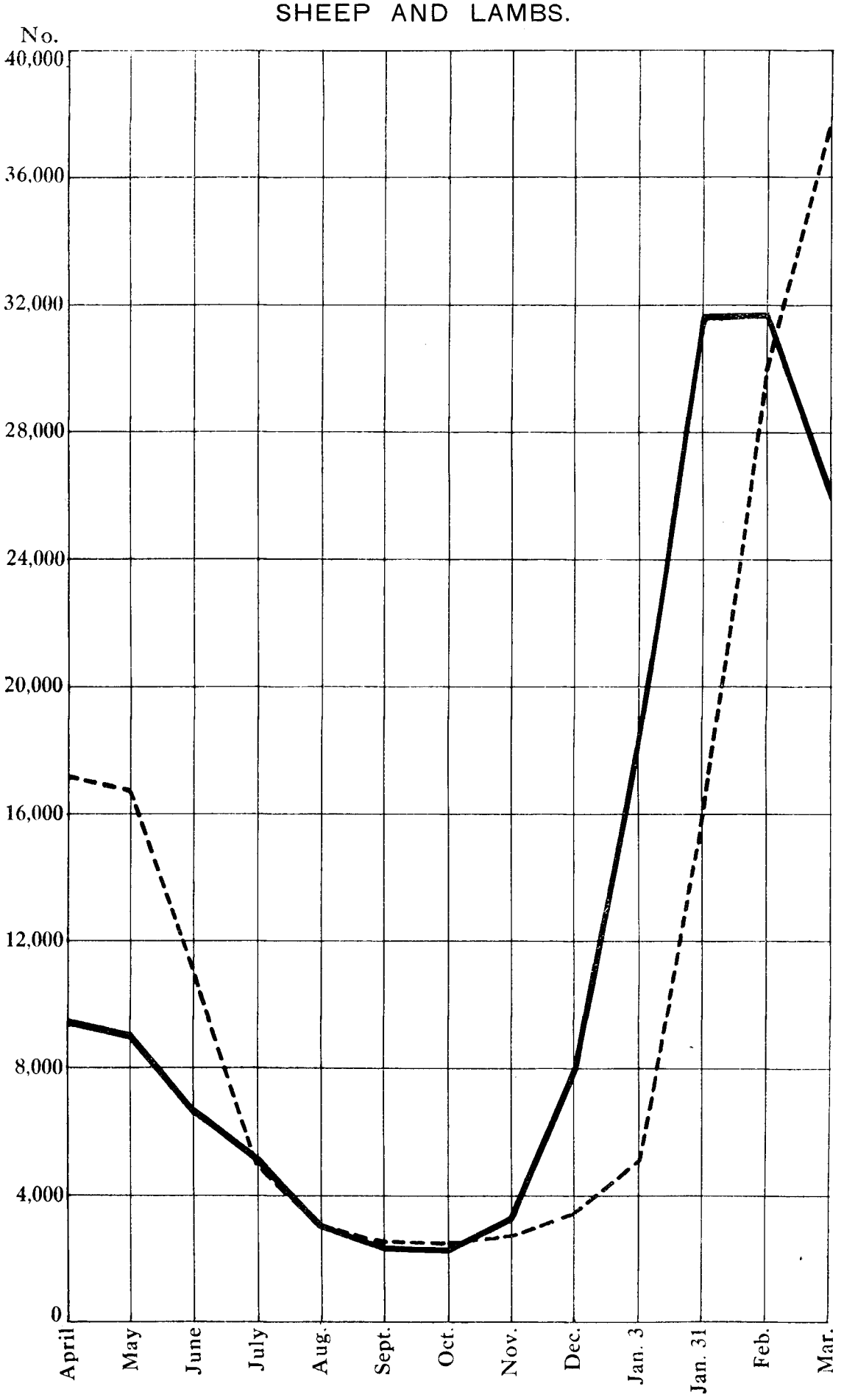


SEASONAL TRAFFIC.

NORTH AND SOUTH ISLANDS, 1924-25.

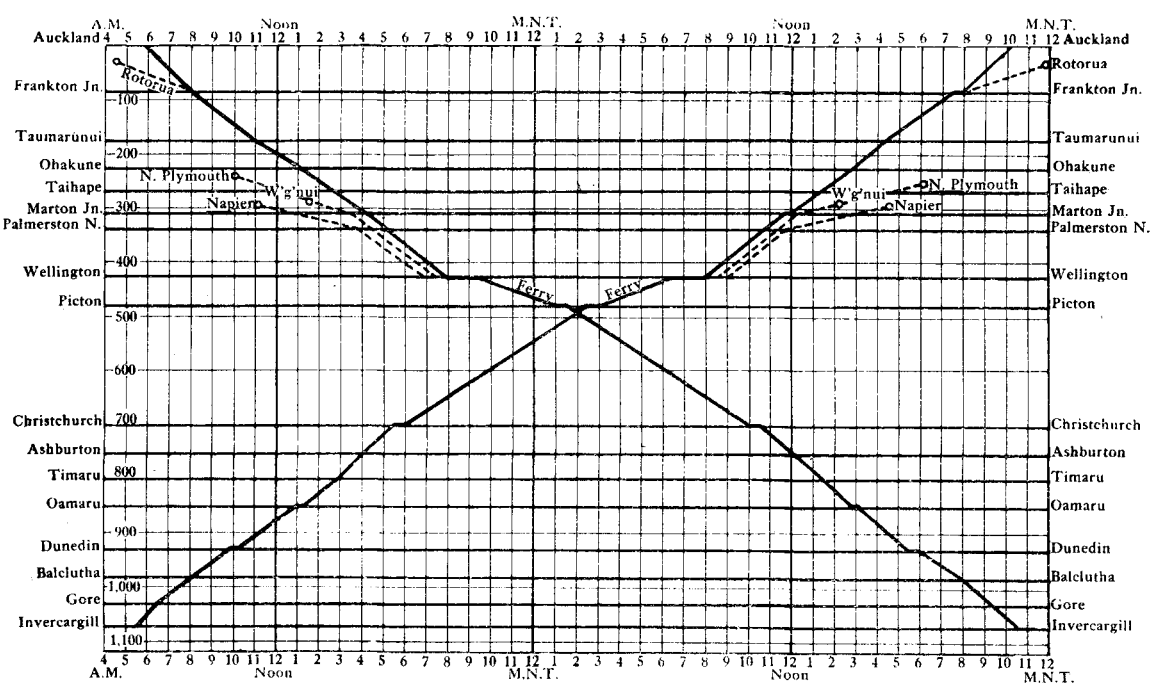
(North Island—Full black; South Island—Dotted black.)

SHEEP AND LAMBS.



(E.)

POSSIBLE TIME-TABLE, AUCKLAND–INVERCARGILL EXPRESS AND TRAIN-FERRY SERVICE.



APPENDIX E.

Report of the Board of Inquiry into the Conditions of Work of Shunters in the Government Railways Department.

ANNEXURE *(A)*.

PAGE.

Report on Stations inspected, covering all Matters referred to in the Order of Reference 87

ANNEXURE *(B)*.

Analysis of Shunting Accidents for Ten Years (June, 1915, to June, 1925) 117

ANNEXURE *(C)*.

Lighting of Shunting-yards 118

ANNEXURE *(D)*.

Alterations to Shunting-yards 118

ANNEXURE *(E)*.

Report of Special Public Inquiry into the Work and Conditions of Shunters at Palmerston North, together with Investigations into various Allegations made against Officers at Palmerston North. Also Investigations into the Circumstances surrounding the Death of the late Shunter Carmichael ... 119

Evidence and Addresses by Advocates before the Board 183

APPENDIX E.

REPORT OF THE BOARD OF INQUIRY INTO THE CONDITIONS OF WORK OF SHUNTERS IN THE GOVERNMENT RAILWAYS DEPARTMENT.

COMMISSION.

To all to whom these presents shall come, and to JOHN BROWN, Esquire, of Wanganui; HARRY LOUIS PERCY SMITH, Esquire, of Auckland; JOHN EDWARD PERRY, Esquire, of Dunedin; SETH SCHOFIELD, Esquire, of Christchurch.

WHEREAS it is desirable that inquiry should be made into the matters hereinafter mentioned:

Now, therefore, I, Joseph Gordon Coates, Minister of Railways, in pursuance of the powers vested in me by section 9 of the Government Railways Amendment Act, 1921-22, and of all other powers and authorities in that behalf, do hereby constitute and appoint you, the said

JOHN BROWN,
HARRY LOUIS PERCY SMITH,
JOHN EDWARD PERRY, and
SETH SCHOFIELD,

to be a Board of Inquiry to inquire and report to me regarding the conditions of work of shunters in the Government Railways Department as affecting the hazard involved in the performance of their duties, having regard more particularly to the following factors, namely,—

(1.) The length of the shifts which shunters are required to work;
(2.) The numbers of the employees composing shunting gangs;
(3.) The time that is allowed for the work of making up trains;
(4.) Supervision that is afforded on shunters' work;
(5.) The general control of the work in shunting-yards;
(6.) The lighting of shunting-yards;
(7.) The layouts and proposed layouts of shunting-yards;
(8.) Drainage of shunting-yards;
(9.) The matter of employees inexperienced in shunting-work being employed thereon;
(10.) And generally any other matters which, in your opinion, affect the conditions of work of shunters as bearing on the risks involved in their employment.

And for the purpose of better enabling you, the said Board, to carry these presents into effect you are hereby authorized and empowered to make and conduct any inquiry under these presents, at such times and places in the Dominion of New Zealand as you deem expedient, with power to adjourn from time to time and place to place as you think fit, and to call before you and examine on oath, or otherwise as may be allowed by law, such person or persons as you think capable of affording you any information in the premises.

And you, the said JOHN BROWN, are hereby appointed Chairman of the said Board of Inquiry.

And you, the said JOHN BROWN, HARRY LOUIS PERCY SMITH, JOHN EDWARD PERRY, and SETH SCHOFIELD, are hereby required to enter upon and pursue the said inquiry with all due diligence, and to report to me under your hands your opinion on the matters aforesaid not later than the 31st day of August, 1925.

And it is hereby declared that these presents shall continue in force notwithstanding that the said inquiry may be adjourned from time to time and place to place.

And it is lastly hereby declared that these presents are issued under and subject to the provisions of section 9 of the Government Railways Amendment Act, 1921-22.

As witness my hand, this 13th day of July, 1925.

J. G. COATES, Minister of Railways.

To all to whom these presents shall come, and to JOHN BROWN, Esquire, of Wanganui; HARRY LOUIS PERCY SMITH, Esquire, of Auckland; JOHN EDWARD PERRY, Esquire, of Dunedin; SETH SCHOFIELD, Esquire, of Christchurch.

WHEREAS by warrant under the hand of the Minister of Railways dated the 13th day of July, 1925, you, the said

JOHN BROWN, Esquire, of Wanganui,
HARRY LOUIS PERCY SMITH, Esquire, of Auckland,
JOHN EDWARD PERRY, Esquire, of Dunedin,
SETH SCHOFIELD, Esquire, of Christchurch,

were appointed to be a Board of Inquiry under and subject to the provisions of section 9 of the Government Railways Amendment Act, 1921-22, for the purposes set out in the said warrant:

And whereas by the said warrant you were required to report to me under your hands your opinion as to the aforesaid matters not later than the 31st day of August, 1925: And whereas it is expedient that the said period should be extended as hereinafter provided:

Now, therefore, I, Francis Henry Dillon Bell, acting for the Minister of Railways, in pursuance of the powers vested in me by the aforesaid section 9 of the Government Railways Amendment Act, 1921-22, do hereby extend the period within which you shall report to me as by the said warrant provided to the 30th day of November, 1925.

And in further pursuance of the powers vested in me as aforesaid I do hereby confirm the said warrant as altered by these presents.

As witness my hand, this 2nd day of November, 1925.

F. H. D. BELL, for Minister of Railways.

REPORT.

The Hon. the Minister of Railways, Parliamentary Buildings, Wellington.

SIR,— Wellington, 26th November, 1925.

In pursuance of your warrant directed to us dated the 13th day of July, 1925, constituting and appointing us to be a Board of Inquiry to inquire into and report to you regarding the conditions of work of shunters in the Government Railways Department as affecting the hazard involved in the performance of their duties, having regard more particularly to the factors enumerated in the order of reference, we, John Brown, of Wanganui (Chairman), Harry Louis Percy Smith, of Auckland, John Edward Perry, of Dunedin, and Seth Schofield, of Christchurch, having made full inquiries into the matters referred to us, have the honour to report thereon as follows :—

The Board commenced sitting on the 16th July, 1925, and conducted a thorough examination into all matters coming within the scope of the order of reference, inspected shunting-yards and facilities at various stations throughout the Dominion, and took evidence at the following places : Bluff, Invercargill, Gore, Clinton, Balclutha, Stirling, Milton, Mosgiel, Burnside, Dunedin, Palmerston, Oamaru, Timaru, Ashburton, Addington, Christchurch, Lyttelton, Greymouth, Westport, Wellington Petone, Lower Hutt, Upper Hutt, Masterton, Woodville, Dannevirke, Waipukurau, Hastings, Napier, Paekakariki, Palmerston North, Marton, Wanganui, Hawera, New Plymouth, Taihape, Ohakune, Taumarunui, Te Kuiti, Frankton Junction, Morrinsville, Paeroa, Huntly, Mercer, Otahuhu, Penrose, Onehunga Wharf, Newmarket, Auckland, Mount Eden, Henderson, Helensville, Whangarei.

All sittings were conducted in camera, with the exception that at Palmerston North, according to your directions, we conducted a special public investigation, the report in connection therewith being submitted to you under date 16th September, 1925. A copy of this report is included in the appendices (Annexure *E*).

Evidence was taken at fifty-three stations throughout the Dominion. 255 witnesses were examined, and 1,055 pages of evidence taken.

Every opportunity was given to witnesses to come forward and submit information and suggestions, and we are pleased to record that witnesses came forward freely, and with their assistance the Board was enabled to obtain evidence which was of material assistance in its deliberations.

At Wellington the shunters declined to appear before the Board to give evidence. Evidence on all points, however, was taken from the Goods Agent and the Foremen.

A detailed report on individual stations bearing on local matters which call for special comment is attached (Annexure *A*). Where no reference is made in this detailed report in regard to matters coming within the scope of the order of reference, it is to be understood that the position in that connection is considered to be satisfactory.

SHUNTING ACCIDENTS.

A return and analysis of accidents for ten years ended June, 1925, is attached (Annexure B). The summary shows the number of fatal, serious, and minor accidents, and the causes. During this time there were 869 shunting accidents, forty of which were fatal and thirty serious. Of the fatal accidents there were fourteen cases where members of staff were knocked down by moving vehicles or engines, and eight were caused through jumping or slipping off wagons and cowcatchers of engines, the others being due to various causes.

The analysis shows that there were only one fatal and two minor accidents due to slip-shunting of wagons, and one serious and ten minor accidents due to tail-roping, for ten years prior to the fatal accident which occurred to Shunter Carmichael at Palmerston North on the 3rd August, 1925, the cause of which formed one of the subjects of the special investigation by this Board at that place. The figures in regard to the slip-shunting and tail-roping of wagons show that, provided the member who is carrying out his work is conversant with the methods, and uses reasonable care, the operations are not dangerous.

The frequent fatal accidents of late are not attributable in any way to the changed conditions of work, but in the majority of cases have been due to errors of judgment.

It has been stated in evidence that a contributing cause of the accidents was the employment of inexperienced men in the shunting-yards. This may be true in some respects, but it is a significant fact that during the war years, when the staff was at a low ebb and there was a shortage of experienced men, the average number of fatal accidents per year was lower than for the years following 1918. In the year 1919 no fatal accident occurred.

In recent years the numerous promotions and resignations, and the increase in staff required to handle the increased business, has in certain directions impaired the working efficiency in some of the shunting-yards, and these frequent changes, together with the placing of some men in shunting-yards who were insufficiently alert or temperamentally unfitted for the work, constituting a danger to themselves and their workmates, has to a certain extent contributed to a number of accidents in recent years.

Shunting-work requires to be performed with reasonable quickness, and even under the very best conditions a member employed at this work is liable to make a miscalculation or slip and be seriously injured or killed.

The Board is of opinion that only men who are physically active and mentally alert should be placed in the shunting-yards. The majority of the men at present carrying out the work possess these qualifications.

The Length of Shifts which Shunters are required to Work.

The shifts are worked out on an eight-hour basis, or on a schedule of forty-eight hours a week. On some shifts a short break for a meal is allowed, the time of the shifts being treated as continuous, and on other shifts members are booked off for half an hour or one hour as circumstances permit. A large number of the shifts worked have been found to be satisfactory. It is not always possible to closely adhere to an eight-hour shift or a forty-eight-hour week. This is mainly brought about by the late running of trains, heavy seasonal traffic and shipping traffic, which at times causes excessive hours to be worked on the evening shifts.

During the slack periods of the year the hours of the scheduled shifts are not exceeded to any great extent except at shipping-ports, and as this traffic is intermittent it is not usually possible to rearrange the shifts in time to avoid the necessity for working overtime.

During the busy seasons long hours were worked at some of the stations, and this should be avoided if it is at all possible to keep the hours down to within reasonable limits.

At several of the stations visited the shunters asked for a six- or seven-hour day in the busy yards. In our opinion the six-hour day would be too costly and the seven-hour day would be impracticable. Although the exigencies of the service do not always permit of working an eight-hour day, we are of opinion that in shunting-yards where the work is heavy and continuous, and to provide a uniform practice in the larger yards, the shunting shifts should be worked out on a seven-and-a-half-hour day, making a total of forty-five hours' actual work for the week exclusive of the time booked off for a meal; the time worked to be paid for as if the member worked forty-eight hours for the week. Should the work not permit of a member being booked off for a meal during his shift, the time from the commencement of his shift till the finish of the shift would count as continuous. Any time worked in excess of forty-five hours per week up to forty-eight hours to be treated as additional ordinary time. We consider that the seven-and-a-half-hour shifts should apply at Auckland, Frankton Junction, Marton, Wanganui, Palmerston North, Wellington, Lyttelton, Christchurch, Timaru, Dunedin, Invercargill, and Greymouth, where the shunting-work is of an arduous nature.

The Numbers of the Employees composing Shunting Gangs.

The number of men in the shunting gangs is generally satisfactory, and with a few exceptions is sufficient, provided that no member of a gang is withdrawn to carry out other duties. This practice, which prevails at a number of places, gives rise to a certain amount of dissatisfaction, and should as far as possible be avoided. The yards at which the gangs require strengthening or adjustment made to keep them intact are shown in the attached detailed report on stations (Annexure *A*).

The Time that is allowed for the Work of making up Trains.

Very few complaints were received from the shunters in regard to the time allowed for the work of making up trains.

Under normal conditions of traffic, and provided the trains run to schedule, the time allowed in the majority of cases is reasonable. Adjustments made in the new Working Time-table will remove some of the difficulties under which the shunting-work was carried out.

There appears to be no justification for the statements made in the newspapers that the speeding-up of the express services has speeded up the shunting-work at the various centres.

The Supervision that is afforded on Shunters' Work.

The supervision of the work has generally been found to be sufficient.

At Dunedin the Goods Agent stated that the supervision over the work in the yard was insufficient, and considered that a Senior Foreman, additional to the present Yard Foreman, should be appointed to take charge of the whole of the yard during the day. We are of the opinion that the appointment of another Foreman is not necessary; and, provided a messenger is placed in the Yard Foreman's office during the day to attend to the telephones and receive the necessary transport instructions, &c., the supervision will then be sufficient.

The General Control of the Work in Shunting-yards.

The control of the shunting-work, with the exception of at Palmerston North, which has already been reported on, has generally been found to be satisfactory. Some exception was taken by the shunters to the method of control in the Auckland Goods-yard. This is dealt with in the detailed report on stations attached (Annexure *A*). The necessity for extra assistance in controlling the work at Taumarunui is also referred to in the detailed report (Annexure *A*).

In view of the motor competition and the necessity for quicker transport of goods, the efficient working of the shunting-yards is essential to carry on the business of the Railways successfully, and the Foremen who are appointed to take charge of large yards should be men who know their business, can display initiative when sudden emergencies arise or new conditions are met, and are capable of carrying on the work without friction.

The Lighting of Shunting-yards.

The lighting of shunting-yards, with a few exceptions, is fairly good. Where the electric lighting has been installed in shunting-yards it has considerably improved the working-conditions. When the additional lights recommended have been placed in position and the lighting programme has been completed one of the most serious complaints in regard to the conditions under which shunters are working will have been removed.

The gas-lighting of yards is generally unsatisfactory. The lights are, as a rule, poor, and during stormy weather go out. The lamps also require frequent attention, and the upkeep is costly.

When it is not possible to place the electric-light poles in suitable positions to light the ladder-points or to avoid the throwing of shadows by standing vehicles, the advisability of suspending the lights should be considered.

In some cases it was noticed that the new lights were not placed to the best advantage, and we consider that in future when any new lights are being installed in yards the members conversant with the working of the yards should be consulted as to the best locations for the lights. A list showing the order of urgency in which the lighting of shunting-yards should, in our opinion, be carried out is included in the annexures to this Appendix (Annexure *C*).

The Layouts and Proposed Layouts of Shunting-yards.

Although the layout of a number of the shunting-yards is good, the majority of them are not effective for the quick handling of the traffic. This has been brought about in some cases by patching the yards instead of reconstructing them, which results in wagons having to be handled several times, with a consequent delay to the work and traffic and increased operating-costs. The main difficulty experienced in the yards at the various centres is the lack of sufficient siding-accommodation and the want of long roads for receiving and despatching trains.

The traffic has outgrown the capacity of the yards at some centres, and at other places the roads are too short to accommodate the long trains now handled.

The congested state of some of the yards, and the want of suitably arranged accommodation for handling the wagons, has increased the difficulties of the shunters and the risk of accident. The demand for quicker transport of goods makes it essential that the facilities should provide for the handling of the traffic through the shunting-yards with the least effort and the greatest speed.

The running of through goods-trains should reduce the congestion which has arisen at some of the subterminal stations in the past.

A number of accidents have occurred through wagons running back or stopping foul after being kicked off into the different roads. When designing new yards the grades should, if possible, be so fixed that the wagons will gravitate from either end of the yard towards the centre.

Receiving-roads should be of sufficient length to accommodate the longest trains handled, and so arranged that a train entering the yard will not interfere with the shunting movements in the yard.

Departure roads should also be capable of holding any train despatched from the yard.

In yards where the shunting-legs are curved the draw-hooks of wagons are liable to jam and the engine-driver is frequently out of sight of the shunter, which slows up the work and also constitutes a danger to the member carrying out the shunting operations. It should be arranged, if possible, when laying out new yards, that the shunting legs and ladders be kept on the one straight; or, if a curve is necessary, it should be only in the direction that will keep shunters and enginemen in sight of each other. Adjoining sidings and structures should be so placed as not to interfere with the view.

In the larger yards the layout should be such that all shunting movements in the yard can be carried out without fouling the crossing-loop or main line.

The clearance from a shunting ladder or leg to the adjoining siding, in which space shunters work, should be at least 15 ft., and car-sidings should be spaced at 12 ft. centres.

Before making any alterations or additions to the layout of a yard the yard staff should also be consulted as to the suitability of the alterations and the effect they will have on the work.

A list showing the order of urgency in which, in our opinion, the work of improving or rearranging the shunting-yards should be carried out is attached (Annexure *D*).

The Drainage of Shunting-yards.

In some instances serious complaints were made in regard to the drainage of some of the yards owing to water flooding the yards and not getting away quickly. This is often due to the yards being at a lower level than the street formation or adjoining properties, making it a difficult matter to readily drain the water away after a heavy downpour of rain. Although it may not be practicable to provide suitable drainage in all parts, we are of the opinion that the drainage of the yards mentioned in the detailed report on stations attached should receive more attention.

The hollows worn in the yards by the shunters cause the water to lie about in pools, and the bad places should be ballasted up to make a level surface.

The Matter of Employees inexperienced in Shunting-work being employed thereon.

Numerous complaints were made in regard to the placing of inexperienced men in shunting gangs. It was also stated that the frequent changes in the gangs by the withdrawal of an experienced porter and the replacement by an inexperienced porter reduced the efficiency of the gangs and placed added responsibility on to the other member or members of the shunting gang.

The changes in the gangs are frequently brought about through transfers, accidents, sickness, and shunters being employed as acting-guards. The vacancies are often filled by porters who have had no experience of shunting-work.

It has been further stated that a number of the porters who are employed in the shunting-yards do not take sufficient interest in their work; also that the porters employed in the coaching department do not desire or will not take up shunting-work, but prefer to remain on the passenger-platform or to obtain a position as tablet-porter. At some stations a number of the porters are unsuitable for shunting-work owing to defective colour perception or some other disability. This makes it difficult at times to provide suitable relief for the shunting-yards.

With a view to making the shunting-yards more attractive, and to stimulate a steady flow of suitable porters into the yards who would take an interest in the shunting-work, we are of the opinion that the time a porter is employed as third man in an authorized three-man gang, or second man in an authorized gang of two men consisting of one shunter and one porter, should count towards his first increment on obtaining promotion to the position of classified shunter. For example, a porter who had served 313 days or more as third man in a three-man gang, or second man in a two-man gang of one shunter and one porter, would, on his promotion to a shunter, be paid at the rate of 1s. $11\frac{2}{4}\frac{3}{4}$d. instead of 1s. $10\frac{3}{4}\frac{3}{4}$d. an hour. This should also apply to porters employed at shunting duties at any station who are now in receipt of the shunting-allowance.

Some regular system of training the porters in shunting-work is in vogue at a few stations, but this cannot be regularly carried out at the majority of the stations owing to no spare staff being available. The system at Christchurch is a good one. Any vacancy in a shunting gang in that yard can be filled at short notice by one of the porters who are termed "generals," "pilots," and "brakesmen," and are capable of filling a third position in any of the gangs. The system at Palmerston North, where a porter is always kept in training in addition to the pilots who are also gaining experience, is a good one. Provided some similar system of training as that adopted at Christchurch and Palmerston North can be instituted at all other large centres it will remove a great many of the present complaints, and will also be the means of building up a competent staff of shunters.

The majority of the Foremen state that they prefer to get the men young for training in shunting-work, as the junior porters in the past readily qualified and became competent shunters.

In view of the congested yards at the important centres and the necessity for quicker transport of goods, there is now a more urgent need for an efficient staff in these yards, and the training of the men should be such that the efficiency of the shunting gangs will be maintained all the time.

General matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Shunting-engines.

Complaint was made at some centres in regard to the condition and type of engines supplied for shunting purposes. It was stated that on occasions considerable clouds of steam escape from engines, obstructing the view and creating a danger to the shunting staff; also that some type of engines were unsuitable and not powerful enough to carry out the work in a satisfactory manner. Frequent reference was also made to the defective sanding-gear on the engines.

From observations made, several instances of considerable clouds of steam escaping from shunting-engines were noticed; also a few instances of train-engines standing or passing through the shunting-yards blowing off steam at the cocks. With wet and foggy conditions the steam does not rise rapidly, and makes the conditions of the shunting-work being carried out in that vicinity of the yard dangerous. Although it may not always be possible to prevent a certain amount of steam escaping from the shunting-engines or from train-engines proceeding from the locomotive-depot through the yard, we are of opinion that the quantity of steam now escaping or blown off in the shunting-yards could be minimized to some extent.

A number of the foot-rests on the cowcatchers of shunting-engines are too narrow and do not give sufficient foot-rest, with the result that the front portions of the shunter's feet are overhanging the edge of the rest. This does not give him sufficient spring to alight from a moving engine with safety.

Some of the aprons on the cowcatchers of shunting-engines require extending right across the bars of the cowcatchers so as to avoid the risk of a shunter getting his foot caught between the bars and prevent water swishing through the bars on to his legs.

The foot-rests and steps on a number of the engines used for shunting purposes are worn smooth, and employees when jumping on engine are liable to slip. The foot-rests and steps should be kept jagged.

At a number of stations tender-engines are regularly used for shunting purposes, and the provision of a hand-grip and step at the tender end of engine would facilitate the work and remove a risk of accident.

Provided the headlights of shunting-engines could be adjusted so that portion of the light could be thrown on the cowcatcher at each end it would reduce the risk of accidents when the shunters require to jump on the cowcatchers.

The majority of the shunters and Goods Foremen in the big yards expressed the opinion that the converted J engine was the best type for shunting purposes. This engine can handle fairly long rakes of wagons quickly, and the braking-power is fairly effective. The additional advantage is that sufficient coal can be carried on the engine for the whole of a shift, and water is, as a rule, only required once during the shift, which is a great saving of time in the working of a busy yard. A good type F engine has been found to be very suitable and quick in marshalling-yards where long rakes of wagons do not require to be handled.

Although the majority of the engine crews employed in shunting-yards keep in close touch with the shunter and readily pick up the signals, it is noticeable on occasions that some of the engine crews do not keep a sharp enough lookout for signals given by the shunters.

It has been stated in evidence that occasionally cleaners are placed on shunting-engines as acting-firemen who are unable to interpret the signals given by shunters. We consider that it is imperative that all members acting as firemen should be capable of readily picking up and understanding the signals.

Rolling-stock.

The step on the end of some of the postal cars is too narrow, and does not permit of the shunter securely standing on the step while attending to the screw brake on car. A more suitable step is necessary.

The lower steps on the elevated-roof cars, more particularly at Dunedin, are too close to the ground, and catch the heel of the boot of a shunter, which is liable to trip him when he is lifting the hook of the moving vehicles. The steps should be raised slightly to remove any risk of danger to shunter.

The vestibules on Main Trunk cars are a source of danger to shunters, and we would suggest the possibility of doing away with them should be considered.

Comment was freely made in regard to the frequent delays to the shunting-work and trains owing to the shortage of brake-vans. The position is more acute in Auckland than in the other districts.

The general opinion of the members of shunting-yards is that the round drop bridle is much more satisfactory than the other type of bridles in use.

A number of the buffers on wagons are not gouged out sufficiently to allow the drawhook to fall back against the end of the wagon, with the result that difficulty is experienced in keeping the hook up when cutting out wagons.

Some comment was made in regard to the difficulty in uncoupling the hooks of side chains. This refers to the new standard side-chain hook, which appears to be slightly heavier than the old type and not so open. This results in slowing-up the work in the yard.

The question of providing a hand-brake at each end of all wagons was raised. The provision of an additional brake would to a great extent reduce the damage to rolling-stock, but, as the cost of fitting the wagons would be heavy, we consider the expense is not warranted.

At present wagons are fitted with two handrails, one above the step and one above the hand-brake at the other end of the wagon. It frequently happens that the shunter has to do his cutting-off at the corner of the wagon where there is no handrail, and, owing to the number of iron wagons in use, is unable to get a grip on the wagon while stepping in between the wagons to lift the hook. The provision of a handrail at each corner of wagons would be an advantage, and provide the shunter with a secure handhold in the event of his slipping while lifting the hook. The handrail would require to be kept low enough so as not to be covered over by the tarpaulin. On a number of new J wagons recently turned out of Newmarket it was noticed that the handrail was placed too far in at the ends of wagons to fully answer the purpose for which it is intended.

Several complaints were received in regard to the danger of coupling up the short Westinghouse hoses. We understand that all vehicles will in future be fitted with the long hoses, which will remove any further complaint in this respect.

One of the greatest risks in respect to carrying out shunting-work in this country is brought about by the necessity for hand coupling and uncoupling of vehicles. Of the 869 shunting accidents which have occurred during the ten years ended June, 1925, 214 of them (principally minor accidents) were due to employees going between vehicles for the purpose of attending to the couplings.

We received no suggestions from members of the shunting staff in regard to any mechanical coupling-device. A model was submitted for the inspection of the Board at Frankton Junction, but it was not considered to be a workable proposition. Another model was inspected at Aramoho Junction, and, being an improvement on the Frankton Junction one, was reported on for the consideration of the Suggestions and Inventions Board.

In view of the number of accidents which have occurred through employees going between vehicles to attend to the couplings, the possibility of designing a coupling-gear which will obviate the necessity of a man going between the vehicles should be investigated. We cannot see that any coupling-device will altogether remove the necessity for the staff going between the vehicles, although it may greatly reduce the risk of accidents.

Tail-ropes.

Although very few accidents have happened when using the tail-rope for the movements of wagons, the question of a suitable and uniform tail-rope has been raised. Some of the tail-ropes have a hook at both ends, and others have a hook at one end and a link at the other end. We consider that the safest and most convenient rope to use is a wire rope, with a link at one end of sufficient size so that the hook of side chain will not jam in it, and a blunt hook at the other end similar to the hook now in use. It was noticed, however, that some of the hooks on tail-ropes now in use were too straight and liable to slip when a strain was put on the rope.

There should be no link between the wire and the hook: the wire should be attached to eyelet hole of the hook, and the rope so constructed that a member using the rope cannot fasten it at the hook end other than by the hook.

Tracks, Structures, &c.

The more frequent painting of points-levers was asked for at practically every place visited. At Wellington the levers are regularly whitened with a mixture of lime and salt water. The work is done by a member of the Traffic staff, and the result is most satisfactory. We recommend the general adoption of the Wellington method.

The open spaces between the sleepers were frequently complained of. The space between the points-lever switches should be planked over or filled in with ballast, the drag-rod being piped in the latter case. Between the sleepers at the switches the spaces should be filled up (with broken metal or old sleepers) to level with the tops of the sleepers. The present open spaces are liable to trip a shunter when between moving wagons lifting the hook.

Double slips on shunting legs or ladders are a source of danger to shunters. If it is necessary to have them in such places the sleepers should be planked in a manner similar to the way they are planked in the Christchurch yard.

At the frog the ballast should be kept well up to the rail-level, to minimize the risk of men catching their feet in the V. Generally this matter receives the necessary attention from gangers.

When any track-work is done about yards which results in sleepers being left bare, the necessary ballasting should be treated as an urgent work. Bare sleepers about a yard are a source of danger to shunters. If a portion of track is opened up and the ballast cannot be replaced for the night, lights should be maintained alongside the opened-out portion of the track.

At a number of small country stations, which are usually shunted by train crews, we noticed that sleepers in places were bare of ballast. These stations are frequently shunted at night in dark yards, and fully ballasted tracks are very necessary. While the Board was at Taumarunui a porter at Waimiha met with an accident which was probably due to his slipping on a bare sleeper.

The cesses for about 3 chains ahead of the points at a number of country stations should be made up to rail-level. This would reduce the risk of accidents to employees when cutting off wagons to kick into the sidings.

We inspected the Thomson's patent spring switch-lever at several stations. The switches cannot be worked as fast with this lever as with the turnover type, and is unsuitable for use at points where much shunting is done. It is of special advantage at points through which the rear ends of trains are frequently backed. As the switches are automatically set for the right road by the wheels, there is no risk of derailment when the train is pulled out.

The goose-neck lever is much criticized. There is a risk of the man holding it while a train enters the siding being knocked off the lever by an overhanging load or piece of timber, or a missile thrown from the train.

Another difficulty has recently arisen in some yards through the necessity of holding down the goose-neck for trailing-points as well as facing-points to avoid damage to the signal-detectors. To do this calls for two men to let a train out of the yard. To avoid the risk of accident the shunters at several places asked that a lever similar to that in use at tablet-locked stations (which in future we shall refer to as "pull-over" levers) should be substituted for the goose-neck levers. Such a substitution, if made at all places fitted with goose-necks, would involve considerable expense, which may not be warranted. We suggest that at stations where the turnouts fitted with goose-necks are extensively used pull-over levers should replace the present ones.

At water-tanks and water-columns the concrete catchwater is frequently a source of danger to the shunters. When these are located in places where the shunters work, a grating should be fitted to give a level surface to walk on. Particular attention should be given to keeping the ballast level with the top of the concrete.

The standard clearances are fairly well maintained in all station-yards, but on private sidings and in workshops-yards we noticed several cases where material was stacked too close to the tracks.

Special attention is necessary to see that in the parts of the yards where the shunting staff carry out their work all interlocking rods and wires are properly boxed in, and that the ballast is kept up level with the tops of the boxing. We noticed during our travels several places where rodding and wires were unprotected and boxing was standing some inches above the ballast. Rodding and wires running parallel with outside tracks should be kept well away from the line when being placed in future.

Where it is practicable to shunt timber-sidings in daylight it should be done in preference to shunting them at night. There are usually pieces of timber lying about timber-sidings which are very liable to trip the member doing shunting-work in the dark.

The present practice when there are cattle-stops in a yard is to place a somewhat narrow plank across the stop alongside the track. Where there is much shunting to be done we suggest that a gangway 18 in. wide should be provided.

Bridges and open culverts close to yard limits should be planked for shunting. The suggestion was made that such planking should be tarred and sanded to reduce the risk to shunters or guards slipping in wet or frosty weather. This idea appears to be a good one.

Obstructions.

We noticed at some of the main cattle-wagon-cleaning depots that the manure was not cleaned up as frequently as could be desired. A shunter in his efforts to avoid heaps of manure may get foul of moving wagons.

Another source of danger which came under our notice is the practice of leaving car-gangways, tarpaulins, buffers, and brake-blocks lying between the tracks in the yards. Water-hydrant boxes without lids, or with the lids left off, were noticed in several yards, and we consider that hinged lids should be fitted in all cases where not already done.

Clothing.

The long overcoat worn by many shunters in wet weather is unsuitable for the work, being liable to cause accidents through catching on wagons or brakes. The most suitable waterproof wear for the work is something after the style of the overalls worn by motor-cyclists. As a shunter must carry on with his work in all weathers, we suggest that the matter of issuing suitable overalls to the men regularly engaged on shunting duties should receive favourable consideration.

On the question of boots, the majority of the shunters consider that each man should wear what suits him best. The general opinion concerning elastic-side boots was that after being worn for a short

time they would become loose round the ankle, and be liable to cause more accidents than they would save. The number of accidents for ten years past due to men being caught in the frogs or switches was three fatal, one serious, and thirteen minor. Some of these accidents would have happened even had the men concerned been wearing elastic-sided boots.

Several shunters stated that the average life of a pair of soles on their boots was three weeks. This involves a heavy expense to the shunters.

Correspondence.

One matter which a number of witnesses brought up was the number of official letters, or "blisters," as they are commonly called, which are received by shunters. Inquiry elicited the fact that the majority of these sought the shunter's explanation concerning a train delay or derailment about which he probably knew some particulars. It is essential that such information should be obtained, and the written request to the shunter for the information does not imply that he has been in any way at fault. Unfortunately, a large number of the staff do not realize this fact, and feel when they receive an official letter asking for an explanation of some point that they are being placed on their defence. A shunter who has made some mistake in shunting may be told to be more careful in the future, but unless the accident were due to incompetence or wilful neglect of duty it is not treated seriously. We are of the opinion, however, that, as far as practicable, shunters' explanations concerning all trivial matters should be obtained verbally instead of in writing.

Hand-lamps.

The general opinion of the shunters is that the swivel-top hand-lamp is the most suitable for shunting-work, and at practically all stations such lamps are supplied to all men in the shunting-yard. At a few stations, however, there was a shortage of suitable hand-lamps to replace the damaged ones. Some complaints were made in regard to the weight of the lamps. Considering the nature of the work shunters are required to perform, a lamp which is not strongly constructed would be easily damaged.

First-aid and Ambulance Tuition.

The matter of training members of the Railway staff in first-aid and ambulance work was raised at several places. If classes for such work could be established, and members would attend them, it would be beneficial for all concerned.

GENERAL.

In view of the responsible nature of the work to be dealt with by a shunter in charge of a shunting shift at important centres where the efficient carrying-out of the work is essential to carry on the business of the Department successfully, we are of the opinion that any employee while in charge of a regular shunting-engine and shunting gang in large shunting-yards, and not in receipt of the maximum rate of pay for a shunter, should be treated as working in an advanced capacity, and be paid at the maximum rate for the time he is in charge of a regular shunting-engine and shunting gang. The necessary qualifications fitting the position of a leading shunter as outlined in the evidence of Signalman J. T. Fisher, Marton, may not be attained by all, but the position should be remunerative enough for all members to aspire to.

A number of hints for the guidance of members when engaged in carrying out shunting operations were submitted by the shunters at Auckland. We would recommend the printing of the hints in pamphlet form, or by circular, for issue to all members of the staff for their guidance.

J. BROWN (District Traffic Manager, Wanganui), Chairman
H. L. P. SMITH (Assistant Engineer, Auckland)
S. SCHOFIELD (Shunter, Christchurch)
J. E. PERRY (Shunter, Dunedin)
} Railway Shunting Inquiry Board.

LIST OF ANNEXURES.

A. Detailed report on stations inspected covering all matters referred to in the order of reference. Page 87.

B. Analysis of shunting accidents for 10 years from June, 1915, to June, 1925. Page 117.

C. Lighting of shunting-yards, order of urgency. Page 118.

D. Alterations to shunting-yards, order of urgency. Page 118.

E. Report of special public inquiry into the work and conditions of shunters at Palmerston North, together with investigations into various allegations made against officers at Palmerston North. Also investigations into the circumstances surrounding the death of the late Shunter Carmichael. Evidence and addresses by advocates before the Board. Page 119.

ANNEXURE *(A)* TO APPENDIX E.

REPORT ON STATIONS INSPECTED, COVERING ALL MATTERS REFERRED TO IN THE ORDER OF REFERENCE.

We submit hereunder brief comment and recommendations in regard to the more important local matters represented at the various stations inspected. The report is arranged in geographical order, and the subjects are dealt with in the order they appear in on the order of reference. Where no reference is made in this detailed report on individual stations to matters coming within the scope of the order of reference it is to be understood that the position in that connection is considered to be satisfactory and does not call for special comment.

Bluff.

The Length of Shifts which Shunters are required to work.

The shunters and porters work excessive hours when shipping traffic is heavy. When an extra shunting-engine is working in the yard and on the wharf an experienced shunter should be sent from Invercargill to keep the hours of the shunting staff at Bluff within reasonable limits.

The Numbers of Employees composing Shunting Gangs.

Two gangs, each consisting of one shunter and one porter, are sufficient.

The Lighting of Shunting-yard.

The electric lighting is good, except that the light near tanks on road to wharf should be increased in candle-power. The shunters ask for an additional light near the locomotive-depot to light points when taking engines to and from loco. yard. Very few engines are dealt with in the dark, and at present there is no necessity for this light.

The Layout and Proposed Layout of Shunting-yard.

When the crossover road (double slips) in front of platform is renewed the crossover road should be placed nearer to the weighbridge, in order to lengthen the present standing-roads. The dead-end road at the end of the main line clear of the points serving the cool stores only holds ten wagons and engine, and should be lengthened as far as possible up to thirty wagons. During the busy season sixteen to twenty-five wagons of butter and cheese require placing at one time.

When the siding to the new wharf is laid a connection to the sidings serving the cool stores should be made from the wharf-siding, to give easy access from the cool stores to the wharf. This would save a great deal of shunting.

The Southland Frozen Meat Company's buildings on railway lease obstruct the view of shunters when shunting round the east leg of triangle. In view of the present obstruction, the question of not permitting the erection of other buildings on this site, when the present premises are demolished, should be considered.

The present goose-neck points-lever on main line at east end of yard should be taken out and replaced by an ordinary reversible points-lever. A large number of shunting movements to and from the wharf are made through these points daily. When pushing a rake of wagons on to wharf, one member of the shunting-gang has to hold down the goose-neck points-lever while the other member of gang is ahead of the shunt on a curve, and consequently is out of sight of the man at points and engine-driver. With the reversible points both members of shunting-gang would be in sight of one another and keep in touch with engine-driver. Although these points are on the main line, all main-line trains stop short of these points and do not pass over them except for shunting movements.

The Matter of Employees inexperienced in Shunting-work being employed thereon.

When a vacancy occurs at Bluff through a transfer of a porter the position should be filled, if possible, by a porter with some shunting experience.

Invercargill.

The Length of Shifts which Shunters are required to work.

The shifts are worked out on an eight-hour basis, and the scheduled hours are not exceeded to any great extent except when the yard is congested and trains arrive late. This extends the 9.15 a.m. to 6.15 p.m. shift for about two hours, and the 2.45 p.m. and 11.30 p.m. shift on Saturdays only for about two or three hours. Some adjustment of the shifts should be made, if possible, so that the gang booked on at 9.15 a.m. will commence later, provided arrangements cannot be made to release them at 6.15 p.m. or shortly afterwards; and the gang booked on at 2.45 p.m. on Saturdays should commence duty about 4 p.m.

The Numbers of Employees composing Shunting Gangs.

Provided the gangs are left intact during the shifts the number of men in each shunting gang is sufficient. Some assistance should be given the shunters during the evening for marking off trains, breaking the couplings, and removing tarpaulins from empty wagons, so that the shunting gang will be together when breaking up the evening trains.

The Lighting of Shunting-yard.

The south end of yard is well lighted with the exception of the shunting-leg. The north end, including portion of the west yard, is badly lighted. Portion of the east yard at the north end is also fairly dark. The following additional lights are required: One near north end of square engine-shed; one near points leading to decker sidings; one about centre of A shed (west yard); one on shunting-ladder opposite loading-bank, north end of A shed (west yard); one north of north signal-box; one in east yard between Nos. 5 and 6 roads.

The lights on overhead bridges should also be raised to improve the lighting in the east yard. When provision is made for dealing with goods-trains in the west yard it will be necessary for additional lights to be provided in this yard.

The Layout and Proposed Layout of Shunting-yard.

The crossover at the north end of yard should be moved farther north to give a connection direct to and from the main line to the west yard. This would largely ease the congestion in the east yard and facilitate the work.

The crossover from No. 21 to No. 22 road just south of shunting-ladder in west yard should be shifted to butt against ladder-points to give more clearance to shunters when working between the tracks. We understand this work has been carried out.

A short dead-end siding between Nos. 11 and 13 roads in east yard was asked for to accommodate loads for the Foreman of Works and Corporation sidings which are received off trains during the day. These loads are at present stored in one of the through roads. The provision of the dead-end siding would be an advantage, but is not an urgent necessity.

Request was also made by the shunters that the loading-bank at south end of yard be shifted to a new position to enable two additional short sidings to be put in. There does not appear to be any other suitable site for the loading-bank, and, provided a connection is given from the main line to the west yard at north end, the additional sidings are not required in the meantime.

The Drainage of Shunting-yard.

The drainage is not satisfactory at the north end of yard—water lies about and does not get away quickly, more especially at Spey Street. This crossing is very wet and slushy in bad weather.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Complaint was made by shunters that hand-lamps sent to workshops for repairs were not properly attended to, the work being carried out by metal-workers. Better attention would be given hand-lamps if they were sent to the Foreman of Works, where the necessary repairs could be done by a plumber.

The structures at the Corporation metal siding are too close to the track, and are a danger to shunters.

Empty live-stock-wagons stored in west yard should be cleaned from west side of wagons instead of east side, as shunters work on this latter side.

The shunters also request that the heaps of coal-dross should not be left lying about between the stages and wagons in the private coal-sidings.

GORE.

The Length of Shifts which Shunters are required to work.

During the slack season shunters work about nine and a half hours a day for five days, with one day off a week. The hours of the shunting gang in the busy season extend to twelve hours a day, and average about ten hours per day for five days in the week. With the addition of a porter to the staff during the busy months the hours of the shunting staff could be kept down to eight per day. The extra man could not be fully employed during the slack season.

The Numbers of Employees composing Shunting Gangs.

The shunting staff consists of two shunters and one porter. For about three hours in the day the three members are working together. When two engines are working in the yard, one engine—usually a train-engine—is worked by one man and the other engine with two men. The shunting movements made with train-engines are usually over interlocked points, and there does not appear to be any necessity for a second man with engine when attaching and detaching wagons from trains. The shunters also ask for three men with the shunting-engine during the busy season. This is not considered necessary. The Waikaka guard is available for assisting with the shunting-work during the time he is at Gore.

The Lighting of Shunting-yard.

There is no lighting in the yard. Lights are required as follows, and should be installed before next winter: Two near ladder, south end; two near ladder, north end; one at cattle-yards; one in weighbridge-house.

A report in connection with the lighting at Gore has already been submitted to the Railway Board (Head Office file 1903/2055).

The Layout and Proposed Layout of Shunting-yard.

Request was made for the two backshunts at south end of yard to be extended to Bury Street, and the road next loading-bank at south end to be extended to end of present backshunts to provide

additional siding-accommodation for the storage of empty stock-wagons. The extension of the two backshunts to Bury Street is not advisable, as wagons stored at the extreme end of sidings would then seriously obstruct the view of an approaching train from the east side of crossing.

When shunting movements are being carried out at the north end of yard the engine-driver is frequently out of sight of the shunters, who ask that No. 22 interlocked points be moved to the other side of Mersey Street to give a longer straight on the shunting-leg. There appears to be no difficulty in giving effect to the suggestion, which would be an advantage.

Request was also made for direct access off the shunting-leg to the loading-bank near Mersey Street. Difficulty would be experienced in giving a suitable connection, and the expense is not warranted.

CLINTON.

The Numbers of Employees composing Shunting Gangs.

The shunting-work is carried out by porters. One porter attends to the signal-box while another porter carries out the shunting movements. Owing to the shunting-leg at both ends of yard being on a curve, the porter carrying out the shunting movements is unable at times to keep in sight of the enginemen. There is no other member of staff available when required to assist with the shunting-work. The shunting movements made are not difficult, and provided reasonable care is exercised there is no great risk of danger to porter carring out the work without assistance. The shunting-hours during the day and evening will average about six—equal to three hours a man per shift.

The Lighting of Shunting-yard.

There is no lighting in the yard, and the shunting-work during the early morning and evening is carried out in the dark. The residents of Clinton, as far as can be ascertained, have made no move towards getting the electric power brought into the district for lighting purposes. There is very little settlement on either side of Clinton, and it is doubtful whether the residents of Clinton will support any scheme for lighting the town with electricity. When the electric lighting of Milton Station and yard is completed the acetylene-gas-lighting plant at that station will be available, and could be utilized for lighting Clinton Station and yard. The lights in the yard should be provided as follows: One at north end, one near goods-shed, and one at south end.

The Matter of Employees inexperienced in Shunting-work being employed thereon.

Porters transferred to Clinton should have some shunting experience, as they are required to take charge of an engine during shunting operations.

BALCLUTHA.

The Time that is allowed for the Work of making up Trains.

It was stated in evidence that the time allowed for shunting Nos. 397 and 414 trains, and breaking up Nos. 420, 482, and 490 trains, and making-up of No. 434 train, was insufficient.

No. 397 (mixed) is allowed seventeen minutes. This train was formerly allowed twenty-two minutes, which was then found to be insufficient.

No. 414 (up goods-train) is allowed twenty-three minutes. The work of remarshalling this train cannot be carried out until the train-engine goes to loco. for coal and water, which occupies about fifteen minutes of the twenty-three minutes allowed. Frequently live-stock has to be lifted from cattle-yards for this train.

The earlier arrival of No. 490 ex branch on Mondays, Wednesdays, and Saturdays—at 3.30 p.m. instead of 4.5 p.m.—will considerably ease the position in regard to the making-up of No. 434 (up mixed train) on these days. The interval between the arrival of No. 420 (up goods-train) at 4 p.m., No. 482 ex branch on Tuesdays and Thursdays at 4.15 p.m., and the departure of No. 434 (up mixed train) at 4.40 p.m. is rather short.

No. 434 train is made up from the loads off Nos. 482, 490, and 420 trains. No. 420 has to be completely broken up, and loads prohibited from running on No. 434 cut out. The roadside wagon and cream-wagons, also live-stock and perishable loads off the branch train, have to be cut out and sent forward by No. 434. Provided No. 377 (goods-train), when running, can arrive at Balclutha not later than 2.30 p.m., this engine would then be available for shunting No. 414 (up goods-train), due at 2.32 p.m., and square up the yard before arrival of No. 420 and branch train.

The engine of No. 420 runs No. 434, and is in loco. for engine purposes for twenty-five to thirty minutes. The earlier arrival of No. 420 at Balclutha would be an advantage, and there does not appear to be any serious objection in timing this train to arrive Balclutha about 3.53 p.m.

The Lighting of Shunting-yard.

The present gas-lighting of yard is unsatisfactory. The quality of the gas is poor. When the present agreement with the gas company for the supply of gas for lighting station and yard expires, the electric lighting of station and yard should be gone on with. The electric lights in yard should be placed near the present position of gas lights, with an additional light at north end near locomotive-yard.

The Layout and Proposed Layout of Shunting-yard.

The layout of the yard is not satisfactory from a shunting point of view, the cutting-off being done at both ends on a curve, and frequently the shunters are unable to lift the wagon-hooks after the kick-up signal has been given.

Owing to the shunting-leg at the north end of yard not being of sufficient length, and being frequently used for the placing of wagons of coal for discharge into locomotive-yard, it is necessary to use the main line for shunting purposes. When a train is blocked on from Stirling, the shunting-work at north end of yard is at times held up owing to insufficient headway in the shunting-leg. The view of the shunters working at the north end is also seriously obstructed by wagons of coal standing on the shunting-leg, coal-stacks, and smoke from locomotive-depot. Provided the train-service permits of using the main line for shunting purposes at the north end of yard, the expense of extending the present shunting-leg over the flood-opening is not warranted. Some provision, however, should be made, if possible, to discharge the locomotive coal in some other portion of the locomotive-yard, and thus remove the present obstructions caused by the loaded wagons of coal and coal-stacks. Huts Nos. 93 and 234 in the railway-yard also obstruct the view of shunters, and should be removed to another site.

At the south end of yard wagons are inclined to run back over points after being kicked into yard. The ladder track appears to have sunk, and requires lifting.

The clearance between Nos. 2 and 3 roads at south end is barely sufficient, and extra room is required between these roads.

Request was made for the extension of the goods-shed road at south end past the river shed, so that wagons pushed down from shed would not foul the steamer-siding. There does not appear to be sufficient room between the River Board shed and the steamer-siding to permit of extending the shed road. The river shed would require to be shifted back a little. The extension of the shed road would give more room for the outward loading of wagons, and avoid complaints from the River Board in regard to the interference with the work on wharf.

Owing to no connection to the cattle-yards from the south end it is necessary at times to slip wagons of stock to yards, and this operation is occasionally carried out when only one shunter is on duty.

A crossover from the south shunting-leg to the cattle-yards would eliminate the slipping of wagons and facilitate the lifting and placing of wagons at cattle-yards.

Stirling.

The Length of Shifts Shunters are required to work.

The shifts are satisfactory. The scheduled hours of duty of shunters are as follows: No. 1—8 a.m. to 5 p.m., one hour lunch; No. 2—10 a.m. to 7 p.m., one hour lunch. The porter working on the 11 a.m. to 9 p.m. shift (two meal-hours) assists with the shunting-work. No. 1 shunter and No. 1 porter change shifts each week.

The Numbers of Employees composing Shunting Gangs.

The actual shunting-work does not exceed six hours a day, and does not warrant two graded shunters being employed at Stirling. The junior shunter should be withdrawn, and replaced by a porter with shunting experience. The shunter would be on duty between 10 a.m. and 7 p.m., and would practically deal with all the shunting-work during the day. Very little shunting would be done when the shunter was not on duty, and this could easily be attended to by the early- and late-shift porters on their shift.

The Time that is allowed for the Work of making up Trains.

Complaint was made in regard to the insufficient time allowed for shunting No. 448 train. This has been adjusted in the new working time-table operating from 15th November—forty-five minutes being allowed to deal with this train, as against twenty-five minutes under the old time-table. The additional time given is required.

The Lighting of Shunting-yard.

There is no lighting in yard. When the electric light is installed in station provision should be made for lighting the yard at both ends. The work, however, is not of an urgent nature.

The Layout and Proposed Layout of Shunting-yard.

When shunting movements are being carried out at the south end of yard the engine-driver is frequently out of sight of shunter owing to the curve, and it has been suggested that a crossover be provided between the loop (south of points leading to yard) and the shunting-leg: this would enable the shunter to keep in view of the engine-driver. The need of the connection asked for is not pressing, and cannot be recommended.

Points-levers for Nos. 2 and 3 roads, south end, and Nos. 3 and 4 roads, north end, are on the opposite side of track to which shunters work, and should, if possible, be altered.

The cattle-stops at the north end of yard extend over the shunting-leg on which the cutting-out of wagons is done, and are a danger to shunters at night. Portion of the yard is not fenced in, and the cattle-stops on the station side of the level crossing do not appear to serve any useful purpose in the direction of keeping cattle from entering the yard. Provided the cattle-stops cannot be removed, some greater protection in the way of decking should be provided for shunters working over the cattle-stops at night.

MILTON.

The Time that is allowed for the Work of making up Trains.

Attention was drawn to the insufficient time allowed No. 410 (up goods-train), due to arrive Milton at 12.55 p.m. and depart 1.13 p.m. Engine requirements occupy about seven minutes, and the balance of time does not permit of cutting off loads, marshalling in loads from yard and live-stock from cattle-yards. When there are no trucks of live-stock to place at or lift from the cattle-yards the time allowed should be sufficient, and there is no need to extend the time.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The coal-stage and engine-shed at south end of yard obstructs the view of shunters, who are unable to keep in sight of engine-driver when working on the shunting-ladder. There is no suitable or available site to which the buildings could be removed, and no recommendation can be made in regard to the matter.

The interlocking-rods adjoining the Lawrence Branch line leading from yard are too close to track, and are a danger to shunters, who use this line as a shunting-leg. The rods should be boxed in.

The boundary-fence on the west side of the north shunting-ladder is too close to running-track to permit shunters to work on that side with safety.

The brace of the pier on the west end of overhead bridge is too close to the back road, and does not give sufficient clearance to permit shunter to pass between brace of pier and wagons. If it is not possible to alter the support of the pier in any way, the brace should be kept painted white to make it conspicuous to any member carrying out shunting duties in that vicinity. Provided sufficient room is given between the boundary-fence and the back road, shunters could then work on that side, which would considerably reduce the risk of danger now caused by the brace of pier.

Portions of the yard require to be ballasted up to rail-level.

MOSGIEL.

The Lighting of Shunting-yard.

A low-power electric light is required in the ground frame box at south end of yard.

BURNSIDE.

The Length of Shifts which Shunters are required to work.

The shifts are satisfactory, with the exception that on Tuesday night, when the live-stock traffic is heavy, the shift which commences at 6 p.m. often extends to about eleven hours. A porter is sent to Burnside from Dunedin on Tuesday nights to assist shunter, but is usually inexperienced, and, not being familiar with the yard, is of very little assistance to shunter. The Burnside porter who assists daily on the Walton Park and Fernhill Branch trains should be used at Burnside on Tuesday nights, and also on Wednesdays during the evening, to assist the shunter. This would make for better and quicker working, and reduce the overtime to some extent. The porter now sent from Dunedin on Tuesdays would not be required. A brakesman for the Walton Park train would require to be supplied by Dunedin on Tuesdays and Wednesdays.

The Lighting of Shunting-yard.

The yard is lit by electricity. Additional lights are required as follows: One at bridge near Messrs. Kempthorne, Prosser, and Co.'s siding; one opposite outward loading-pens of the saleyards; one at the level crossing at the south end of blue-gum trees; one about half-way between the two level crossings; one at water-tanks near signal workshops.

The provision of additional lighting at Burnside has already been reported on to the Railway Board.

DUNEDIN—PASSENGER.

The Numbers of Employees composing Shunting Gangs.

There are three gangs, each consisting of two graded shunters. The two shunters in each gang work together except between the hours of 8.50 a.m. and 10 a.m. and between 3 p.m. and 6 p.m. During these times there are two engines working in the yard, and the gang is broken up and the shunter in each case is working "on his own." Some arrangement should be made, if possible, to send one of the platform-porters to assist in the shunting-yard during the time the shunters are working single-handed. The porter could assist the shunter at the north end or south end as required, and assist the shunter by conveying signals when piloting a long train over the Rattray Street crossing.

The Layout and Proposed Layout of Shunting-yard.

The siding-accommodation is insufficient during the busy periods, and extra siding-accommodation is required for the storage of cars. The provision of two additional roads in the south dock and one in the north dock would remove the present difficulties and provide sufficient standing-room for cars, also facilitate the despatch of trains during the rush periods.

The Drainage of Shunting-yard.

Water lies about the yard in front of shunters' cabin on the west side, also between overhead bridge and the gashouse, and some provision should be made for draining it away.

The Matter of Employees inexperienced in Shunting-work being employed thereon.

The placing of inexperienced porters in gangs to relieve shunters is unsatisfactory, and two competent men should be available to relieve the shunters and signalmen and also keep down the overtime

DUNEDIN—GOODS.

The Length of Shifts Shunters are required to work.

The shifts are satisfactory except that on No. 3 shift (9.45 a.m. to 6.45 p.m.—one hour for lunch) and on No. 5 shift (4.30 p.m. to 12.30 a.m.—crib-time for meal). No. 3 shift is frequently extended for one or two hours: this is due to shunters waiting for roadside wagons to be loaded in D shed. The Goods Agent and Goods Foreman state that the roadside wagons cannot be loaded earlier, and could not suggest any remedy to avoid or reduce the overtime worked on this shift. The same gang would work this shift once in seven weeks, and would not cause any undue strain on shunters provided the gang could finish about 7.45 p.m.

When the extra all-night shift (12.30 a.m. to 9.0 a.m., Tuesdays to Fridays) is not booked on, No. 5 shift usually finishes duty anywhere between 1 a.m. and 3 a.m., and occasionally later. When this shift extends beyond 2.30 a.m. it is too long. The all-night shift had been booked on for about three months prior to this Board taking evidence in Dunedin, and the hours worked on No. 5 shift were then satisfactory.

Very little overtime is worked on the other shifts, and a recasting of the shifts may distribute the overtime worked more evenly over them.

Complaint was also made in regard to the long period without a meal on No. 4 shift (3.30 p.m. to 11.30 p.m.—crib-time for a meal) which is usually obtained between 8.30 p.m. and 9.30 p.m. The volume of work on this shift prevents the shunters obtaining a meal before the time stated.

The Supervision that is afforded on Shunters' Work.

There are four Foremen in the goods department. One is in charge of goods-sheds, one in charge of the inward unloading and outward loading in yard, and two in charge of the shunting-work. The latter Foremen work from 7 a.m. to 4 p.m. and 4 p.m. to midnight. There is no Foreman in charge of the yard between midnight and 7 a.m., the senior shunter in the north-end gang being in charge. The Goods Agent states that the supervision is not sufficient, and considers that there should be a Senior Foreman in charge of the yard during the day in addition to the other Foreman, and also that a Foreman should be in charge of the yard between midnight and 7 a.m. Provided a porter was in attendance at the Shunting Foreman's office from about 9 a.m. to 6 p.m. to attend to the telephones and receive instructions in regard to the make-up of trains, also deal with detail work, this would relieve the foreman considerably and enable him to give more supervision over the work in yard. There would then be no necessity for a Senior Foreman to be placed in the yard. Between midnight and 7 a.m. there are never more than two gangs in the yard, and there is no need for a Foreman during these hours.

The Lighting of Shunting-yard.

The lighting at the north end of yard is good. At the south end the work is carried out in the darkness, no lights being available. Additional electric lights are required as follows: One on bracket on south-west corner of C shed; one near Agricultural Department's store; one near south end points of No. 37c road; one within the vicinity of points leading to C road near Public Works store; one near south-main-line points; one near south end points, No. 46 road. The two latter lights should be erected near the fence on the west side of the ladder.

Owing to wagons standing on No. 39 road, the present light between Nos. 38 and 37c roads casts a shadow on the main line where a considerable amount of work is done, and this light should be shifted and suspended between the main line and No. 39 road.

Some provision of lighting is required at the new sidings serving Pelichet Bay and the Cement-works.

A report in connection with the lighting of the Dunedin Goods-yard and Pelichet Bay sidings has already been sent to the Railway Board (Head Office file 1914/2916/1).

The Layout of Shunting-yard.

The layout of the yard is satisfactory. The lack of long roads for receiving and making up long trains and sidings for storage purposes, however, congests the yard and seriously interferes with the work. Owing to there being no direct access from the main line into the goods-yard, all inward and outward goods-trains have to be received in the passenger-yard and worked to goods-yard by shunting engine over Rattray Street. The shunting-trains are frequently held at Rattray Street up to three-quarters of an hour waiting admittance to the goods-yard, owing to no roads being available until such time as the goods shunters clear a road or two to accommodate the incoming wagons. While the incoming wagons are being placed in the yard the shunting-work at the north end of yard is held up until the wagons are disposed of. The arrangement is unsatisfactory and a very costly one.

The removal of the B shed to the other side of the yard on waterfront would enable receiving and departure roads to be provided on the present site of the shed, with direct access to the main line for north and south goods-trains. This would eliminate the congestion in both the passenger and goods yards, and reduce the operating-costs considerably. If the suggested rearrangement cannot be given effect to the provision of additional storage roads is necessary at the south end of the yard.

The two turnouts from No. 18 road to No. 17 road near overhead bridge should be taken out, and No. 17 made into dead-end siding terminating at overhead bridge.

The Drainage of Shunting-yard.

The drainage is fairly satisfactory. After heavy rain the water lies about the switches near the D and C sheds, and takes some considerable time to drain away. The water in other parts of yard gets away quickly when the surface of the ground is broken.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The cleaning of the live-stock wagons is done on two roads in the centre of the south yard, and the shunters complained of the danger through heaps of manure being left between the tracks. Provided the cleaning of the wagons cannot be done at some other suitable depot, arrangements should be made to clear up the manure at more frequent intervals.

The lever of No. 17 points stands in an upright position, is too close to the track, and should be replaced by an ordinary reversible lever.

The lever of No. 37c points leading to horse-box siding is on the wrong side of line; and two pairs of levers towards the C shed are set to lie in the wrong direction, and should be reversed.

The present coal-stage is in a bad position, and a road has to be cleared or kept clear to enable engines to get coal and water. The stage should be shifted to the north end of No. 38 siding, so that access can be obtained to it by shunting-engines at any time. The provision of another coal-stage at the north end of the yard would save considerable delay at times. There is a coal-stage in the passenger-yard which is seldom used, and could be utilized to better advantage in the goods-yard.

The door at the south end of the D shed is too narrow, and gives just sufficient clearance for wagons, with the result that when shunting the shed the shunters are unable to keep in sight of one another, and difficulty is experienced in conveying signals to the engine-driver. The shed-door should, if possible, be enlarged to permit the shunting of shed to be carried out without any risk of accident.

The shunters also ask for some additional lockers in the shunter's cabin, for the use of members of the shunting staff.

PALMERSTON.

The Number of Employees composing Shunting Gangs.

There are no graded shunters at Palmerston, and the shunting-work is carried out by porters during the twenty-four hours of the day. The shunting-work during the day and evening is not heavy, but between 11.30 p.m. and 6.30 a.m. the shunting-work is fairly continuous. In the live-stock season about ten goods-trains arrive and depart during the night, and the work is then strenuous. The porters are all capable of attending to the shunting-work, and perform this duty satisfactorily. The shunting-work at night warrants a graded shunter being in charge of the station and yard; but, in view of the hardship that would be inflicted on the shunter working the night shift continuously, the present arrangement of employing porters to carry out the work should be continued. We are of opinion, however, that the time worked by the porter in charge of the yard on the all-night shift should count for his increment, in the same manner as if he was working in the advanced capacity (Regulation 53).

The Time that is allowed for the Work of making up Trains.

The time allowed for dealing with trains is sufficient provided the interval between the arrival of trains at night permits of one train being dealt with at one time. When two trains arrive in the yard about the same time and require to be shunted, the time allowed in some cases is not sufficient to despatch both trains within the scheduled time. The late departure of one of the trains under such circumstances is not serious, and does not warrant any extension of time.

The Lighting of Shunting-yard.

The present electric lighting of the yard is insufficient. Additional lights are required as follows: One at north end, near main-line points; one near centre of yard, opposite platform. We understand that the present electric light plant will not carry any more lights. If this is so, one of the present lights at the south crossing could possibly be shifted to the north end of yard to light up that vicinity, where the cutting-off of wagons is done. The light required in the centre of the yard is not so important.

The Layout and Proposed Layout of Shunting-yard.

During the busy season the yard gets very congested at night, and on occasions it is necessary to use the Dunback Branch line to store a train in order to make room for an incoming train. Provision of additional siding-accommodation is necessary, but is not of an urgent nature.

The gooseneck points-lever on the back road, north end, leading to the turntable road should be replaced by a reversible points-lever with chain and lock. At present, with one man carrying out the shunting movements on the back road, he has to sit on the gooseneck points, and is unable to attend to the dropping of drawhook into position when setting back on to wagons. Owing to the curve in road the hooks often fail to couple up when wagons come together.

The Drainage of Shunting-yard.

The drainage is not satisfactory, more particularly at the south end. After rain the water lies about for some time, and the yard in some places gets very muddy, and the men engaged in shunting operations are liable to slip on the muddy surface.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The points-lever on the main line at the south end of yard near the cattle-yards is on the wrong side of the line, and should be shifted to the other side. When tail-roping wagons out of the stock-yards siding the rope is liable to catch in the lever.

OAMARU.

The Length of Shifts which Shunters are required to work.

The shifts are worked out on an eight-hour basis. The scheduled hours of duty are occasionally extended owing to the shipping traffic and boats working overtime. At times it is necessary for one of the gangs to work up to twelve hours when the shipping traffic is heavy or when late advice is received that a boat will work overtime. The overtime for the week is not excessive, and the shunting-work does not warrant an additional gang being employed during the whole year.

There are seven shunters at Oamaru, one of whom is fully employed running as guard during the busy season. The shunter employed as acting-guard should be used in the goods-yard when necessary to reduce the long days worked by the shunters and avoid the necessity for splitting up one of the regular gangs when an extra gang is required in the yard.

The Numbers of Employees composing Shunting Gangs.

There are three regular gangs working in the yard. When the traffic is heavy an additional gang is booked on. A shunter is withdrawn from one of the regular gangs to work the extra gang with the assistance of a porter, the shunter's place in the regular gang being filled by a porter. The porters are drawn from the passenger-yard, and usually have very little experience of shunting-work. This tends to slow up the work, and throws added responsibility on to shunter in charge of engine. The number of shunters in each gang is sufficient, except that some assistance should be given to the gang engaged in making up the afternoon trains. A porter could give the necessary assistance when required, and be employed in the goods-shed during the other portion of the day. When this porter had sufficient training he could be utilized to assist the shunter in charge of the extra gang which is booked on when the traffic warrants it.

The Lighting of Shunting-yard.

The electric lighting in the goods-yard is satisfactory. The lights are controlled by switches on the poles. This is not a very satisfactory arrangement, as the shunters, before going to the passenger-yard at night, require to turn the lights out, and on return to the goods-yard have to enter a dark yard. It would be an advantage if the lights could be controlled by the signalman in the south box.

The electric lighting of the passenger-yard is satisfactory at both ends, but an additional light is required in the centre of the yard.

The Layout and Proposed Layout of Shunting-yard.

A request was made by shunters that the stationary crane on the coal-delivery siding should be removed to a new site, in order to avoid the necessity for interfering with the wagons at the crane each time wagons are placed for delivery in the coal-siding. This Board cannot suggest any other suitable site for the crane.

It was also suggested that the cattle-yards be removed from their present site owing to wagons standing at the cattle-yards interfering with the shunting of the coal-delivery sidings. The shunting of the coal-sidings is not frequent, and we cannot recommend that the cattle-yards be removed.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Blocks of stone for sea-protection purposes discharged from trucks on the Beach Road are left lying too close to rails, and do not give sufficient clearance for shunters. Some stacks of timber in Craig and Co.'s siding are too close to the line, and should be kept back to standard clearance. The Loan and Mercantile Company and the North Otago Farmers' Company premises are not the standard clearance from the line of rails of the private sidings serving these stores. An engine cannot enter the sidings in order to shunt, and when wagons require to be lifted it is necessary to have other wagons attached to the engine. The companies concerned should arrange to push all outward wagons to a point in siding where the engine can conveniently lift them.

The goods-yard should be raked more frequently to remove the larger stones lying about the yard.

The cattle-stops at the street-crossing at south end of the passenger-yard should be planked over to enable the shunters to cross them with safety when carrying out shunting-movements in the vicinity.

TIMARU.

The Length of Shifts which Shunters are required to work.

When the traffic is slack four shifts of shunters are employed in the yard. During the busy periods one or two additional shifts of shunters are necessary. With the exception of the shift commencing work at 1 p.m. and scheduled to finish at about 10 p.m., the scheduled hours of duty are not exceeded to any great extent. For the greater portion of the year the late shift commencing at 1 p.m. finishes on an average between midnight and 2 a.m., and occasionally may work until about 3 a.m. To avoid the necessity for this gang working two consecutive long days they are booked on later the day following the long day worked. When the ordinary and shipping traffic is heavy, arrangements should be made to book on an additional shunting gang at about 5 p.m., so that the gang commencing work at 1 p.m. can finish work at 10 p.m.

The Numbers of Employees composing Shunting Gangs.

Each gang should consist of two graded shunters. This cannot always be arranged owing to the manning of extra shunting gangs in yard during busy periods, sickness, and shunters being required

to relieve signalmen and guards. The shunters ask for three men in each gang, and also that an extra man be attached to the gang working No. 4 shift (1 p.m. to finish), to attend to the uncoupling and coupling-up of wagons, tarpaulins, and also to protect Strathallan Street crossing while shunting-movements are being made over that street.

We are of opinion that three men are necessary on No. 2 shift (8 a.m. to 5 p.m.) for the full length of the shift, instead of receiving the assistance of a third man for only two hours as at present, and we consider that the strength of the other gangs is sufficient. The shunters on No. 4 shift (1 p.m. to finish) are required to gather up tarpaulins for supplying orders for the country. This work should be carried out as far as possible by a man from the goods-shed, and thus relieve the shunters of this work.

The Lighting of Shunting-yard.

The lighting of yard is by gas-lamps, and is unsatisfactory. The lights are not powerful enough, and go out during stormy weather. More attention should be given to the lamps by the plumber, or, if it can be arranged, by the gas company. If it is not proposed to instal electric light in the yard for some time, we consider that additional gas lights should be installed as follows: One near water-tanks at north end of yard; one near weighbridge, north end of goods-yard.

The Layout and Proposed Layout of Shunting-yard.

The layout of the yard is bad, and the accommodation is insufficient to deal satisfactorily with the present traffic. There is no road in yard of sufficient length to receive or despatch a long train.

The shunters ask for a connection between the ladder in front of south signal-box and the road leading to the long road at back of signal-box, in order to avoid going over the interlocked points. The connection would be an advantage, and would reduce the movements along the ladder and over interlocked points.

The points-lever at the turnout in front of the south weighbridge should be fitted with spring points to obviate the risk of derailments.

The roads at the approach to No. 2 wharf are too close, and are unsafe for overhanging loads such as chaff and straw.

The lever of No. 3 points leading to No. 3 wharf is too close to No. 1 road, and when a train or shunt is coming into or leaving No. 1 road the wagons brush against the shunter holding No. 3 points. The lever of No. 3 road should be placed on the other side of the track if there is room for it.

The 10-ton crane at north end of yard should be shifted back to clearance, and the two dead-end sidings connected up to make a loop.

The interlocking rods and gear at north end of yard should be boxed in. The sleepers also require ballasting up. The sleepers on the Harbour Board's sidings at the back of the yard should be ballasted up.

The Drainage of Shunting-yard.

The drainage of yard is not satisfactory. The maintenance gang should give more attention to yard during wet weather by breaking the surface of ground in places to let the water away quickly.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Tender engines not equipped with cowcatcher at tender end are supplied for shunting purposes for certain hours during the day. The use of these engines for shunting should be restricted as much as possible. The shunters consider that the cowcatcher on engine F2 is dangerous owing to it protruding too far and causing a risk of accident when jumpimg on the cowcatcher. It also damages the Westinghouse and steam hoses.

It would be an advantage if arrangements could be made for berthing coal-boats at No. 1 wharf, as coal could then be pulled direct from wharf to weighbridge.

ASHBURTON.

The Length of Shifts which Shunters are required to work.

The shunters consider that the scheduled hours of duty could be improved to permit sufficient time for meals and reduce the long hours worked on the late shift during the busy season. Under the new time-table there should be no difficulty in recasting the shifts to effect an improvement in this direction, as No. 150 goods-train, which formerly left Ashburton at 12.45 a.m., now leaves at 8 p.m.

The Numbers of Employees composing Shunting Gangs.

The shunters ask for three men in the gang during the day. This is now provided at certain busy periods of the day. Under the new time-table two shunters will be together during the greater portion of the day, and with the assistance of a porter at times when required the strength of the gangs is sufficient.

The Supervision that is afforded on Shunter's Work and General Control of Work in Shunting-yard.

The shunters stated that a head shunter was required during the day to control the work in the yard. The supervision exercised by the Stationmaster is sufficient, and if the shunters are in doubt as to what loads to send forward they can always ask for instructions. There is no need for a head shunter.

The Lighting of Shunting-yard.

The electric lighting of the yard at south end is satisfactory. At the north end of yard an additional light is required at the north end of loading-bank to light up the loading-bank and Nos. 2 and 3 points. A low-power light is required on weighbridge-shed to throw a light on the bridge. The present light on the overhead bridge at north end of station should be adjusted to light up the dark place near the water-tanks. The lighting of this yard has already been reported on to the Railway Board (Head Office file No. 1913/3916/1).

The Layout and Proposed Layout of Shunting-yard.

Owing to the difficulty in setting back heavy goods-trains into the yard at the south end up a grade of 1 in 110, a request was made for a cross-over road from the loop to No. 3 road south of the scissors crossing in centre of platform; also for a crossover road from No. 3 road to scissors crossing at south end, to permit of goods-trains being brought direct into yard from the platform or despatched from No. 3 road direct, to avoid the necessity for setting back up the grade at south end when a train has to be drawn from the loop or main line, or when a train requires placing in loop from yard. We recommend that the crossover from No. 3 to the south scissors be provided. The expense of providing the other crossover asked for is not warranted in the meantime.

The Drainage of Shunting-yard.

The drainage at the south end of the yard is not satisfactory. The scissors crossing at the centre of platform is often under water during wet weather.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Request was made that the branch engine, which is used for shunting purposes, should be fitted with a cowcatcher at the tender end, and also that a shunting-engine should be stationed at Ashburton, as a great deal of shunting is done by tender engines, including "AB" class, which cannot cross over the wagon-turntables. We consider the work does not warrant a shunting-engine being stabled at Ashburton, but we are of opinion that the branch engine should be fitted with a cowcatcher at both ends.

Some of the gooseneck levers are too close to the main line, and where room permits the levers should be moved farther back.

ADDINGTON.

The Length of Shifts which Shunters are required to work.

During the busy season the shifts, particularly on Tuesday and Wednesday, are too long, and between these shifts and between the Wednesday and Thursday shifts the shunters are occasionally booked off for eight hours only, The shifts should be so arranged that excessive hours will not be worked and shunters will have at least ten hours off between shifts. The shunters asked that an extra gang be put on for the busy season, but the Board does not consider that the work yet warrants an extra shift for full time. On days when work is heavy at Addington it should be possible to supply relief from Christchurch to keep down the hours of the Addington men.

The Numbers of Employees composing Shunting Gangs.

On Tuesday nights assistance should be provided for the shunter who is working on the saleyards shunt. Owing to the curved tracks the shunter cannot keep in touch with the engine-driver when pushing long rakes of stock-wagons across Lowe Street, along which there is fairly heavy traffic.

The Lighting of Shunting-yard.

The lighting is fairly good, but four extra lights are recommended at the following positions: One over the stock-cleaning sidings, south of the existing light (in view of the large numbers of stock-wagon orders supplied from Addington, this extra light is very necessary); one in the goods delivery-yard near shed; one about 3 chains east of the Clarence Road (this will require to be placed so that it will not interfere with signal light); one between the office of the Inspector of Permanent-way and the overhead bridge.

The Drainage of Shunting-yard.

It is very necessary that better drainage be provided at the stock-wagon storage sidings. It may be possible to drain into the ditch to the north of the main line.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The scrapings from the stock-wagons at the storage sidings should be cleaned up more regularly than is done at present. There are difficulties in doing this, but if this is not done regularly the shunters have a most unpleasant job when shunting in that vicinity.

The sleepers are standing well above the ballast, and, particularly when wet, are a source of danger to the shunters. The tracks should be ballasted up to rail-level.

The signal-rods between Lincoln Road and Park Road would be safer if they were planked in.

CHRISTCHURCH.

The Numbers of Employees composing Shunting Gangs.

The gangs generally are sufficient to cope with the work. An extra man was asked for on the 4.30 p.m. to 12.30 a.m. shift, but the Board does not consider this man necessary on that shift. On busy days when car-shunters are handling long trains an extra assistant should be provided by the coaching staff.

The Time that is allowed for the Work of making up Trains.

When the goods-yard is congested it is at times difficult to get trains away on time. This is due more to the shortage of accommodation than to the insufficient time allowed for making up trains. Some of the passenger-trains in the evenings are timed in at close intervals, and shunters have difficulty in keeping the main line clear for following trains. This trouble is one that cannot very well be overcome.

The Lighting of Shunting-yards.

The electric lighting is satisfactory in those parts in which it is installed, but extra lights are required in some parts that are now dark. Three extra lights are required in middle yard. We understand that these lights were recently applied for by the District Traffic Manager. In addition a light is necessary over the double slip just west of Waltham Road crossing. The lighting of the car-sidings recently installed in the passenger-yard at east end will probably be found sufficient. Some of the lights could be better placed if it were possible to suspend them over the parts of the yard where the lights are most needed. The possibility of having this done should be investigated by the Electrical Branch.

When Lake Coleridge power fails the yard-lights also fail. If an emergency supply could be obtained from the City Council's standby plant for such occasions it would be a very great boon to the shunters.

The Layout and Proposed Layout of Shunting-yard.

When shunting off the north yard shunting-leg wagons do not run freely. Consequently fewer "kicks" can be made for each forward shunting movement, and this naturally slows up the work. To overcome this difficulty we suggest that the leg should be graded up from Colombo Street until it is about 12 in., if possible, above existing rail-level at the middle of B shed. From there the grade should fall into the marshalling-sidings. The wagons would then run freely when kicked, shunting would be speeded up, and engine-power would be saved. The accommodation is insufficient for the traffic handled, and the yard at times becomes very congested.

The Drainage of Shunting-yard.

The drainage in the goods-yard is fairly good except for parts in the south yard. There is a system of drains by which the surfacemen can let the water away. The drainage is unsatisfactory in the Waltham yard and in the passenger-yard.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Engines from Linwood come up to Waltham Road on the engine-running track and wait there for a pilot. The engines while standing frequently blow off steam, which obscures the view of the shunters working on the Waltham yard shunting-leg alongside. Engines ex Linwood should wait for the pilot or signal somewehere in the vicinity of the advance starter—about 150 yards east of the crossing.

Added responsibility is thrown on the Foremen owing to the manner in which the transport order-sheet for the make-up of the morning trains is compiled. Frequently orders for wagons by one train are in excess of the number allowed to be despatched by this train, and very often the number of the various classes of wagons is not available to supply all orders, and it is considered that in such case the sheet should definitely state which orders should take preference. Some improved method should be devised so that the order from the Transport Office will be simplified and made more definite.

The crossover from the Waltham yard shunting-leg to the engine-running road is often used by the passenger shunters, who leave the points lying for the crossover, necessitating the goods shunters, who use the straight leg, coming along to set them right. Engines are not permitted to go through the crossover without a green disc, but with the present reversible levers it may happen that the turnout is left lying for the crossover, and when a shunting movement is being made from Waltham yard down the straight, and the shunters fail to notice that the points are set for the crossover, the shunting-engine might collide with an incoming Port goods-train.

A non-reversible lever would be unsuitable for the car-shunters, as both members of gang are required for handling long trains. The goods-shunters ask therefore, that the crossover be interlocked. The Board suggests that the interlocking staff be asked to report on the suggestion concerning its practicability and cost.

Derailments occasionally occur through trains being set back and then pulled out through goods No. 1 points off the through road when the points are set for the wrong line. A Thompson's spring lever for these points would obviate these derailments.

To save shunting-engines losing considerable time by crossing Colombo Street four times when going from the south yard to the north yard for water, a water-column is required in the south yard near Colombo Street.

LYTTELTON.

The Numbers of Employees composing Shunting Gangs.

The gangs consist of two shunters each. On the shift working the inwards goods from 8 a.m. to 5 p.m., and on the shift which works the northern end of yard between the same hours, an extra man

is necessary on busy days. There is insufficient work to fully employ two extra men regularly in the yard, but there appears to be no reason why the Coaching staff, which is numerically strong at Lyttelton, should not render assistance to the Goods staff in busy times.

The Supervision that is afforded on Shunters' Work; the General Control of the Work in Shunting-yard.

The supervision and control at Lyttelton is good, but the Board suggests that an extra Foreman should be stationed there in place of the two head shunters. This would result in a saving in expenditure. The Senior Foreman, whose hours would be 8 a.m. to 5 p.m., could attend to wharf labour and general supervision of the yard. The other two Foremen would work the same shifts at present worked by the head shunters.

The Lighting of Shunting-yard.

The lighting of most parts of Lyttelton yard is good. There are some dark places, however, where extra lights are considered necessary. A special report has been made to the Railway Board concerning this extra lighting (Head Office file 1913/4084).

The Layout and proposed Layout of Shunting-yard.

The "in" goods shunting-leg is too close to the main line, constituting a grave danger to shunters. It should be pulled over to give an extra 11 ft. clearance.

The Drainage of Shunting-yard.

The evidence indicates that in wet weather the drainage in Lyttelton yard leaves much to be desired. It should not be difficult to get the water away from the bad places.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

When a shunter is working the points-levers at the three-throw under the overbridge while a shunting movement is being carried out on the adjoining siding, the shunter at the points has scarcely sufficient room to work the levers and be clear of the wagons. The layout will not permit of any alteration, but the shunters and Foremen should be able to arrange a suitable local practice to eliminate the risk.

Certain fences at the shore end of some jetties are an obstruction, and the Harbour Board should be asked to remove them.

When shunting on No. 7 jetty the shunters cannot keep in touch with the engine-driver on account of the curves and buildings. Possibly a shunting signal could be fixed near the cool stores where it would be visible from the yard, and be worked by a shunter from a position where he could see down the jetty.

WESTPORT.

The Numbers of Employees composing Shunting Gangs.

When work is very heavy the shunter on the 7.30 a.m. staith shunt works alone. It may be possible to put out a platform-porter to assist him. If it can be arranged this should be done.

The Lighting of Shunting-yard.

Gas-lighting is installed in this yard. There is no electric power available in the town at present. Extra lights at the following points would greatly improve the lighting, and are recommended by the Board: One near the Westport Coal Company's office near the Merchandise Wharf; one opposite workshops towards Crane Wharf; one towards the end of the Crane Wharf. The gas-lamps should receive frequent attention, as in a climate like that at Westport they quickly get out of order.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

On the old staiths are a number of openings. About five wagons a day are shunted up to the local delivery-bins, and a slight risk exists of shunters falling through. When the opportunity offers these holes should be boarded up.

The headlights on some of the engines used for shunting are too low and catch the shunter's head. This may lead to an accident, and it is considered that lamps should be raised to eliminate this risk.

Some of the old wagons from the Cape Foulwind line are unsuitable for railway traffic, and, although they are only used within yard limits, their use should be restricted to the utmost extent. They are not fitted with brakes, and it does not appear that brakes can be fitted to them.

GREYMOUTH.

The Length of Shifts which Shunters are required to work.

The shunters at Greymouth are working an undue amount of overtime. To eliminate this overtime two extra shunters should be appointed to the staff. The elimination of overtime will more than pay for the extra staff recommended.

The Numbers of Employees composing Shunting Gangs.

The gangs are two-men gangs. On the make-up late shift there should be three men (two shunters and one porter). This shift has heavy work making up early morning trains. The

strengthening of this shift and the appointment of two extra shunters should provide sufficient staff for the work to be done. The car-shunting at Greymouth is light, and does not warrant the appointment of extra staff.

The Time that is allowed for the Work of making-up Trains.

In order to facilitate the work we consider that the guard of No. 771 train should telegraph from Moana particulars of perishable and urgent loads on his train for the Hokitika line.

The Lighting of Shunting-yard.

The gas-lighting was fairly good at the time of the Board's inspection, but apparently all lights had recently received a good overhaul. What are known locally as "twin lights" are more effective than most types of gas lights, and the lamps in the Greymouth yard not now fitted with such lights should be so fitted.

Gas is not a satisfactory method of lighting in shunting-yards. As electric light will shortly be available at Greymouth it should be installed in the shunting-yard as soon as the more urgent works are completed. Extra lights are desirable in some parts of the yard.

The Layout and Proposed Layout of Shunting-yard.

The Greymouth yard was originally laid out to deal with coal traffic for shipping and was suitable for that work. The opening of the Otira Tunnel has entirely altered the nature of the work in the yard, and the present layout is now unsuitable and inadequate to deal with the traffic. The Board understands that a new yard for dealing with the overland traffic is to be constructed on the present site of the passenger-yard. The question as to whether the traffic could be conveniently handled on this site would appear to require further consideration. The problems of exchange between the two yards would be fairly serious, and the cost of operating both yards would probably be higher than the cost of working one yard.

The Drainage of Shunting-yard.

The drainage of the wharf-yard is fair, but in the passenger-yard it is bad. When the new passenger-yard is under construction drainage should receive special attention.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Trespass of the general public over the lines between Mawhera Quay and the river is a constant source of anxiety to the shunters. A fence between the railway and the road was suggested to minimize this trespass. Such a fence would probably be unpopular with the residents of the town, and, as trespassers could still get round the ends, the Board does not recommend it.

The LB wagons are unsuitable for use even in yard limits, and should be withdrawn from traffic.

Class F engines are not powerful enough for some of the work required to be done at Greymouth: a class J shunting-engine should be provided. The handling of heavy coal and timber trains with class F engines causes much loss of time.

The congestion of the Greymouth yard is accentuated by the use of railway-wagons by consignors for storage purposes. In a shipping-port a certain amount of latitude is inevitable in this respect, but at Greymouth the use of wagons in this manner appears to have gone beyond reasonable limits. The enforcement of demurrage charges would probably minimize the trouble and help to ease the congestion. A shortage of vans causes extra work, especially when goods-vans must be sent to the passenger-yard for gassing.

At Greymouth there are some four-wheel vans on which the lower step is too low. These steps should be raised to the same height above the rail as bottom steps on bogie-vans.

WELLINGTON.

The Numbers of Employees composing Shunting Gangs.

The Thorndon car-shunting gang, which consists of two shunters, should be strengthened by an additional porter during the busy hours of the day. The shunters have to handle long passenger-trains on curved tracks, and have to do a considerable amount of reversing of express trains. The spare man is needed for passing on signals and for coupling up cars while shunters go on with other work.

For a period in the evening a third man is required on the "make-up" at Thorndon while outward goods-trains are being made up.

The Time that is allowed for the Work of making up Trains.

Nos. 662 and 668 trains are made up at Thorndon with loads ex Lambton. Many of these loads, which consist of general merchandise, are not completely loaded until late in the afternoon, and consequently do not reach Thorndon until between 6 and 6.30 p.m. The lack of accommodation at Thorndon does not permit shunters to fully marshal the trains in the short time at their disposal. An attempt is being made to group the wagons at Lambton. If this attempt is successful, then one of the difficulties of marshalling at Palmerston North will be minimized.

Supervision that is afforded on Shunter's Work and the General Control of Work in Shunting-yard.

The supervision and control of shunters' work, which is sufficient, is in the hands of four Foremen (two at Thorndon and two at Lambton) acting under a Senior Foreman, who exercises general super-

vision and control over Thorndon and Lambton yards, goods-sheds, wharves, and private sidings. The question of replacing the storeman in charge of wharves with a Foreman was raised in evidence, but we have no recommendation to make in regard to this matter.

The Lighting of Shunting-yard.

The lighting at Thorndon and at Lambton is generally satisfactory.

The Harbour Board lights on wharves are extinguished at 10 p.m. after boats finish working, and any shunting-work on wharves after that time is carried out in darkness. Arrangements should be made with the Harbour Board to leave the lights on wharves switched on until shunting-work is completed.

One light near the weighbridge-house in Lambton yard should be placed close to the nearby vat and raised higher.

A light suspended over the exchange sidings at Thorndon would be advantageous, but this light may interfere with the picking-up of signals by engine-drivers of down trains on the Wairarapa line.

The Layout and Proposed Layout of Shunting-yards.

The layout is quite inadequate for the work required to be done. Extra carriage accommodation is required at Thorndon. Extra marshalling-room at Thorndon was asked for, and a suggestion was made that the Hutt line should be moved towards the sea sufficiently to make room for two extra sidings. If this can be done at reasonable cost and without interfering with the construction of the new yard it should be carried out.

The foreman's office and shunters' room in the Lambton yard are badly situated, and obstruct the view between shunters and engine-driver when shunting-work is carried out in this vicinity.

The Drainage of Shunting-yards.

The drainage of both Lambton and Thorndon yards is unsatisfactory. The water drains off the goods-shed at Thorndon into the yard and floods badly at the south end of yard. Some provision should be made, if possible, for the water off shed to be carried into a drain.

PAEKAKARIKI.

The Length of Shifts which Shunters are required to work, and the Numbers of Employees composing Shunting Gangs.

In the busy season some shifts are long on account of the late trains and specials. Between 3 p.m. and 12.5 a.m. the shunters have about eighteen trains to deal with in the busy season, and the work is somewhat heavy. The provision of an extra man at these times would enable assistance to be given during the rush hours, and possibly allow the long hours to be somewhat reduced.

The Time that is allowed for the Work of making up trains.

The time allowed Nos. 668, 662, and 620 trains is insufficient to fully marshal in all loads lifted at Paekakariki.

The Lighting of Shunting-yard.

The lighting is by acetylene gas, which is not always satisfactory. Electric light should be substituted. The lights are well placed. Two extra lights are required, one near the train-examiner's shed and one south of the goods-shed. The switch for the yard-lights should be in the signal-cabin.

The Layout and Proposed Layout of Shunting-yard.

At present the station is interlocked to handle up trains on one side and down trains on the other side of the platform. This at times causes delays to trains, and means that shunting at the north end of the west yard must cease as soon as the up home signal is lowered for a train. This interruption could be avoided if the layout were altered to allow shunting to be carried on without fouling the up line at the north end, or if the interlocking were altered to permit up trains to be brought through the down line. To put the non-stop trains through the down line would have the additional advantage of keeping the trains on the straight track instead of going through the curved legs at the turnouts.

The Drainage of Shunting-yard.

The drainage is fairly satisfactory. Some improvement could be made at the south end of the east yard.

PETONE.

The Lighting of Shunting-yard.

Three additional lights are required, one at Petone Junction, one on the ladder at north-west end of the goods-yard, and one on the cattle-yards siding. The provision of the additional lights is not urgently required.

The Layout of Shunting-yard.

The cesses near the junction to the Gear Company's siding at Petone Junction should be made up to the rail-level, and the small culvert ahead of the points should be planked for the shunters to walk over.

The Drainage of Shunting-yard.

Water lies about in the workshops-yard for a considerable length of time. In view of the proposal to rebuild the workshops at another site, heavy expenditure on drainage is not warranted.

LOWER HUTT.

The Lighting of Shunting-yard.

There are no lights in the yard at present. Lights are required as follows: One at north end of the yard; one at south end near water-tank; one behind station, half-way between station and sidings.

UPPER HUTT.

The Lighting of Shunting-yard.

The acetylene-gas lighting is poor. Electric lighting should be substituted. The present lights are well placed, but an extra light is required at the loading-bank to light cattle-yards and points in this vicinity.

The Layout and Proposed Layout of Shunting-yard.

If the north-end shunting-leg were extended to hold twenty cars and an engine, the Maidstone Park picnic traffic could be handled there instead of at the platform or in loop. It would also facilitate the handling of long trains on race days. The difficulties of storing rolling-stock during the busy season would be reduced if the south dead-end were connected up to the Trentham storage sidings.

Nos. 1, 2, and 3 levers at south end of yard should be chain-locked.

The Drainage of Shunting-yard.

Complaint is made of the drainage at the south end. The macrocarpa-trees shade the lines at this end and keep the ground wet.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Sleepers are stacked too close to siding at south end of yard. Cattle-trucks are cleaned there and manure therefrom is left about. The shunters require more than the minimum clearance when working at that spot.

MASTERTON.

The Time that is allowed for the Work of making up Trains.

Insufficient time is allowed between arrival of No. 734 and departure of No. 730.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The door of Levin and Co.'s store does not give sufficient clearance. Manure lying about tracks near the cattle-yards should be cleaned up. This also applies to Featherston.

The Lighting of Shunting-yard.

Electric light was being installed in the yard at the time of the Board's visit.

WOODVILLE.

The Length of the Shifts which Shunters are required to work.

The shunter who runs the Pahiatua shunt would prefer to stay in yard so that he can keep in touch with his work and considers that the porter should run this train. Better working would be obtained by retaining the shunter in yard.

The Numbers of the Employees composing Shunting Gangs.

Some extra assistance is required in the yard between 11.30 a.m. and 2.30 p.m., when the shunting work is heavy.

The General Control of the Work in Shunting-yards.

The shunters ask that a senior shunter be appointed to control the work in the yard, but the Board does not consider the expense is warranted.

The Lighting of Shunting-yard.

The yard is lit by gas, and the lighting is unsatisfactory. Electric lighting is required. The lights should be placed in the following positions: One at site of present gas light, north end; one at site of present gas light, south end; one near cattle-yards; one near the loading-bank; one near centre of shunting-ladder, Palmerston North end of yard.

The Layout and Proposed Layout of Shunting-yard.

The cattle-yards are too close to the shunting-ladder, with the result that loaded stock-wagons foul the ladder after three trucks have been loaded. If a crossover were put into the cattle-yards

siding from the train-examiner's siding north of the yards, and the drovers pushed the loaded wagons up the maintenance siding, this difficulty would be overcome. The engine could then go through the proposed crossover and pick up the loaded wagons. Drovers, however, would probably object to the altered arrangement, and also it is a question whether the expense of a crossover is warranted.

At present engines cannot run direct from the main line to the creosote sidings. This is a disadvantage when locomotive-coal wagons are being discharged on the north shunting-leg, and prevents a train standing on the main line being shunted while a train is approaching from Dannevirke or Pahiatua. If the interlocking were altered to allow the creosote sidings to be used as a shunting-leg from the main line it would be an advantage. The locomotive-depot is in an inconvenient position, and the coal-dumps seriously interfere with the view of shunters when shunting off the north leg. This difficulty cannot be overcome, however, until the locomotive-depot is shifted to a new site.

The Drainage of Shunting-yard.

Woodville, being a place with a copious rainfall, has troubles with water lying about the yard. The drainage of the Napier end ladder requires particular attention. It should be possible to drain the water to the low ground behind the cattle-yards.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Shunting is done with A engines at certain times of the day. Shunters ask that the WA engine, which is the usual shunting-engine, be brought out for these periods. This would probably mean transferring the crew from the A engine to the WA, but this should be done if at all possible.

DANNEVIRKE.

The Numbers of Employees composing Shunting Gangs.

No. 936 is shunted in the dark. The train comes in with the wagons in very mixed order, and one man shunts this train. Assistance should, if possible, be given while breaking up No. 936.

The Lighting of Shunting-yard.

There is only one gas light in yard, which will not stay alight. Electric lighting is required. Lights should be placed in the following positions: One light at north end between No. 7 points and No. 7 traps; one inside the points at the back road; one in centre of yard at goods-shed; one at south end between trap-points and loading-bank.

The Layout and Proposed Layout of Shunting-yard.

The south backshunt could with advantage be lengthened and a scissors substituted for the present crossover. This would avoid setting back up a grade of 1 in 50 on the main line when down trains are being shunted. The work is not urgent. Shortage of storage-room for wagons appears to be the main cause of trouble at Dannevirke, and the provision of extra holding-sidings at the north end of the yard would relieve the situation.

The Drainage of Shunting-yard.

Considerable quantities of water flow into the yard from the adjoining street, causing the yard to flood.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The interlocking rodding south of the signal-cabin is too close to the main line, and the gangways over the rods crossing the yard are too narrow. Where shunters work these gangways should be the full width between tracks. Points-lever for No. 3 road, south end, is on the wrong side of the line. The shunters ask that the bridge at Tamaki be planked. The Board did not have an opportunity of inspecting this bridge, and is not in a position to express an opinion on the request.

WAIPUKURAU.

The Numbers of Employees composing Shunting Gangs.

The bulk of the shunting-work is carried out without assistance by the shunter on duty. Owing to the curves in the yard and the necessity for protecting the level crossing over the yard it is difficult for one man to carry out the work. At the same time the amount of work scarcely warrants additional staff. Possibly if the non-reversible levers on the main line were replaced with pull-over levers the shunter's difficulties would be reduced somewhat. It should also be possible to arrange for more assistance to be given by guards or porters.

The Time that is allowed for the Work of making up Trains.

It was stated in evidence that the time allowed for dealing with some of the trains was insufficient, but under the new time-table the time allowed appears to be sufficient for all trains.

The Layout and Proposed Layout of Shunting-yard.

The yard is too short to conveniently handle long trains. The curves at the north end make shunting difficult.

The Drainage of Shunting-yard.

Drainage is unsatisfactory. In wet weather water drains off road into yard. The remedy would appear to be the provision of boulder and tile drain up the centre of the yard. The cattle-stop pit a the street-crossing floods and floats the footplanks : these should be secured.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Some levers are on the wrong side of the line. A local instruction lays down that the shunter must protect Ruataniwha Street crossing while trains are going across. It is impossible for him to do this while holding the goose-neck lever to admit a train to the yard.

HASTINGS.

The Lighting of Shunting-yard.

The lighting is fairly good, but an extra light should be placed at the south end of the yard near the cattle-yards. The provision of this light is not an urgent matter.

The Layout and Proposed Layout of Shunting-yard.

The present yard has too many dead-end sidings, involving too much slipping of wagons. All loads for weighing (which are fairly numerous) must be slipped on to bridge. Some means of getting round these loads without slipping is required.

The single slip in front of the stock-yards should be replaced with a double slip. This would enable the goods-shed to be shunted at the south end without fouling the crossing-loop.

A short dead-end at the south end of the crossing-loop, to act as trap-points, is asked for by the shunters, but the cost does not appear to be warranted by the advantages to be gained.

NAPIER.

The Numbers of Employees composing Shunting Gangs.

The shunters at Napier work alone with the engine for certain periods each day. During a good part of the year the shunting-work at Napier is light, and no hardship or risk is imposed on the shunter by having at certain times of the day to work alone. When work in the yard is busy, and during the time the shunter is engaged in breaking up trains or marshalling-work, he should always have an assistant. The Coaching Foreman states that assistance can be given at busy times when shunters require it and that no extra staff will be required.

At present the Woods lock on the Eskdale line junction points causes much loss of time to one of the shunting staff. This will be dealt with under the general heading.

The Lighting of Shunting-yard.

The lighting is by gas-lamps, and is fairly good for gas. An extra light at the north end of the goods-shed would be an advantage, but it is not urgently required. Electric light should be installed at this station after the installations at the more poorly lighted yards have been completed.

The Layout and Proposed Layout of Shunting-yard.

The layout of the Napier yard is not a suitable one for shunting-work, but the curve at the north end makes any considerable improvement on the present site practically impossible. Extra storage accommodation for empty wagons is necessary to relieve the congestion in the main yard. To obviate shunting-engines having to go to locomotive-depot for water the provision of watering facilities in the main yard is necessary.

The Drainage of Shunting-yard.

The drainage of the Napier yard is worse than any other yard that the Board inspected. The ganger states that in the times of heavy rain the water flows into the yard through the drainage-sumps. To drain the yard under such conditions is impossible, but it should be possible to get rid of the water more quickly after the storm-water sewers again commence to carry all water to the proper outfall. The foot-tracks between the sidings, which are low and allow water to lie in pools, should be ballasted up.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The Woods lock controlling the Eskdale Junction points causes much loss of time for the shunters. The points are locked for the Eskdale Branch. The key which controls these points also controls the points leading into the locomotive-depot and dock siding, the yard points at the south end, and the up home signal. Every time a train departs to or arrives from Port Ahuriri it is necessary for a member of the shunting staff to go up and open the points, and the same key must be taken to the south end of the yard whenever an engine is to be let into or out of the locomotive-depot or a train is to be brought into or despatched from the yard at that end. On a busy day on the Port line this involves a great deal of running about by a man who should be assisting one of the shunters. The reason for having the points lying for the Eskdale Branch is to enable No. 951 train to be brought in from Eskdale to the yard at the same time that No. 900 train is being brought into the dock from Hastings. No. 913 down mail-train, due to depart at 8.30 a.m., is standing at the platform.

As alternatives for the Woods lock the following suggestions are made : (*a*) Substitute a Ramapo switch for the present lever, and lock it with the ordinary points-key ; (*b*) fit the junction-points with a two-way lock controlling starting-signals ; (*c*) alter the layout to give direct access from the

Eskdale line to the yard. Both (*b*) and (*c*) would cost a great deal more than (*a*), which, considering the nature of the traffic over the Eskdale and Port lines, should be quite satisfactory.

If the necessity for the many trips which now have to be made from the one end of the yard to the other with the Woods lock key was done away with by the removal of the Woods lock from the Port Ahuriri Branch junction-points, the occasions on which a shunter is alone with the engine would be considerably reduced.

The shunters ask for Thompson's patent spring switches at the north end of the loop and at the crossover points from No. 5 to No. 6 roads. When these are available they should be fitted. There are some of these levers at Hastings which could be shifted to Napier. Ordinary levers would be quite as serviceable as the spring levers at the points where the latter are installed at Hastings.

Palmerston North.

In accordance with your directions, a special public inquiry was held at Palmerston North into the conditions of work of shunters at that station; and, in addition to investigating various allegations made against officers, and inquiring into the circumstances surrounding the death of the late Shunter Carmichael, all matters coming within the scope of the order or reference were dealt with, the recommendations of this Board being contained in the special report on this station submitted to you under date 16th September, 1925. (See Annexure *E*.)

Marton.

The Length of Shifts which Shunters are required to work.

The evidence shows that during certain periods of the year long hours were worked at Marton under the old time-table. Under the new time-table it will be necessary for shunting-work to be carried on continuously throughout the twenty-four hours of the day. This will involve an additional shift, and with three eight-hour shifts in the yard all overtime incurred under the previous arrangement should be eliminated.

The Numbers of Employees composing Shunting Gangs.

The shunters ask for three men in each gang. The work at the north end of the yard is not so heavy as that at the south end, and two men should be sufficient at the north end under ordinary circumstances. The south-end gangs require the assistance of a third man during the busy periods of the day. Under the new time-table extra gangs will be necessary to deal with the night trains.

The Supervision that is afforded on Shunters' Work, and General Control of Work in Shunting-yards.

Request was made for an additional Foreman. The platform duties at Marton keep the two Foremen fairly busy, but in the opinion of the Board there is insufficient work to employ a third Foreman during the day. Under the new time-table operating from 15th November it will be necessary for a telegraph operator to be on duty all night, and this member can attend to the despatch of trains and exercise a general supervision over the outside work. We therefore cannot recommend the expense of an additional Foreman.

The Layout and Proposed Layout of Shunting-yard.

All goods traffic from the Main Trunk line is dealt with in the west yard. At present down trunk trains must be brought into the east yard and then taken across to the west yard. A direct connection from the trunk line to the west yard at the north end would facilitate and reduce the work. We recommend that this proposal be given favourable consideration.

At the north end of the west yard a shunting-leg with access across to the east yard is required. At present shunting movements with long rakes of wagons cannot be carried out in the west yard at the north end, and shunts cannot be made from one yard to the other at this end during the time trains are blocked on from Bonny Glen.

The existing shunting-leg at the south end of east yard is too short for the trains handled, and should be lengthened. In the south end of west yard there is no shunting-leg. The short dummy at the end of No. 2 siding should be extended to hold about fifty wagons.

In the west yard the sidings are too short to hold the trains being handled. By moving the north ladder farther north the extra accommodation required could be obtained.

The short siding at the north end of the goods-shed should be straightened and converted into a dead-end finishing at the subway. At present wagons on this siding are too close to shunters when working on the ladder.

If access could be given to the locomotive-depot from the south shunting-leg south of the engine-shed, engines could be put into depot without interrupting shunting operations in the east yard. We consider that heavy expenditure to give this connection is not warranted in the meantime.

A shunting-leg is asked for at the north end of the east yard. As all outward trains for the trunk line are made up in this yard, the leg would allow the work to continue while the main line is occupied or a train is approaching.

In view of the spreading-out of the time-table trains on the Main Trunk line, the provision of a shunting-leg in the east yard is not so important as the alterations and additions asked for in west yard.

The north signal-box obstructs the view between the shunter and engine-driver when shunting in this vicinity. This matter should be kept in view if yard alterations necessitate the removal of the signal-box. A cottage farther round the curve at this end also obscures the view when a long rake is being shunted. The Board has no recommendation to make as to its removal.

The Drainage of Shunting-yard.

The drainage of the east yard requires attention.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

In the Sash and Door Company's siding, which is shunted at night, much material is stacked close to the line. If it is necessary to shunt this siding at night the company should arrange to keep all material to standard clearances and provide adequate lighting.

To facilitate shunting movements, a telephone should be provided between the up home signal and the south signal-box, and between the Wanganui down home signal and the north signal-box.

WANGANUI.

The Length of Shifts Shunters are required to work.

During the busy part of last year a considerable amount of overtime was worked, in spite of the fact that an extra gang was brought out each day. The new time-table will make an adjustment of the shifts necessary, which will eliminate all overtime.

The Numbers of Employees composing Shunting Gangs.

The shunting gangs at present consist of two shunters and a porter, with the exception of the wharf shunt, where there is only one shunter. We consider that the three-men gangs are of sufficient strength to deal with the work required to be done. The wharf shunter should have an assistant when the shipping traffic is heavy. Under the new time-table it will be necessary to employ another gang to handle the night trains. This gang will keep the overtime down.

The Layout and Proposed Layout of Shunting-yard.

With the development of the port at Castlecliff the traffic to and from the Castlecliff Railway is steadily growing. When the phosphate and sulphur traffic for Messrs. Kempthorne and Prosser's works at Aramoho commences, the traffic will be heavy on certain days. To handle this traffic without interfering with the shunting on the ladder, and to give convenient access to the weighbridge, a connection is needed from the Castlecliff exchange sidings to what is known as Anzac Road. This connection will involve diamond crossings across locomotive-roads; but if this is not given, serious interruptions to the shunting-work on busy days will be inevitable.

The north end of the yard should be rearranged so that trains could be brought into or despatched from the main-line, loop or No. 3 siding. A crossover from No. 3 to the loop at the south end would be necessary.

The weighbridge should be shifted to a more convenient site in the yard; its present position seriously interferes with the shunting-work when wagons are being weighed.

Additional sidings at Aramoho to hold through wagons, instead of bringing them into Wanganui, would relieve the congestion at Wanganui to a considerable extent. The Board recommends that the additional sidings at Aramoho be constructed.

The Lighting of Shunting-yard.

The present gas-lighting of the shunting-yard is unsatisfactory. Electric lighting is required. A special report in this connection has been submitted to the Railway Board.

The Drainage of Shunting-yard.

The drainage of parts of the yard requires attention.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

A suitable hut should be provided in the Wanganui yard for the use of shunters.

HAWERA.

The Length of Shifts which Shunters are required to work.

A certain amount of overtime is worked at Hawera. In the summer and autumn the shifts extend to ten hours at times. There is not sufficient work, however, to keep an extra gang fully employed.

The Numbers of Employees composing Shunting Gangs.

The gangs at Hawera consist of one shunter and one porter. Under the old time-table, when there were two trains to shunt at the one time one man had to shunt one train singlehanded, while the other man, with the assistance of the shed-porter, shunted the other train. In the busy season when the shunter was working by himself this arrangement made the work more risky. Under the new time-table Nos. 508 and 515 trains cross at Normanby instead of Hawera, and this will remove some of the shunting difficulties which arose under the old time-table. In normal times two men in a gang should be sufficient at this station. When heavy traffic is moving, shunters are withdrawn from the yard to run special goods-trains, and this depletes the shunting staff. We consider the provision of an extra shunter on the staff, to run specials as required and to assist the shunters during the busy part of the day, is warranted.

Supervision that is afforded on Shunters' Work, and General Control of Work in Shunting-yards.

Request was made for the appointment of a Coaching Foreman. We consider the volume of work and number of staff at this station does not warrant the appointment of a Coaching or Goods Foreman.

The Lighting of Shunting-yard.

The lighting is satisfactory, except that an extra light is required near the north shunting-leg. There was at one time a locomotive-light at this place.

The Layout and Proposed Layout of Shunting-yard.

The yard becomes very congested at times. Both the weighbridge and the 5-ton crane are in awkward positions, causing extra shunting-work, but the Board can see no better site in the present yard.

The same running-track serves the locomotive sidings and the delivery sidings. Engines standing on this running-road taking coal and water prevent shunters kicking down wagons for the delivery sidings. These wagons off inward trains are kicked into the yard, which means double handling, and in times of congestion increases the shunting difficulties. An independent siding to serve the delivery sidings would do away with this trouble.

The access asked for to the locomotive sidings from the south end of yard does not appear to be feasible.

When high wagons or cars stand on the dead-end recently put in at the north end of yard they obscure the engine-driver's view of the shunter when the engine is up the shunting-leg. This siding should be pulled over to give a clear view between shunter and engineman.

The Drainage of Shunting-yard.

The water off the shed-roof drains into the yard and floods it This water should, if possible, be carried off to the nearest drain.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Water-hydrant boxes in the yard require to be fitted with hinged lids.

On account of the inconvenient site of the weighbridge, wagons should not be retared at Hawera. When the weighbridge is being used it disturbs the loading of dairy-produce.

The shunters ask that certain levers in the yard be replaced by pull-over levers. In our general report we have dealt with the question of substituting a different type of lever for the goose-neck.

NEW PLYMOUTH.

The Length of Shifts which Shunters are required to work.

When shipping traffic is heavy the shunting staff at New Plymouth has at times to work long shifts, but this is difficult to overcome in a port where the work fluctuates greatly. When the shifts extend over ten hours it makes too long a day, and provision should be made, if possible, to keep the length of any shift within reasonable limits. When the shipping traffic is heavy the staff is insufficient to keep the hours down to eight-hour shifts.

The Numbers of Employees composing Shunting Gangs.

The gangs at New Plymouth consist of one shunter and one porter. The Breakwater shunter works alone. The shunters ask for three men in a gang at New Plymouth, and two men in the Breakwater gang. We consider that two men are sufficient in the town gangs, but when the shipping traffic is heavy the Breakwater shunter should be assisted by a porter during the day.

The Lighting of Shunting-yard.

The electric lighting of the yard is fairly good with the exception of some places in the yard. The following extra lights are necessary: One west of the signal-box; one between Nos. 3 and 4 roads in delivery-road; one on the north side of shunting-ladder alongside weighbridge-siding points; one east side of goods-shed; one near train-examiner's shed. The light on the west side of Huatoki Stream should be moved to the east side of the stream. A light is required at the weighbridge, sufficiently low to light the numbers and tares of wagons to be weighed. At Breakwater a light is required in the V between the approaches to Moturoa and Newton King Wharves. These lights have already been reported on to the Railway Board (Head Office file 1919/3216).

The Layout and Proposed Layout of Shunting-yard.

The heavy shipping traffic from the Breakwater causes the New Plymouth yard to become very congested at times, but, in view of the Harbour Board's programme for building of sheds on its wharves, and their proposal to handle all merchandise cargo, we do not recommend any large expenditure on additional accommodation.

The weighbridge at New Plymouth is in an unsatisfactory position to work, but there is no more suitable site in the yard. As the bulk of the freight to be weighed consists of coal, sulphur, and phosphate ex ship, the most suitable place for a weighbridge would appear to be at Moturoa, where all bulk cargo ex ship could be weighed and then run direct to destinations. This would

reduce some of the congestion at New Plymouth, and would avoid the interruptions to the shunting-work which now occur in the New Plymouth yard when weighing is being done.

Nos. 1 and 2 sidings at New Plymouth should be altered as shown on the sketch. This would give the shunters two long roads for making up trains.

A connection from the goods-shed through the delivery siding to the main line is asked for by the shunters. This would enable the Breakwater engine to shunt the delivery sidings and goods-shed while the yard-engine worked in the yard; but the Board considers that the disadvantage of not being able to shunt direct from the shunting-leg into the goods-shed may be sufficient to make the cost of the change unwarranted. The alteration will also shorten up the delivery sidings slightly. The proposal should be referred to the District Officers for further investigation.

A crossover from the main line to Morley Street engine-road, at the west end of the yard, was asked for, but the convenience of a direct connection scarcely warrants the cost.

The scissors crossing at the west end of Moturoa sidings and the crossover by the Breakwater home signal should be exchanged. One leg of the scissors is never used at present, and a scissors is required at the home signal to enable trains to go direct to or from the Newton King Wharf.

The Morley Street loop is too short at the west end, and should be extended about a chain when opportunity offers.

The Drainage of Shunting-yard.

The drainage of the yard is fairly good, but some stone drains in the yard should be covered over with fine gravel.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

A bank of sand on the sea side of the line, between the Breakwater home signal and Moturoa, blocks the engine-driver's view of the shunter's signals. Some form of fixed signal which would enable the shunter to signal to the driver to go ahead, stop, or set back is wanted. The request that the points-levers of the crossover at this place should be replaced by a pull-over lever is covered by the general report.

Watering facilities for engines are required at the Breakwater.

Where the shunting-leg crosses the main line at New Plymouth there is a double slip. At this point the shunters do a considerable amount of cutting off. The interlocking-rodding and the bare sleepers of the slip make the spot risky for the shunters. The boxing-in of the interlocking-gear should be extended, and the spaces between the rails should be planked.

TAIHAPE.

The Length of the Shifts which Shunters are required to work.

The shunters ask that the porter booked on at 4 a.m. be brought on at midnight. The object of bringing this porter on at 4 a.m. was to have three men with the engine between 9 a.m. and 12 noon, when the work was heaviest. Under the new time-table the rush of work between these hours will not occur, and the porter will no doubt be booked on at midnight with the shunter.

The Time that is allowed for the Work of making up Trains.

Under the old time-table the shunters did not have sufficient time for the work of making up certain trains. Under the new time-table, however, the conditions are entirely altered, and only by working to the new schedule can it be known whether the difficulties are now removed.

Supervision that is afforded on Shunters' Work, and the General Control of the Work in Shunting-yards.

The shunters complained that the Stationmaster could not efficiently supervise and control the work of the shunters, and asked for a Foreman. The majority of the Board consider that, as there is only one gang on at a time, a Foreman is not warranted so far as the shunting-work is concerned, and that the present Stationmaster, who had several years' shunting experience prior to his promotion to the First Division, is quite competent to supervise the work. Mr. Schofield dissents from this recommendation, and considers that a Coaching or Goods Foreman should replace the clerk recently appointed at Taihape.

The Lighting of Shunting-yard.

The present electric light is fairly good, but the standards are too low. An extra light is required between the shed and station, and the suspended light over the south end of yard should be brought over the track where the shunters walk. A special report was submitted to the Railway Board on this lighting. (Head Office file 1909/2407/1).

The Layout and Proposed Layout of Shunting-yard.

The interlocking of Taihape yard is somewhat unusual in that the main line only and not the first loop is interlocked. The shunters ask that the loop be interlocked. If this were carried out the shunting-work would be slowed up, and the Board does not think the cost of interlocking the loop is warranted so far as shunting-work is concerned.

The cattle-yards are in an inconvenient position. The shunters suggest that they should be moved to a site up the north backshunt, but the site would be a difficult one on which to construct yards. If the loading-races were moved farther north in the present yard the danger now arising through loaded wagons being pushed foul of the shunting-leg would be obviated. A stop-block should be fixed to prevent wagons fouling at this point.

The sidings in Taihape yard are too short to accommodate some of the trains arriving at and departing from this station. When other yards where the conditions are worse than at Taihape have been brought up to date the matter of lengthening the sidings at this station should be considered.

The Drainage of Shunting-yard.

The drainage at Taihape is only fair. The ballast between the tracks where the shunters walk should be made up, to prevent pools of water lying about.

General Matters affecting the Conditions of Shunters as bearing on the Risks involved.

The shunting-engine supplied at Taihape is not in good order. It is a class Wu engine, and is apparently not equal to the work it is required to perform at Taihape.

The points-lever at No. 1 points, south end, is on the wrong side of the track, and should be shifted to the other side.

The local instruction that No. 3 road, south end, is to be kept set for the dead-end, which the shunters ask should be cancelled, was brought into force for the purpose of protecting the engine-shed road and the crossing-loop. The instruction applies only to the one road, and not all the roads, as stated by the shunters, and appears to the Board to be a necessary one.

OHAKUNE.

The Numbers of Employees composing Shunting Gangs.

The shunters complained of the constant changing of the second man in the gangs; but this was done in order to avoid giving any one of the porters an unreasonable amount of night-work, and, providing no porter was put in a shunting gang until he had some training, was the fairest way of allotting the work. Four porters worked four duties in rotation, two of the duties being as shunters' assistants. When the north signal-box is worked the shunter's assistant works it, leaving the shunter alone. Possibly a platform-porter could be trained for this work, so that he could operate the box at times when the shunter and his assistant are busy shunting. The times the assistant must leave the shunter to do this work are only short intervals, and do not justify the appointment of an extra member to the staff.

The Layout and Proposed Layout of Shunting-yard.

Under the old time-table the yard was very congested at times, but the trouble seems to be overcome under the new time-table, which more evenly distributes the work over the twenty-four hours.

The Drainage of Shunting-yard.

The drainage is better than in most yards, but water lies around the points.

The Matter of Employees inexperienced in Shunting-work being employed thereon.

Frequent transfers cause a loss of trained men, whose places are often filled by untrained men. Under the old time-table a porter had to work the night shift alone, and frequently was booked on this shift when he had comparatively little experience.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The locomotive-running men's room and the water-tanks at the south-end of the yard interfere greatly with the engine-driver's view of the shunter during shunting operations. Their removal to another site should be considered.

The engine and crew of the Raetihi train are booked on for shunting from 7 a.m. to 8.30 a.m., when the regular shunting-engine comes out and the train-engine goes to its train. The shunters find this unsatisfactory, as the crew of the train-engine do not take the same interest in getting through the work. The reason for the present arrangement is no doubt to suit the hours of the locomotive crews. It would be more satisfactory to have one engine-driver in the shunting-yard for the whole of his shift.

TAUMARUNUI.

The Numbers of Employees composing Shunting Gangs.

The new time-table has altered the working-conditions since the Board visited Taumarunui. In the future the heaviest work will be on the day shifts. The gangs each consist of one shunter and one porter. During the day shifts there should be a porter on each shift to attend to the south signal-box, piloting of engines, and letting trains in and out of the yard. This would enable the shunting gang to be kept intact.

We consider that the work at Taumarunui justifies the replacing of two of the porters by two shunters, making the authorized staff of shunters five. This should enable more attention to be given to the marshalling of trains than has been done in the past.

Supervision that is afforded on Shunters-work, and the General Control of the Work in Shunting-yards.

The supervision of the shunter's work is carried out by the Stationmaster, who states that with the present efficient shunters it is sufficient. The various duties which the Stationmaster has to perform allow him very little time to supervise and control the yard-work, and we are of the opinion that a Coaching Foreman should be appointed at this station.

The Lighting of Shunting-yard.

The lighting (electric light) is fairly satisfactory, but some parts of the yard are dark. To light these dark spots extra lights are required as follows: (*a.*) One at the south end of engine-shed. (The shunters state there was a light here originally but that it was removed. This was possibly on account of interference with signal lights, but it should be possible to overcome this difficulty by screening the light sufficiently to avoid such interference.) (*b.*) One near the No. 10 traps on the south shunting-leg. (*c.*) One suspended over the centre of the yard. (The shunters asked for three lights, but one should suffice.)

The light at present situated half-way between the locomotive-shed and the goods-shed should be shifted to a position alongside the shunting-ladder. It would then more effectively light the shunting-yard, and would be quite as efficient as a locomotive-light.

The double slip south of the goods-shed should be better lighted. This could be done by moving the light at present at the south end of the goods-shed down towards the slip.

The Layout and Proposed Layout of Shunting-yard.

The locomotive-sheds are not in a suitable position, but, in view of the more urgent need for alterations to other stations, the expenditure of a large sum of money at Taumarunui to shift the sheds is not at present warranted.

If the points of the crossover from the shunting-leg to the locomotive sidings north of the shed were worked from the north signal-box much time would be saved the shunters, but there is no spare lever in the interlocking-frame to permit of this being done. With this crossover interlocked engines could be run between the depot and up trains without a pilot.

The Drainage of Shunting-yard.

The drainage is fairly good, but some low places where pools form should be ballasted up.

The Matter of Employees inexperienced in Shunting-work being employed thereon.

If the two graded shunters recommended are not appointed, then only porters experienced in shunting-work should be placed in the gangs as second men.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The shunters considered it dangerous to shunt the train-examiners' siding at night. The Stationmaster has arranged for this shunt to be done in daylight. The cesses at the south end of the yard are in some places low, and should be made up.

Te Kuiti.

The Length of Shifts which Shunters are required to work.

When traffic is heavy at Te Kuiti the shunters are called upon to work a certain amount of overtime, the shifts extending up to about ten hours on some days.

The Numbers of Employees composing Shunting Gangs.

The two gangs consist of one shunter and one porter each, but they do not work together for the whole of the shift. A considerable amount of the work at this station is reducing or making up the trains to the proper tonnages, and there should be no difficulty in one man doing this, except when any marshalling or cutting out of perishable or urgent loads is necessary, when two men should be with the engine.

The shunters do not consider it should be the assistant's duty to protect the crossings during shunting movements, but to provide other crossing-keepers would be costly and unnecessary. As there are no automatic means of working alarm bells or signals at crossings in shunting-yards excepting for the main line traffic, it seems necessary that the shunting staff should do the work. The same conditions rule at other yards in New Zealand.

At Te Kuiti the shunters and their assistants do the number-taking, except when a spare porter is available to do the work. Under the old time-table there appears to have been sufficient work to keep another porter fully employed in number-taking and keeping down overtime. The new time-table will probably reduce the shunting-work, and may render this extra man unnecessary. After the effects of the changed conditions are known the need for an extra man should have further consideration.

The Time that is allowed for the Work of making up Trains.

The shunters ask that the guard of No. 412 train should wire from Puketutu the composition of his train, so that they would know what work had to be done when it arrived. This should be arranged.

The Lighting of Shunting-yard.

The electric lighting is fairly good, but two extra lights, one at the north end of the goods-shed and one near the double slip at the south end of No. 4 siding, would make a decided improvement.

The Layout and Proposed Layout of Shunting-yard.

The request was made that the north shunting-leg should be lengthened, and that scissors crossings should be put in at each end of the yard. When money is available the north leg should be lengthened. Scissors crossings are costly articles of permanent-way, and the saving of time to a few trains occasionally delayed by being unable to shunt because other trains are approaching would not pay for the expense of putting them in.

The loading-races at the stock-yards are close to the shunting-leg, resulting in loaded wagons fouling the leg. A stop-block should be fixed to prevent wagons being pushed foul at other times than when the shunter removes the block.

A cutting at the north end of the yard interferes with the shunters' view, and they ask that it be widened alongside the shunting-leg. As we understand that a bridge is mooted at this point we have no recommendation to make.

The Drainage of Shunting-yard.

The drainage, excepting around the stock-yards, is satisfactory.

General Matters affecting the Condition of Work of Shunters as bearing on the Risks involved.

The shunting-engine, which at present comes out at 8.30 a.m., should be brought out at 7 a.m., to place inward loaded wagons in the shed and delivery sidings before 8 a.m.

At the north end of the yard the wall of the coal-store is too close to the shunting-ladder, and should be moved back another 3 feet.

The practice of engine crews discharging ashes alongside the shunting-ladder near the point to the locomotive sidings, where they are a source of danger to the shunters, should cease.

The shunters ask that the shunting-engine provided should be either a tank engine or a tender engine fitted with a cowcatcher on the tender. Providing that it is suitable for the banking of trains to Poro-o-tarao the Board considers that a "Ww" class engine would be more suitable at Te Kuiti for shunting purposes than a "B" or "Bb" engine. Should it not be feasible to supply a suitable tank engine, then the tenders of the "B" engines stationed at Te Kuiti should be fitted with a suitable handrail and step, on which shunters could ride when slipping wagons.

FRANKTON.

The Length of the Shifts which Shunters are required to work.

There is very little overtime worked at Frankton Junction. The shunters asked that the shifts overlap fifteen minutes; but, as the granting of this request would probably lead to the gangs being booked off for thirty minutes for a meal, to allow time for the overlap, the Board thinks it will be more satisfactory to all to leave matters as they are. If the Foreman is with the gangs for a short time before they finish he should be able to direct the shunters coming on duty as to the state of the yard and the work to be done.

The Numbers of Employees composing Shunting Gangs.

The gangs at Frankton consist of two shunters and a porter, with the exception of the house-factory shunt, which consists of one shunter and one porter. These gangs are strong enough, but at times one member is required to leave the gang to perform other essential duties. As Frankton Junction (with the possible exception of Christchurch) is the busiest yard in New Zealand, the gangs should, as far as is possible, be kept intact. To enable this to be done two extra porters should be appointed to the yard staff. They would not be attached to any gang, but would be used in the busy portions of the day for marking off, uncoupling, and coupling up trains. They would act under the directions of the Foreman. These men could always be drawn on to fill any vacancies in the shunting gangs.

The Time that is allowed for the Work of making up Trains.

At junctions like Frankton Junction, no matter what time-table is drawn up there are bound to be instances where in busy seasons the times for making up trains may be a little short. The troubles at Frankton arise as much from shortage of siding-room as from the shortage of time. When sufficient traffic is offering, a special train should be dispatched north shortly before the evening trains commence to arrive, in order to clear the yard.

The Lighting of Shunting-yard.

The electric lighting is good as far as it goes, but extra lights are required as follows: Two above the overbridge—*i.e.*, one above the east and one above the west yard; one at points of cattle-yard siding. One of the lights near the vats at the north end of the yard should be moved north to light the group of turnouts near Norton Street crossing. The back roads of the west yard require lighting too, but this should stand over until the yard alterations are carried out.

The guards of Frankton who have to shunt Otorohanga ask that some lighting be provided to dispel the gloom at each end of the yard. Pending the advent of electric light they ask for kerosene lights. As the Board did not inspect this station at night it does not know what the conditions are.

The Layout and Proposed Layout of Shunting-yard.

The Frankton yard is too short for the trains handled, and in busy times the yard gets very congested. In the east yard two extra loops are required for marshalling purposes. To make room

for these the weighbridge and the gas-storage cylinder should be moved to other sites. The best place for the weighbridge is at the north end of the east yard, and for the fixed gasometer the best site is on the short backshunt at the south end of the loop which runs past the existing gasometer-site. The proposed layout is generally satisfactory, except that the north ladder on one straight should be considered. Extra land will need to be taken to allow this to be done.

A crossover is asked for at the south end of the two long backshunts of the east yard, so that a van can be placed behind a rake of wagons without pulling them out. These two dead-ends will be used for making up north-bound trains, which are seventy and sometimes up to one hundred wagons in length. As shown on the plan of the proposed yard they are too short, but if the shunting-ladder is kept on the one straight, as suggested above, they will meet requirements.

The shunters ask that the connection from the cattle-yards siding to the shunting-leg, shown dotted on the plan of the proposed alterations to the yard, be put in when the other work is done. At present it takes them twenty minutes to lift stock for south and place it on the trains.

The gassing of cars involves extra shunting, and extra gaspots are asked for at the south end of the platform. As we do not know the cost of putting the extra pots, we cannot say whether the saving in time warrants the expenditure. Possibly if the gasometer is moved as suggested the pressure at the present gaspots may be so reduced as to make pots at the south end essential.

The Drainage of Shunting-yard.

The drainage is by soakage, and as the subsoil north of Commerce Street is pumice the water gets away from most parts fairly quickly. About some of the switches, however, it lies for a considerable time. Possibly suitable soak-pits filled with scoria would satisfactorily drain these wet places. Round the points-levers, where constant walking of the shunters has worn hollow places, some ballast should be spread.

The Matter of Employees inexperienced in Shunting-work being employed thereon.

At Frankton frequent transfers of porters with shunting experience, and the supply of such men for relief and emergency purposes to other stations, leads to inexperienced men frequently being placed in the gangs to fill their places. If two extra men were appointed to the yard as previously suggested, these men would be gaining experience all the time, and would be available to fill vacancies in the gangs as they occurred, their places being taken by inexperienced men.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Some of the shunting engines in use at Frankton during the visit of the Board were not suitable for the work. We understand that converted J engines undergoing repairs at Newmarket would replace the unsatisfactory locomotives as soon as the overhaul was complete.

Box wagons standing on the siding adjoining the south shunting-leg, east yard, block the driver's view of the shunter, making it necessary for the shunter to cross in front of the wagons to give the signal on the fireman's side. There have been several narrow escapes from accident through this, and the shunters ask that these box wagons, which are to be loaded with dairy-produce, be placed at one of the sidings which served the old cattle-yards. This should be arranged.

In the west yard at the south end the interlocking-rodding it too close to the track, and should be boxed over. Fences and huts interfere with signals from the shunter to the driver, and some alteration and improvement is desirable.

Huntly.

The Length of the Shifts which Shunters are required to work.

Each shunter every third week works only five days, but gets in fifty hours for the week. The shift on which these hours occur (No. 2) is the one in which the bulk of the shunting-work is done. There does not appear to be any strong reason why No. 2 shift should be booked on before 9 a.m. instead of 8.30 a.m.

The Numbers of Employees composing Shunting Gangs.

An extra shunter is asked for on No. 2 shift. The present staff of the station seems strong enough to provide any necessary extra assistance required by No. 2 shift. Some rearrangement of the various duties should enable this to be done.

The Layout and Proposed Layout of Shunting-yard.

The yard is very congested, and this congestion is intensified by having to store so many empties for supplying the mines. When empty goods-wagons are available more are often worked to Huntly than can be conveniently stored. The new yard at Huntly is urgently required.

The Board understands that there is a possibility of another mine being opened at Mahuta. This will mean another class of coal to handle, and will involve more shunting-work at Huntly.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Complaint was made that No. 236 train, which is allowed ten minutes for shunting at Huntly, spends nine minutes of this time at the water-column, the cause of the delay being the slow flow of the water. As a result the shunting has to be done hurriedly.

MERCER.

The Lighting of Shunting-yard.

The lighting at this station is very poor. Pending the installation of electric lighting in the district, the present lighting should be augmented by two lights at the north shunting-ladder. We are unable to say whether the generator could supply these extra lights, but a rearrangement of existing lights may make it possible to supply the extra yard-lights where they are urgently required.

The Layout and Proposed Layout of Shunting-yard.

The sidings in the yard are too short to hold the trains now running.

The Drainage of Shunting-yard.

The yard is subject to flooding by the Waikato River. Unless the yard were raised above flood-level, which would be a big undertaking, the difficulty cannot be overcome.

OTAHUHU.

The Numbers of Employees composing Shunting Gangs.

The three Westfield gangs consist of one shunter and one porter each, and the three Otahuhu-yard gangs are composed of one shunter each. The gangs work in eight-hour shifts for the twenty-four hours. The work of the Westfield shunt has increased considerably during the past few years, and is still increasing, and in the opinion of the Board the three porters who work with the Westfield shunters should be replaced by shunters.

The Supervision that is afforded on Shunters' Work.

The shunters asked that two Foremen should be appointed to Otahuhu, but the work does not yet warrant such appointments.

The Lighting of Shunting-yard.

The gas-lighting is most unsatisfactory. As the alterations to the yard which are shortly to be put in hand will involve changes in the sites of all lamps, electric lighting will no doubt be installed. The Westfield yard should also be lighted when the Otahuhu yard is being done.

The Layout and Proposed Layout of Shunting-yard.

The alterations to the layout of Westfield and Otahuhu which are in hand will overcome most of the troubles experienced on account of the existing layout. The shunting-leg at the south end of the east yard will be straightened, and additional sidings are being provided.

Recently a dead-end was put in at the north end of the saleyards siding. If the north end of this dead-end were connected with the abattoir loop the placing of wagons for the saleyard sidings would be greatly simplified.

In view of the proposal to erect workshops at Otahuhu, a crossover will be required at the north end of the yard to run trains bound from Auckland to the shops from the down line to the west yard.

Kempthorne, Prosser, and Co.'s sidings are congested, and unable to hold sufficient wagons. The shunting-leg of Wright-Stephenson's siding is too short.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The work at Otahuhu and Westfield is growing beyond the capacity of one shunting-engine, and there are often times when an extra engine is required. This engine, which is now supplied at certain hours in the busy stock season, will, with the present growth of traffic, be required much more frequently in future.

There are several obstructions about the yard, such as gas-pipes, above ground-level, which are liable to trip shunters. These should be removed by the Maintenance staff.

Telephone communication from the up starting signal to the north signal-box and Stationmaster's office, and from the saleyards to the Westfield and Otahuhu signal-boxes and the Stationmaster's office, is asked for to enable the shunters to advise their movements and ascertain movements of trains. The alterations at present being carried out may affect the position, and the installation of telephones should be held in abeyance until the alterations are complete.

There is no footway alongside the shunting-leg of Wright-Stephenson's siding. One is needed so that shunters can work alongside the wagons without risk.

A coal-shed recently erected at Otahuhu is in a bad position for the shunters, who state that the closeness of the building to the track, and the engine-pit between the rails, are a danger to them. A better location for the shed and pit would be at the end of the shunting-leg.

PENROSE.

The Numbers of Employees composing Shunting Gangs.

There is one porter on each shift at this station. Extra assistance was asked for from 4.30 a.m. to 6.30 a.m. The Stationmaster states that he will be able to give this assistance when the new down line is opened for traffic. The work does not yet warrant the appointment of shunters.

The Lighting of Shunting-yard.

The lighting, which is by gas, is not good, and should be replaced by electric lighting. Three lights in the east yard, two in the west yard, and one at the Onehunga end of the triangle will probaby be required.

ONEHUNGA WHARF.

The Numbers of Employees composing Shunting Gangs.

Two men shunt together at Onehunga, but, as the shunter runs as guard for most of the week, the shunting is mainly done by two porters. If the railway traffic at Onehunga Wharf increases to the extent anticipated, when the Onehunga Wharf is completed one of the porters should be replaced by a shunter.

The Lighting of Shunting-yard.

The Harbour Board will light the wharves when they are completed. Two lights will probably be required in the yard in addition to the lights the Harbour Board will install. One is needed near the overbridge, and one near the goods-shed. The position of the latter light should not be decided on until the wharf lights are installed.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

Parts of the yard require extra ballasting. Sleepers are bare.

NEWMARKET.

The Length of Shifts which Shunters are required to work.

When stock-trains are running from the north line the late shifts have at times to work long hours. These are caused through the shunters having to run the stock through to Westfield, but there is not much actual shunting involved.

The Numbers of Employees composing Shunting Gangs.

There are two gangs each consisting of a shunter and porter, and two of a shunter alone. The strength of the gangs is sufficient for the work done. The shunters who work alone are engaged a great deal of their time in running shunts to Mount Eden, Remuera, and Penrose. The assistants during certain portions of the day spend considerable time taking numbers, during which time the shunter works alone. An extra number-taker is required in the yard, so that the shunter and his assistant may be together for the whole time. The number-taker could assist the shunters when not employed number-taking.

The Lighting of Shunting-yard.

The lighting at Newmarket is fairly good. The shunters ask for the light at the north end of the shed to be shifted to the middle of the shed so as to light the centre of the yard more. The Board considers the present site is more suitable, as the back roads are now lit up, whereas they would be in darkness if the light were moved. Better lighting is desirable alongside the shunting-leg parallel to the old main north line. This could be obtained perhaps by putting a more powerful light in place of the existing one near the corner of the triangle (opposite No. 22 points).

The Layout and Proposed Layout of Shunting-yard.

The traffic for Odlin's Company has all to be "slipped" into their siding. To avoid this the shunters ask for a turnout near Manukau Road Bridge. This does not appear to be feasible, on account of the curve, but the possibility should be investigated.

Drainage of Shunting-yard.

In wet weather a lot of water lies about No. 2 delivery and shed goods-delivery sidings. Water off the various buildings on the leases adjacent to the yard discharges into the yard. If this water could be got away the drainage would be reasonably good.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The interlocking at the north end of the yard frequently causes delay in the despatch of trains from the west yard to the north line while trains are signalled from Remuera. At certain hours during the day, if a north-bound goods-train cannot get away from the yard at a convenient time it may be considerably delayed on account of being unable to reach Mount Eden in time to cross opposing trains. This delay also holds up the work in the yard. While the main-line up home signal is off a train cannot be let out of the west yard for the north line. The Board suggests that to overcome this difficulty the locking be altered so that when the main up line is set for Auckland No. 22 points will lie for the yard. The train for the north could then depart from the yard.

AUCKLAND.

The Length of Shifts which Shunters are required to work.

All the shifts are worked out on an eight-hour basis. In the case of the late inward shift a little overtime is worked occasionally, and on the late wharf shunts when the ships are working late

the shunting gangs work at times one and a half to two hours overtime. When it is known the previous day that overtime will most likely be worked the following night it might be possible to book on the late wharf shunts at a later hour, and thereby reduce the length of the shift that is worked.

When the work in the inwards yard gets too heavy for one shift to deal with an extra engine and shunting gang are brought out. The shunters ask that this engine be booked out every night, but we do not see any good reason for recommending this. The advantages claimed were that wagons could be freed more promptly, and loads placed in the delivery sidings early in the morning. The extra engine is out when the traffic is busy and the necessity for the prompt return of empties to traffic exists. The earlier shunt of the delivery sidings would no doubt be an advantage, but this advantage does not warrant the expense of an extra shunting engine and gang.

Occasionally overtime is worked on the car shunt, which is sometimes due to the cutting-out of cars for brake overhaul. The shunters' suggestion that a complete service be sent for overhaul at one time was found on investigation to be impracticable. Possibly at the beginning of the week the Car and Wagon Inspector could give the shunters a list of all cars required to be sent to the shops that week. The shunters could then cut them out at convenient times.

The Numbers of Employees composing Shunting Gangs.

The gangs on the outward shunts and the car shunts consist of three men each, and are strong enough for the work. All other gangs consist of two men. On the wharf shunts a third man is necessary under present conditions, but if the switches on the track in Quay Street were fitted with points-boxes which would hold the switches for either road without being held by the shunter, two men would be sufficient. The wharf shunting is performed at a speed of not more than four miles per hour, but at present the curves prevent a shunter piloting the shunting movement on to the wharves and at the same time keeping in sight of the engine-driver, and the second man in the gang who holds the points is not in a position to see and pass on his signals.

When a shunt is going on to the Central Wharf at Auckland with a long rake of wagons it is necessary that both shunters should hold points (there being two turnouts) while wagons are being pushed round a curve on to the wharf, and the shunt is not protected in front owing to a third man not being available to protect it.

On the inwards shunt a third man is asked for. For much of the work on these shifts two men should be sufficient, but a third man would be of great assistance during the busiest portions of the shift. Owing to no spare staff being regularly available at Auckland for training purposes, two extra men should be placed on the Goods staff. These men should be at the disposal of the Foremen to use to the best advantage, but in the Board's opinion a suitable place to train them would be on the inwards shunts. This would give the necessary assistance required on the shifts concerned.

For a portion of the day the third man on the outwards shunt is away from his gang coupling up trains and marking off wagons ex shed and sidings. On account of the curved shunting-leg the third man should be with the gang whenever shunting is being carried on off the leg.

The pilots pilot the trains back through sundry curves and lose sight of the engine-drivers, but, as the local instructions are that the Westinghouse brake must be coupled through, the pilot at the front can always stop the train if necessary. The appointment of extra pilots to enable more than one pilot to be on during the night shift is scarcely warranted.

The Time that is allowed for the Work of making up Trains.

For a large part of the year the congested state of the yard causes delays in getting trains made up. The new yard at present in course of construction will remove most of the present difficulties.

The Supervision that is afforded on Shunters' Work, General Control of the Work in Shunting-yards.

The effective supervision and control of the Auckland yard in its present congested state is a most difficult matter. On the Senior Foreman falls the duty of co-ordinating all the work in the yard during the day, and in doing so he frequently must alter the routine of the shunters' work. To the shunters these interferences are naturally irritating, for, as a rule, they are not in a position to know the conditions in other parts of the yard which make the changes in their plans necessary. Such interference is inevitable in all yards at times, but is found to occur more often in times of congestion, when the shunters naturally least appreciate any changes in their work. The Senior Foreman, who is a good practical man, seems in the past to have had to shoulder rather more than his share of the work. In Auckland yard the Yard Foremen should be men whose shunting experience makes them competent to direct the work, and who are prepared to give a decision when appealed to by the shunters and accept responsibility therefor. In this respect there appears to have been a weakness on the part of the junior Formen in the past. When the Senior Foreman finds it necessary to give orders to the shunters which override orders already given by a junior Foreman, he should, if it is convenient to do so, give these orders through the junior Foremen. In an extensive yard like Auckland it must be recognized that this will not be possible on all occasions.

The proposal that the wharf shunters should work under the wharf storeman instead of under the Senior Goods Foreman would not be satisfactory. The Department's clients would have difficulty in getting in touch with the storeman, whose duties take him from King's Wharf to Princes Wharf, whereas the Senior Goods Foreman is usually within telephone call. The wharf storeman should keep the Senior Foreman well posted with the requirements of the wharves, and particularly with any change of plans made by the shippers and stevedores.

Generally, car-shunting gangs should be under the control of the Coaching Foreman, instead of the Goods Foreman, who is not in close touch with the coaching requirements. In the new yard it will be possible to do this, but in the present yard such an arrangement would mean that the two Foremen would be exercising control in the one yard.

The Lighting of Shunting-yard.

The yard is electrically lighted, and, generally speaking, the lighting is good. There are some places, however, which are dark, and extra lights are required. Some of the lights asked for by the shunters are in places where in a short time they will be in the way of the construction of the new yard. These lights should not be installed until the alterations have been carried out, when the lights can be placed to suit the new layout.

The following extra lights are recommended by the Board: One near No. 9 disc, to be placed in a position where it will not interfere in any way with the signal lights; one near shunting-leg between pilot-box and "short cross" points; one near No. 7 points, wharf leg; one half-way along engine-shed on Quay Street fence (this need not be a high-candle-power light). The present light near the "short cross" points should be shifted towards the B roads, and the light near the site of the old overbridge should be increased in power and suspended over the shunting-leg of the inward yard.

The Layout and Proposed Layout of Shunting-yard.

More accommodation is required in the wharf exchange. This should be given as early as possible. Any work done here can be done as part of the final layout.

One of the difficulties at Auckland is to find storage-room for empties and out-of-order wagons.

The plan of the new yard was examined by the Goods Agent, Senior Goods Foreman, two shunters, and the Board, and a few alterations were suggested. The Chief Engineer was advised of the suggested alterations, so that he could alter the plan along the lines of the suggestions where such alterations were feasible.

The Drainage of Shunting-yard.

The drainage of the Auckland yard compares favourably with other places visited. Around some of the points water lies about. Where pools form round the levers the ground should be ballasted up to run the water off.

The Matter of Employees inexperienced in Shunting-work being employed thereon.

With a large shunting staff such as at Auckland vacancies are constantly occurring, which in the absence of trained porters must be filled by inexperienced men. If two or three men were kept attached to the Goods staff as trainees these men could be utilized to fill such vacancies. If on completion of their term of training they were not required in the yard they could be placed on other work until their services were required for shunting-work. Two of these men could be used as third man on the inwards shunt.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The shortage of guards-vans in the Auckland District is a cause of much delay to trains, and greatly hampers the shunters in their work. Pending the provision of extra vans, more cars should be fitted with side- and tail-lamp brackets. When engines are running to and from locomotive-depot through the shunting-yard headlights should be dimmed.

The provision of an ambulance outfit in a position accessible to shunters on the night shift is very desirable. Unfortunately, such outfits are subject to petty thefts, and unless secured would probably be short of essential dressings and appliances when required. Possibly a box could be kept outside the Foreman's office in a locked cupboard, which could be opened by breaking a glass and unlocking the door from inside.

During the hours that the Foreman's office is locked up (midnight to 6 a.m.) the shunters cannot telephone to the signal-cabin. The telephone should be shifted to a box outside the office, so that the shunters can have access to it at any time. A telephone should also be provided from the Coaching Foreman's office to the Car Storeman's hut in the car-yard. This telephone would save train delays, particularly at holiday and race periods, by enabling the Coaching Foreman to arrange promptly for additions and alterations to the make-up of trains.

At Auckland many "not-to-run" wagons are used for traffic between the wharves and the yard. These wagons should be marked with a distinctive label by the train-examiners before being used for such traffic, otherwise there is always a risk of an accident occurring through the shunters using a wagon which is unsafe for traffic.

At times the number of wagons marked for repairs is a source of considerable trouble at Auckland. Newmarket shops cannot take them as quickly as they arrive, and there is insufficient storage-room for them at Auckland. It may be possible at such times to leave in traffic wagons having minor defects which in no way make them unsafe to run or to handle.

MOUNT EDEN.

The Lighting of Shunting-yard.

Lights are required, one at each end of the yard. At present the platform-lights are left on for the shunters while shunting, but this lighting is ineffective and rather costly. A light is asked for at

the junction of the Gaol and Kauri Timber Company's sidings. These sidings are shunted in the darkness every evening in the winter months. The sidings are in a very dark spot, and a light is necessary. All yard lights should be controlled by the Signalman.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

The private sidings at the Helensville end of the yard require more ballast. The sleepers are bare, and the ballast is very rough to walk on.

The provision of an ambulance outfit at Mount Eden station is recommended.

The grade of the Kauri Timber Company's siding is such that wagons run away unless securely braked, and the company should be called upon to regrade it so that the wagons will stand without braking.

HENDERSON.

The Lighting of Shunting-yard.

There is no lighting at present, but electric lighting has been approved.

The Layout and Proposed Layout of Shunting-yard.

The yard is too short for the trains handled. Valley Road crosses the yard on the level, and in its turn with other bad crossings should be fitted with a warning-signal worked from the signal-box. Shunting is carried out over this crossing at times with only one man in charge of the engine. He cannot attend to the shunting and watch the road traffic also. If a turnout were put in on the south dock siding to act as trap points it would be possible to store a service in the dock overnight. This would relieve the congestion in yard, where at times it is difficult to accommodate vehicles received during the evening. If the cost is not too high, this alteration should be made.

HELENSVILLE.

The Lighting of Shunting-yard.

The lighting is by one acetylene-gas light, which is practically useless. When the new yard is constructed electric light will be available, and presumably will be installed.

The Layout and Proposed Layout of Shunting-yard.

The layout of the present yard is the worst of all country stations visited, and is quite unsuitable for the work. The design for the new yard is satisfactory.

WHANGAREI.

The Lighting of Shunting-yard.

The lighting of the main yard is satisfactory, except that an extra light is required at the south end of the yard beyond the vat, and another at the north end between the scissors and the points of the cattle-yards siding. The approach road to the station is very well lighted by four lights. Three lights would seem to be sufficient, and the fourth could be placed in the suggested position near the scissors. From this position it would throw a certain amount of light on to the street.

Three lights will be necessary in the goods-yard, as follows: One near the bridge; one at the south end of goods-shed; one between the shunting-leg and loading-bank. A light somewhere in the vicinity of the cattle-yards will also be required.

The Drainage of Shunting-yard.

The drainage is bad in the old yard, but should be satisfactory when the yard is reconstructed.

General Matters affecting the Conditions of Work of Shunters as bearing on the Risks involved.

A complaint was made that the private sidings at Waro required ballasting, and that the cesses were too narrow and low for safe shunting.

ANNEXURE *(B)* TO APPENDIX E.

Analysis of Shunting Accidents for Ten Years between June, 1915, and June, 1925.

Cause of Accident.	Country Stations.			Auckland.			Frankton.			New Plymouth.			Wanganui.			Palmerston North.			Napier.			Wellington.			Lyttelton.			Christchurch.			Timaru.			Oamaru.			Dunedin.			Invercargill.			Greymouth.			Totals.		
	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.	Fatal.	Serious.	Minor.
Points-levers	..	..	13	..	..	2	..	..	4	..	..	..	..	..	1	..	..	1	..	..	..	..	..	6	..	..	3	..	..	6	..	..	1	..	..	1	..	..	..	..	..	2	..	..	..	..	..	40
Caught in switches	1	..	5	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	9
Caught in frogs	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	4
Rough surface in yard and bare sleepers	..	..	3	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
Material and plant left between tracks	..	1	4	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	8
Interlocking rodding and gear	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Clearances of structures insufficient	..	1	11	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	3	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	1	20
Wagons standing foul	1	..	3	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..	9
Slipping off brake of wagon	1	2	7	..	..	..	..	..	1	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	1	2	14
Falling or slipping off cars or wagons	2	1	11	..	..	2	..	..	7	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	3	..	..	3	..	..	..	..	..	3	..	..	..	..	..	..	..	2	1	32
Jumping off vehicles	3	1	40	..	..	1	..	..	..	..	..	3	..	..	2	..	..	2	..	..	3	..	..	9	..	..	4	..	..	5	..	..	2	..	..	1	..	..	5	..	..	1	..	..	2	3	1	80
Getting on moving vehicles	1	..	15	..	..	3	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	24
Slipping or tripping while on foot	..	..	49	..	1	1	..	1	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3	..	..	1	..	6	..	..	..	..	1	..	..	1	..	1	2	..	..	..	..	3	66
Slipping on rails	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	2	..	..	..	..	..	1	..	..	9
Slipping off cow-catcher of engine	1	2	7	..	..	6	..	..	1	..	..	..	..	..	..	..	..	1	..	..	2	..	2	5	..	..	1	..	4	..	..	1	..	..	1	..	1	..	..	1	..	..	1	..	..	2	4	30
Foot caught between cow-catcher and rail or ground	..	..	4	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	10
Damaged draw-gear	..	..	8	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	12
Bridles	..	..	12	..	..	5	..	..	1	..	..	..	..	..	1	..	..	2	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	2	..	..	..	..	..	28
Braking of vehicles	1	..	39	..	..	3	..	..	2	..	..	..	1	..	1	..	..	2	..	..	..	..	..	2	..	..	2	..	5	..	..	3	..	..	1	..	..	3	..	..	1	..	..	2	2	..	67
Coupling and uncoupling vehicles	2	2	54	..	..	3	..	..	5	..	..	4	..	..	1	..	..	3	..	..	1	..	..	13	..	..	4	..	4	1	..	2	..	..	4	..	..	4	..	..	4	..	..	3	3	2	109
Caught between buffers	..	..	48	..	..	10	..	..	6	..	..	2	..	..	2	..	..	3	..	..	..	..	..	3	..	..	3	..	5	..	..	4	..	..	..	..	..	8	..	..	3	..	..	1	..	..	98
Buffers locking	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Slip, shunting of wagons	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2
Caught between moving vehicles	..	..	..	..	1	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3
Collisions	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	3	2	2
Derailments	..	1	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	10
Load on wagons shifting or overhanging	1	..	8	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	..	2	..	..	1	..	..	1	..	..	16
Tail-roping of wagons	..	..	8	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	10
Knocked down by moving wagons	3	2	3	..	..	3	..	1	..	..	..	..	..	..	..	..	1	1	..	..	..	2	..	..	..	..	..	1	..	1	1	..	2	..	..	..	1	..	..	..	..	..	1	7	4	12
Knocked down by moving engines	5	2	3	1	..	1	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	6	2	9
Steam from engines obscuring view	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2
Cause unknown	1	..	30	..	..	7	..	..	4	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	3	..	..	1	1	1	50
	25	16	404	2	5	57	1	2	36	..	..	13	1	..	13	1	1	23	..	..	7	2	3	57	2	..	29	1	..	53	3	..	21	..	..	12	1	2	37	1	1	25	..	..	12	40	30	799

ANNEXURE *(C)*.—LIGHTING OF SHUNTING-YARDS.

THIS Board considers that the work of installing the electric light in shunting-yards should, as far as possible, be carried out in the following order of urgency :—

Marton.	Woodville.	Dannevirke.
Wanganui.	Masterton.	Helensville (when new yard constructed).
Otahuhu.	Henderson.	
Greymouth.	Gore.	Mount Eden.
Palmerston North.	Upper Hutt.	Stirling.
Timaru.	Napier.	Lower Hutt.
Paekakariki.	Balclutha.	Petone.
Milton.	Penrose.	Onehunga Wharf.

The alterations and additions to lights should be carried out as near as possible in the following order :—

Burnside.	Christchurch.	Te Kuiti.
Dunedin Goods.	Lyttelton.	Wellington.
New Plymouth.	Taihape.	Oamaru.
Invercargill.	Ashburton.	Newmarket.
Auckland.	Palmerston.	Bluff.
Frankton Junction.	Taumarunui.	Hawera.
Whangarei.	Addington.	Hastings.

The electric current is not available at Mercer, Westport, and Clinton. Additional gas lights are required at Mercer and Westport, and some form of lighting is necessary at Clinton. As the electric power becomes available these yards should be lit by electricity.

In the above lists order of urgency alone has been considered. In the event of yard alterations being carried out at any place in the near future the improved lighting of that place should be deferred until the alterations are complete.

ANNEXURE *(D)*.—YARD ALTERATIONS.

THE urgency of the alterations and additions suggested or recommended to yards are set out below :—

URGENT WORKS.

Invercargill (direct connection to west yard from main line at north end of yard).	Wellington.
Dunedin Passenger.	Thorndon (additional sidings).
Christchurch (new yard).	Palmerston North.
Lyttelton.	Marton.
Greymouth (rearrangement of yard).	Wanganui and Aramoho.
	Frankton Junction.
	Huntly (new yard).

ESSENTIAL WORKS BUT NOT OF AN URGENT NATURE.

Bluff.	New Plymouth Breakwater (scissors crossing at home signal).
Dunedin Goods.	
Timaru.	Taihape.
Ashburton.	Mercer.
New Plymouth (joining up No. 2 siding with backshunt).	Helensville (rearrangement of yard).
	Morrinsville (new yard).

NECESSARY WORKS.

Invercargill (short dead-end siding between Nos. 11 and 13 roads, east yard).	Upper Hutt.
	Dannevirke.
Gore.	Hastings.
Balclutha.	Napier.
Stirling.	Hawera.
Palmerston.	Henderson.
Paekakariki.	

The proposed new yards at Auckland and Wellington and the rearrangement at Otahuhu will remove the present difficulties under which the work is being carried out at these stations.

ANNEXURE *(E)* TO APPENDIX E.

SPECIAL PUBLIC INQUIRY INTO THE WORK AND CONDITIONS OF SHUNTERS AT PALMERSTON NORTH, PUBLIC INVESTIGATION INTO VARIOUS ALLEGATIONS MADE AGAINST OFFICERS AT PALMERSTON NORTH; ALSO AN INVESTIGATION INTO CIRCUMSTANCES SURROUNDING THE DEATH OF THE LATE SHUNTER CARMICHAEL.

Railway Shunting Inquiry Board, Wanganui, 16th September, 1925.

The Hon. Minister of Railways, Parliamentary Buildings, Wellington.

SIR,—

In pursuance of the order of reference bearing date the 13th July, 1925, whereby a Board of Inquiry, consisting of John Brown (Chairman), Harry Louis Percy Smith, John Edward Perry, and Seth Schofield, was appointed and authorized to inquire into and report to you regarding the conditions of work of shunters in the Government Railways Department as affecting the hazard involved in the performance of their duties, and the subsequent directions that the Board conduct a special public inquiry into the work and conditions of shunters at Palmerston North, and investigate the circumstances surrounding the death of the late Shunter Carmichael, the Board has concluded its investigations into these matters at Palmerston North, and has the honour to report as follows:—

The Board commenced sitting at Palmerston North on the 19th August, 1925, and continued sitting daily until the 21st August, 1925, when the Board adjourned to enable Mr. M. J. Mack (advocate for the men concerned and general secretary of the Amalgamated Society of Railway Servants) to proceed to Wellington to attend a deputation from his society to yourself and the Railway Board.

Meantime the Shunting Inquiry Board conducted investigations at other centres in the Wanganui district into shunters' work and conditions, and resumed the public inquiry at Palmerston North on the 2nd September until the 9th September, 1925, when the inquiry was concluded. This inquiry covered a period of ten sitting-days, and forty witnesses were examined. The evidence taken (255 folios) is attached, together with a verbatim report of the concluding addresses by advocates before the Board. An index to witnesses prefaces the evidence.

1. The Length of Shifts which Shunters are required to work.

The shunting-hours of each shift are worked out on the basis of forty-eight hours a week. Practically no overtime is worked, except on No. 5 shift (2.45 p.m. to midnight or finish), and this is only necessary on occasions when the work is heavy. No complaint was made in regard to excessive hours of duty at Palmerston North.

It has been stated in evidence by the Stationmaster and Coaching Foreman Robertson that when the forty-four-hour week was in operation, and the men in the yard were only required to work a seven-hours-twenty-minutes day, the men gave better service, and greater efficiency was obtained.

The length of shift which a shunter should work in a busy yard on any one day will be dealt with in the general report covering investigations throughout the Dominion.

2. The Number of Employees composing Shunting-gangs.

There are five shunting-gangs, each with two shunters and one porter; in addition, there are two main-line shunters who assist in the gangs at times. There is also a porter or a newly appointed shunter attached to the north-end gang during the day for training purposes. Two porters who are engaged in piloting engines to and from the locomotive yard also assist the shunters when not required for pilot duties.

The staffing of the Palmerston North yard is satisfactory so far as the number of employees in each shunting-gang is concerned. The efficiency of the gangs has of late been considerably reduced owing to the frequent transfers of the senior men on promotion, their places being filled mostly by men inexperienced in the shunting-work of a large yard.

In view of the congested state of the yard at Palmerston North during the busy months and the extensive marshalling done it is necessary that the shunting-gangs should be kept up to their full strength, and that the second man in each gang should be a practical shunter.

3. The Time that is allowed for the Work of making up Trains.

The time allowed for the making-up of trains at Palmerston North is dependent principally upon inward trains arriving on time and the marshal order of wagons on the trains. Very few trains arrive at Palmerston North with the wagons in marshal order, or grouped for the various districts. Frequently the trains arrive with wagons in a very mixed order, necessitating considerable shunting in the transference of wagons to outgoing trains. The late arrival consequently causes a late departure to connecting trains. If possible, some arrangement should be made for the grouping of loads for the various districts at Wellington and Paekakariki. Provided this can be done it would considerably ease the position in the Palmerston North yard.

The running of a through goods-train from Wellington to Auckland would also ease the congestion in the yard.

The time between the arrival of No. 620 mixed train ex Wellington, due to arrive at Palmerston North at 3.33 p.m., and the departure of No. 590 mixed train for Wanganui, due to depart at 4.22 p.m., is not sufficient when the yard is congested to permit of the urgent and perishable loads off No. 620 train being marshalled in with the loads off No. 925 ex Woodville, due to arrive at 3.24 p.m., and complete the making-up of No. 590 train in time to avoid a late start to the latter train. The earlier arrival of No. 620 train at Palmerston North would expedite the work and facilitate the despatch of No. 590 train.

4 AND 5. SUPERVISION THAT IS AFFORDED ON SHUNTERS' WORK, AND GENERAL CONTROL OF THE WORK IN SHUNTING-YARDS.

There are three Goods Foremen at Palmerston North. The Senior Goods Foreman commences duty at 8 a.m. and finishes at 5 p.m., the early-shift Goods-yard Foreman at 7.45 a.m. and finishes at 4.45 p.m., the late-shift Goods-yard Foreman at 4.45 p.m. and finishes at 12.45 a.m. or clear. The Coaching Foreman, who is on duty at the station from midnight to 8 a.m., exercises a general supervision over the work in the yard during the time there is no Goods-yard Foreman on duty. Foreman M. Shinkwin is the senior man, and is in charge of the goods-shed and yard, and exercises direct supervision over the work in the goods-shed and general supervision over the work in the shunting-yard while on duty. He is in direct telephone communication with the Stationmaster, Transport Office, and the public, and issues orders direct to the Goods Foreman, who is in control of the shunting-work in the yard. He also makes up the duty-sheet for all members of the Second Division staff in the goods-shed and yard. These duties, with the supervision required in the shed, occupy most of his time and leave very little time for the supervision of the work in the shunting-yard, which is practically controlled by the other two Goods-yard Foremen (Mr. Sweeney and Mr. De Rosa).

Senior Foreman Shinkwin has controlling authority over the Goods-yard Foreman, and can supplement or override orders given by the Goods-yard Foreman to the shunters. This, at times, causes arguments between the foremen concerned. Sometimes when the Goods-yard Foreman is at the other end of the yard the senior foreman gives an order direct to the shunter in charge of the engine to place an urgent wagon of goods for delivery. The shunter may be engaged in making up a train, and has to leave this work to attend to the instructions given by the senior foreman.

The present arrangement was brought into operation by the Stationmaster, Mr. O'Shea, shortly after Mr. Shinkwin (senior foreman) arrived in Palmerston North. The Stationmaster states that better results have been obtained since the Senior Foreman was placed in charge of the shed and yard. This is probably so, but the Board is of opinion that any orders issued by the Senior Foreman should be handed direct to the Yard Foreman, who should personally instruct the shunters.

Foreman J. Sweeney has been in control of the shunting-work at Palmerston North for about seven years, and Foreman J. De Rosa for about one year and eight months. The relations between these two foremen and the shunting staff are not friendly, and have been strained for some considerable time. The Foremen concerned stated in evidence that the feeling against them was brought about by their action in remaining loyal to the Department during the railway strike last year. The trouble, so far as Mr. Sweeney was concerned, existed before the strike of 1924. Mr. De Rosa took up his duties as Goods-yard Foreman, Palmerston North, just prior to the strike.

A number of the charges made against Foreman J. Sweeney were not of a serious nature, and in some cases were not proved. His control of the work and men has not been altogether satisfactory. He has endeavoured to do his best, but failed in administering discipline owing to his lack of tact and sound judgment. His agressive manner has also contributed to a great deal of the friction. These characteristics have caused a feeling of antagonism on the part of the men towards him. Foreman J. Sweeney has thirty-seven years' service, and has served practically the whole of his time in connection with the work of goods-yards, and has given the Department faithful service.

In regard to Foreman J. De Rosa, the specific charge against him was his harassing tactics. The majority of the witnesses in giving evidence stated that Mr. De Rosa was continually following the men around and nagging at them all the time while they were carrying out their work. Foreman De Rosa denies the allegations made against him, but there are undoubtedly grounds to justify the charge that he worried the men in carrying out their work owing to his anxiety to get the work through. Foreman De Rosa is not capable of directing the work in a large shunting-yard without friction. He appears to be temperamentally unfitted to control the men and the work, and his lack of experience of the shunting-work in a big yard before being appointed as Goods Foreman makes it difficult for him to judge whether the men are carrying out their work to the best advantage.

Both Foreman Sweeney and Foreman De Rosa made no complaint that the men under them were not good workers.

In some instances the shunters have taken exception to the changing of their work after it had been mapped out. This has been brought about by the foreman in charge issuing orders for some urgent work to be carried out which was necessary at the time. Some of the shunters viewed the issuing of additional urgent orders as an interference with them in the carrying-out of their ordinary work. The additional orders in the circumstances were necsssary, and the shunters should have carried out the instructions of the foreman without demur.

Although the evidence does not show any organized agitation against the foremen concerned, there are indications of an undercurrent of personal feeling from a few members of the staff against them. The majority of the witnesses, however, showed no personal animus towards the foremen.

All the members of the shunting staff examined stated in evidence that they had no trouble with Senior Foreman M. Shinkwin, and the older members who worked under Foreman W. J. Robertson when he was in charge of the yard, state that no friction arose during that time. Foreman Shinkwin states that, as far as he knows, he is on the best of relationship with the men.

While Foremen Sweeney and De Rosa are in charge of the yard at Palmerston North the troubles are likely to continue, and it is in the best interests of the Department that some reconstruction of the staff at Palmerston North should be made.

Mr. J. J. O'Shea, who has been Stationmaster at Palmerston North for two years and ten months, stated in evidence that he had received only two complaints from the shunters in regard to the actions of the Goods Foremen, and in these two cases the shunters were proved to be in the wrong. He

further states that until the inquest on the late Shunter Carmichael he was under the impression that the work in the yard was going on satisfactorily, and had received no serious complaints from the shunting staff in regard to the manner in which the foremen were carrying out their duties. Mr. O'Shea admits settling several differences between the shunting staff and the foremen. The Board is of opinion that Mr. O'Shea should have been aware of the conditions existing in the yard prior to the inquest on the late Shunter Carmichael..

6. The Lighting of Shunting-yard.

The yard at Palmerston North is lit by gas, and the lights are well maintained. There are dark places in the yard, and additional lights would be a decided improvement and a great help to the shunters.

If the shunting-work is to be carried out in the present yard for some years to come the Board is of opinion that additional lights should be placed as follows: One light just south of Cook Street; one light alongside south ladder; one light alongside north ladder; one light over centre of yard; one light near the north shunting-leg at the south end of roadside siding. Provided the construction of the new shunting-yard is gone on with immediately, one light alongside both the north and south ladders in the present yard should suffice in the meantime. If it is decided to fully light the yard, electric light should be installed.

7. The Lay-out of Yard.

The insufficient siding-accommodation at Palmerston North makes it very difficult to handle the traffic in the busy season, and serious congestion results. In view of the provision of the new shunting-yard the Board cannot recommend any heavy expenditure in altering the present yard.

As additional siding-accommodation is urgently required, the provision of some extra dead-end sidings on the spare land between the present shed road and Church Street would facilitate the handling of the traffic and considerably ease the congestion. The new roads should be taken off the road on the west side of the goods-shed. The additional sidings would enable the cars now stored in No. 3 road to be placed in another road and leave No. 3 road clear for the purpose of bringing in and despatching goods-trains.

Owing to the system of locking certain of the interlocked points in the yard, shunting movements are delayed, due to the shunt having to pull some considerable distance past the points required to allow the signalman to operate them. This is brought about by two lock-bars being operated by one lever. The Board suggests that the matter be referred to the Signal Engineer to see whether any improvement can be effected at reasonable cost.

8. Drainage of Yard.

The drainage of the yard is fair, except that at the north end the water lies around the points. Some better attention is necessary during wet weather to see that the water is let away as soon as possible.

The tracks on which the shunters are continually working should be well ballasted up with limestone so as to give them a dry path underfoot.

9. The Matter of Employees inexperienced in Shunting-work being employed thereon.

Palmerston North is a busy yard, and in view of the heavy marshalling-work and the congested state of the yard, and with the necessity for prompt transference of loads from incoming trains to outgoing trains, it is necessary that the two shunters in the gang should be men with practical shunting experience to fill the positions they hold. Recently two men who had no practical shunting experience in a busy yard were transferred from tablet stations and appointed shunters at Palmerston North. Neither of these men were suitable for filling the position of a shunter as second man in a gang at Palmerston North. Both of these men found difficulty in carrying on the work, and one of them asked to be relieved of the position of shunter and be sent as porter to a tablet station. The other man was transferred to New Plymouth, where the shunting-work was not so heavy.

In the past, however, the shunting-gangs at Palmerston North have been maintained in a state of efficiency, but latterly the frequent changes, owing to the transfer of a number of the men on promotion, and defective colour vision, has caused the efficiency of the gangs to be considerably reduced. We consider that the system in vogue at Palmerston North of having a fourth man in a daylight gang for training purposes is a good one, and, providing that the changes in staff are not too frequent, it will be the means of training a number of young men to take up the position of third man in a gang at short notice, and lay the foundation for building up a good shunting staff at Palmerston North.

The porters who are engaged in piloting engines between the locomotive-yard and station also assist with the shunting operations, and gain knowledge in this way.

The practice at Palmerston North is for the Coaching Foreman, after satisfying himself that the men have a knowledge of the rules and regulations, to select the young, active, and intelligent men for learning shunting duties. Any member who is considered unsuitable for shunting duties is not placed in the yard for training purposes.

The Board is of opinion that the training of staff in shunting duties at Palmerston North is satisfactory, and the facts as elicited by the Board do not bear out the opinion expressed by the Coroner at the inquest on the late Shunter Carmichael. The Coroner, in expressing his views in regard to the lack of training given the men engaged in shunting, was not in possession of the information regarding the system of training the men at Palmerston North.

10. Any other Matters affecting the Work of Shunters.

The points-levers at Palmerston North have not been painted white for some years, and are not readily picked up at night. The Board is of opinion that the best way to keep the levers white is for a member of the local staff to whitewash them at intervals with a preparation similar to that used at locomotive-depots.

In regard to the open spaces between the sleepers at points, section 178 of Maintenance Workmen's Code has not been observed at Palmerston North. As there is difficulty in keeping the ballast clear of the sliding-plates and the connecting-rods the Board would suggest that an experiment be made with old sleepers to fill the spaces.

Where there are double slips on shunting-ladders some provision is necessary to provide the shunter with a better surface to walk on.

A number of the spare hand-lamps available for use by the shunting staff at Palmerston North are old and not in good working-order.

Fatal Accident to Shunter Thomas Carmichael at Palmerston North.

In connection with the fatal accident to Shunter Thomas Carmichael at Palmerston North at about 6.30 a.m. on Monday, the 3rd August, 1925, the Board reports as follows:—

Carmichael, with Roberts as second man and Lepper as third man in his gang, attempted to slip about fourteen wagons up No. 3 road at the south end of yard, and as the rake did not run clear of the turnout the wagons had to be tail-roped clear. Carmichael, instead of fastening the hook of the tail-rope to the side of the wagon in the rake, fastened it by placing the hook of side chain through the eyelet of the tail-rope, and the other end of the tail-rope was similiarly fastened to the side chain of wagon attached to the engine. When the wagons had run far enough to clear the points Carmichael instructed Roberts to give the engine-driver the "Stop" signal. Carmichael, who was following up the tail-rope, which would have dropped clear had it been properly fastened, stepped in between the moving wagons to free the tail-rope from the hook of side chain. Just as he was stepping in between the wagons the slack of the tail-rope caught in the weight of the points-lever, which caused the rope to tighten up suddenly, pinning Carmichael against the step at the end of the wagon. Roberts was some distance back, and Lepper was on the opposite side of wagons attending to the brakes, and neither of these men, nor the men on the engine, saw the accident happen. Carmichael was heard to cry out, "I am done boys," and the fireman, who was first to reach Carmichael, found him lying face downwards across the rope between the headstocks of wagons, with the tail-rope round his hips pinned up against the step of wagon. He was immediately released, and arrangements were made for the attendance of a doctor and his removal to the hospital. Everything was done for the comfort of Carmichael while he was lying in the station-lobby waiting the doctor, who arrived at the station about 6.45 a.m. A taxi was also ready to take him to the hospital. The doctor considered the ambulance was necessary and that Carmichael was quite comfortable in the lobby pending the arrival of the ambulance. The patient's wound was dressed, and he was despatched to the hospital before 7 a.m.

Unfortunately, the railway-stretcher would not fit the ambulance, and the patient had to be transferred to the ambulance-stretcher.

In regard to the statement made at the inquest that some delay occurred in telephoning the doctor, the times stated by Porter Lepper, Doctor Bett, and Mr. Hildreth in evidence show that there was no delay on the part of Coaching Foreman Robertson in advising the doctor.

Guard Doig, who has first-aid knowledge, was in attendance on Carmichael before the doctor arrived, but owing to the serious nature of his injuries did not consider it wise to do anything before the doctor arrived. The necessary first-aid outfit was available in the Coaching Foreman's office.

There was a fire in the station-lobby, and Carmichael was made quite comfortable. The construction of the Stationmaster's and Coaching Foreman's offices did not permit of the stretcher with patient being easily placed therein.

Doctor Bett, who first attended to Carmichael, states that the case appeared to him to be hopeless from the outset, and that the patient was not neglected; also that the best was done for him while he was in the lobby. He further stated that he took full responsibility for leaving Carmichael in the lobby until the arrival of the ambulance, as the patient was quite comfortable.

The evidence shows that the late Shunter Carmichael was of a highly strung disposition, nervous temperament, and of excitable nature, and it would appear that he was temperamentally unsuitable for taking charge of an engine in a busy yard like Palmerston North. He was a good worker, but over-anxious in carrying out his duties, which trait caused him to make mistakes. He had over two and a half years' shunting experience, and had been in charge of an engine in the Palmerston North yard for three weeks prior to the accident, and consequently he would be familiar with the proper method of using a tail-rope. No one could advance any reason why he should fix the tail-rope in the manner described. The Board is of the opinion that Carmichael fixed the tail-rope as he did owing to his anxiety to avoid any delay which may have occurred had the hook of the tail-rope slipped from the wagon, which it sometimes does when fixed in the correct way.

Mr. T. H. Hildreth, Palmerston North, who was a personal friend of the late Shunter Carmichael, and had known him for about fourteen years, was at the station on the morning of the accident and accompanied Carmichael to the Hospital. There was also a Hospital attendant in the ambulance. On the way to the Hospital Carmichael, who was quite conscious, asked Mr. Hildreth to break the news regarding the accident to his wife, who was always anxious while he was at work, owing to the reports that he had given her from time to time about being pushed by the "heads."

Mr. Hildreth states in evidence that Carmichael was of a nervous temperament, highly strung, and objected to any arguments and unpleasantness; also that he was liable to get agitated and lose his head for the time being.

Several witnesses stated that Foreman De Rosa was continually following the late Shunter Carmichael around and hurrying him up for two weeks prior to the accident. It has also been stated in evidence that the harassing of Carmichael by Foreman De Rosa directly or indirectly contributed to the cause of the accident.

There was no Goods Foreman on duty in the yard between midnight and 7.45 a.m. on the morning of the accident. The acting-foreman, who came on duty at 7.45 a.m. that morning, was Guard Webber, with whom the men say they got on well.

There is no doubt that when Carmichael was working under Foreman De Rosa the system of supervision adopted by the foreman affected Carmichael, causing him to become excited and make mistakes at times; but in view of the fact that Foreman De Rosa was not on duty when the accident occurred, that he had gone off duty thirty-nine hours previous to and did not take up duty until ten hours after the accident, and also considering the nature of the accident, the Board considers that Foreman De Rosa cannot be held responsible in any way for the accident, and that the death of the late Shunter Carmichael was purely accidental and was brought about by his over-anxiousness to get through the work.

In connection with the recent fatalities at New Plymouth and Palmerston North, it was necessary to remove the patients from the railway-stretchers to the ambulance-stretchers before the injured men could be sent to the Hospital. It is desirable that all railway-stretchers should fit public ambulances, and it is considered that all stretchers, including railway-stretchers, should be standardized. The Health Department may be able to assist in carrying this out.

J. Brown, Chairman,
District Traffic Manager, Wanganui
H. L. P. Smith,
Assistant Engineer, Auckland
J. E. Perry,
Shunter, Dunedin
} Railway Shunting Inquiry Board.

Minority Report.

I agree with the above report except that portion on page 120, paragraph 9, which reads, "Although the evidence does not show any organized agitation against the foremen concerned, there are indications of an undercurrent of personal feeling from a few members of the staff against them."

I consider there is no evidence to show that there is an undercurrent of feeling from any of the members of the staff against the foremen.

In my opinion, the only reconstruction of the staff necessary at Palmerston North—*vide* the majority report, page 120, paragraph 11—is the removal of Foremen Sweeney and De Rosa from Palmerston North.

S. Schofield, Shunter, Christchurch,
Member, Railway Shunting Inquiry Board.

EVIDENCE TAKEN AT SPECIAL PUBLIC INQUIRY INTO THE WORK AND CONDITIONS OF SHUNTERS AT PALMERSTON NORTH, TOGETHER WITH PUBLIC INVESTIGATION INTO VARIOUS ALLEGATIONS MADE AGAINST OFFICERS AT PALMERSTON NORTH; ALSO INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE DEATH OF THE LATE SHUNTER CARMICHAEL.

Personnel of Board.—J. Brown, Esq. (Chairman); H. L. P. Smith, Esq.; S. Schofield, Esq.; J. E. Perry, Esq.

Advocate for the Officers concerned.—Mr. W. J. Robertson (first day); Mr. J. Carnachan (second and successive days).

Advocate for the Men concerned.—Mr. M. J. Mack (General Secretary A.S.R.S.).

Secretary-Reporter.—Mr. A. Sutherland.

Proceedings open to the Press.

INDEX TO WITNESSES.

Date.	Name.	Designation.	Page.
19/8/1925	Roberts, W. W.	Shunter	125
	Firth, M. J.	Engine-driver	126
	Lepper, E. A. H.	Porter	127
	Bett, Dr. D. H.	Medical practitioner	129
	White, W. V.	Fireman	130
	Tapp, P. E.	Shunter	130
	O'Dea, E.	Shunter	132
20/8/1925	Hunt, R. C. B.	Porter	132
	Cole, J.	Ex-shunter	133
	Worthington, T. E.	Shunter and Acting-storeman	134
	Hartland, P. H.	Assistant District Traffic Manager, Wellington	136
	Biggs, R. W. G. S.	Shunter	136
	Goudie, A.	Guard	137
	Aldrich, W. W.	Guard	137
	Doig, J.	Guard	138
	McLaren, J.	Signalman	139
	Pepperill, C. E.	Shunter	139
21/8/1925	Skinner, C. J. D.	Attendance officer, Wanganui Education Board	141
	Cunneen, J. J.	Shunter	142
	Atkinson, H. P.	Shunter	144
2/9/1925	Shirley, H. H. O.	Shunter	145
3/9/1925	Gillespie, W. J.	Shunter (Wellington)	147
	Lucas, J. W.	Signalman	148
	Lewin, F. J.	Engine-driver	149
	Voltz, L. A.	Traffic Inspector (Wellington)	150
	Boyd, R. J.	Engine-driver	152
	Robertson, W. J.	Coaching Foreman	154
4/9/1925	Sweeney, J.	Yard Foreman	155
5/9/1925	De Rosa, J.	Yard Foreman	165
7/9/1925	Shinkwin, M.	Senior Goods Foreman	169
	Cavanagh, M.	Coaching Foreman	170
	Wylie, A.	Timber-checker	170
	Quirke, T.	Detective-Sergeant	171
	Newton, G.	Signalman	171
	O'Shea, J. J.	Stationmaster	172
8/9/1925	O'Shea, J. J.	Stationmaster	173
9/9/1925	Hildreth, F. H.	Motor Salesman	181
	Olsen, W. J.	Fireman and acting engine-driver	182
	Eckersley, G.	Train Examiner	182
	Gordon, W. A.	Inspector Permanent-way	182
	O'Donnell, W.	Train Examiner	183
	Lucas, J. W. (recalled)	Signalman	183
	Mack. M. J. (*re* point raised in Mr. O'Shea's evidence)	Advocate for men concerned	183

CONCLUDING ADDRESSES.

Mr. J. Carnachan	Representing officers concerned	183
Mr. M. J. Mack	Representing men concerned	186

FIRST DAY.—PALMERSTON NORTH.—19TH AUGUST, 1925.

The following evidence was taken on behalf of the men concerned:—

WATKIN WILLIAM ROBERTS sworn saith.

To Mr. Mack: I joined the service nine years ago last March. I am going into my tenth year of service. I was twenty-seven years of age when I joined the Railway service. When I first joined I started in the Auckland Goods-shed as a porter, and I was about a month in the goods-shed, and then I went on to the Auckland platform, where I was about twelve months. From there I went to Helensville, and I was stationed there just under two years, still doing porter's duty in the shed and relieving the Wellsford porter two days a week. From Helensville I went to Manurewa, where I was stationed as tablet porter for little over five years. I then went to Portland, where I was stationed about sixteen months. From Portland I was transferred to Palmerston North as shunter. Prior to coming to Palmerston North I had no experience in the yard as shunter, but I had a little experience on trains. From the time I joined the service until coming to Palmerston North I was employed for about nine or ten years doing porter's and tablet porter's work. On arrival at Palmerston North I was put on as spare man at the north end of yard for one week, and I think the next week I was assisting on the early shunt to Terrace End, and then when I returned I went as spare man, south end. I was employed there for a week. I was then employed on coupling-up duties—that is, during the third week at Palmerston North. Following that I was put on as third man in a shunting-gang. I was working at the south end of the yard on the morning of the 3rd August when Shunter Carmichael was killed. On that date I was working as second man. On the morning of the accident to Carmichael, immediately prior to the accident, the engine was taken in the car-and-wagon siding, and a number of wagons were lifted, probably thirteen or fourteen. We pulled out of this siding down to the south end and slipped the wagons to No. 3 road running north. In the operation of slipping Carmichael cut the wagons off from the engine behind one, leaving one wagon attached to the engine, and I operated the points myself. The third man was further north waiting to catch the rake. The wagons did not run clear—they stopped foul when being slipped. Carmichael then went and got a tail-rope. I did not see him adjust the tail-rope. I was then towards the south end. I did not see how the tail-rope was adjusted after the accident. Carmichael adjusted the tail-rope. I was then behind Carmichael, and I cannot say how he had the tail-rope on the wagon. He took the tail-rope from the engine round the corner of the wagon and on to the near side chain on the wagon behind several other wagons. I cannot say how he put the tail-rope on to the side chain of the wagon. I gave the signal to the engine to start on instructions from Carmichael. I saw the vehicles being moved forward up No. 3 road. I gave the signal for the engine to stop on instructions from Carmichael. Carmichael was following up, and he gave directions as to signalling, and when the engine stopped he went in to release the tail-rope. I did not see what happened to Carmichael. It was very dark that morning. The first thing I heard after that was a groan from Carmichael, and saw the fireman get down. I immediately went to the scene of the accident. The fireman had Carmichael in his arms on the ground. I could see some blood on the step of the R wagon, which was the wagon the tail-rope was fixed to. I did not notice the position of the tail-rope at the time. There was a lot of blood on Carmichael's thigh, and I thought the best thing would be to get a doctor. I ran up to the Coaching Foreman's office, and I asked Mr. Robertson, the Coaching Foreman, to ring for the doctor and the ambulance. He said, "Is he badly hurt," and I said, "I think, at least, his leg is broken." He said, "Do you think I should go and see him." I said, "I don't think there is much use going and seeing him. You can't see anything more than I have." He then asked if I could send him home in a taxi. I told him I thought that it was a doctor and ambulance that was required. I repeated it. The foreman walked along to the Parcels Office telephone then and rang up for a doctor. It was five minutes from the time I told the foreman until the time the telephone-bell rang for the doctor. I put the watch on him. I then went out with Mr. Robertson, and he told me to go and see about bringing Carmichael inside, but when I got down the platform the men were actually bringing him in on the stretcher. The doctor got to the entrance of the station about 6.45 a.m. That would be about twenty-five minutes from the time of the accident until the doctor arrived—that is including the time I went to Mr. Robertson to get him to ring up. I cannot say whether anything was done for the comfort of Carmichael while waiting for the doctor. I did not see him put in the ambulance. That is all I know about the accident. When I came to Palmerston to take up shunting duties I was about 36½ years of age. Nobody instructed me as to the performance of my duties, and I was not told how to perform my work. I was put in the yard and had to find out myself. Nobody instructed me how to adjust a tail-rope. I had never seen one used prior to this occasion. It might have been adjusted rightly or wrongly as far as I was concerned. I did not find the conditions in the shunting-yard congenial so far as the men were concerned. I always got on well with Carmichael as third man in the shunting-gang. He always tried to do his work conscientiously. He was always endeavouring to do his best. Whenever the foremen and Carmichael met generally loud words and high words and nagging-words were used. No bad language was used. During the time I was with Carmichael I had dealings with only one foreman, Mr. De Rosa. I am sure that this nagging upset Carmichael. On the way home at night with me he (Carmichael) was always discussing the job and the attitude of the foreman towards him. I would say that Carmichael was of a nervous temperament, highly strung—above the average. During the time I was in the yard the drainage of the yard was not all that might have been desired. There was not a plentiful supply of good hand-lamps available. I think that the lighting of the yard could have been considerably improved. As a result of my experience in the Palmerston North yard I have asked to be reduced. I would prefer to go back to the position of tablet porter rather than take the risk of the duties and conditions in Palmerston North yard.

To Mr. Robertson: I reported to Mr. Shinkwin on the day I arrived in Palmerston North. He asked me if I had done any shunting before, and I replied that I had done none. I was at a tablet station altogether about six years and ten months. I did not say and imply that I did not know the difference between a pair of facing and trailing points. The guards did the shunting at the stations where I was stationed as tablet porter. The guard does the shunting at the request of the tablet porter, but I say the guard is responsible for the actual carrying-out of the shunting. The tablet porter assists. I entirely disagree with the statement that I should have had a good knowledge of shunting while stationed at tablet stations where shunting-work was performed. Mr. Shinkwin placed me fourth and third man in a shunting-gang, and you placed me second man in the gang so as to enable me to qualify. I know Shunters Williams and O'Neill, who came to Palmerston after me and who have done good work. They have worked under the same conditions as myself. I think O'Neill was here in Palmerston previously as porter. I say that it was the attitude of the foremen in addition to the conditions of work which forced me to relinquish my work as shunter and ask for reduction. When we were on the night shift there was nobody on. Carmichael was left to himself. There was nobody in charge. There was no complaints then. Mr. Sweeney spoke to me at the time. On one occasion when I was uncoupling a wagon that was being kicked off he told me not to do it and to be more careful and to look after myself. Mr. De Rosa, another foreman, did not speak to me as regards my work. My evidence is heresay and observation, as applied to the previous inquiry in connection with this matter. I do not think Lepper stated that the accident happened at 6.30 a.m. I stated in evidence that I was shunting slipping wagons about 6.20 a.m. I made no report to the police in connection with this matter. I stated previously that the shunt started at 6.20 a.m. I think it was 6.20 a.m. that the accident happened. It would be necessary after the wagons fouled to go and get the tail-rope. This would at least take five minutes.

To the Board: I maintain that I observed the time from my watch. I put my watch on the foreman when ringing up for doctor. I am absolutely positive that the time I came into the office was 6.25 a.m. I did not see brandy supplied to Carmichael. I did not see a coat put over Carmichael after the accident. I said that I was not given any instructions as to my duties. I was placed under senior men when I came to Palmerston North. I was placed in a junior position for the senior men to teach me. These men did give me instruction, and anything that I know now I have learnt from them.

To Mr. Mack: When I say I gave evidence of a hearsay nature I mean that which I saw and heard myself. I always endeavoured to get out of the way when I heard anything going on. My interpretation of "hearsay" is that which I have heard.

To Mr. Robertson: Carmichael gave his orders in a loud voice. If he spoke to the foremen he would speak in the same tone of voice. On one occasion, on the Friday previous to the accident, Mr. De Rosa and Mr. Shinkwin were standing outside the entrance to the shed, and the same thing happened about which I am complaining. I caught one sentence of the conversation. That was from Mr. De Rosa, and he said, "Don't you give me any of your cheek." That was going on from the time I came into the yard. That was on the Friday previous to the accident.

To the Board: There was no foreman in charge of the gang when the accident happened. Portland, where I was stationed once, is a fairly busy station. I was at tablet stations for about five or six years. At Portland a wagon could not be kicked or slipped owing to the nature of the yard. I say that what I pick up at a tablet station is absolutely useless in a yard like Palmerston North. I stood down two years ago for promotion. If I was passed over for promotion I would certainly expect a trial and an opportunity of showing my worth. It all depends on the individual in taking up shunting duties—that is, I think that even though I took up shunting duties late in life I think I would do well if I were properly instructed. I maintain the Department could give a man a good opportunity of shunting duties in the Palmerston North yard. I consider that if it is a question of life the Department do not spare any expense. I make that the basis of my argument. To start my training I should have had about a fortnight to learn what the points were and learn the lay-out of the yard. On the Sunday morning when the yard is not used a man with the experience and capabilities of Mr. Webber, who knows the yard from A to Z, should take junior members round the yard and give instructions. He should give instruction in buffer to buffer splitting, tail-roping, and anything that is likely to crop up, and before a member is placed in a position of responsibility, such as second man, the senior officer instructing should certify that the junior is a fit and proper man to undertake the duties allotted in the shunting-yard. If a junior member could not manage the work, then he would then be put out, and he would not be able to say that he did not have a fair chance to learn the work.

To the Board: I do not know who disengaged the tail-rope after the accident to Carmichael.

MALCOLM JOSEPH FIRTH sworn saith.

To Mr. Mack: I have been stationed in Palmerston North five years. During that time I have been connected with the shunting-engines in the capacity both of fireman and driver. I was driving the engine on the morning of the 3rd August last when Shunter Carmichael was killed. The engine was taken into the Car and Wagon Inspector's siding by Carmichael, drew out a number of wagons, backed down to the south end of the yard, and slipped them in No. 3 road. The wagons stopped foul after being slipped. Carmichael then got a tail-rope. I was on the engine all the time, and I did not see at the time how Carmichael hooked the tail-rope on to the engine or wagon. After the wagons had been shifted far enough with the tail-rope Shunter Roberts gave me the signal to stop. It was after that I learned that an accident happened to Carmichael. I heard him call out. I was on the far side of the engine to Carmichael. When I stopped and secured my engine I went to the assistance of

Carmichael. My fireman was there already. I think there was a truck behind the engine. The tail-rope was, I think, fixed on to the side chain of the truck. The hook of the truck was hooked into the eye of the tail-rope, and the other end of the tail-rope was secured in the same manner—that is, the hook of the truck was hooked into the eye of the tail-rope. When I came to the scene of the accident, Carmichael was clear of the tail-rope. I think the fireman released him. The accident was caused by the slack of the rope catching in the points-lever and jamming deceased up against the end of the wagon. I assisted to carry deceased over to the station, and I then went back to the engine. That was after the doctor arrived. I would say that it was a good six or seven minutes after deceased was placed in the lobby before the doctor arrived. I say that deceased was absolutely conscientious in the carrying-out of his work. He was a fine fellow to get on with. He was very excitable. When the foreman was present deceased got more excited than usual. It appeared to me that the foremen worried him a lot. I had good opportunity of observing what was happening. I noticed Foreman De Rosa harassing deceased the week before. In the three last days, Thursday, Friday, and Saturday, I was working with deceased. On the Thursday and Friday Foreman De Rosa was harassing deceased so much that I told him that if he (the foreman) did not leave him alone he would get killed. Deceased told me that he could get along much better if the foreman would leave him alone and give him his own way. In my opinion Carmichael did better when there was no foreman about. I think that the harassing of deceased caused him to take undue risks in connection with the shunting. In my opinion I think the harassing of deceased and the consequent anxiety contributed to the accident and made the deceased do things that he would not otherwise have done. I suggested to Porter Lepper that some one should go with Carmichael in the ambulance to the Hospital. Mr. Robertson, the Coaching Foreman, said that there was no need for any one to go with him, as there was none of our property going with him. He would have about two miles to go to the Hospital. The doctor did not go with him. There were ambulance attendants. I was away when deceased was placed in the ambulance, and I cannot say whether the doctor was present when deceased was placed in the ambulance. It is generally recognized that Palmerston North is a very congested yard, and that at times it is difficult to carry on shunting-work satisfactorily. It frequently happens that during shunting operations some twenty or thirty wagons are attached to an engine at one time. There is more slack to take up in such cases, and if there were greater facilities at Palmerston North such long cuts would not be necessary. I have shunted at night in Palmerston North yard. I think the lighting in the yard is very poor. I think that more lighting would be an improvement and would assist the shunters.

To Mr. Robertson: At the inquest I said that deceased was not a capable shunter. It would surprise me to learn that deceased's work as a shunter gave his foremen every satisfaction. I cannot say where Carmichael got the tail-rope from. I went back to my engine after Carmichael was placed in the lobby of the station. I suggested to Porter Lepper that some one should go in the ambulance with Carmichael in your hearing. I am aware that a hospital attendant was also present with the ambulance. I have not complained to the foremen about the bad lighting of the yard.

To Mr. Mack: I am aware that there was a hospital attendant with the ambulance in addition to the driver.

To the Board: There was no foreman on duty on the morning of the accident. When I said that the harassing indirectly contributed to the accident I meant that if the work got behind the foreman would take it up with Carmichael when he came on duty. As far as I know, the tail-roping was fixed in the correct manner, and had the points-lever not been in the road I would say that the accident may not have happened. The rope tightened up when caught on the points-lever.

To Mr. Mack: I have never been a shunter. I have never adjusted a tail-rope. I do not know the practice other than observing the shunters. I presume that Carmichael went in to release the hook. He was on the other side.

To Mr. Robertson: I did not actually see Carmichael at all until after the accident.

To the Board: I have not had any experience in other large shunting-yards with the exception of a few days. I would say that it was about twenty minutes after the accident happened before the doctor arrived.

To Mr. Mack: Had the hook of the tail-rope been hooked to the brace on the side of the wagon it would have automatically fallen clear when the wagon ran by and the rope caught on the points.

ERNEST ARTHUR HORACE LEPPER sworn saith.

To Mr. Mack: I am a porter employed in the shunting-yard at Palmerston North. I have a little over five years' service. I have worked all this time at Palmerston North. I have been attached to the shunting-gang at Palmerston North for about five years. I did a few months porter's duties when first coming to Palmerston North, and then I went into the yard. I have never been in charge of an engine in a shunting-yard. I have been employed as second and third man. I remember the morning of the 3rd August last when Shunter Carmichael was killed. I was the third man in that gang. Carmichael was in charge, and Roberts was the second man. I had more experience in shunting than either of the other two men. The statements made by other witnesses as to the movements in the yard on that morning are correct. When the wagons stopped foul Carmichael procured a tail-rope out of a van some distance away. It would be 200 yards away. I did not see him actually fix the rope, but I saw him fix the rope on the wagon attached to the engine. He put the hook of the side chain through the eye of the rope. When he fixed the rope to the engine I went round to fix the brake. After the accident I saw how the rope was fixed on the wagon. The hook of the side chain was through the eye of the tail-rope, so that both ends of the tail-rope were secured in the same way. I heard Carmichael sing out to Roberts to give the signal to go ahead, and when the strain came on the rope I lifted the

brake. I did not see Carmichael then. The first I knew of the accident was when Carmichael called out. I immediately applied a couple of brakes and then went round. I went round and saw the fireman holding him up. The deceased had been hurt by the slack of rope catching in the points and pressing him against the wagon-step. Four other men took deceased over to the station, and I walked beside the stretcher. The newspaper report of the inquest stated that I said he was on the inside of the tail-rope, but I made it clear that he was on the outside. There was a very serious delay from the time of the accident until the arrival of the doctor and ambulance. After the doctor arrived they sent for the ambulance, and when it arrived they lifted him and put him in the ambulance on the top slide over the top of a hospital stretcher, and after some effort it was found that the railway stretcher would not lay on the top of the hospital stretcher, and they lifted him out and put the hospital stretcher out, and lifted him up and tried to make the railway stretcher fit the slide of the ambulance, and that would not do, as the railway stretcher was too narrow. They then lifted him out the second time and transferred the deceased from the railway stretcher to the ambulance stretcher, and a third attempt was made to place him in the ambulance. That is where I think the delay occurred. I think that if foresight had been used in making the railway stretcher to suit the ambulance considerable delay would have been saved. It seemed a long time since the arrival of the doctor after the accident. The accident occurred at 6.30 a.m. After deceased was taken to the Hospital I went back to my work, and I took charge of the engine for a few minutes, and the main-line shunter came down to give me a hand, and he took charge of the engine and the work continued. I knew Carmichael very well. He was a very good mate, easy to get along with. He was not cantankerous. He was quite a good living man. I think that he was too conscientious and over-anxious to do his work satisfactorily. The foremen worried him very much. Foreman De Rosa worried him more than any other foreman. I think that the worrying of the foremen caused him to take very undue risks. I saw from my own observation that Foreman De Rosa harassed him. I had been working with Carmichael for two or three weeks. Foreman De Rosa unduly harassed Carmichael during the week prior to the accident. Carmichael was very nervous when he came on duty on Monday morning. I think that the worrying of Foreman De Rosa directly and indirectly contributed to the cause of the accident. The deceased would have got along much better had he been left alone. I have worked under other foremen at Palmerston North. I have worked under Foreman Sweeney, Foreman Webber, and Foreman Robertson. The shunters get on very well with Foreman Web ber. Shunters get along fairly with Mr. Robertson. Mr. Sweeney actively interferes with shunting operations, and Mr. De Rosa also actively interferes in some ways with shunting operations. He tells men to drop what they are doing and go on with something else, and that upsets the men. They call the work they put the men on to urgent work, but we find by experience that much of it could have been held over. I have never received any instructions on coming into the yard as to the method of using a tail-rope. I was just told to go into the yard. I had to pick up what I know of my own volition. From the 27th July until the 1st August Mr. De Rosa paid particular attention to Carmichael and followed him about during the performance of the work. It is a fact that Carmichael got so worried that he was cutting the wagons off in the wrong places. For two weeks prior to the accident Carmichael was being continually harassed by Mr. De Rosa. There is not a good and sufficient supply of hand-lamps at Palmerston North. The drainage of the yard is very bad, and if we get a heavy shower we are over the boot-tops, and it sometimes takes a week before the water is away. So far as that portion of the yard around the points is concerned this is true literally, but it is not quite so bad in other portions of the yard. I can remember the points-levers being painted once since I have been here—that was about two or three years ago. It is time they were painted white again. I think the provision of more lights in the yard would materially help the work of the shunters, and would eliminate the risk of accident to some extent. I discovered that the side-chain hook was put through the eye of the tail-rope, and had I seen the way it was put on at the time I would have had it altered. I consider that the tail-rope should be affixed to the stanchion or the bracket under the wagon. I would have fixed it this way and stood clear. Had the tail-rope been fixed in this way on the date of the accident it would have automatically fallen clear and no one would have been injured.

To Mr. Robertson: I stated that the accident took place at between 6.20 and 6.30 a.m. The newspaper report may have differed. Shunter Roberts told me that it took five minutes to ring up for the doctor. I was not there. After we slipped the wagons into No. 3 loop Carmichael had to go to a van some 200 yards away to get the rope, and this would take him a few minutes. I stated that Carmichael was not capable. Carmichael may have given his foreman every satisfaction in his work. Carmichael was all right when there was no foreman about. I made a statement that Carmichael was on the wrong side of the tail-rope, but I found out afterwards that this was not correct. I also stated that the tail-rope is in general use. One time it was used three days running. When you get a man who is inexperienced and bustled he would not be able to do his work properly. Carmichael was not bustled on this occasion, but he was suffering from the effect of such bustling. I have stated that before the war a shunter was supposed to have three years' experience before he could be classed as a qualified shunter. I also said that there was no one to teach me. I do not resent the foremen speaking to me, but it is the way that they speak that I resent. On one occasion when Mr. De Rosa told me to bleed some wagons and I told him that I knew my business and did not require to be told, I said at the time that if Mr. De Rosa was any sort of a man he would have done the work himself. I was up at the points, and I did not go down the rake of wagons. If I had done so and noticed the wagons I would have bled them off. I did not refuse to take an engine out for No. 663, and did not say that "He should knock his b——— head off with his hand-lamp." The shunter in charge did not persuade me to do it. I did get the engine. It would surprise me to know that Mr. Sweeney was a shunter all his life, and that he had risen from first-grade shunter to Goods Foreman.

If Mr. De Rosa has had considerable experience shunting and on night goods-trains I say that he does not show that ability now. When I said that the foremen at Palmerston North were incompetent and had no experience in shunting I was judging them by their actions in the yard. I would be willing to attend shunting classes. I remember Signal Instructor Welsh coming round to Palmerston North and giving a lecture on shunting, but I did not attend that lecture, as I was on late shift. I am supplied with books of instructions, and I failed in examination of them last year. I passed the three previous years. I do not know that I am solely responsible in failing in the examination. When I said that Foreman De Rosa was harassing the deceased, Carmichael, I mean that he was following him up and "barking" at him. I would not consider an instruction to a shunter in charge harassing a man. If a shunter were marshalling No. 920 and an urgent wagon were required to be shunted and an nstruction was given that the work being performed was to be dropped to deal with this urgent wagon I would not say this was harassing. Perhaps the men may take exception to being interrupted with the ordinary routine work. When I said that Carmichael was nervy on the Monday morning prior to the accident I judged that by the fact that when spoken to Carmichael jumped. If the repair-siding was not shunted by 8 a.m. the foreman would come down and want to know what the shunters had been doing. I am not aware whether or not the deceased complained about the conditions of work in the yard. The deceased was not actually frightened by the foreman, who was not on duty, but it was the knowledge that he would be taken to task if the work was not completed. I still adhere to the previous statement that the harassing by Foreman De Rosa directly or indirectly contributed to the accident which led to the death of Shunter Carmichael. I have now really qualified in the rules and regulations. I would say that Regulation 58, clause 1, implies that a member must have served three years before he is a qualified shunter. It also implies that a man is not suitable for the position of guard until he has had three years' experience as a shunter and classified as such. In connection with the incident about bleeding-off trucks, Mr. De Rosa was standing by the trucks himself, and as the operation only necessitated the pulling of a string I thought that he might have done the work himself. When I stated that Carmichael was incapable I meant that he was incapable due to the excitement consequent upon the harassing by the foreman. That is the reason why I have made the statement.

To Mr. Robertson: I deny that two foremen came to the shunters' hut in connection with the incident referred to *re* the refusal to take out an engine.

To the Board: What I mean when I say that Mr. De Rosa follows the men round and "barks" at them, is that he is speeding them up and telling them that if they do not hurry up they will be late. I have seen Shunter Carmichael take undue risks in that he has lifted the hook at the wrong place, run down six or seven wagons and lift the right one, and I have repeatedly seen the driver have to switch on his brakes.

To Mr. Mack: That was when the foremen were present.

To the Board: The driver and I removed the tail-rope from the wagon. It was jammed and difficult to get out. If the deceased had put the eye of the tail-rope on to the brace at the side of the wagon I do not think the accident would have happened. The accident really happened through his not doing this. On the occasion when I observed the deceased lifting the wrong hooks, and then go down some wagons there would be considerable risk in that when he got to the right wagons they would have gained a good speed before he had lifted the right hooks.

DOUGLAS HUME BETT sworn saith.

To Mr. Robertson: I am a medical practitioner at Palmerston North. I remember the date of the 3rd August when Foreman Robertson rang up at about 6.35 a.m. asking me to attend at the station. I reached the station within a quarter of an hour afterwards. On reaching the station I found the patient in the lobby of the station covered by some coats and suffering from a severe shock. I examined him to see if he was bleeding, which at the time was not the case to any extent. His wound was dressed. I inquired whether the ambulance had been sent for, and was informed that the patient was about to be sent up to the Hospital in a taxi. As I did not consider this suitable I had the ambulance called by telephone, and after a slight delay it arrived. I remained with the patient until the ambulance arrived. I gave the patient a hypodermic to lessen the shock. The patient was quite comfortable, and I considered that it would be wise to leave him where he was until the ambulance arrived. I saw the Coroner's finding as reported by the Press, but I cannot remember exactly the extent of the finding. I cannot say whether I could agree with the Coroner's finding or not, but I certainly could not agree that the man had been neglected—that is, at the time I arrived on the scene—and I am perfectly ready to take the responsibility of having the man kept where he was under the circumstances. I consider that the best was done for the short time he was left in the station-lobby.

To Mr. Mack: It is generally accepted that railway accidents are apt to be serious—that is, the causes of railway accidents are apt to make them serious. The shock in a serious accident would be severe. Hot-water bottles and rugs and coverings would in some cases lessen the shock and alleviate the suffering. An attempt was made to place the railway stretcher in the ambulance but even after the hospital stretcher was removed it was found that the railway stretcher would not go in. I think all stretchers should be standardized so that any stretcher could go into any ambulance, and I agree that railway stretchers should be standardized to fit in with this arrangement.

To the Board: All stretchers are not standardized. Generally the stretchers are made to suit the ambulance built, and a stretcher in a railway van may not, say, fit in a Wanganui Hospital ambulance.

To Mr. Mack: Failing the ability to standardize stretchers throughout New Zealand, a local standardization would be of great benefit and assistance.

To the Board: The case appeared to me hopeless from the outset.

WILLIAM VICTOR WHITE sworn saith.

To Mr. Mack: I am a fireman employed at Palmerston North. I have been at Palmerston North for about twelve months. I have been here before and know Palmerston North yard fairly well. I was firing the engine for Engine-driver Firth on the day the late Shunter Carmichael was fatally injured. The movements of shunting as enumerated by other witnesses are quite correct—that is, on the date in question—and it is correct that the wagons stopped foul. Shunter Carmichael was in charge as first man in the gang. I do not know whether Carmichael got a tail-rope. I did not see anything while the engine was standing. I did not see or know that Carmichael adjusted the tail-rope. The signal was given on the other side of the engine from me. The tail-rope would be on my side of the engine. The tender of the engine intervened between me and Carmichael, and I did not see anything of Carmichael. After the engine stopped I heard Carmichael call out. I immediately jumped down and went to him. When I got to deceased I found him lying face down between the headstocks of the two wagons, and the rope was twisted round his hips, and he was in an inclined position forward. I placed my hands round his armpits and lifted him off what proved to be the step of the wagon. Carmichael kept on repeating that he was done. I assisted the deceased to the ground, and held his head, and asked somebody whether the doctor had been sent for, and they said, "Yes." I had no idea how long the deceased lay on the ground before a stretcher was brought. It seemed like three or four hours. I waited with him and helped to carry him to the station, and was with him until he was placed in the ambulance, and then I went back to my work. I have been firing for some time. I think that the yard could be considerably improved if there were more lights. I think that the drainage could also be improved. I did not know Carmichael very well. He was always courteous to me. He appeared to be a very conscientious man doing his best to get along with the work.

To Mr. Robertson: I have not reported to my foreman regarding the bad lighting in the yard.

PERCY EDWARD TAPP sworn saith.

To Mr. Mack: I am a shunter employed at Palmerston North. I have been stationed here practically six and a half years. I have been practically head shunter since I came to Palmerston North, and have been out as a guard. Previously I was head shunter, and then I declined promotion to the position of guard, and now I am what is termed main-line shunter. I remember the accident which occurred to the late Shunter Carmichael. I would describe him as a conscientious man, a man with a nervous disposition, and a man who would be easily excited. It has come under my notice that when the foreman was about he would make wrong movements, and deceased told me once or twice that things were not quite as nice as they should be. He said, "I don't know what it is—I suppose I am a bit of a fool—but I don't know why it is that when the foremen are around I cannot stand them talking to me while I am working" I remember an occasion when Mr. De Rosa came to the south end of yard and was watching Mr. Carmichael performing his duties. His observations of Mr. Carmichael caused Mr. De Rosa to say to me, "He will be killed for sure before long." The trucks were not uncoupled, and Carmichael was uncoupling them while they were in motion, complaining and saying, "Why were they not done before?" He was diving in and breaking them while the trucks were in motion, and this caused the foreman, De Rosa, to say that he would be killed before long. The foreman, De Rosa, saw him in there breaking the wagons. The foreman told him to keep cool. He said, "Keep cool; keep quiet, Tom." Foreman De Rosa told me to keep in close touch with south end of yard in the capacity of acting-foreman. He said he would have to go back to the north end of yard, as Shunter Carmichael was in a hell of a mess, and was behind in his work, and his trains would be late, and he could not leave him for one minute. I have been in trouble with the foremen myself. Previously Mr. Sweeney, one of the foremen, and I have had differences, and latterly Foreman De Rosa. I stood on my dignity against the action he showed me—that is, his attitude towards me was displeasing. Eventually he became overbearing, and I told him what I thought of him. The result of that conversation was that I was asked to repeat my statements if I was a man. I had the courage of my convictions, and I did so before another witness on Mr. De Rosa's behalf—namely, Foreman Cavanagh. The result was that I was reported and asked to report on my insubordinate action. I did so lengthily in my defence, explaining the whole position and the cause leading to it. I was brought before the Station-master for a further reference, and after a fairly lengthy conversation the matter stayed there. I have heard nothing further, and about six weeks have elapsed since then. I believe Foreman Shinkwin is the senior foreman. He makes out the duty-sheets in the yard. He would be the senior foreman in the yard. He makes out the duty-sheets for all shunters and shunters work under the direct control of Mr. Sweeney and Mr. De Rosa. The senior foreman, Mr. Shinkwin, seems to give rulings when the foremen in direct control differ. The senior foreman, Mr. Shinkwin, does not come out and interfere with the duties of the foreman. Occasionally the foremen quarrel between themselves. From my observations I would regard it as a fairly serious quarrel. I do not regard it as a good example to the men. I would say that the points have not been painted white for at least twelve months. If they were painted white it would make them conspicuous, and this should be done. The draining of the yard is not good. Sometimes the water is over the boot-tops, especially at the points. I consider the lighting is unsatisfactory in the yard. Last evening there was an accident through not being able to see the points that were laying in a wrong position twenty paces away. At the present time we seem all supplied with hand-lamps, but in the event of a man losing his lamp or getting it broken I do not think there would be sufficient to meet these emergencies. The trains are never marshalled on arrival. On trains from north there is not even any grouping—say, with wagons from Palmerston North to Wellington. It would facilitate the work of the shunters if the arrival trains were

reasonably marshalled or grouped. With my experience I say that there is not sufficient room in the yard at busy times to carry out the work properly. I think that it would help if the roads were extended, and if the car and wagon sheds were removed, and the goods-shed removed to face Church Street, and the land now lying idle round the Social Hall were used. The work of the yard is generally congested, and some improvement is necessary in the way of accommodation. I think that if there was better lighting for shunters working at night, a more complete supply of hand-lamps for the shunters, and increased accommodation as set out, it would greatly help the work of the Department and tend to less accidents and better working.

To Mr. Robertson: I say that the deceased would do his work when the foreman was about, but he would not do it so well. I do not think that the deceased would revolt against authority, but he realized that when the foreman was present he was there to pull his (Carmichael's) work to pieces. He would come to that conclusion through the experience that he was having and the conditions that existed at the time. The presence of the foreman would have that effect. When I stated that Mr. De Rosa told me to look after the work of deceased I came to the conclusion that Mr. De Rosa considered he was incompetent, and that I was to guide him. It would not necessarily mean that Mr. De Rosa meant to harass the man. Mr. Sweeney and I have had differences of opinion. That is to be expected in every walk of life. This, of course, reached a climax. I also had a difference with Mr. De Rosa about six weeks ago. I deny that I went to the Stationmaster and asked that the matter be dropped. Mr. O'Shea, the Stationmaster, said to me, "I'll see Mr. De Rosa, anyhow" and I left, and I have heard nothing since. I have a recollection that the Stationmaster once did say something to me regarding suggestions for the improvement of the work, and I believe that it had reference to the accommodation to a back road. For a while the incoming trains were marshalled or grouped fairly well, but it has now dropped back.

To Mr. Mack: I have worked under other foremen besides Mr. De Rosa and Mr. Sweeney I have not had any trouble with any of the other foremen.

To the Board: There is room for improvement in the supervision of the work in the yard. Firstly, the man over the employee should certainly show more respect. I feel sure that if that were done the employee would return that respect willingly. I am very strong on that point. In my capacity as main-line shunter I practically assist the foreman in the carrying-out of his duties. The accident I referred to as occurring last night was a truck of overhanging timber put into a truck of sheep at the south end. If there had been better lighting in the yard the accident might not have happened. I would suggest a light midway between two south present lights, and also one at south end of Cook Street, about forty paces from the road, also one midway between the two present lights at the goods-shed. I would suggest the same method of lighting as that at the north end of shed—that is, suspended. I would also suggest one light midway between the light at the south end of shed and next light down the yard. If these lights were put in I consider it would be a big improvement on the present state of lighting. My shift is worked out out at practically an eight hour day. Some shifts are a little longer. On a long day the shift starts at 5.30 a.m. at south end and finishes at 3 p.m., being booked off an hour for lunch. It would be more satisfactory if an eight-hour-day average was struck right through. In wet weather when a man is wet through it is a long day. In the north-end day shift, from 8 a.m. to 5 p.m., meals are to be taken when convenient. I am not too conversant with shunters' shifts. I consider that in a busy yard with continual work without any "let up" seven hours per day is enough, especially in the heat of the summer. That is on the physical aspect of the case. After seven hours in a busy yard in the heat of summer the best is out of a man. I believe verbal reports and sometimes written reports have been made to the senior officers regarding the lighting, but there has been no additions to the lights since I have been here. The mentality of the shunter is lower at night-time than in the day. The work at night-time as compared with daytime is practically equalized right through. In the south end of the yard there are three men in each gang with an occasional lift of a man to couple up. At the north end there are three men in the gang, and one and sometimes two assisting three. They are apprentices practically. I consider the method of training shunters could be improved. I think new men coming into a busy station could be given a better and quicker insight into the work by an experienced shunter being told off to show to him the different workings pertaining to shunting in the local yard. A new man at present does not come under the head shunter at all, only just tails up the field—he works in with the other men. If I am in charge of a gang and when a new man comes I do not see him, as regards helping him, until he is actually put in the gang as one of the gang in the place of second or third man. I have seen raw recruits in the gang without any previous experience, and I have been continually in a state of anxiety over such men being put there, for the simple reason that, fairly speaking, one could not trust them with the work. When men are transferred I think they come into the gangs before they have a fair knowledge. I have known cases where the transfer of men by way of promotion, &c., has resulted in the efficiency of the Palmerston North yard being lower than previously. It is quite feasible that the conditions relating to the private or domestic responsibilities cause men to ask to stay in the shunting-yard in preference to going out on the road as guard. I am at present standing down. I elected to do so. It suited my domestic arrangements. I have met men who have told me that they were not too keen on shunting, but they considered the road was the lesser of two evils. It would be best to have the most practical and logical men to be placed in charge of big and busy yards. We have experienced cases where an experienced shunter—say, at Palmerston North—is shifted to Frankton Junction, and a porter is taken from, say, Frankton Junction to fill the vacancy. This lowers the efficiency of both yards. In connection with the painting white of points levers, I think that the system at present stated to be in operation in Christchurch, where fat, kerosene, and whitewash mixed together is used on the points-levers, if adopted at Palmerston North would have a good effect provided it was done frequently. I think

that the 11 ft. clearances at the goods-shed at Palmerston should be widened to at least 16 ft. There are points all the way up, and shunters do not have sufficient clearances. We have not had any trouble at Palmerston North in connection with the tender engines throwing the points up. For cutting purposes I find the 10 ft. switch is preferable to the 12 ft. switch in the shunting-yard. It would be better if the sleepers in the yard at points were boarded up, and the frog should be blocked with wood and the check-rail protected as far as possible. The shunting-locomotives at Palmerston North are of the "N" and "J" type, and are fairly ancient. The "J" is the best in use at Palmerston. We have become accustomed to them. The "J" engines sometimes get out of order, and we find them hard to replace. We have a lot of trouble with the sand in the wet weather. I think that if wagon-cards were placed near the number on each side of the wagon it would be of assistance to the shunter. If a handrail were placed on the right-hand side of the vehicle as the shunter faces the buffer it would be an improvement. It is very dangerous for a shunter to wear a long overcoat. I should think that gear worn by motor-cyclists would be suitable for shunters. I think that such overalls would be preferable to long coats and would tend towards safer shunting. There are different opinions as to the kind of boots which should be worn by shunters—some prefer elastic-side boots. I consider that no iron should be placed on the sole of the boots. I have been working at Palmerston North for about six and a half years, and during that time I have recollection of the two recent fatal accidents only. In the case of Murphy he was not actually working with a movement of wagons, but had left one set of work and was crossing to another set of work when the accident happened. I have seen many narrow escapes from serious accident in Palmerston North. A pair of boot-soles, unprotected, working in a busy yard would not be much use to the shunter after two and a half weeks. In connection with the age to start a shunting career of a member I should say that twenty-two to twenty-four yearsof age would perhaps be the best age to send a man into the yard. I am close on forty years of age myself and am as athletic as many much younger. It depends on the individual. I started at twenty-six years of age and have fourteen years' service, practically shunting all the time.

EDMOND O'DEA sworn saith.

To Mr. Mack: I am a shunter at Palmerston North, and have been at this work for about two months. I have been about seven years in the service. I was eighteen months as a surfaceman, and the rest of that time up till the 10th June last I was a tablet porter. I was stationed at Erua, Kaukapakapa, and Piriaka. I was transferred from Piriaka to Palmerston North as a shunter. I can say that I got no training and no opportunity of learning the yard shunting when I arrived at Palmerston North. I was given one week at each end of the yard catching brakes, and I was given two weeks at coupling up trains, and then I went out as second man in a shunting-gang. I was thirty-five years of age when I started to learn shunting. I have never done any tail-roping or seen any done at Palmerston North. I have assisted a guard to use the tail-rope at tablet stations. As second man in the gang I have seen, time and again, where the foremen would come to the leading shunter and interfere with the operations of the shunting-work. The foremen may harass the men, but they may do it to the leading men and it would not come under my notice. I was under Foreman Sweeney during the first week I started. On the first morning when I came to Palmerston North I was speaking to Mr. Sweeney in the shunters' hut, and Mr. Sweeney proceeded to give me some fatherly advice, which was appreciated at the time. He told me not to get bustled, and that sort of thing. He finished up his conversation, and said that I would have an ignorant lot of b———s to work with in this yard, and that he was the boy to put them in their place. I began to feel that I was sorry that I had come here. The construction I put upon the remark was that there was a certain amount of ill feeling existing among the men. So far as I am concerned, I have had no difference with Foreman Sweeney. From my observation I think that the foremen could give the shunters a little more assistance than they do at present. At present I do not think they are giving that assistance which might reasonably be expected of them.

To Mr. Robertson: I never was third man in a gang in Palmerston North, and did not ask to be placed second man in the gang. I spoke to Mr. De Rosa, the foreman, when coupling up wagons, and stated that I wanted something different, as I was gaining no knowledge coupling up wagons. I agree that it is absolutely necessary—that it may be necessary—to drop certain work to undertake urgent work. I would not call an instruction to a shunter interference. I am positive that the word used by Mr. Sweeney was "b———." Even though it has been said at a previous inquiry that Mr. Sweeney does not use bad language, I say that such statement is news to me.

To the Board: I found it was very difficult to take up the work of second man in the gang. I hardly knew one set of points from another. I did not object to the work. If I had been third man in the gang it would have helped me in second-man's work. By placing me as second man it would throw more anxiety on the senior men to see that I was doing my work. A certain foreman at the present time comes along when we are pushed and assists in marking up the wagons. This assists the shunters. There are not special men told off to perform this work. Each gang does their own marking-off.

SECOND DAY.—PALMERSTON NORTH.—20TH AUGUST, 1925.

ROBERT CUNNINGHAM BRUCE HUNT sworn saith.

To Mr. Mack: I am a porter employed at Palmerston North. I have been at Palmerston North about five years. Most of the time I have been shunting, but at present I am in the goods-shed. I know

the various foremen in Palmerston North. I have had difficulty with one foreman while here. That foreman was Mr. Sweeney. I have got along all right with the other foremen. While I have been at Palmerston North I have noticed Foreman Sweeney unduly harassing men. He has harassed me. He has asked me to do things in connection with my work which I consider too risky. I can give one instance: One night about 5.30 p.m. or 5.45 p.m. there was a string of empty "J" wagons coming up from the bottom of Cook Street travelling about twenty or twenty-five miles per hour, and there was a brake trailing on the off side from where I was standing. Foreman Sweeney instructed me to get over and lift this brake. He told me to get through the wagons. I had my hand-lamp in my hand at the time. I told him that it was too risky, and that I was not going to risk my life in doing it. He replied, "You are going to do what you are told. I am the foreman of this yard." I said, "All right, I am not going to lift it, and I will see Mr. O'Shea to-morrow." He said, "There is no need to be afraid of that; you won't be here to-night." I said, "If I were to be chopped to pieces you would not look after my wife and children." He said, "You are here to do your work; it does not matter about that." The "J" wagons were set back on to the train, and Foreman Sweeney was excited at the time and seemed to have lost his head. He jumped around and said, "Do you still refuse to lift the brake?" I replied, "No." The vehicles were standing then. We both went around, and he told me to shine my light upon the number of the wagon that the brake was down on. I did that for him, and he took out his book and wrote the number down. The next thing that I got was two sheets of foolscap reporting me for not lifting the brake. This came through the Stationmaster, and I replied and explained the circumstances. I did not hear any more about that incident. Foreman Sweeney was all his time chasing me around while I was working in the yard. When other foremen were on duty I was not harassed in the same way. When I was shunting in the yard I was running third man in the gang. I was taken off the shunting-work and put into the goods-shed through defective colour vision. To the best of my knowledge I have never given Foreman Sweeney cause to harass me.

To Mr. Carnachan: When I said that the trucks were moving at twenty to twenty-five miles per hour I would say that I was a fair judge of speed. I would be prepared to go out in the yard and tell the Board or give them a rough idea as to how fast a vehicle would move. A rough idea would mean, say, within two or three miles an hour. I was acting as third man, and it was my duty to lift the brakes. The fourth man is equally responsible. I do suggest to the Board that I was asked to lift the brakes while the vehicles were travelling at twenty to twenty-five miles an hour. Foreman Sweeney tried to force me to do it. The letter I received about not lifting the brakes was in Foreman Sweeney's writing, but it came through the Stationmaster. When I was working as third man in the gang I acted under the direction of the senior man. I worked under the direction of the senior man in the gang, and the foreman usually gave directions or instructions to the senior man in the gang, but I have known instances where the foreman would give instructions to the second man while the senior man was present. The date of the incident in connection with the lifting of the brake was the date of the inquest at Wanganui. I cannot remember the reply I gave to the Stationmaster's memo. on this subject.

To Mr. Mack: It is my duty to lift brakes, but not to take any undue risk in doing so. In this instance Foreman Sweeney was expecting me to take an undue risk. It was a trailing brake. I worked under the direction of the first man in the gang. I can remember an incident of being asked to push back when I did not know where my mates were. I declined on the ground that I considered it risky for my mates to push back. If Sweeney wanted the train pushed back there was no reason why Sweeney should not have given the signal to push back. I do not think the driver would have taken any notice of him nevertheless.

To the Board: The wagons which were coming from the bottom of Cook Street were being drawn, not pushed. I was up by the north signal-box when Mr. Sweeney asked me to lift the brake. The wagons had travelled from Cook Street to the north signal-box, and it was at the north signal-box where Mr. Sweeney asked me to lift the brake. Although the wagons had travelled only that distance I estimated the speed at between twenty and twenty-five miles an hour. The engine drawing the wagons was a "J." There were fifteen "J" wagons empty in the rake. I did not ride up on the rake. I still maintain that I think the driver would not take a signal from the foreman in connection with the incident regarding the pushing-back and my refusal to do so on account of the danger to my mates. I was merely repeating the signals from my mates. I have seen Foreman Sweeney hop in in front of the shunters and give signals any amount of times.

To Mr. Carnachan: I was not at Cook Street, and therefore could not lift the brake before the rake left Cook Street. When the rake passed me the wheels on the "J" wagon were not skidding. It is the duty of every member if he sees danger to give the "Stop" signal to the driver.

JOSEPH COLE sworn saith.

To Mr. Mack: Recently I was employed in the Railway Department. I left the Railway Department about last November. I left the Railway Department owing to the attitude of Foreman Sweeney towards me. I was working in the shunting-yard for about twelve months when working at Palmerston North. During the time I was in the yard I noticed that Foreman Sweeney was continually harassing the men. I ultimately became tired of his attitude towards me, and the conditions generally in the yard were made very unpleasant. When I resigned I handed my resignation to Mr. Shinkwin, the senior foreman, and stated in the resignation that the resignation was owing to the attitude of the foreman. Mr. Shinkwin said he would not have that, and said that

it was not fair to be chased out of the yard by the attitude of Foreman Sweeney. He said he would go and see Mr. O'Shea, the Stationmaster, about that. He came back and asked me if I would go and see Mr. O'Shea about it. I went to the office and saw Mr. O'Shea and discussed the matter of the resignation. He asked me if I would reconsider it or put it in a different way, as he did not want any trouble with the Head Office over Mr. Sweeney. He wanted me to put my resignation in in a different way. We had quite a discussion on the matter. I must say that Mr. O'Shea was very fair to me and treated me very fairly always. Mr. O'Shea fully understood the reason why I wanted to leave the railways. It was simply out of favour to Mr. O'Shea that I withdrew the resignation at the time. Mr. O'Shea said that he did not want me to leave the Railways, as he always found me all right. I said that if I did elect to stay I would not work under Mr. Sweeney. He said that he would arrange that I would not come into contact with Mr. Sweeney. I went back to work again and thought the matter over, and as I had had a letter from Mr. Sweeney previously condemning my work and for which I could see no reason—that is, no just reason—and I had worked in the yard for just on twelve months and I had nothing reported against me in the way of delays and derailment, I objected to his condemning my work. He made a general statement regarding my work and gave no specific instances. I ultimately decided that I would leave the service. I recognized that Mr. Sweeney had the power to make or mar my career as a railwayman, and that did not appear satisfactory to me, and I decided to get out of it. Every one else I came into contact with were all right, and I had no ill word to say against any one else. It was owing to the way in which the other superior officers had treated me that caused me to alter the form of my resignation.

To Mr. Carnachan: I was in the railway for about three and a half years. I had no experience before in railway matters, as I joined at Palmerston North. During the last twelve months I was practically the whole time in the yard. I cannot remember using bad language to any one. I spoke to Foreman Sweeney regarding his attitude towards me, and said I would expect civility and respect from him the same as I extended to him. I would deny absolutely any suggestion that I used bad language, and if the foreman stated I did I would deny it. There is absolutely no reason other than that set out which caused me to tender my resignation from the Railway service.

To the Board: I have worked in the yard under Foremen Shinkwin, Robertson, and various acting-foremen. I have got along all right with these foremen and have had no trouble whatever with them.

THOMAS EKENSTEEN WORTHINGTON sworn saith.

To Mr. Mack: I occupy the position of shunter, but at the present time I am employed as acting-storeman. My classification is that of a shunter. I have been stationed at Palmerston North for about nine years. I have had ample opportunity of observing the conditions obtaining in the Palmerston North yard. For about eight years I have been shunting in the yard at Palmerston North. I have had ample opportunity of observing the attitude of the foremen towards the men in the yard. I have worked under Mr. Robertson, Mr. Sweeney, Mr. De Rosa, and Acting Coaching Foreman Webber. Mr. Robertson I have found a very good foreman—he left us alone and allowed us to carry on our work. Mr. Sweeney is of a harassing nature—he interferes and harasses the men persistently. Mr. De Rosa is more inclined to follow the men around while they are carrying out their duty. Mr. Webber is rather the other way about. He does not interfere with us at all. If he comes to tell the men anything it is always in the direction of assisting them in the work. The work of the yard does not suffer in any way by the attitude of Mr. Robertson and Mr. Webber. I appreciate the attitude of Mr. Robertson. That is not the case with Mr. Sweeney and Mr. De Rosa as foremen. It is generally recognized that the Palmerston North yard is a congested and obsolete yard. I think that improvements should be effected along the lines of giving more space to carry out the work. I have been at Palmerston North nine years, and I agree with the view as expressed by Mr. Hiley that the Palmerston North yard is inadequate for the business. The volume of traffic has outgrown the facilities at present at Palmerston North. That makes it much harder for the shunters, and makes it much more dangerous. Short cuts in shunting operations are less dangerous than long cuts. If we had the room in the yard short cuts could be used, and the work would consequently be got through much quicker and the risk to the shunters minimized. If the goods-shed were shifted nearer to the street there is ample room for quite a number of other roads, and this would improve the conditions and remove the congestion in the yard. The lighting in the yard could be improved. It would help if the points-levers in the yard were painted white. It is some time since this was done. The drainage in the yard could be improved, and I think that the sleepers at the points could be boxed in or filled up to reduce the risk. I consider that it is very risky at present. I have had about eight years' shunting. I think that the adoption of these suggestions, together with an improvement in the attitude of the foremen, would materially assist in securing better working-conditions in the yard. I have not made complaints to the Stationmaster regarding the attitude of Foremen Sweeney and De Rosa. Other men have done so, but with no good result.

To Mr. Carnachan: Foreman Sweeney is very hard, and harasses the younger men in the shunting-yard. Very often coming on duty at 8 a.m. the first thing is generally an argument with Mr. Sweeney. I start to go and do a job, and just as I am starting he comes and wants to alter it. Very often I argue with him, and very often I do it. I do the job the way Foreman Sweeney wants it done, instead of the way I wanted to do it, and I know my way is the best. I do not know what shunting experience Foreman Sweeney has had. I cut out my work according to my orders. I am the senior man in the shunting-gang. If there was any alteration made in the orders of the day Mr. Sweeney would have to advise me of them, but this would not necessarily upset the programme. If

I had mapped out my work and I got a fresh order, that would not necessarily alter my vision of the work set out to be done. I resent any orders given by the foremen which would upset the orders of the day and the work set out by myself. I have had no experience in shunting outside Palmerston North. I do not know anything about methods of shunting in other yards. I consider that if the best shunter was brought from Auckland he would know nothing to begin with in Palmerston North. I consider that a man who has had thirty years' shunting experience in all big yards, including Palmerston North yard, would be more competent in shunting matters than myself. I have not made any suggestions to the Stationmaster at Palmerston North along the lines of improvement in conditions and facilities. I remember an incident in connection with Foreman De Rosa coming to me regarding the action of Porter Lepper bringing out an engine for No. 663 train. We were in the south-end shunters' whare having supper. Foreman De Rosa came in to the hut and asked Porter Lepper to go for an engine for No. 663; Porter Lepper replied that it would not hurt Foreman De Rosa to do it, seeing that we were having supper. A few minutes elapsed after that when Porter Lepper went out to carry out the instruction of Foreman De Rosa. About three minutes after he left the whare I walked out and saw Foreman De Rosa and Porter Lepper talking in Cook Street. I went to see what was wrong, and I asked Foreman De Rosa, and he got a bit wild, and after that we got word that there was a bullock down in a truck in the dock. I left and went over to find out what was wrong. That is as far as I know of the matter. I did not hear Porter Lepper tell Foreman De Rosa to go and knock his head off. During the course of shunting operations in the yard rolling-stock gets damaged through shunters doing things which they should not do. I suppose that there is a fair number of vehicles damaged in the yard shunting, but I could not give the Board a rough idea of the damage. I could go for twelve months and not have an accident if I liked. By taking our time and working slowly and not rushing through the work, splitting buffer to buffer, double doubles, doing trebles this could be done. I have an idea of the number of vehicles which go through the yard during the day. I would say that at this time of the year—say, at the slack period—probably 4,000 vehicles go through the yard. If I were informed that since the 1st April, 1925, three carriages and twenty-two wagons were damaged and there were fourteen derailments in the Palmerston North yard I would consider that a fair average for such mishaps. I cannot give any one case where the porter or shunter concerned in the derailments referred to were cautioned or fined in connection therewith. I think it is only a fair thing that the Department should not fine the men, as they must know that we have to speed up. I consider that the points through not being painted white are a danger to shunters in the yard. The points in the Palmerston North yard have not been painted for a good long time. I have never brought it under notice that the points required painting.

To Mr. Mack: If the foreman came to me with additional orders it would not necessarily mean extra work. In some cases it does. Supposing some "J" wagons were wanted and a train was standing on top of them it would mean extra work. If after I got that order and I then got an additional order for more "J" wagons, that would not involve additional work. If the foreman comes to me and gives me additional orders after I have set out my work I do not resent such orders. If a shunter of, say, thirty years' experience came from, say, Dunedin or Timaru yard to Palmerston North yard I would know more about the local conditions at Palmerston North yard, and I would have to teach him his job. I do not think that it is possible for a man to grasp the local conditions by observation apart from engaging in the work. From my experience I do not think that suggestions coming from the junior members of the staff are accepted in good grace. It would seem that it is a reflection on the senior officers or the officers in control. The Stationmaster and the foreman have the same opportunity of observing the conditions and judging what is necessary as I have. I cannot remember any improvements that have been carried out at the suggestion of the foremen and Stationmaster. I have no complaint with the management of the railways apart from the foremen. My complaint is that the foremen unduly harass me. There is more liability to damage in a yard that is congested than in a yard that has plenty of room. If we had to shunt with smaller cuts and had plenty of time there would be less derailments and accidents than now. Broken buffers and derailments are inseparable from railway-work.

To the Board: As leading hand in the gang the foreman leaves instructions in the shunters' hut for me. If there is anything to be done while I am in charge of the gang the foreman comes and deals direct with me. The foreman very often comes when we are doing some work and tells us to do other work, and we know in our own mind that it is not helping us to get on with our work. We consider that he should not interfere. Foreman De Rosa tells us to do this and do the other thing, and says that "You have not done this, and you have not done that." I recognize that there must be some one in charge, but we do not get that sort of thing from Mr. Robertson or Mr. Webber, the other foremen. When necessary the foreman is justified in coming along and altering the routine of the work if he considers it necessary, but he should not be continually at it. Sometimes we have inexperienced men in the gang. I have had cases where the second and third men in the gang had practically no experience in shunting-work. When these inexperienced men are put into the gang they have to take their full share of the work. I consider that to train a shunter he should be started as a porter and given three years' training in the yard classified as a porter. I consider that a man should not be over thirty-five years of age when put into the yard to learn shunting-work. I consider that about twenty years of age is young enough to put a man in the yard to learn shunting. A porter should be given six months to learn the shunting before being given a place in a shunting-gang. At Palmerston North the gangs have to do their own braking and marking off. There are not men specially told off to do this work. On some of the big "Z" wagons the brake is similar to the car-brake—that is, a screw brake—and I consider a drop brake better. The step on some of the postal vans here is very awkward for putting the brake on. I think that the provision of a hand grip or rail on all four corners of wagons would be a help to shunters in their work.

The following evidence was called on behalf of the officers concerned :—

PERCY HARRY HARTLAND sworn saith.

To Mr. Carnachan : I occupy the position of Assistant District Traffic Manager, Wellington. I have occupied my present position for about six months. I was stationed at Frankton Junction prior to going to Wellington. Mr. De Rosa was on my staff while I was at Frankton Junction. I had there three Goods and one Coaching Foremen. Mr. De Rosa was Goods Foreman at Frankton Junction. He had eighteen shunters under his charge at Frankton Junction. Mr. De Rosa gave me every satisfaction during the time he was under my supervision at Frankton Junction. He performed his work in a very satisfactory manner, and there was no friction as far as I am aware with the staff at Frankton Junction. He got on with the staff very well to the best of my knowledge. During the time I have been stationed at Wellington as Assistant District Traffic Manager it is part of my duty to come to Palmerston North, and I have been here four or five times during that time. As far as I know, Mr. De Rosa has performed his work in a satisfactory manner at Palmerston North. I have not been aware of any friction existing between Mr. De Rosa and any of the shunting staff.

To Mr. Mack : If there was any friction between Mr. De Rosa and the staff if did not come under my notice. I do not know anything of the late Shunter Carmichael, and I do not know anything about Foreman De Rosa's attitude towards Carmichael. I have not seen anything in the attitude of Foreman De Rosa towards the staff at Palmerston North. Mr. De Rosa has given me satisfaction in the performance of his work, and nothing has been brought under my notice in connection with his attitude towards the staff either at Frankton Junction or Palmerston North.

To the Board : I consider that there is perhaps more congestion in the yard at Frankton Junction than at Palmerston North.

The evidence on behalf of the men concerned was continued.

RAYMOND WILLIAM GEORGE SHARP BIGGS sworn saith.

To Mr. Mack : I am a shunter at Palmerston North. I have been in Palmerston North ten years, and have been shunting for about eight years of that time. In my opinion Palmerston North is a congested yard. With the room we have at present it is a difficult yard to work satisfactorily. I think there is sufficient room to extend the yard by putting in extra roads. The goods-shed could be shifted over, room could be made, and several roads could be put down. I think Cook Street should be closed, as it is a dangerous crossing. I think that by moving the shed, some roads near the Car and Wagon Inspector's shed could be put in, and that would be a great improvement. The trains arriving from north are never marshalled. I think the trains should be grouped. For instance, Wellington could group the Taranaki District together, the Main Trunk line together, and the Hawke's Bay District wagons together, and the same thing applies in the case of Marton for wagons coming in south. The grouping would be a big help. I recognize the difficulties guards have to contend with along the road shunting, and I think that, as far as Palmerston North is concerned, it would make a big difference if there was grouping. The lighting at Palmerston North is far from what could be desired. I think that it could be considerably improved. The drainage is far from right. I think that that could be considerably improved. I think that if the points in the yard were covered over or boxed in it would minimize the risk to shunters. It would help if the points-levers were painted white like in other yards. It is close on three years since the points-levers were painted white in Palmerston North yard. In my opinion I think that the difficulty in carrying out the work is caused by the interference of the foremen, and I would mention Foreman De Rosa in particular. During my period of shunting I have worked under Mr. Robertson, and he has never interfered with me. I have worked under Mr. Webber, and he has not interfered with me. He is a help. I do not get along too well with Mr. Sweeney—that is, some time ago. He has not interfered so much with me lately. Mr. De Rosa has harrassed me and interfered with me in the performance of my work. He has worried and harassed other men to a certain extent. I have seen him do so. I do not resent additional instructions by foremen while work is being carried on. There have been times when the foremen have told us to do certain work urgently when there was no necessity to do so. One evening at the south end, about 9.30 p.m., Foreman De Rosa told me to hurry up and catch the loop, meaning by that to take the vehicles out of the loop, saying that there was a special train waiting at the stick from Marton, and he wanted to bring it in so as to let the "Limited" northwards go out. I cleared the loop, and I had to put it into the road which I wanted for marshalling purposes, because I had wagons on the engine at the time. The "Limited" went out, and seeing Foreman De Rosa I asked him where the special was, as I did not see it in the loop, and he said that they were crossing at Feilding, and instead of the special being at the signal-post, it was somewhere the other side of Feilding. The special arrived about 11 p.m. That was one instance where he interfered with the work when there was no apparent necessity to do so. Last week he asked me to get a car out of No. 3 road and put it into No. 2 road short. I pulled up and started to kick off when he started to wave his arms to stop me. I had to rush in and drop the hook and stop the engine. Then he gave me the signal to pull out, and he kept on waving me ahead, and I did not know where I was going or what he wanted. After pulling up the back-shunt the signalman pulled the points over for the loop. I presumed that he wanted it down the loop, and I kicked the car down the loop, then pushed the remaining cars back into No. 3 road. I then caught No. 2 road again and started to pull out when he rushed across and told me he wanted another car out of No. 3 road. While I was getting the second car out the south-end engine caught the first car that I had kicked out off the loop and pushed it up No. 2 road again so that I could put it into the top of No. 3 road again. It was found that he had got the wrong car out in the first

case. I regard that as being unnecessary work, and this delayed me from doing other necessary work. I did not work with Carmichael.

To the Board: I agree with the suggestion regarding lighting outlined by Shunter Tapp, but I consider that the only satisfactory method of lighting the yard is electric light, but I still think that there should be some extra lighting in the centre of the yard if it could be fixed. I suggest this extra lighting for the safety of the rolling-stock and the safety of the men—primarily for the safety of the men. Mainly it is the third man's job in the gang to work in the portion of the yard stated. I prefer electric lighting if it could be obtained. The electric-lighting wires run along the streets on both sides of the yard. The present gas lights in the yard are fairly well maintained. In stormy weather the globes of the gas lights and mantles have been known to have been blown off. Barring that, the lights keep burning on stormy nights. When lights become defective they do not always get immediate attention. The shunters report immediately the lights are required. The two instances I have quoted regarding the work and the attitude of Foreman De Rosa are what I would term interfering, not harassing.

ALEXANDER GOUDIE sworn saith.

To Mr. Mack: I am a guard stationed at Palmerston North. I have not been at any time stationed at Palmerston North as shunter. I have been at Palmerston North for a little over three years. I have at times seen the foremen at Palmerston North adopting an attitude towards the men which I would call harassing. I have relieved a foreman at Palmerston North yard on one occasion from about 4.45 p.m. to about 2.20 a.m. I approached Foreman De Rosa on that occasion as to what was expected of me, and the matter of the work in the yard was discussed—I do not know whether it was I or he who first mentioned it—and Foreman De Rosa said, "Yes, you have got to chase the men if you want promotion." I replied to him, "Never in your life," or words to that effect. I would be prepared to forfeit my promotion if that was the condition under which I had to work.

To Mr. Carnachan: I have been about three years as an appointed shunter. I was not shunting in the Palmerston North yard. I was shunting in the Greymouth yard. I have no working experience of the conditions of the Palmerston North yard, but have a good idea of the work. I have never shunted in the Palmerston North yard. When I say that the foreman was harassing the shunters I really mean that he was singing out to the men and following the men up and giving them instructions. I should say that the shunters work in the yard under the direction of the foreman. If the foreman wants the work done he must necessarily give instructions to the shunters. I am a second-grade guard. I do not think that I am in early order for promotion. I must be a long way back. In the ordinary course of events I would not be in order for promotion to foreman for some years yet. The night I relieved the foreman at Palmerston North for a full night shift I issued orders to the men. I had to go round and instruct them what work they were to do. That was what I was placed in the yard for.

To Mr. Mack: On the night I relieved the foreman and issued instructions to the men I did not have a row with the men while I was giving them their orders. They took their orders quietly and went on with their work as instructed.

To the Board: I did not find any difficulty in supervising the work of the yard. I think the shunters understood their work more than I did; they kept going while I was in charge. They had the work finished and up to date when I went off this shift.

WILLIAM WOGAN ALDRICH sworn saith.

To Mr. Mack: I am a guard and was a shunter in the Palmerston North yard about eighteen months ago. I had occasion to go and see Mr. O'Shea, the Stationmaster, over a report that I had received from the foreman. I went into Mr. O'Shea's office with the report, and stated that I had been done an injustice in the report I had got from Foreman Robertson and that it looked like victimization. The Stationmaster got very angry with me, and told me that he would not have those accusations made against the foreman, and that he would uphold his foremen whether they were in the right or the wrong. I am absolutely positive about that. I replied to the Stationmaster that he was rather a peculiar man, and he replied by saying, "That is the attitude that I intend to adopt." I said that there would be no use going to him about anything, and that I would have to put the matter through the Union. He said, "You can take it where you like." I had not noted the correspondence, and I refused to do so, and I handed it to the Stationmaster at his request, and that is the last I heard of it. I knew and believed that the Stationmaster would uphold the foremen, and I knew that there was no use going to him any more.

To Mr. Carnachan: Mr. Robertson was in charge of the yard at this particular time. The subject he wrote to me about was the subject of reversing tarpaulins. There were two wagons which went out on a train with sheets which had not been turned, and somebody reported the matter, and the report was sent to me quoting Rule So-and-so. I replied that this rule had never been carried out to my knowledge in Palmerston North. In the meantime an instruction that the matter of reversing the tarpaulins was to be held over until instructions were given from the Manager and was placed in the shunters' book. I was aware of this instruction at the time the loads were forwarded. I was the only shunter, out of fifteen or sixteen shunters, who was made to note this instruction that I was to so deal with the tarpaulins. This occurred about three years ago. I did not represent this matter to the Union. I did not represent this particular case to the Union. I have been away from Palmerston North recently, and have been absent for about twelve months. I have nothing to say about the conditions of the yard, only that the yard accommodation is not adequate and causes congestion. I applied to come back to Palmerston North in the capacity of guard.

To the Board: In connection with the reversing of the tarpaulins and the letter which was sent to me in connection therewith, I think it must have been me who made the train up and shunted the train, on which the sheeting was reported as being wrong. I do not insinuate that I was singled out and that the blame was put on to me wrongfully. I might have been a little bit harsh when I used the word "victimized," but it seemed peculiar to me that I was the only one out of fifteen shunters who was asked to note the correspondence when another instruction was issued that the whole thing was to be held in abeyance until further advised.

JOHN DOIG sworn saith.

To Mr. Mack: I am a guard stationed at Palmerston North, where I have been for about fourteen years. I have shunting experience in the Palmerston North yard. I think I have had approximately eight years' experience shunting in the Palmerston North yard. I knew the late Shunter Carmichael, who was killed in the shunting accident. I found Carmichael a good-living, straightforward, and honest man. During the time Carmichael was in Palmerston North I remember one occasion where Foreman De Rosa unduly interfered with him. This occurred over the reversing of No. 640 train at the north end of the yard. Carmichael was engaged in reversing the train, and was just about finished with the operation when Mr. De Rosa came along and called out to him that he was to get a roadsider down to the south end of the yard. At the time he was being told this by Mr. De Rosa he was working at his maximum speed to get the train away so that he could get to the roadsider which he had been spoken to about by Mr. De Rosa. Carmichael called back to Mr. De Rosa that he would get to the roadsider as quick as he possibly could. A few moments elapsed before he got it, and Mr. De Rosa said that the train was standing apart waiting to get it in. Carmichael called back in a rather excited tone, which was brought on by the first remarks of De Rosa, and he said that he would get it down as quick as he possibly could, and that he could not get it any faster. In asking Carmichael I think that Mr. De Rosa was unduly pressing him, as up to that time he was working quite all right. He then said to Mr. De Rosa to "go away and leave him alone," and on passing that remark Mr. De Rosa said to me that "Old Tom is a bit excited to-night." The only remark that I passed at the time was that speaking to Carmichael would not improve him, as the man was doing his best; it was a wet night. Carmichael always gave me the impression that he was a man endeavouring to do his best for the Department. I do not think he was the type of man who would resent orders being given to him in a reasonable way. I think that if he were left alone at the time he was shunting he would have got along better. The shunters in Palmerston North to a certain extent work under high pressure owing to the congested conditions prevailing. It is generally recognized that the Palmerston yard is a congested one. It is also generally recognized that the working-conditions in the Palmerston yard could be easily remedied.

To the Board: That is my personal opinion.

To Mr. Mack: I think that the draining could be improved with a little difficulty. The road where the shunters walk on could be made up with limestone, and they could then walk along without being over their boot-tops in water in wet weather. I often see the water over the boot-tops, and it is not an exaggeration to say that the water is over the boot-tops. In my opinion there is plenty of room to relieve the present congestion in the Palmerston North yard, and such improvement would make for the safety of the men, and would certainly tend towards the safety of the work and result in a benefit to the Department.

To Mr. Carnachan: The incident in connection with No. 640 train and Mr. De Rosa's attitude towards Shunter Carmichael occurred on the Thursday or Friday night about eleven days before he was killed. I was on duty on the spare shift on the platform. My duty on that duty is to assist Auckland express and any specials required. We did not run any specials that day. I cannot give any indication of any orders which Mr. De Rosa gave to Carmichael before he asked him to bring the roadsider down for No. 663. If the foreman states in his evidence that he had previously instructed Carmichael to bring out the roadsider for No. 663 I would not be in a position to deny it. It has been the usual practice while I was there to immediately reverse No. 640 after arrival. I am not in a position to give any evidence regarding the shunting of the roadsiders for No. 663. When I stated that Carmichael was going at his maximum speed I meant that he was going as hard as his physical ability would allow him to go. I could not say that Mr. De Rosa was speaking harshly about Carmichael when he said on that night "Old Tom is a little excited to-night," but at the same time the foreman knew that he (the foreman) had caused him to become excited. Carmichael was of an excitable nature, and that is all the more reason why he should have been treated with a little more fairness. I had three and a half years' shunting experience at Paeroa. I had experience in other places, and had assisted to shunt at Frankton Junction, but was not in charge of the shunting-engine.

To the Board: I was not on the Frankton Junction staff. It was in 1919 when I was last shunting in the Palmerston North yard. That is the last time I have worked at shunting-work at Palmerston. It would not be fair to ask the Marton shunters to marshal the wagons for Palmerston North. I have had experience shunting at Thorndon years ago. It should be an easy matter to marshal the loads —through loads—from Thorndon for, say, Palmerston North and Wanganui. There is one goods through-train from Paekakariki to Palmerston North. It is possible for trains arriving in Palmerston North to be kept in some sort of grouping order, right through. I consider that trains come from the main trunk to Marton in a bad order, and Marton has not time to marshal them. The trains from Wanganui arriving in Marton are all right. I am aware of the tonnage restriction *en route* from Thorndon to Palmerston North, and I am aware that loads have to be lifted at Paekakariki for Palmerston North, but I do not see any difficulty in lifting them provided there is sufficient time for the loads to be placed.

JAMES MCLAREN sworn saith.

To Mr. Mack: I am a signalman stationed at Palmerston North. I have been stationed at Palmerston North about sixteen years. I have been a shunter in the yard in second grade and first grade, and have been guard. Now I am a signalman. As signalman I have had fairly reasonable opportunity of observing how the work is carried on. I knew the late Shunter Carmichael. I found him a good worker, and was very conscientious, and as far as I know he was a very good-living man. I should say he would be quite the reverse of offensive to anybody. If he answered back I think he would have just cause. I do not think he would answer back to anybody unless he was driven to it. I have seen him being worried by the foreman while he was working. The week before he was killed —he was killed on the Monday morning—it was either on the Wednesday or Thursday before he was killed he was being harassed by Foreman De Rosa. I mean to harass a man is to continually follow him about and dogging him in his work, and generally worrying him. What I mean by harassing is the attitude of following the man about and not leaving the man alone when he was doing his best. It seemed in a sense that the foreman distrusted him in the carrying-out of his work. I think that if Carmichael was left alone after instructions were given he would have got along much better. The position appealed to me this way: Carmichael was making up a train, and the foreman did not seem to think he was getting along fast enough and that Carmichael was making mistakes, and the foreman was afraid that he would be late with his train.

To Mr. Carnachan: On the date of this incident Mr. Carmichael was in charge of the shift. He was the senior man. Roberts was the second and Lepper was the third man. If there were any instructions necessary it would be necessary for Foreman De Rosa to give them to Carmichael. In speaking to Carmichael on this date he would be only performing his ordinary duties in the yard.

To the Board: I am employed in both signal boxes at three-weekly periods.

CYRIL ERNEST PEPPERILL sworn saith.

To Mr. Mack: I am a shunter stationed at Palmerston North. I have been in Palmerston North for five years. I came to Palmerston North as a porter and have spent all my time here in the shunting-yard. I got my appointment as shunter at Palmerston North and worked my way through until I got charge of an engine, which I have had for about two years. I was about twenty-nine years of age when I came to Palmerston North. During the time I have been at Palmerston North I have had ample opportunity of observing the conditions in the yard. The conditions have been the reverse of congenial. I attribute this chiefly to the attitude of the foremen towards the men. We do not have trouble with all the foremen. Mr. De Rosa is the foreman whom I have personally had the most trouble with. I have also had numerous differences and arguments with Mr. Sweeney. I have got along quite all right with Mr. Robertson and Mr. Webber, the other foremen. My chief trouble with Mr. De Rosa is his attitude towards the men. He nags, grizzles, and grumbles from the beginning to the end of the shift. Mr. Sweeney is a totally different class of man. We have a good old row and a bit of a "bust up," and we think no more about it afterwards, and we forget it. I have not much complaint about Mr. Sweeney. I consider that Mr. De Rosa is temperamentally unfitted for the position he holds. He cannot help himself. When I say he "nags" I mean to say that on numerous occasions when there are small jobs of no particular urgency requiring to be done the shunter will give an idea of the time when he will be able to do such work without any inconvenience to his other work, and about ten minutes afterwards Mr. De Rosa will come along and ask if the work is done, and from then on the shunters will meet him at intervals, and the foreman will harp on the particular little job until it is finished. Probably his idea is that he has not confidence in his men to do the work. These incidents happen regularly. Frequently De Rosa will follow the men round, and he will nag and grumble and follow the men round like a ghost. He was at one time christened "The Ghost" because he was always haunting the men like a shadow. I knew Shunter Carmichael well. All the time I knew Carmichael intimately he was working under me, and it was me that got the worrying from the foremen. Carmichael was a willing worker and never resented me telling him to do his work. The whole of Carmichael's trouble was that he was too anxious to do his best. I do not think he was quarrelsome. I think that if he were let alone while working he would have done better. The senior foreman is Mr. Shinkwin in the goods-shed. He compiles the duty-sheets. He allocates the men in the shunting-yard for the other foremen to work with. He claims the prior right of the engine for any requirements of the goods-shed. If he wants any work done in the goods-shed he will instruct the shunter to go and get the engine and tell them to leave the work they are at and do the work at the goods-shed. There is dual control. When the work is busy in the yard, Mr. De Rosa is worse. When the work is heavy he wants everything done at once, and that leads to difficulty. The Palmerston North yard is capable of a tremendous amount of improvement. It follows generally that all improvements will be to the mutual interests of the men and the Department. In the first place, we require more room to relieve the congestion. That is the most pressing need. There is ample space available for an extension of the yard. This would obviate an enormous amount of double handling of wagons, and enable the work to be performed more expeditiously, and at a station like Palmerston North, where there is so much connecting trains, time is a more important factor than at terminal stations. We also require more lights, better drainage, and better supply of hand-lamps. At the north end we want more clearance between the shunting-leg and the adjoining road. We also want less interference with the work. We want the points-levers painted white. I have mentioned the matter to the foremen several times. I think that if these things were carried out matters would be very much improved. We do not know what it is to have a train coming in that is properly marshalled. I think Palmerston North is the dump of the northern portion of the North Island. If any improvements are to be made in the marshalling of trains it would be necessary to start a long way back. There should be some sort of system universally to start with the train and be worked right through.

This matter was taken up rather seriously three years ago by the present Stationmaster. Other stations were insisting on Palmerston North carrying out the instruction *re* the marshalling of trains, but were not doing anything for trains coming into Palmerston North from Marton and Woodville Stations stated that they could not carry out the instructions *re* marshalling, and the matter finally lapsed, and the marshalling of trains has gone back to what it was previously. It is no uncommon thing to get a train of forty wagons and find not more than two together in any one place for the same destination. I agree with the lighting arrangements suggested by the other shunters with the exception that the additional lights south of Cook Street should be carried a chain and a half further south near No. 9 interlocking-points. I think an additional light should be placed at the end of the road-side siding at the south end of the siding at the north end of the yard, and it should be fixed to a high post. This light will probably need screening at the north end to prevent interfering with the home signals on the Napier line. I think that some alteration should be made in the coaling arrangements at the south end. I suggest that the practice of coaling engines at the cattle-yards should be abolished altogether. This constitutes an interference to the men shunting, and causes danger to shunting operations at night-time and an interference to the work in the daytime owing to train engines having to use the shunting-leg to get to the train. Under existing conditions I think there is not sufficient time allowed for the making-up of some of the trains. This refers more particularly to No. 590 in the evening. An extension of the yard, which was previously suggested, would allow the shunter more room to separate the goods which he requires from the goods which he did not require, and that would in a measure overcome the difficulty, and the earlier arrival of No. 620 would also assist in this connection. The bulk of the loads for No. 590 arrive by No. 925 from Woodville and No. 620 from Wellington. By this time the yard is usually fairly full, and we have no room to separate perishable from non-perishable wagons. No. 925 arrives at 3.20 p.m. and is shunted by the south-end gang and goods for north transferred to the north, which operation naturally takes some time. No. 620 arrives at 3.35 p.m., is very frequently late, and the wagons off these two trains have to be marshalled for the train to depart at 4.22 p.m. There is insufficient platform accommodation, which causes frequent delay to No. 912, and we frequently have the train made up in the yard waiting for the "Limited" to arrive, and then No. 912 is late away. The same thing applies with No. 584. The train will be made up in the yard waiting for the departure of No. 922 at 11.54, after which a 300-ton train has to be shifted from the yard to the dock, brakes tested, and depart at 12.10 p.m.

To Mr. Carnachan: I have been in Palmerston North for about five years. The feeling at that time—five years ago—between the men and Mr. Robertson was very good. As regards the feeling between the men and Mr. Sweeney there was a great deal of friction. At the present time there is a much better state of feeling between Mr. Sweeney and myself, but the feeling between Mr. Sweeney and some of the men is as bad as ever it was. I have interviewed the Stationmaster several times regarding staff matters at Palmerston North. At first I was always satisfied with the treatment I received. Several matters were adjusted locally as the result of these interviews. I am the senior man in my gang. I receive a copy of instructions each shift from the Transport, and that maps out the work for a period of time during the day. If extra work was required which was not on the transport list the senior man of the gang would be instructed to perform that particular work by the foreman. I would not consider that I was being harassed by being asked to do something that was out of the ordinary routine work. I would say that Mr. De Rosa is over-anxious to get the work through. In busy days there is a lot of extra work in the yard, and under these conditions I would receive a lot of extra instructions—probably one every half-hour. I would not consider that the foreman was harassing me by issuing those extra instructions on a busy day.

To the Board: I do not think that the Shed Foreman should have the right to give orders to the shunters direct. If the Yard Foreman has given the shunters instructions, then I think that that work should have prior right over the orders of the Shed Foreman. We want the Yard Foreman to be the boss of the yard. I will give an instance showing the way in which the dual control of the yard works. About five weeks ago I had a special to make up for Marton in addition to the ordinary work. Twice during the ordinary shunting operations, acting under instructions from the Shed Foreman, I left the work to place particular wagons for individual consignees. In consequence of this delay to the work when the engine of the special came up the yard the train was not made up. Foreman De Rosa told me, when I explained the position regarding this train, not to put any more on but let the special get away. Half an hour afterwards he found that there was a wagon which we had previously been instructed to send had not been sent, and later on I was asked to explain why this wagon had not been sent. I explained the position and detailed the extra work which was required that morning, but although I have not heard anything more I fully expect in the future that should anything serious happen in this respect this matter will be brought up against me. This is an instance where the work in the yard and the despatch of trains was delayed carrying out specific instructions from the Shed Foreman, who has no responsibility or connection whatever in that direction.

To Mr. Mack: The foremen themselves have had one or two little rows over the business of what I call dual control. They have differences of opinion which lead to rows as to who should have the use of an engine. Quite recently the Stationmaster was brought out to act as mediator between the two. Mr. De Rosa's over-anxiety to get the trains away is more of a hindrance than a help to the shunters in their work. In my opinion, I think it would be decidedly better if he would let the men alone in this connection.

To the Board: I would consider it quite warrantable for the Department to spend, say, £10,000 or £12,000 on the suggested improvements to the present yard, even though it may be possible that the new yard might be built within, say, three years. I am aware that surveyors are at present

engaged on the work in connection with the new station. I am aware that the Borough Council objected to the closing of Cook Street—that is, I have heard so, but I do not know that from my own knowledge. I would stress the danger that exists in connection with shunting operations over Cook Street. Owing to all the shunting at the south end having to be done uphill wagons require to be kicked fairly hard, and it is not possible to carry out the work without kicking detached wagons across the street, and I would suggest, if the street cannot be closed, that a crossing-keeper be appointed. There are eight tracks crossing this street, two of them regularly used for shunting. The traffic on this road is very mixed—there is a great deal of heavy horse traffic and a lot of motor traffic. There have been numerous very narrow escapes from accident. The public use the overhead bridge only when the road is blocked with a rake of wagons. I suggest that, as there are two lock-bars controlling one set of points, the second lock-bar should be disconnected in order to facilitate shunting, as it means pulling 50 yards further than is necessary. The same thing applies when shunting off the loop at the north end. There is two lock-bars controlling one pair of points and the shunting-disc. I would suggest that the loop shunting-disc should be operated independent of the lock-bar controlling the crossover from the Napier to the Wanganui main line. I consider there are too many inexperienced men at present stationed at Palmerston North. Insufficient time is allowed them to become conversant with the routine of the yard and acquire a general knowledge of shunting duties. This imposes a great deal of extra work upon the senior shunter, as well as increasing his anxiety regarding the work. At the present time there is only one gang in the yard containing two experienced men.

To Mr. Mack: In addition it is a fact that every gang at Palmerston North has a porter running as third man, and in one gang there are two porters. To-morrow night there will be one gang—the late shift gang—which will comprise as shunter in charge a man who has only just received his appointment as a shunter, his second man will be a porter who has only had about three week's experience as third man, although he has for some time acted as pilotman, and the third man will be a man who has only done four weeks in the yard, and he is a porter. This is the heaviest shift of the five, and six hours out of the eight are worked in darkness. I think that it is not fair for a gang under these circumstances to be expected to get through the work in a yard like Palmerston North. A shunter's anxiety regarding the other men in the gang considerably increases the personal risk to himself. I know of no attempt to train the men at Palmerston North as shunters—they are sent out as spare men in the shunting-gangs, and the time as spare varies. These are extra men—fourth men—and it largely depends upon the men who are available whether they are given a good time or not training. It is not possible for the shunter in charge to give any personal supervision or instruction. That instruction is generally given by the third man, and it is a case generally of the blind leading the blind. The work would be facilitated if there were three classified shunters in a gang. It would largely depend on the individual as to what time he should be given to learn the shunting-work in a yard. On an average I should think about two months should be given him, and he should be the fourth man in a gang of three classified shunters.

To the Board: There have been numerous transfers and some promotions, and this has resulted in the personnel of the yard being depleted of experienced shunters. It is usually the most experienced man who is transferred away. On the wharves you will find all the frogs and heels of switches filled up with timber or asphalt to such a distance as will prevent a horse getting its foot jammed in the points, but in a yard where human beings are concerned no such provision is made.

THIRD DAY.—PALMERSTON NORTH.—21ST AUGUST, 1925.

CHARLES JOHN DUNBAR SKINNER sworn saith.

To the Board: At present I am employed by the Wanganui Education Board as Attendance Officer. In the past I have had about eight years' shunting experience in Wellington. I finished up in that yard in 1896. Since then I was employed by the Natal Government Railways in South Africa. I started there as a shunter, and in about six months I was promoted to foreman in charge of a shunting-yard at Port Durban, which is one of the largest shunting-yards in the Southern Hemisphere. The yard is something like four miles in extent. At the time I held this position everything was imported to South Africa, and to make matters worse there was a mealie famine in the land, and all meal and meat and other foodstuffs had to be imported. This port at Durban is also a great coaling-port, and some thousands of tons of coal is shipped every day. To give an idea of the shunting operations at this place I will mention that all the imported goods was handled by the railways there. Shunting in New Zealand is child's play compared to South Africa. In South Africa we have for coupling purposes three different classes of links. A Transvaal truck has different coupling-links to that of a Natal wagon, and to couple up one of each a compound link is used. The shunting staff on an engine in Natal consists of one white man and two niggers or two Indian coolies. These Kaffir and coolie assistants do the majority of the running about in connection with changing links. Links are kept in link-racks in different parts of the yard, and also a supply of links is kept on the engine. The Kaffirs or coolies do the fetching and carrying of these links if they are required in any operation. The continuous brake in South Africa is called the simple vacuum system. When a train arrives at a station each wagon has to be bled before the shunting operation for the train commences. Check-rails are used at all crossings, sharp curves, and on the wharves. The coolies and niggers shunt without boots. In some cases the shunters caught the heel of their boot in the check-rail, so we instituted what was called a "spring side boot," which was an elastic-side boot. The Natal yards are of the worst nature for shunting purposes. At The Point at Durban

thousands of tons of coal are stored, and this coal has to be marshalled for the various mines. At Durban Point all the sidings are dead-end sidings. There must be, roughly, twenty or more such sidings. Unless we received instructions to the contrary, we would use the coal or lift the coal as we came to it. The trucks are marshalled before they are placed in the siding. Occasionally it is necessary to shunt out coal which has been standing in the trucks for a considerable time, and this entails considerable shunting operations. A few fingers and a few hands were crushed by the buffers during shunting operations, and during the time I was at Durban there was only one fatal accident, and that was where a man had his head crushed by an overhanging girder. That was the only fatal accident while I was there. That was eight years ago. Natal is a semi-tropical country, and the rain is very heavy there at times. All the white shunters are supplied with short waterproof overalls to guard against the weather. They are not supplied with the long coats which I have seen worn in New Zealand. When I was shunting in New Zealand we used to provide our own overalls and overcoats. I was at Durban Point during the Boer War prior to 1900. The difficulty then was to get sufficient white men to shunt in the shunting-gangs. We solved the problem by getting lots of sailors who had run away from their ships, and these sailors were put into the shunting-gangs. These sailors had no previous experience, and splendid shunters they made. We were not free from accident. The chief cause of accident there was running through points when setting back. Special ramps were kept for placing derailed vehicles on. I always found that derailed vehicles went on the opposite way to which they went off, and we did not have very much difficulty in that connection. Shunting in New Zealand perhaps should be taken a little more seriously, inasmuch that the whole gang to start with is composed of all white men, whereas in South Africa if a nigger got killed it did not cut much ice, as there was plenty of them. There was never any inquests over a dead nigger—they just gathered up the remains and had them buried. With ten thousand niggers working at The Point some idea will be gained as to how many accidents would take place in a month. In 1906 the present Palmerston North yard was more convenient than the Durban Point yard, and wagon traffic could be handled more expeditiously at Palmerston North than at Durban. Shunting-yards should be constructed with gravitation towards the centre of the yard, and then the shunting is done practically by gravitation. When I was put in charge of an engine at Wellington I had to undergo a test. The examiner was fairly severe—I was then well under twenty-five years of age—and I suppose I was as fit a man as there was in the country. The test comprised of three wagons which had to be fly-shunted or slipped and put into three different roads. I did this successfully, and I was promoted to the position of shunter. In those days the engine staff or gang consisted of myself—I had no assistants. Therefore I came to the conclusion that before a man is put in charge of a shunting-engine—especially where white men are in the gang—he should pass some fair test. Then there is the class of engine used for shunting. I would not care to shunt with some I have seen in this country. I have seen engines in this country with only one cow-catcher. It is very essential that a cow-catcher should be provided on both ends of the engine, and that a broad foot-rest should be provided also. In the olden days the L-type engine was well adapted for shunting purposes. A handrail should be provided on these engines. In South Africa they had Fairlie double-funnelled engines built by some Scotch firm. They also had another class of engine built by some Dubbs firm. These engines carried sufficient coal for use during the day. When I said that shunting in New Zealand was child's play compared to South Africa I mean that the yards at, say, Durban are obsolete as compared to New Zealand. With the different classes of links the work is made harder in having to send to the depots for links which might be wanted in different shunting operations. The niggers do this work. The heat is very intense in Durban. When I say that during the Boer War sailors were used at Durban for shunting and they made excellent shunters, I would add that sailors have plenty of gumption and are able to adapt themselves to the work. At The Point at Durban—take the coal-engine: it puts down to the ship some 6,000 tons of coal in a day. This particular shunter at The Point was a sailor, and when a train-load of coal came to The Point it may have contained ten or twelve different mines' coal. This had to be all split up and marshalled into the different sidings, and as all this coal was stored in dead ends it had to be slipped out of the dead end, and I have seen this particular shunter slip nearly 1,000 tons gross in one operation. I have done this myself often. This was not by gravitation. I used to ride in front of the operation and throw coal at any Kaffirs who might be in the road. The shunt would often go through large numbers of nigger workers in the yard. General merchandise had to be marshalled at The Point before it was sent to Durban. At The Point the goods-marshalling yard was all dead ends. The class of wagon used on the Transvaal railways was a four-wheeler carrying 10 tons. In Natal they also had a double-bogie iron or steel truck, and these two classes comprised most of the wagon stock. They had then 46 ft. wagons carrying 40 tons net. We did take risks in South Africa. We were supposed to tail-rope many movements, but we did not. This would cause train-delays. I have had casual observations of the shunting-work in a busy yard. I cannot speak of the present-day conditions in a shunting-yard as I can of the time when I was working on the New Zealand railways. At Feilding I have seen a shunting movement crossing Kimbolton Road Crossing while a mail-train was coming in. This is dangerous to the public.

JAMES JOSEPH CUNNEEN sworn saith.

To Mr. Mack: I am a shunter employed at Palmerston North. I have been at Palmerston North nearly seven years. I have been shunting nearly five and a half years of that time. I did not have any previous training in shunting before I came to the Palmerston North yard. I was shunting for four and a half years as porter. I was for a time relieving what they call the fourth man, and I went to third man, and now I am in charge of an engine. I consider the yard at

Palmerston North is very much congested. The working-conditions apart from the congestion is not what I would call congenial. I would attribute that to the foremen's attitude towards the men. I would mention Foreman Sweeney in particular. I have not come much in contact with Foreman De Rosa since I have had charge of an engine. I have worked under Foreman Robertson, and I got along with him A 1. I have worked under Foreman Webber and got along with him just the same. I did not work under Foreman Hiskins. I have not had any difficulty with any of the acting-foremen. The difficulty I have had is solely with Mr. Sweeney. The trouble with Mr. Sweeney has occurred from the first day I came into the Palmerston North yard until the last. Foreman Sweeney has asked me to lift brakes on wagons which were being pulled out by engines sometimes at excessive speed and other times not. I did not refuse to do the lifting, but sometimes I did not lift the brakes because I regarded my life more valuable than the brake. On two or three occasions I have had what might be called very serious rows with Mr. Sweeney. Mr. Sweeney made an attempt at one time to fight me. I just stood waiting for him, but he must have changed his mind because it did not come to anything. He has brought the Stationmaster to me, as he considered that I had insulted him and used obscene language. The Stationmaster took me into the Yard Foreman's office, and Foreman Sweeney and Foreman Shinkwin were there in addition to himself. The Stationmaster stated that Mr. Sweeney had made a charge against me, and he wanted me to give him a fair hearing, and he (the Stationmaster) would see that I had a fair hearing. Mr. Sweeney gave his version of what took place, and then the Stationmaster, before I gave my statement, said, "If I can prove this statement of Foreman Sweeney regarding you, you won't be suspended, but out you will go." The Stationmaster then asked me my version of the matter, and I stated that it was untrue, and after a little further conversation he said it appeared to him that there was something in the matter, and he told me to go back to work, and if he heard any more of it I would not have another chance. I was running second man to Shunter Lambarth at the time the incident occurred, and at the time Foreman Sweeney threatened to fight me Shunter Lambarth was present. The Stationmaster questioned Shunter Lambarth in my presence. Lambarth corroborated what I had said in regard to the incident. Lambarth was not in the office at the time I made my statement. I was taken in by myself in the presence of the other two foremen, and subsequently Shunter Lambarth was interviewed in the yard after we had finished in the foreman's office, and Lambarth did not know when he made his statement what I had said. I knew the late Shunter Carmichael well. He was running third man in the gang that I was running second in when Carmichael first came to Palmerston North. Shortly after that—he being senior to me—he was placed second man in the gang, and I had to run third, although he had not had as much experience by half as I had. When the late Shunter Carmichael was running third man he was a good man at his work. He was only too pleased to be told what to do. He did not resent me—the junior man—giving him directions. It made no difference. I think at all times he endeavoured to do his duty conscientiously and as well as he was capable. I did not at any time see any of the foremen harassing Carmichael. I was working on the north end while he was working at the south end, or else I would take over from him or he would take over from me, and consequently I would not see whether he was harassed or not. I think that Foreman Sweeney's attitude towards the men is a hindrance instead of a help. Foreman Sweeney hardly ever gives me instructions: he generally gives them to a junior man to hand on to me, or else he verbally instructs the junior man. There is not a good and sufficient supply of hand-lamps at Palmerston North. The yard is not drained as well as it might be. It could be very much improved. It would help and reduce the risk if all the points were boxed in and the frogs filled up so that shunters would not get their feet caught. I think that better lighting is required in the yard. From what I can see the trains which arrive at Palmerston North are not even attempted to be grouped. If there is only four or five wagons on a train they are reasonably marshalled. The average length of trains coming into Palmerston North would be about thirty to thirty-five total. There is no attempt, as far as I can see, to have these trains grouped. If some extra roads were put in it would facilitate shunting a lot. There is ample room at Palmerston North for such extension, and that would be of very great benefit in shunting operations. If the foreman would leave the men alone and these things that I have suggested were carried out, and men given more training, the working-conditions of the yard would be greatly improved. The efficiency of shunting-gangs has been materially reduced through transfers and promotions. During the last twelve months the efficiency has gone back through the transfer of experienced men and untrained men taking their places. In nearly all cases the men who have been transferred have been transferred on promotion.

To Mr. Carnachan: At the time I was fourth man in the gang I was placed there for training purposes. There is still a fourth man in one of the gangs. He is placed there to gain some practical knowledge of shunting-work. Foreman Sweeney has had occasion to report me for coming late on duty. He reported me once to my knowledge. I have worked under Foreman Webber on several occasions in the yard. Foreman Webber usually relieved other foremen for short periods, and it was on these occasions that I would come under his jurisdiction. When I was asked to lift brakes on wagons by Foreman Sweeney I would say the speed of the wagons would be just fast enough to get off without getting on the brakes. If the brakes are clipped it would be necessary to get on the brakes to put a certain amount of weight in the operation to release the brake. I cannot remember the date Mr. Sweeney accused me of using obscene language towards him. It was not so long ago. Notes were taken at the time. I would say, roughly, about twelve months ago. I remember the late Shunter Carmichael being placed as third man in the gang I was in. That was shortly after he came to Palmerston North. He had a little experience previous to coming into the gang, but he was quite capable of filling the third man's position. He had previous experience in Palmerston

North yard before going into this particular gang. I did not come in contact with Carmichael when he first came to Palmerston North, and I could not say whether he was an incompetent shunter when he first came to Palmerston North. Towards the latter part of his time I did not consider him competent to take charge of an engine in the yard. I am not aware that the late Shunter Carmichael had 313 days' shunting experience in the Dunedin yard prior to coming to Palmerston North. It is not for me to say whether there are any competent shunters in the Palmerston North yard. I have a hand-lamp at present which is in good working-order at my own expense. I always take a pride in my hand-lamp — there is no one who uses it excepting myself — and I keep it in good working-order. If the lamp was out of order the Department would repair it for me after some considerable delay. The lamp is the ordinary oil-lamp. I would not be able to shunt without a hand-lamp, but oftentimes the Department could not supply me with one to go on with. I have made applications for lamps to the Coaching Foreman and Yard Foreman on such occasions. There are not very many trains arriving at Palmerston North with only four or five wagons attached. There might be one or two during the day. I do not remember any occasion when Foreman Sweeney had to remove me from the yard. I have never been out of the yard except for holidays and sickness. I was never removed from the railway premises by Foreman Sweeney. Foreman Sweeney brought the police to remove another shunter and myself on one occasion. I cannot remember the date.

To Mr. Mack: It is necessary to lift the brake when it is not pinned down as well as when it is pinned down. If the brake is pinned down and the wagon skidding, then it is necessary to lift the brake. I would not risk my life to lift a brake on a moving wagon which was going at a good speed. I would lift a brake on a wagon at a slow speed, but I would not risk my life in the operation. When a shunter takes his hand-lamp to be repaired they usually cannot replace it. If they have a replacement it generally is an old-type lamp which cannot be used. When a lamp is damaged it is handed to the foreman, and I think he hands it to the lamp-man to be consigned to the workshops at sometimes East Town or other place. I prefer to get the lamp mended at my own expense rather than have a delay. When Foreman Sweeney brought the police to remove myself and another shunter from the yard the circumstances were that on a previous night we had worked an hour overtime and the next night an hour short. We were booked on till midnight on the night following that on which we worked an hour overtime, and Foreman Sweeney wanted to book us off to equalize the time we had worked the night before. We said we did not reckon it was a fair thing because we had slogged at our work and our extra effort was being used against us. With that he said, "If you are not off in five minutes I will put you off." Of course, we said, "We will wait." He then went for the police, and when a policeman arrived he introduced him to both of us, and told the policeman that he had ordered both of us off duty and he wanted the policeman's assistance to put us off. The policeman said, "Well, what have they done?" The policeman said, "They have not stolen anything, they have not killed anybody, and I cannot order the men off the premises." He said that he thought we would be wise to go, all the same. On this occasion Foreman Sweeney ordered us off, and because we would not go off he went for the police. I did not hear any more about the incident. I do not know whether the Stationmaster knew about it. I think that this was a departmental matter and not a police matter, and was uncalled-for. This matter describes one incident of Foreman Sweeney's attitude towards the men.

To the Board: The lamps used for replacements are in bad repair and have no triggers. I have never sent any lamps to the shops. I cannot say whether there was any tail-roping done in the gang while the late Shunter Carmichael was working with me in the gang. About five weeks ago I had two men placed in my gang as second and third men who had only done about a fortnight or three weeks in the yard previous to that, and one of them came from a tablet station and was placed second man in my gang. The other had no experience in the yard at night, as far as I can remember. This would probably come about through the transfers. I have inexperienced second and third men ever since—that is, during the last five weeks. There have been occasions when a man was nicely broken in and was then transferred to another station. I consider that men who have been in Palmerston North all the time and know the routine are fit and capable men to take the job in the shunting-yard.

HERBERT PRESTON ATKINSON sworn saith.

To Mr. Mack: I am a shunter stationed at Palmerston North. I have been at Palmerston North six years this coming October. I have been all of that time, with the exception of six months, in the shunting-yard. When I was first placed in the yard I had one week as fourth man in the gang at the north end and one week as pilot taking the engines to and from the engine-shed to give me experience. I then went as third man in the shunting-gang at the south end. That is the end where I had had no previous experience. It is a fact that three or four days after taking up the duty as third man at the south-end gang I narrowly escaped being killed. It is a fact that on account of the shock I received on this occasion that I asked the then Stationmaster Mr. Morgan to take me off the job. I told him that I did not think that I had the necessary experience or the confidence necessary for shunting at that time. The Stationmaster met me very courteously, and we had quite a talk—I do not know whether it was bluff or not—but he told me the Department were taking exception to men turning down shunting-work, and he did not put it into words, but I understood that by inference my services would not be required further if I did not follow up shunting duties. He asked me to consider the matter, and I went back into the yard. It is true that shortly afterwards another accident was narrowly averted. Mr. Morgan himself stopped the wagons from which I had fallen. I again appealed to be shifted from the shunting-gang, and he said that a strong young fellow like myself would soon gain confidence and experience. He urged me to give the work a further trial, and I did.

A short time after that I was put on pilot duties, which is lighter work. Since I got into my stride I am getting on fairly well. I am not in charge of an engine now. I am second man in a shunting-gang. I was classed as a shunter from the second of the present month. The relations between the shunters and the foremen in the yard are not all that might be desired. Personally I have not been worried at my work, but I have observed the foremen worrying the other men. Mainly the man in charge of each gang gets the brunt of such worrying. I have taken notice of Mr. Sweeney in this regard, but I cannot say that I have noticed anything of Mr. De Rosa. I think Mr. Robertson is quite a good man to work under. Mr. Webber is also a good man to work under. I am sure that if Mr. Sweeney was a little less aggressive and less harassing things would get along better. The yard gets very wet in wet weather. Water lies about, and the men get wet feet. This does not tend to help the men in their work. I agree with the view that with the provision of better lighting, extra roads, a better supply of hand-lamps, and the drainage attended to, would make the working-conditions much better, and would be in the interests of both the Department and the men.

To Mr. Carnachan: The work is heaviest at the south end. When I first commenced duty in the shunting-yard I was acting as pilot. These duties consisted of bringing engines from loco. at stated periods, and occasionally picking loads out of the yard and placing engine and loads on the train. I have had five and a half years' shunting experience at Palmerston North. At present I am acting as second man. I am not yet in charge of a gang. I do not consider that the proper method of training a shunter had been adopted in my case. I consider that Mr. Sweeney's attitude towards the men takes the form of undue bullying, which I do not consider is required at all times. There are small instances which I cannot recollect in which Mr. Sweeney has bullied me personally.

To Mr. Mack: I do not consider that I had sufficient training before I went into the yard as a shunter. I told Mr. Morgan, the then Stationmaster, that I had not sufficient training, and that I was not competent. My experience of pilot consisted of occasionally picking up a straight lift and coupling up.

The Board adjourned at 3 p.m. on the 21st August and resumed on the 2nd September, 1925, at 4 p.m.

HERCULES HAROLD ONSLOW SHIRLEY sworn saith.

To Mr. Mack: I am a shunter employed at Palmerston North. I have been stationed at Palmerston North for about five years. I have been a shunter all of that time. I was not a qualified shunter when I came to Palmerston North. I was sent to Palmerston North on my appointment as shunter. I had no previous experience as a shunter. I came from Patea. On my arrival from Patea I was running as spare man for about a fortnight. Nobody gave me any special instructions regarding the work. I was left to pick up the work in the yard. After two weeks as spare man I was put in as third man. I am not now attached to any gang. I am what is known as a main-line shunter attending to main-line trains. Prior to being put on as main-line shunter I was in charge of a gang. When I was in charge of a gang Mr. Robertson and Mr. Sweeney were the foremen. We had no trouble with Mr. Robertson at all. Mr. Sweeney was always up against us. He was always biting and barking at the shunters for no reason whatever. It was just the mood that he was in. I cannot say that at any time I had any very serious difficulties with him. He worried me at my work. I think that his worrying attitude interfered with the work. I think the work would have got along better had he not interfered. Mr. Robertson did not interfere with us, and the work got along better in consequence. Foreman Sweeney treated practically all the men the same. During the time I was working with him I have never known of him giving anybody instructions how to use the tail-rope. I have seen him use the tail-rope. I remember seeing him on one occasion try to pull on an "AB" engine, which was off the road, with a tail-rope. The engine weighed about 70 tons, and the tail-rope, I think, would stand the strain of about 5 tons dead-weight. The tail-rope broke. I could not say how he adjusted the tail-rope on that occasion. I have worked under Foreman De Rosa, but not as a shunter in charge of an engine. When I worked under him he was always trying to bustle me, although I was not in charge of an engine. When I say he bustled me I mean that he would give an order and say that he wanted such-and-such a job done, and he wanted it done at once, and then he would worry me until he got it done. As a shunter in charge of an engine I did not resent any of the foremen giving me legitimate orders. I knew the late Shunter Carmichael. I worked with him as second man in a shunting-gang in which I had charge. I found Carmichael very willing and conscientious. I did not find it necessary to chase him to do his work. I have at times seen one of the foremen worrying Carmichael. I refer to Mr. De Rosa. I think Mr. De Rosa worried him unnecessarily. I have never heard Carmichael speak of the worrying by Mr. De Rosa or any other of the foremen. Mr. Shinkwin is the senior foreman in the yard. Mr. Shinkwin makes out the duty-sheet for the shunters. He does not take his turn in the yard in charge of the shunters. Mr. Shinkwin makes out the orders, and the shunters come under the control of Mr. Sweeney, Mr. De Rosa, and also Mr. Shinkwin. Mr. Shinkwin comes out of the goods-shed, where he is foreman, and gives orders. Although he is in charge of the goods-shed he comes out and gives instructions to the shunters although Mr. Sweeney and Mr. De Rosa may be on at the same time. This interferes with the work of the yard to a certain extent. I have seen the work of a shunter being held up because he did not know which foreman to obey. There is a sort of dual control so far as the shunting-yard is concerned. In wet weather the yard gets wet and sloppy. The water does not get away quickly and gets into the shunter's boots. This applies more particularly to the space round the points-levers. The yard

is bad also. I do not think there is sufficient accommodation for the work that passes through the yard. I think that if some extra roads were supplied it would ease the work of the shunters here. I think the work of the yard would go along better if there was less worrying by the foremen. I think there would be less dissatisfaction. I agree with the suggestion that more lighting would improve conditions in the yard and make shunting less dangerous. Having seen the plan of the yard, I agree generally with the suggestions of the other shunters regarding the situations of the other lights. In addition to these lights I would suggest that it would be in the interests of the Department to have some lighting on the back road where goods are stored at night. I also think the light at or about the corner of the Car and Wagon Inspector's shed should be shifted to over the facing-points. I have known occasions when the dual control of the yard has caused difficulty between the foremen themselves. I remember on one occasion Mr. Sweeney wanted the shunters to clear the main line and Mr. Shinkwin wanted the shunters to put some wagons in the shed. Work was suspended for a while, and eventually Mr. Sweeney won. I mean that Mr. Sweeney got his own way. I have never known Mr. Sweeney to ask any one to do anything which was unduly risky to their lives.

To Mr. Carnachan: When I first came to Palmerston North I went into a shunting-gang as spare man. The duties comprised coupling up wagons and doing up hose-bags, catching brakes, and all this work would be done under the supervision of the shunter in charge of the gang. I do not consider that this was a course of instruction in shunting. I was not watching other men working. I was engaged in catching brakes, coupling up, and doing hose-bags up. The other shunters were employed in kicking off wagons and putting down the brakes. I would ask the shunters if I did not understand the work, but they were too busy at this time. There would also be a foreman in the yard to whom I could apply for any instruction or information in this connection. When I said that Foreman Sweeney was always barking and biting at me I would say that when he asks me to do anything he waves his book at me as if he was going to hit me—he yells and shouts at me. I have had no serious difficulty with Foreman Sweeney beyond his manner. I was not in the gang when Mr. Sweeney put the tail-rope on the AB engine as described previously in this evidence. Mr. Sweeney was in charge of the work. When an engine is derailed in the yard the foreman in charge directs operations of rerailing. If Mr. Sweeney is about he takes charge. It is not a fact that the loco. would be in charge. I do not argue with the foreman over orders if the orders are within reason. I am unable to say definitely how long I worked under Foreman Robertson: it was when he was in charge of the yard. I have been senior man in charge of a gang at Palmerston North. I would have usually three men in a gang. The second and third men would take their orders from me. I would take my orders from the foreman. I would not consider this dual control. On an average of once or twice a day Mr. Shinkwin would come out and give the shunters orders. If we were busy it would be more frequent. Orders given by him would be in connection with urgent shed loads. I have relieved in the Frankton Junction yard for three months. There was more work to do at Frankton Junction, but they had more engines to do it with. As far as shunting goes I would sooner shunt at Palmerston North.

To Mr. Mack: During the two weeks when I was running as fourth man the shunter in charge did not allow me to cut off when they were slipping. He did not allow me to manipulate the points when they were slipping. I did not during that time see anybody use a tail-rope. I do not think it is possible for any man to become proficient in a gang at Palmerston North with two weeks experience such as I had. When I had charge of a gang the other members were not all classified shunters. I had two porters with myself. I did not, as far as I can remember, have three shunters at any stage. Whilst I said that I would sooner shunt at Palmerston North than Frankton Junction, I work quite as hard at Palmerston North as I did at Frankton Junction. I would not have the same worry at Frankton Junction as I would have at Palmerston North. The harder work at Frankton Junction was lightened in some respect as compared with Palmerston North on account of the attitude of the foremen at Frankton Junction. We did not see much of the foremen at Frankton Jnnction. They did not worry us much. They would never come pestering round the men. I have not worked as a shunter under any other foremen. Palmerston North is the only place where I have had foremen harassing me.

To the Board: The third man in the gang is brakesman, pointsman, and assists in coupling up, &c. When I was spare man I would be assisting the third man in a certain respect. Most porters get a bit of knowledge coupling-up before they are put out on shunting-work. I consider that as a spare man I was learning nothing in the way of coupling up and fixing hoses, &c. I relieved at Frankton Junction for about three weeks; about eighteen months after I was transferred to Palmerston North. When Mr. Shinkwin gives orders they refer principally to shed orders for putting in loads. The porters I had under me in a shunting-gang were experienced porters. I think that men should be trained as shunters under the supervision of some competent shunter in the yard. When a man gets his appointment he is placed as fourth man catching brakes, &c., and when he is placed splitting wagons he is useless. Sufficient time should be given for a man to get to know the run of the yard. In my duties as main-line shunter I am attached to a gang for eight hours in one week coupling up wagons, attending to brakes, and coupling up dummies. This may be to fill in the time up to the weekly hours. The gangs are chopped and changed about every month or so. These were caused by transfers and holidays. The changes in the gangs were pretty frequent when I was in the yard. This is very unsatisfactory, as it stands to reason that the work suffers when one man who is trained to the work is transferred away shortly afterwards. I think that a small horizontal grip on the opposite side to the present handrail on trucks would be of assistance to shunters. I think a brake (hand) on each end of wagon would be of advantage and would prevent a certain amount of damage to rolling-stock. This would be of great advantage to the shunters. Seeing that shunters are required to work in all weathers, I think the Department should compensate shunters for boot-wear, and I also think that the Department should issue suitable waterproof clothing. The shunters' hours in the summer-time at the

south end of this yard (late shift) are too long. They start from 3 p.m. and have been known to work to 3 a.m. This is too long. Seven hours is enough for shunters in the summer. I consider that seven hours as a shunter is as arduous and is harder than eight hours as a porter. There is not a great deal of tail-roping done in Palmerston North yard. The usual method of fixing the rope is to the side of the wagon. When Shunter Carmichael was shunting second man to me he would have seen tail-roping done, as I have used it that way. I cannot think of any improvements on the tail-rope for the work it is used for. If we had a better graded yard we would not need to use a tail-rope. I consider that a spare man attached to a gang for learning shunting-work could be placed as third man in the gang after he has learnt the work in the yard as fourth or spare man, and then after getting some experience as third man he could be placed as an additional second man in the gang to learn the work of second man, provided the other second man is an experienced shunter. I would like to draw the Board's attention to Cook Street. It is only the alertness of the shunters and watchfulness of the shunters which saves many accidents at this crossing. There is too much responsibility put on to a shunter at this crossing. He has got to look after his own life, as he is shunting between two roads the majority of the time. He also has to watch where his wagons are going and watch the road traffic as well. I consider that a crossing-keeper should be put there in the daytime and the road closed at night. I think the carding of wagons on both sides close to where the number is would be of great assistance to shunters. I consider that in shunting-yards all switches should be 10 ft. switches. I consider there should be three shunting-gangs at the south end of the yard in the summer-time.

PALMERSTON NORTH.—3RD SEPTEMBER, 1925.

WILLIAM JOHN GILLESPIE sworn saith.

To Mr. Mack: I am a shunter employed at Wellington. I was formerly employed at Palmerston North. I left Palmerston North about seven or eight weeks ago. I was employed as a shunter at Palmerston North for about fourteen or fifteen months. I was appointed shunter when I came to Palmerston North. I was previously employed as shunter at Marton and latterly at Hastings. I was first appointed shunter at Marton Junction. I was in charge of an engine for about eleven or twelve months at Palmerston North. Whilst at Palmerston North both foremen, Mr. De Rosa and Mr. Sweeney, interfered with my work. I did not work any of my time under Mr. Robertson. I have worked under Mr. Webber as acting-foreman, and I got along fine with him. I never had a word all the time I was working under him. Mr. Sweeney and Mr. De Rosa harassed me all the time at my work. When I say "harassing me," I would say that Mr. Sweeney was always "at" me, but Mr. De Rosa was not quite so bad as Mr. Sweeney. When I was doing my shunting Mr. Sweeney was continually chasing me all the time telling me to do this and do that, and in some instances at night he would give the driver a signal with his hand-lamp to come back while I was in between wagons uncoupling. I did tell him about it, and told him to get away out of the road, and that if he wanted to do the shunting he should take the lamp and do it. I have seen him chasing one or two other shunters also. I think that his harassing causes greater risk to the shunters than if they were left alone. They are more liable to accident when they are interfered with and their attention drawn from their work. That is how it applies to me, at any rate. If the foremen came and gave me the orders and then left me alone I would certainly do the work without any trouble. The Department transferred me to Wellington. I was glad of the transfer. I was glad to get away, as I have got on better since I have been in Wellington than I did at Palmerston North. I did not have any trouble with the foremen at Marton while I was there. At Hastings I was under the control of the Stationmaster, and I had no difficulty with him. When I was going away he told me that he was sorry to lose me.

To Mr. Carnachan: I put in fourteen months at Palmerston North as a shunter. For eleven months of that time I was in charge of a gang, and for the other three months I was learning the yard and picking up the work as third and fourth man. There was a shunting-engine at Hastings while I was there. I would be with the engine at Hastings in the morning for five hours and in the afternoon for about four hours, and in between we used to have the train-engine. I found the work much heavier at Palmerston North than Hastings in shunting-work. I was acquainted with methods of marshalling when I came to Palmerston North. Other than in connection with my work I was not harassed by the foremen. I never refused to carry out instructions given, and I do not think that this trouble was caused through not carrying out instructions when given. In the instance where I stated that Foreman Sweeney gave a signal to the driver to move back while I was in between wagons I was certainly in danger at the time. I did not report this matter at the time to my superior officer. Previous to this I had reported Mr. Sweeney owing to the way he had harassed me over a shunt I was doing, and the Department upheld him, because I should not have got into arguments with the foremen. I argued with the foreman on that occasion. I have read the book entitled "Railway Service Handbook" and the part headed "Twenty Rules for Shunters." I have read Rule 6, which says, "Don't argue the point with the foreman or his understudies. The foreman is paid to give orders and you have eight hours to finish your job."

To the Board: I did not know that this rule was numbered 6. This book is a private publication.

To Mr. Carnachan: I may have read Rule 13, which states, "Let the man in charge do the head-work, as all shunters have different ideas of doing different shunts." The trouble was that Mr. Sweeney never let me use my head. He used to take it into his own hands. At Wellington I was in charge of a shunting-gang. I was there about three weeks before I was given charge of an engine. I occupy the position of second man shunting at the wharf at the present time.

To Mr. Mack: Referring to the book entitled "Railway Service Handbook," I have no idea who issued that publication. When I read the book I did not regard it as being an instruction from the Railway Department. When I read the book I treated it more as a joke put out by somebody. When I reported Mr. Sweeney I was told that I should not argue with the foremen. I received the letter from the Stationmaster embodying the text of a letter from the District Traffic Manager. After this incident I had further trouble caused by the foreman. When the foreman attacked me I would resent it.

To the Board: I recognize that there should be some sort of supervision in a big yard. On one occasion when I was making up a train for Marton due out at 12.30 p.m. I got the head of the train ready, but there was still two wagons of stock down No. 2. The shunting-engine at this time had run out of water, and to get water they had to go in on the shed road, which was very full of wagons. Mr. Sweeney came running up when I told him that the engine had run out of water, and told me to stand the engine up the backshunt and go down No. 2 with the train-engine. I then told Mr. Sweeney that this engine wanted water very badly. The engine-driver told me this. Mr. Sweeney said, "Never mind about the engine wanting water, you go down No. 2 and get that stock." I then asked him whether he would take the responsibility if the engine dropped the plug. He said, "Never mind about the b——— plug. You go down and do what I tell you." I then told him that I would not go down No. 2 until he took the responsibility, and he then said, "Send your second man down." I considered this was a very serious thing, and that if the engine dropped a plug I would be held responsible. The train was late away. On similar occasions like this one he used to harass me about the yard all the time. The engine-driver informed me on two previous occasions that he wanted water, and after doing what he could in the shunting he said, "I cannot go another yard; I am very short of water." I do not know whether the foreman spoke to the driver at the time. I have used a tail-rope at Palmerston North. I have used it several times at the south end. When I used it I fastened one end on to the side chain and on to the buffer on the other wagon. On some instances I hooked it on to the side chain on the engine and the other end on to the D-shaped fastening near the door of the wagon. I had no difficulty in carrying out my work at Wellington.

JOHN WILLIAM LUCAS sworn saith.

To Mr. Mack: I am a signalman stationed at Palmerston North. I have been at Palmerston North for about twenty-seven years. I have had a fair opportunity during that twenty-seven years to learn all the conditions pertaining to Palmerston yard. I started at Palmerston North as junior porter, porter, first-class porter, and then I was in a shunting-gang for about fourteen years. I was a shunter for about ten years. I was a second-grade guard, night ballast-guard for twelve months, first-grade shunter, and first-grade signalman. As signalman I have had a fair opportunity of observing how the work was carried on under Mr. Sweeney and Mr. De Rosa. I have seen and heard Mr. Sweeney, and I have seen Mr. De Rosa following the men about. I have seen Mr. Sweeney harassing the men. In my opinion the work seems to go on better in the yard when Foreman Sweeney is not there. Foreman Sweeney has given me instructions which in my opinion I considered dangerous. On one occasion when I was bringing in a train from Marton, I told Foreman Sweeney that this train was coming in and that there was no clear road. The train arrived and was checked at the signals. Foreman Sweeney gave me "Right," and said the road was right for the goods-yard. I lowered the goods-yard semaphore. After I lowered the semaphore I noticed that Foreman Sweeney was putting the arriving train down No. 9 road, instead of No. 2 which was the usual practice. To go down No. 9 road the train had to pass over about seven pairs of facing-points. I noticed two of these points unsecured and unheld. I told Foreman Sweeney that these points would have to be held before the train passed over them, and I received some abuse from Foreman Sweeney. He told me to "Mind my own business." I cannot remember the words exactly. I told Foreman Sweeney that if the points were not secured I would stop the train with a red flag. I went down and stopped the train before it passed over the first pair of unheld points. Foreman Sweeney then sent Porter Bodle into the goods-shed to get another man to hold one pair of points which was unsecured. The man they got was Porter Kelly. Foreman Sweeney then held No. 6 pair of points. The train was then brought into the yard. The matter was reported, and in Foreman Sweeney's explanation he said that all the points were held before he gave the "Right" signal to me. I denied it, and asked the Stationmaster to send the report to the Traffic Office at Wanganui for a ruling. The Stationmaster gave me his own personal ruling, stating that I was responsible, without sending the report to Wanganui. I thanked him and again asked that the matter be sent to Wanganui, and I have heard nothing of the matter since. I referred the Stationmaster to all the men who were on the points to corroborate my statement. I asked the Stationmaster who was responsible for trains coming into the yard after receiving "Right" from the foreman, and he replied that I was responsible. Mr. Sweeney interferes with me in my duty in the same way as he interferes with the shunters. I have found it necessary to tell Foreman Sweeney to leave the signal-box on some occasions. I know from what other signalmen have said that they have had to order him out also. On another occasion Mr. Sweeney ordered me to send two engines down the main line in front of the up Auckland express. When I refused he went and told Foreman Shinkwin, who I understand is the senior foreman. Foreman Shinkwin came to the signal-box to see what the trouble was. By that time the Auckland express was standing at the platform, and I informed Mr. Shinkwin that was the reason why I would not send the engines out. He went away quite satisfied. I have been punished as a result of Mr. Sweeney's interference. I was censured for the delay to a train reported by Mr. Sweeney as being my fault through turning the

shunting-engine up the wrong road. I wrote in objecting to be censured, and the Department sent the Assistant District Traffic Manager from Wellington to make investigations. The censure was removed, and I was notified in writing. The officer who investigated the matter was Mr. Hartland. I think that the harassing conditions in the yard increases the risk that is always run by shunters. I think it is a very unwise thing for the foreman to interfere with the work of a shunter while he is carrying out his work. It is a fact that all shunters differ in the methods of arriving at the same end. Every shunter has got his own idea. I think that if there was less interference in the Palmerston North yard, which is a yard at all times a difficult one to shunt in, things would be improved. Generally I think it would be in the best interests of the Department and the men also.

To Mr. Carnachan: I have been a signalman about seven years. In my position in the signal-box I have a bird's-eye view of the shunting-yard. I cannot give the reason for the harassing tactics of the foremen, but I can hear the noise all round the box. The foremen would be under my observation for all the time they were at the north end of the yard. In connection with the incident regarding the bringing of a train into the yard, I have the names of all the men who held the points and the driver's name, also the date. I never speak to Mr. Sweeney off the job. Mr. Sweeney makes a point of "picking" at me with anything he can get at. I have been reported by him for being absent from the signal-box. I do not remember whether I have been fined or not by the Department for being absent from the signal-box without leave. In connection with the incident where Mr. Sweeney wanted me to send engines out on the main line when the express was due, I had by that time given control to the south signal-box. Once giving that control it would be impossible, as the interlocking would not allow these engines to be sent out. When I refused to send the engines out he would not wait, and he rushed and got Mr. Shinkwin. I do not remember another incident when I was fined 10s. for leaving the signal-box without permission and delaying a train in 1920. I do not remember receiving a caution for delay to No. 221 train in 1922. It may have happened. I cannot remember these things individually. I have not been advised by the Department (in writing) that if I still desire to run my taxi in opposition to the Department I must first resign from the service. I did have a taxi license until the Department objected. I then cancelled the license, or I did not renew it. It was reported by Foreman Robertson that I was plying for hire, and the Department advised me that if I wanted to ply for hire it would be advisable for me to resign. I do not remember being fined in connection with a delay to No. 567 train. I have been recommended for promotion to guard and foreman or Ticket Inspector. I was recommended by Mr. Morgan, who was Stationmaster at Palmerston North at one time. I think the recommendation was for guard only. I do not remember being advised that I was not recommended for foreman or Ticket Inspector as I was not considered reliable. I remember since Mr. Morgan's time that I was advised that on account of my unsatisfactory record I was not recommended for promotion. I do not think that I have made any threats of charges I would bring against the foremen. I remember a shunter who used to be in railway service named Stanley Lucas. He was my brother. I do not remember Foreman Sweeney reporting my brother. He is not a member of the service now. He is better off. In connection with the incident relating to the bringing of a train into the yard, the train was being put into No. 9 road. I am certain that it was No. 9 road.

To the Board: I usually take instructions from the Coaching Foreman for trains coming to the yard. If the train is to go into the goods-yard the signalman usually gets "Right" from the shunters or the foreman. The shunter in such cases would be the leading hand. It is always the practice to hold the facing-points when trains are being brought into the goods-yard. There was an "AB" engine on this train. The up Auckland express referred to previously in evidence was No. 626. I asked for a ruling from the Stationmaster in writing, and the Stationmaster gave me his ruling in writing.

FREDERICK JOHN LEWIN sworn saith.

To Mr. Mack: I am an engine-driver stationed at Palmerston North. I have been at Palmerston approximately fourteen years. I have done very little in the Palmerston North yard—an odd day now and again. It is generally recognized that the yard at Palmerston North is very congested. Naturally the congestion would make conditions more difficult for shunters to carry out their work. During the time I have been at Palmerston it is my duty to watch the shunters. I watch them pretty closely. On one occasion I saw Mr. Sweeney in particular—it was the day on which Joe Carty gave Mr. Sweeney a hiding——

To the Board: I do not know who was the aggressor.

To Mr. Mack: I did not see the incident. Mr. Sweeney's manner on that day was such to cause a breach of the peace at any time. From an engineman's viewpoint I would say that Mr. Sweeney is a joke in the way he behaves and relating to the handling of trains. Mr. Sweeney has told me to do things which I considered unwise to do. On one occasion when coming in from Marton with a 500-ton train the train was brought down the main line through the crossover in front of the platform, and the van was stopped over the crossover points. Immediately the train was stopped Mr. Sweeney waved me back. I whistled to gain the attention of the signalman in the north box, as there was a fixed signal there which must be lowered before I could back up the train. I can also pass this signal by the necessary hand-signal given from the north box. I received none of these signals, either fixed or by hand. Mr. Sweeney walked up to the engine waving all the time. He came right from the van, and the engine was over Cook Street fouling that road. He said to me, "Why don't you set back when I am signalling?" I said, "I have got no signal from the signalman." He then said, "I am the Yard Foreman." I said, "Then surely you ought to know

that I must get a signal from the signalman." With that he told me that he knew his business, and that he had "cleaned up" better men than me, and that he would "mix it" with me. That is a common phrase with Mr. Sweeney. By the term "mix it," I supposed he wanted a bout of fisticuffs—he wanted to fight. I felt like obliging him, but I had too much sense. His attitude towards me caused me to keep control of myself or it would have led to a breach of the peace. I told him that if he would get the signal from the signalman I would set back. He said, "I'll wait here all day until you do." He meant he would wait until I set back. I did not ultimately get the signal. By this time there was quite a few people gathered round on Cook Street, and I could see no sense in remaining there, so I instructed my fireman to cut off the engine, and we went to the pit and left the train. I do not know what happened to the train after that. There have been other occasions when he has interfered with me. When I would be going up the loop with my engine to go on to its train and the engine would be wet after standing in the shed—our duty is to move slowly from the shed so that the water can get away from the steam-pipes and cylinders, because if this was not done dresses on the platform would be damaged and probably some damage would be caused to the engine—and Mr. Sweeney would get up into the cab of the engine and start to dictate how to drive the engine almost. He would say, "Shake her up. Open it out." Sometimes he would talk about "mixing it," and I would tell him he was treading on his foot, and there used to be a dialogue, and I have had to tell him to get off the engine. I do not think that Mr. Sweeney can help his attitude. I do not think he has any tact.

To Mr. Carnachan: In connection with the Carty incident I believe that the matter was investigated by the Department. I believe Mr. Carty was dismissed in consequence. I have only been in the yard odd days shunting. I could not tell or give particulars of the shunting in the Palmerston North yard. I do not know what the foreman's duties are in the yard. I could not judge of the necessity of any orders that he might issue to the shunters unless I heard it and knew it was wrong. The matter of the altercation at Cook Street was reported, and I heard no more about it. I reported the incident to my foreman. I reported the fact that I cut off and went to the pit on my own authority. This was the first occasion that there was any trouble with Mr. Sweeney. He has reported me twice since. Each time he reported me since then I have been held to be right. One night I made a stop with the train coming in. Following on the argument I had with Mr. Sweeney about setting the train up the loop he reported me on another matter. He reported me for breaking a glass door in the van when stopping a train. He said it was a very rough stop, and I would have "fallen in," because a driver does not know whether the stop behind was bad or not, but for the train-examiner who happened to be standing by at the time and who saw a porter put a bicycle-lamp through the glass door. On another occasion he reported me for being late off the loco.-pit. I was going on a special to the Pahiatua races, and I was ready to come off the pit, and prior to the time I did come off I could not get off because Mr. Sweeney was shunting across the points with another engine in front of the signal-box. He brought Mr. Harris, the Traffic Inspector, to me that day, and I was five minutes late away with the train in consequence. I just referred the Department to the south-end signalman—Mr. Cammock—and I heard no more about it, and I concluded that I had come out of it best and that there was no blame attachable to me. The train-examiner's name was Bramwell, I think. I have never refused to take Mr. Sweeney's signals while shunting in the goods-yard. I looked upon Mr. Sweeney as a joke. I reported him about the signalling incident. I did not report him for jumping on the engine and telling me to shake it up. One has only got to mention Mr. Sweeney's name to raise a smile.

To the Board: If the driver does his duty and the engine is wet he should release steam coming up the yard, and he should come up slowly. This cannot be done in the shed. The movement of the engine moves the steam out. The only remedy would be to have a road on which to move the engine up and down while doing this. I realize the danger of escaping steam from one engine obscuring the view in the yard. It can possibly be minimized but not overcome.

The following witness was called on behalf of the officers concerned:—

LOUIS ALFRED VOLTZ, Traffic Inspector, Wellington, sworn saith.

To Mr. Carnachan: My duties as Traffic Inspector bring me to Palmerston North on an average of twice a week. I have been in my present position of Traffic Inspector, Wellington, for about six months. I go through the Palmerston North yard frequently to see how things are going on. I occasionally get into conversation with various shunters in the yard. The first complaint I had from shunters in the yard regarding the attitude of the foremen was after the death of Shunter Carmichael. Prior to that I had no complaint regarding the conduct of the foremen. In connection with the complaints of the men, it appeared to me that there was a sort of organized agitation. When I tour round I go into numerous matters. For instance, I have been down at Otaki inquiring into the porters' duties there, and I found that their duties were satisfactory, and I asked them if they had made a complaint, and they said "No." They said, "The matter had been taken up by the Palmerston Branch of the A.S.R.S. against their wishes." That is the reason why I said that this appeared to be an organized agitation. Both cases of the recent shunting fatalities at Palmerston North were investigated by me. The conclusion I arrived at as the result of my investigations was that both accidents were not due to the conditions under which the men had to work, but were both due to want of thought on the part of the two men who were killed. For instance, Shunter Murphy walked across the yard through steam escaping from the engine when he could have walked across the yard 10 or 12 yards away from the engine and free from the steam. In the late Shunter

Carmichael's case he walked between a fixed tail-rope and moving wagons, and if he had stopped to think he would have realized the danger. In both cases I considered them purely accidental. I am conversant with the methods adopted for training men at Palmerston North in the shunting-yard. I consider that they are given proper opportunities to qualify in this work.. I am aware that a fourth man is always attached to a shunting-gang for training purposes. I consider that this is a very good method of giving members an opportunity of learning shunting-work. It is what I call practical training.

To Mr. Mack On an average I went through the Palmerston North yard twice a week, and this would be roughly forty-eight times I would have been through the Palmerston North yard during the last six months. Prior to the death of Carmichael I received no complaints. I consider, judging from my observations in going through the Palmerston North yard, that the yard is congested, and I would say that no shunting-yard is quite safe. I think there is always room for improvement in any yard we have, and I think that this applies to Palmerston North as well as other places. Palmerston North yard could be made safer by giving more shunting-room in the way of additional roads. There is nothing else I can suggest to make it more safe. I have watched the shunting operations in the yard, and with three men to a gang I consider this gives them an opportunity to do the work well and with reasonable safety. Most gangs I have noticed shunting have only had two men, necessitating a good deal of running about, whereas a third man minimizes the running about whilst shunting. I have never been a classified shunter myself. I have done a lot of shunting myself. I was Relieving Officer in the Wanganui Section for two years and a half. At country stations there is a little shunting to do. I have never had charge of a gang. At Patea, where I was stationed as Stationmaster for six years, I frequently took charge of an engine and shunted a busy yard for Patea for an hour or an hour and a quarter. I would be in charge of the engine, and a guard or a porter would assist me. I say that I took charge of the engine at Patea and carried out shunting when there was a guard and a porter to carry out the work. I was the brains of the shunting-gang at that time. In the course of my inspection of Palmerston North yard I have seen all the points in the yard. I consider that the points in the yard, unballasted and exposed as they are, could be made safer for shunters. If the points-levers in Palmerston North yard were painted white it would improve them. I have been through the yard in wet weather, and I have never experienced water lying about. I think the yard could be improved by drainage. I have been in the yard at night. I have observed the lighting. I consider the lighting very fair. I think the lighting of the yard is very good. I have not drawn the Department's attention to those things which I have mentioned which could be improved. These things had not come under my notice, and this is why I did not call the attention of the Department to them. This is notwithstanding that I went through the yard forty-eight times on an average during the last six months. I have frequently used a tail-rope at various stations. At Patea it was a very common occurrence to use a tail-rope for moving trucks in the yard when they were in the backshunt. They were tail-roped out. We also used to move trucks in the yard with a motor-lorry and a tail-rope. The tail-rope was used for quickness. For instance, we would have to run the engine round the trucks to pull them back over the points, whereas by putting the tail-rope on to the trucks we could pull them over the points and get the engine on the right end and put them on to the train more quickly. I think it would be safer to have slipped the wagons on to the train with an engine, but the tail-rope is fairly safe if properly used. I elected to take the more dangerous method of the two because, firstly, it was quicker, and, secondly, the risk was not very great. This is my own opinion. The tail-rope at Patea had a blunt hook at each end. This is the only sort of tail-rope I have seen. I always found it to answer the purpose very well. I used to adjust the hook on the side chain of the engine—the hook of the side chain on the engine through the eyelet-hole on the tail-rope—and the hook at the other end was secured on the side of the wagon. I used this method of fixing the rope on the engine to save a man standing there to hold it. I agree that if there were a ring at one end of the tail-rope it would be better. I have never seen a man standing on the engine holding the hook of the tail-rope when it was attached to the engine. I have seen a tail-rope fly off from the wagon end. There is the same risk of it flying off the engine end, but I do not consider it very dangerous if it does fly off. The shunter should stand well clear when the strain gets on it. I would say that a tail-rope would be 22 ft. long. A man would have to stand 22 ft. clear from the rope, but usually it does not fly that far. As soon as the engine slows down the tail-rope falls off of its own accord. When Carmichael was killed he did not use the blunt hook of the tail-rope on one end. It would surprise me to learn that if a hook was used side chain to side chain it would not fall off on its own accord. I have not, as far as I can remember, seen the rope used side chain to side chain. I do not know that I have taken any action as a Stationmaster and Traffic Inspector to see that every shunter with whom I have had to deal with who was put into a yard was conversant with the use of a tail-rope. I did not do this until it was necessary to use the tail-rope. I consider the build of the tail-rope would describe to the man how to use it. There is only one way to attach the hooks. The method I have described is the right way. I could not say what Carmichael's idea was in fixing the tail-rope the way he did. The man must have known how to use the tail-rope, and probably he had some special reason for fixing it the way he did. This does not in itself demonstrate that instruction should have been given. I have been twenty-eight years on the railways, and I have never previous to the present controversy heard the method of using a tail-rope being questioned. I consider that every Stationmaster would take the same view as I did that the rope itself would explain itself the method of use. I could not say whether Carmichael fixed the rope in the position he did because he did not know how to use it. I know how Carmichael fixed the rope. I do not think that he was wise to have fixed it the way he did. I could not say whether Mr. Carmichael would have fixed it in that way if he had had some instruction. I think he knew that he was fixing it wrongly. I think he had a reason for fixing the rope the way

he did. I do not know the reason. I consider that this trouble is an organized agitation. I gave one instance at Otaki, and I heard nothing of what was going on in the Palmerston North yard until after the death of Carmichael. I therefore thought that perhaps the matter had been debated by the Palmerston branch of the union, and that they had a reason for making the charges against the foremen. I judged this from the fact that when touring round I heard nothing about it until it came like a bombshell. A man always forms conclusions in regard to incidents. I heard certain statements made. I asked one man who made a statement against the foreman if he was prepared to give evidence at the Commission. He replied that the branch was not prepared unless the inquiry was made public. I was asked what my opinion was, and I gave it. I do not think it is biased. My opinion at the time was that the agitation was organized by the men, but this is not my opinion at the present time. If all one hears is true the men appear to have grounds for complaint. I should not think that the fourteen or fifteen men who have come forward to sustain the charges against the foremen would all lie, and I would be very loath to think that such was the case. I should say that it was rather late in life to send a man of thirty-six to thirty-eight years of age to shunting-work. I agree that twenty-six to twenty-eight years of age is quite late enough to send a man to learn shunting-work. I think that if a spare man in a gang were given one month as spare man, a further month as third man, supervised by the regular third man in the gang, and after one month as third man exchange places with the second man, the latter supervising him for a further month, that would be an improvement in the method of instruction of shunters. This would give him a good opportunity to get used to local conditions. I do not place much on the instruction of the use of a tail-rope. Any one ought to know how to use it, notwithstanding that Carnichael was killed by the misuse of it. It would be an advantage if the foreman or Stationmaster satisfied himself that the men knew how to use the tail-rope. Unless the interference is necessary it is not wise to interfere with the shunter in what he has mapped out to do in his work. A shunter may have his duties worked out and the foreman may require some work to be done urgently which would necessitate the shunter departing from his ordinary routine of duties. I do not think it advisable to interfere with a shunter in breaking up and marshalling. I think that it is dangerous to interfere with a shunter when he is cutting off wagons, and I think that it is not in the interests of the men and not advantageous to the Department to interfere with shunters in the way just described. I think that any instruction from the senior foreman should go through the immediate superior officers of the shunters—that is, to the foremen in charge of the shunting. Any other method may upset arrangements. If the foreman in charge directly of shunting operations gave certain instructions and the senior foreman came and gave other instructions the shunter would have to obey the instructions of the senior foreman. I would not say that it would cause friction, but it would cause trouble. Friction is something more than trouble—it is accentuated trouble. In my tours of inspection I look around to see that the equipment of the men are all in order. I have not inspected the stock of hand-lamps at Palmerston North to see whether there was a sufficient supply of good hand-lamps. I heard the statement at the inquest on Carmichael that the local railway stretcher would not fit the town hospital ambulance. I think it would be an advantage if all railway stretchers were made to fit local hospital ambulances. I explained everything in a report to the management and sent the report on to the Department direct as it came from the Coroner. I did not particularly mention the ambulances, but I think that it would be a wise thing if the railway stretchers were made to fit hospital ambulances.

To Mr. Carnachan: I have never seen a tail-rope in use in the Palmerston North yard. I do not think the foreman would be present on all occasions when the tail-rope was being used in the yard. I heard the evidence of Shunter Shirley that the usual method of fixing the rope was on the side of the wagon. I also heard the statement by Shunter Shirley to the effect that when Shunter Carmichael was shunting with him he would see the tail-roping done, as he had done it that way. There is a rule which forbids slipping wagons on to a passenger-train. I do not think that there is also another rule which prohibits the slipping of wagons over main-line points on to goods-trains.

To the Board: It is not a safe practice to slip on to the main line at all, as it may cause a derailment, which might block the main line. If a man was doing shunting-work wrongly I would call any interference by the foreman necessary interference. That is what the foreman is for. If he sees anything done wrongly it is his place to put it right. In my experience I did not find the tail-rope hook more liable to slip off a wagon when the wagon was wet or on a dewy morning. In my investigations into the accident to the late Shunter Carmichael I did not inquire into the question whether Carmichael was of an excitable nature, but at the inquest it was stated that Carmichael became excited when the foremen spoke to him. Prior to being transferred to the position of Traffic Inspector at Wellington I occupied the position of Traffic Inspector in the Ohakune district, and in that position I would travel between Frankton and Marton.

The following additional evidence was by consent taken on behalf of the men concerned:—

ROBERT JAMES BOYD sworn saith.

To Mr. Mack: I am an engine-driver stationed at Palmerston North. I have been at Palmerston about six years. In some of the shifts I have put in two days a week, and on other occasions I have had my time adjusted shunting in the Palmerston North yard. I have had ample opportunity to judge the conditions obtaining in the Palmerston yard. I have seen the conditions in all sorts of weathers. I think that the Palmerston North yard is the worst yard I have struck in my twenty-five years' railway experience for water lying about the yard. The yard at times becomes very much congested. When the yard is congested it is the usual practice to shunt with long rakes of wagons

at both ends of the yard. This is largely on account of the congestion. I should say that this increases the risk to the shunters. I am of the opinion that this hinders rather than facilitates the work. I think if the space was available the work could be got through with shorter rakes of wagons. I have observed undue interference by Foreman Sweeney in the work of the shunters in the yard. I think Foreman Sweeney is the worst in my opinion. I have not seen Foreman De Rosa actually interfering with the shunters. I remember one case—about the beginning of the year during the sheep season—we were coming from the loco.-sheds to run No. 922 train. On this occasion we were waiting on No. 2 road to get wagons from the Wanganui train. The shunter pilot had been instructed by Shunter Shirley to wait for the wagons, and after waiting a minute or two I saw Foreman Sweeney waiting near the north-end signal-box. He had his fingers to his mouth whistling and waving frantically. My fireman drew the pilot's attention to this, and he came over, and eventually we went up with the pilot. On arrival there Foreman Sweeney started to abuse the pilot for not looking out for his signal, and told him his place should have been on the front of the engine. The pilot evidently tried to explain to Mr. Sweeney the reason why he was waiting, and Mr. Sweeney was evidently in no humour to listen to him. Mr. Sweeney told him that he would let him know who was foreman in the yard, and that he would fix him. This pilot got very nervous and appeared to be trying to get out of Mr. Sweeney's way. Mr. Sweeney then ordered the pilot and the engine round to No. 4 road at the north end, and then ordered him to go and cut off behind a certain number of wagons, and then to lift some wagons off No. 5 road or some other road. While the pilot was in coupling up these wagons Sweeney gave me a pull-out signal, and I did not move. I could not see this pilot—he was between the wagons somewhere—and I certainly did not want to move the engine until I knew that the pilot was clear. Sweeney came and accused me of adopting the "go-slow" policy. I told him that when he went mad and was trying to drive the shunter mad it was up to somebody to keep cool. When the pilot appeared I did pull out towards the north-end signal-box, and by that time Shunter Shirley had brought the two wagons up No. 2 road with the No. 567 train-engine. I then left the two that I had picked up in the yard and picked up the two that Shunter Shirley had put in the road. This ended the incident as far as I could see. Shunter Shirley went over to Mr. Sweeney, but I cannot remember exactly what was said, but I think it was in connection with the instructions that Shirley had previously given to the pilot. I have repeatedly seen Mr. Sweeney interfere with the shunters and come out and give signals apart from the shunters altogether and irrespective of where the shunters might be. Mr. Sweeney threatened to report me for not obeying his signal on one of these occasions. I was watching the shunter, and Mr. Sweeney was giving a signal contrary to the one I was receiving from the shunter. Shunting-work is always an anxious time for an engine-driver. It is necessary to keep a sharp look-out. This interference in the shunting-yard makes times more anxious for the engine-driver and makes conditions more risky for the shunters. I think that if there was less interference in the yard things would get along much better. When the other foremen are in charge of shunting things get along all right. I have no trouble whatever with the shunters. My relations are generally good with the shunters. Mr. Sweeney seems to me to have spasms—that is, sometimes he is all right and then he breaks loose again. It is a common saying in the yard that "He has raw meat for breakfast." These are on the occasions when he is feeling savage. These are the times when his worrying commences. I think that if more consideration were shown to the men in the shunting-yard the work would be lightened for the shunters and conditions improved. I think the Department must surely have evidence of this fact. When Mr. Sweeney told the pilot his position was in the front of the engine I took it to mean that he was to ride on the leading cow-catcher. I should say that this is a risky position for a pilot to ride on. It is in all cases safer for the pilot to ride on the trailing cow-catcher or the step of the cab. In telling the pilot to ride on the leading cow-catcher Foreman Sweeney would be asking the pilot to take undue risk. I remember a shunter being censured for not riding on the leading cow-catcher and a cream-can being knocked over by an engine between the loop and the main line.

To Mr. Carnachan: I have twenty-five years' railway service. I have had all that service in the Locomotive Department. I have never been a classified shunter. I have worked in the Dunedin and Christchurch yards in addition to the Palmerston North yard. I consider the conditions at Palmerston North are worse than those in the other yards I have worked in. I do not think any of the shifts of an engine crew for a shunting-engine exceed eight hours. I make out a duty-sheet after each day's work. I book forty miles for a day's shift in the shunting-yard. That is considered to be the average speed for shunting movements. This is an average speed of five miles per hour. I cannot remember the particular date in connection with the incident regarding No. 922 train. I was in charge of the train-engine of No. 922. Corlett was the pilot on this occasion. I would not say that Foreman Sweeney had previously or often accused me of adopting the "go-slow" policy. When Mr. Sweeney gave me the signal to pull out I told him that I was watching for the pilot. Mr. Sweeney has never reported me for bringing out engines late in the yard. He did report me once for allowing the fireman to drive the engine. When I explained the position the foreman of the loco.-depot did not refer the matter to me. I have not been shunting in the yard since the week before last. Foreman Webber is one of the foremen to whom I referred to as one whom I got along well with. He was in charge the week before last. On the occasion when I refused to take the signal of Mr. Sweeney owing to the pilot being in between the wagons, the pilot seemed to be anxious to get away from Mr. Sweeney. He was not arguing the point with Mr. Sweeney at the time.

To the Board: I should think that a pilot should walk ahead of the engine to pilot an engine. The word "pilot" means to go before, and this would not mean that a pilot should ride on the engine. Most of the engines piloted out would be tender engines, and therefore would not have trailing cow-catchers. There would be a few which would have trailing cow-catchers. A pilot would not see

much ahead if he rode on the trailing cow-catchers. A lot of shunters make a practice of running and jumping on the leading cow-catchers. I consider this an unnecessary risk. I agree that there would be risk travelling on the step of the cab, especially on a dark night when there would be risk of fouling another wagon at points on an adjoining road. There is less risk in getting on the step of a cab than on a front cow-catcher of an engine whilst moving. If Mr. Sweeney cared to look he would have seen the pilot in between the wagons on the occasion previously described in this evidence. He was standing close by at the time.

The evidence on behalf of the officers concerned was continued.

WILLIAM JOHNSTON ROBERTSON sworn saith:

To Mr. Carnachan: I have been in Palmerston North thirteen years and three months. I have heard the rumour that is going round that I have been dismissed the service. I wish to give that a public denial. [Mr. Mack here desired it to be placed on record that as far as his side was concerned there had been no suggestion that Mr. Robertson was in any way to blame in connection with the accident to the late Shunter Carmichael, and he wished to give that rumour and such rumours in that connection in existence a public denial. Mr. Robertson did everything within reason and as well as he could at the time.] I have been in charge of the Palmerston North yard. That was about two years and ten months ago. I did not experience any trouble with the men at that time. As Senior Coaching Foreman it would be my duty to put all the men through an examination of rules and regulations, and knowledge of working. I conducted that examination each year. I select the junior porters to go out in the yard to assist the shunters. I always send out the porter who is senior provided I consider he has the necessary qualification. I usually select a young, active, and alert individual and one who I would consider would have a natural aptitude for that sort of work. Usually before a man is sent out into a yard he would have at least twelve months' experience on the job, and he would at least have some little knowledge of the general working-conditions. Some of the members had been much longer in the service before being sent out into the yard. When first going out into the yard these men usually take up the fourth position in the gang. A man occupying the position of fourth man in a shunting-gang is looked upon as undergoing a course of training. Circumstances govern the transferring of a man from the fourth position in a gang to the third man. I have known men being in the fourth position up to six months, and sometimes only one month. This is usually due to transfers, which come sometimes in waves. I might mention it has always been my endeavour to build a gang and keep that gang intact as far as possible and not disturb it at all, and if the gang is disturbed it is for some unavoidable reason, which would be mainly due to transfers, promotions, sickness, and exigencies of the service generally. It all depends on the individual whether they should be transferred from the position of fourth man to the position of third man. It all depends on the individual—some take to it like a duck to water and some do not take to it at all. Thirty years ago I took charge of the Wellington yard, and I had only then been five years on the job, and in my young days there were only two men in a gang, and the first job I got on the railway was second man in a shunting-gang. After about four months I was put in charge of an engine, and when I went to Wellington we men were rated as shunters and were required to undertake shunting duties from the day we landed at the station. I think this made better men of us. You have got to put the men up against it to make men of them. I think if we could take a number of porters into the yard at some slack period and give them a demonstration regarding points and shunting and how not to put a wagon off, this would make for efficiency. There is only one way to teach a shunter and that is to put him in the yard. I think the yards are in a better condition to-day than they were in my day, for the simple reason that in my day we were running on loose gravel and to-day they are more like cinder-tracks. In my day there were sometimes one man in a gang and in the big yards two men. We have no gangs in this Palmerston North yard with a complement of under three men. One gang—the north-end gang—has four men between the hours of 9 a.m. and 6 p.m. I know of no other station in New Zealand where there are four-men gangs. The junior men at the present time receive the same training as was given in the early days—that is, the junior man is put into the yard and the senior man teaches him his business. The younger man emulated the tricks of the trade of the more experienced man. There is the additional fact that at the present time the gangs are better staffed now. Instead of two men in a gang we now have three, and in some cases four men in the gang.

To Mr. Mack: When I was shunting in Wellington thirty years ago the number of vehicles handled were much less than to-day. We shunted with "D" and "L" class engines, and later we shunted with "R" and "S" class engines. The line then ran up to Eketahuna only. One man shunted with one engine at times. The largest engine in those days would only take about thirty wagons to Upper Hutt. Sixty-five tons was the maximum weight allowed on one train over the Rimutakas at that time. At that time there were about eight or nine different classes of wagons. I would not deny that at the present time there are about forty-four or forty-five different classes of wagons in use on the New Zealand railways. We did not have any Westinghouse brake in those days. I do not think there were any "J" engines at Wellington at that time. The "J" and "B" were looked upon as fairly big engines at that time. That is the class (J) of engine now used at Palmerston North in the shunting yard. Notwithstanding the fact that there were only a few classes of wagons and that the work was hard and we had to work long hours, I would not compare that with the present times when things are congested. I agree that the Palmerston North is a congested yard. It has been reported daily that the yard is congested and that the facilities have outgrown the yard. That made the difficulties greater for the shunters. Notwithstanding this I got along quite all right while I was in charge.

To the Board: All the shifts, with the exception of one, are worked out on a basis of eight hours. I would say that when the shunters were working on a forty-four-hour week or a seven hour and twenty minutes day we got splendid service from the men. The south-end gang exceeds the eight hours daily by about forty-five minutes. Frequently if the work is behind they work from nine to ten hours daily on the late shift. When we were on the forty-four-hour-week basis we had six gangs, against five gangs at the present time. My experience is that a shunting job is a young man's job, and I think that seven hours twenty minutes is quite long enough for a shunter. If overtime was necessary I would put another gang in after one gang had worked seven hours twenty minutes. This refers to a busy yard. This would make for greater efficiency. When the men worked the seven hour twenty minutes day we frequently remarked on the excellence of the work that was being done at that time. We obtained greater efficiency. If a man is brought on physically fit better work can be got out of him than from a man who comes on dog-tired from the previous day's exertions. Providing the trains run to schedule the time allowed at Palmerston North is sufficient, but owing to late running of trains the work becomes disorganized, and trains are late away in consequence. I consider that there is not sufficient time between the arrival of No. 620, which is due to arrive here at 3.3 p.m., and the departure of No. 590, due out at 4.22 p.m., owing to the perishable goods arriving by No. 925 also having to be connected to No. 590. It is a difficult matter to make the connection with No. 590. The latter train is dependent upon its load from loads off No. 620 and No. 925 trains. If No. 620 were to arrive earlier it would be a big advantage. No. 575, which is due at 5.5 p.m., brings in a load of between 400 and 500 tons, and by the time this train is broken up No. 429 is due to arrive. This train is due at 5.50 p.m. No. 921, due at 6.5 p.m., follows with about sixty total, and possibly No. 656 from Wellington will arrive at 6.3 p.m. with about 400 tons, and then perhaps a special from Marton—No. 591—which is due at 7.34 p.m., will bring another 400 or 500 tons, and then No. 931, due at 8 p.m. with another sixty total, and No. 587 arrives 8.15 p.m. with usually about 350 tons ex Wanganui. There are only two roads in the yard to receive these trains—the main line and the loop—and the yard becomes very congested, and there is difficulty in clearing the trains from the platform in time to receive other trains due to arrive. After No. 640, due to arrive at 9.40 p.m., arrives at the station the service is taken away immediately from the platform after the passengers are cleared and the luggage for the "Limited" is taken out of the van. The service is shunted up the Napier main line with a guard in charge and left there until the "Limited" is dealt with. This is a nightly occurrence. After the departure of the "Limited" the train has to be put back to the platform and the guard's van and roadsider dealt with. Although it has been stated in the public Press that the discipline of the service has been tightened up it has not come under my notice. The punishment lists of late do not appear to me to be quite so bulky as formerly. It appeared to me that the punishments, judging from the last lists I have seen, have been a little easier than formerly. I agree that the additional lights as suggested by the shunters would be a decided improvement. I also agree that the addition of two lights on the outside of No. 13 road would be an improvement. I have previously verbally suggested that the goods-shed should be shifted back to Church Street, and I do not think that the suggestion was taken too kindly. I am still of the opinion that this work should be carried out in order to provide additional roads, for which there is ample room. Considering the rainfall I think the drainage of the yard is fairly good. The water does not lie about to any great extent. I think it is generally known that all round the points has been drained. I think that the silt after a tropical shower is washed over the rocks at the points and this holds the water. I think that if a ganger went round after heavy rain and let the water down through the surface silt this would improve matters. I have seen the drainage-system being put in. Under very exceptional circumstances it has been necessary to place inexperienced men in shunting-gangs. We have had a fairly good run, but, as explained by the shunters, men failing in colour vision, transfers, and promotions have all tended to appreciably weaken the strength of the shunting-gangs at Palmerston North within the last three months. We have sufficient graded shunters at present in Palmerston North to fill the position of leading and second man in each gang. We have a man here at present with five years' shunting experience, and he is a qualified shunter as far as the yard is concerned. He is a porter in designation, but a shunter in experience, and a man such as this might be a better man than another fully graded shunter, who might not have so much experience in the yard, and the porter would be the best man for the yard. When the staff is at full strength we have fourteen graded shunters and five shunting-gangs, and in addition two main-line shunters. We have to provide, of course, for the necessary relief for sickness and leave. At the present moment I am quite satisfied with the strength of the gangs in the yard. Some time ago we were right down to bed-rock, but things have been strengthened, and are now on the improve. The new men are becoming more experienced, and this all tends to strengthen the gangs. I would suggest that no tablet porter be appointed shunter in a big yard over the age of twenty-five, unless under exceptional circumstances—that is, that he would require to be a young, active, and intelligent man before I would recommend him for a position in a big yard. I think it would be a good idea if tablet porters' work was given to men who would not make shunters. I consider that shunters should be trained young. When we lost our junior porters we lost our apprentices to the shunting-work.

PALMERSTON NORTH.—4TH SEPTEMBER, 1925.

JOHN SWEENEY sworn saith.

To Mr. Carnachan: My occupation is Senior Shunting Foreman, Palmerston North. Including my casual service I have been in the service approximately thirty-seven years. During my railway

career I have done shunting-work. I have been a practical shunter and connected with shunting-work for about twenty years. I have been shunting in the Greymouth yard for about eight years; at Lyttelton shunting for about two years; at Christchurch one year shunting; Cross Creek, one year and two months; Head Shunter, Dunedin, two years; Goods Shunting Foreman, Dunedin, twelve years; Bluff, about two years; Palmerston North, about seven years. I began casual in the Railway Department in the year 1887. I am an expert shunter, and can probably claim to have the widest experience of any man at shunting duties in the New Zealand railways to-day. I was the smartest shunter that ever stood on a truck in Greymouth in my time. I remember Shunter Roberts arriving at Palmerston North. I gave him instructions as to his duties in the yard. He was running spare man in the Palmerston yard for about three weeks or a month. The duties of spare man would consist of the very simplest duties a man could be given—that is, coupling up wagons, assisting to couple trains, hooking up the Westinghouse brake in the proper place, and braking down wagons for their respective roads. As a spare man he would be really occupying the position of learner in the gang. I cautioned Roberts on arrival and warned him to be careful not to expose himself to danger. I cautioned every new man coming under me to start duties in the Palmerston North yard. I did have the late Shunter Carmichael working under me. He worked under my charge for about a year and nine months. I did consider Shunter Carmichael a competent man for this time of the year.

To the Board: I mean that he was a competent man for the slack season of the year.

To Mr. Carnachan: I know what shunting experience Carmichael had in the service. He had about twelve months at Dunedin and one year and nine months at Palmerston North. He always gave me every satisfaction in his work. He was not the type of man who resented orders being given to him. If Porter Lepper stated in evidence that he had more shunting experience than Carmichael, this is not correct. Porter Lepper does not know what he is talking about. My duties as Yard Foreman at Palmerston North are enumerated on Exhibit A (see page 189) handed to the Board herewith. I was on annual leave on the date of the late Shunter Carmichael's accident in the Palmerston North yard. I went off duty prior to the accident thirty hours previously. I was on the very best terms with the late Shunter Carmichael. During the industrial trouble last year I remember the Stationmaster calling all the foremen together and addressing them. He advised me and other foremen present that he considered that we should all remain loyal to the Department. All the foremen remained on duty during the strike period. I performed all the shunting operations in the yard during that period, and, besides, delivered half the goods out of the goods-yard from the trucks to the respective business people in Palmerston North. There was no delay to any of their goods. I certainly consider that the discontent at present existing is due to the industrial trouble of 1924 and the previous strike. There is scarcely any comparison in the slack time between the Palmerston North yard and other yards which I have controlled. During the busy period the work is very heavy and exceedingly trying on all concerned connected with shunting-work. Shunter Tapp was not correct when he said in evidence that there is no improvement and has been no improvement in the lighting of the yard during the last six years and a half. On my arrival at Palmerston North about seven years ago, or shortly after, a deputation of the shunters waited on me to find out what improvements I could bring about in lighting. Shunter McIndoe, Shunter Ridley, Shunter Cassidy, Shunter Harvey, and Shunter Tapp formed the deputation. I told them I would do or try to bring about what they desired. I made my recommendation to the Department, and the extra lights were placed where the shunters wanted them—one at the far north end of the yard, one on the weighbridge, one lamp shifted from the north signal-box, where it was sticking through the roof, and placed in its present situation at the north end of the shed. Down towards Cook Street at the other end of the yard an extra lamp was placed at the repair-shed. The shunting-men at that time said that these lights made the yard safer for shunting purposes. The men were then quite satisfied that sufficient lights had been supplied. I remember Shunter O'Dea starting in the Palmerston North yard. I gave him a lot of fatherly advice and told him to exercise every care in shunting in the Palmerston North yard. I did not tell him "That he would have a lot of ignorant b——s to work with in the Palmerston North yard." I deny this absolutely. I never use such language. I have never instructed Porter Hunt to put hand-brakes down on wagons in the yard which were travelling at twenty-five miles per hour, and, further, I require a demonstration with the Board and Hunt present to prove his remarks. I do not consider that "J" 81 could get up to this speed with a string of fifteen "J" wagons on starting from Cook Street and running up close to the north signal-box. The brake was hard down on the "J" wagon on the right-hand side facing Cook Street—that is, the station side. The wheel of the "J" was skidding I will give the Board my version of this incident. The shunters were making up No. 592 train in No. 7 road for despatch at 6 p.m. Porter Hunt was brakesman as third man in the gang. His duty was to lift brakes in order to let the shunting-engine get along smartly with the wagons. While I went from the foreman's office towards the south end of the goods-shed shunting-engine "J" 81 was drawing out fifteen or sixteen sheep-trucks. Porter Hunt was standing near No. 9 points at the corner (south) of the shed. When I got close to him I said, "Why are you not with your gang?" "Oh," he said, "I just hopped off here; they can manage without me." As the engine got closer, labouring heavily, I could see the fire-sparks flying out from the side of the "J" wagon. I said to Porter Hunt, "Lift that brake; the wheel is skidding." He did not answer, and did not lift the brake. He then said, "You will not keep my wife and child if I get killed." I said, "Do as you are told. Lift the brake." He still hesitated, and by that time the wagons were up going towards the signal-box. He went away from where I was standing and hid himself behind some other rakes of wagons. I followed him up and told him to lift the brake again. He said, "I want to see the Stationmaster." I replied, "You will soon have the pleasure of seeing the Stationmaster if you do not do as I direct you." By this time the wagons were getting close upon their train. He walked leisurely along and then lifted the brake. I said to him then, "Do you see the number of that 'J' wagon?" He said,

"Yes." "What's the number?" I said. He told me correctly. I said, "Are you satisfied that that is the wagon you refused to lift the brake on?" He replied, "Yes." As he lifted the brake after my repeated requests I let him go. When this string of wagons was passing me Porter Hunt was standing near me at the south end of the goods-shed. The brake of the truck was on the same side on which Hunt and myself were standing. It would not be necessary for him to jump through the string of wagons to lift the brake. An old man from the Old Men's Home could have lifted the brake of the wagon at the speed it was going. I do remember calling the police on one occasion to remove Porter Cunneen from the railway premises. I was on night duty on that particular date, and as there was a lot of pilfering and thieving going on in the Palmerston North goods-yard I wanted all members off the premises after their work was done. Porter Cunneen and Shunter Y. S. Lucas were booked off duty at 11 p.m., and as they hung about the premises and as they were not under suspicion I thought it would be a good act to tell them to go away home. Porter Cunneen replied, "I will not do so." Shunter Lucas replied, "I won't either." "All right," I said. "Remember I have told you to go home for the second time." They both refused, and I said, "If you don't go off I will have you put off." They said, "Do your best." I then left the shunter's box and went to the station, and I could not see a Coaching Foreman. I met a constable and told him I wanted his assistance. He came with me to the shunter's box. I pointed out both men to the constable and told him their names. The constable asked them who they were working under, and they said, "Foreman Sweeney." The constable then said, "He has told you to go home. Why have you not done so?" Porter Cunneen replied, "We are doing no harm." The constable replied, "Never mind that. You had better go off now, the both of you," and they did so. I had instructions to see that as the men finished their shifts they left the premises at night. I received these instructions from Mr. Morgan, Stationmaster. There were a tremendous lot of thefts taking place at that time—thousands of pounds worth of goods were stolen from the precincts of the Palmerston North Railway-station. My action in advising these two men to go home and leave the railway premises was really in their own best interests. If they remained behind on railway premises after their ordinary hours of duty it could be only assumed that they had some ulterior motive in remaining there. At the same time I made no suggestion that these two men were under suspicion in any shape or form, and I say this in justice to those men. In asking them to leave the premises I was simply acting according to my instructions and as a friend to both of them. Shunter Cunneen stated that he wished to book another hour on duty and I would not let him. My reason for not letting him book another hour was that his work was finished, and he was not entitled to be paid for the extra hour. I remember the incident related by Signalman Lucas *re* bringing a goods-train into No. 9 road goods-yard. I informed Signalman Lucas to bring the train into No. 9 road as it was then clear and I would make the necessary arrangements. He did not advise me when the train had left Bunny-thorpe. He gave me no information whatever. He has ample means of advising me. There is a porter available in the signal-box to send out to give me any information necessary, and, besides, it is only a few yards from where I stand from the signal-box, and this is where I give him my instructions from, and he could have called out to me. It was in consequence of Signalman Lucas's failure to advise me that the train had left Bunnythorpe that the points were not held. I could not delay shunting-work and have the men idle for about twenty or twenty-five minutes. The men were all ready for the arrival of the train, but were still going on with the shunting movements. I placed the men at the points after the train had been checked at the signal-box. I certainly look to the signal-man to advise me and keep me in touch with the running of trains. If I do not get such information I cannot carry out the duties in the interests of the Department. If the signalman was on the alert the first thing he would do would be to send word to the foreman that the train was due to arrive in the yard. I have knowledge of assisting a driver to put a derailed "AB" engine on the rails at the north end of yard. On this particular date a special had to be despatched for Marton with two "AB" engines returning to Taihape. Owing to some irregularities when the engines were first coupled on to the special and the roads set clear for departure it was found to be too late to let the train away on main line. Other shunting-work on trains had to be performed, and as this long train was blocking north part of the yard two engines had to be cut off again and placed in another road waiting suitable opportunity to despatch this special later on. I instructed the pilot of the two "AB" engines to stand by his engines in the meantime. The shunting-engine came along and did shunting-work close to the head of the special train. When that work was cleared with the shunting-engine I instructed the pilotman to hook both his train-engines on to the special. While doing so and as the engines were coming back slowly on to their train by some misunderstanding the front engine was partly derailed. That would be the second engine which would be coupled on to the train. The points were left wrong in that vicinity, and the pilotman did not notice them. As soon as the driver found what had happened he went to the front part of his engine and said to me, "We are off the road." I said, "The buffer of your engine connecting the leading engine is smashed off." He said, "That is a bad business, Mr. Sweeney. We won't get away, and I will have to return to the loco. with my engine." I said, "I have a suggestion to make to you. Will you try it? I think I can get you away." "All right," he said. I asked, "Will you go to Taihape with a buffer out of your engine and no other damage if I get you on the road." He said, "Yes, I will." I despatched a member for a tail-rope and explained to the drivers what I would do. As there was no buffer to hook on to and the front engine could not be coupled on to the side chains through the angle I got the tail-rope and doubled it on the coupling-chains of both engines. Then I drew the driver's attention to it, and I asked, "Do you think you can manage? With the front engine under steam and your engine only slightly off we could pull forward and get the derailed engine on again." We did so, and were successful. I then changed the engines, put the good engine on to the train, and put the damaged engine in front, and the special was despatched with both engines. I doubled the rail-rope. This was not any

ordinary case of using a tail-rope; it was a case of using the tail-rope under an emergency. I was acting under the charge of the driver, and I was assisting him. As the result of my action I saved a big delay to the train. This was a practical movement with the tail-rope. I have never given a signal to Driver Boyd to move his train while Shunter Gillespie was in between the trucks uncoupling. I absolutely deny the statements made by Driver Gillespie and Shunter Boyd on this subject. Never in my whole career in the Railway service directing shunting operations have I had a man even slightly injured while I have been in charge of the yard. That service in the railways covers a period of approximately thirty-eight years—that is, casual and permanent service together. My method of giving orders is done in a practical manner. When I am giving written orders to the shunter in charge of any gang or for any work I write the name of that shunter on the slip of instructions. When I am giving verbal instructions to shunters and porters or any man under my charge I speak in a loud tone in a commanding manner, and as officer in charge I expect these men to carry out their instructions. I never harass the men. I help the men, but through lack of knowledge on their part my efforts are not understood. Once I give an order to the men and they carry it out I never go near them again. All I want is that they do the job. If they fail to carry out my instructions as officer in charge I want to know why they are not carried out. I consider that the shunters are not always aware of the necessity of carrying out certain work at certain times. They do not know what is in the foreman's mind when he is giving specific orders. It is my duty as officer in charge to see that trains get away sharply to time. I am responsible, and it is necessary for me to arrange the work accordingly. Anything out of the way such as urgent and live-stock orders and rapid orders from the Transport have got to be carried out, also orders from the Goods Office have got to be attended to as the occasion requires. Some of the men resent orders when issued to them. Some of the men do not want to do the work. If they do they speak back in their manner to suit themselves. I find that sometimes shunters verbally dispute my orders. Some of them are inclined to think that they know more about the work in the yard than I do, and these men with five or six years' experience think they can dictate shunting-work to a practical shunting foreman. I do not allow it. I have to very often issue an order which the shunters consider unnecessary, but I am instructed to do it, and I must obey. First of all, I expect respectability in my capacity as Yard Foreman, and, secondly, I expect obedience while in that capacity. I have given a lot of advice on shunting-work at different times since I have been placed in Palmerston North, but I find my knowledge is criticized and ridiculed by members of the Department not connected with shunting, or, in other words, many of the shunting porters and shunters themselves are sort of poisoned by the atmosphere they work in by persons not responsible to the Department for shunting-work and shunting duties. I have heard individuals in the Palmerston North yard tell my men not to do as I told them. They have said, "He does not know what he is talking about." In their opinion, caused through ignorance, they take me for a joke. I know the persons who advised men under my charge not to take any notice of my orders. I have the names in my book. Some of them are members of the Railway service. I will supply the Board with the names: Train-examiner O'Donnell, a prominent man in the union, Signalman J. Lucas, Train-examiner Eckersley. I attribute a lot of the present trouble owing to these members telling the men not to take any notice of my orders. I never harass the men, and I take this opportunity of denying that I have ever harassed the men. I have a wonderful knowledge of shunting, and I work my men according to the rules and regulations set down by the Department, and I consider that I should not be interfered with in my supervision as Yard Foreman. I am satisfied that with my supervision in the yard I obtain the best results for the Department. Any laxity on my part would result in trains getting late away, delays to perishables and important loads, and this would bring the Department into disrepute with the public, and also cause loss of revenue. Under present conditions where we are faced with motor competition it is very necessary that the very best service should be given and all delays eliminated in order to maintain the revenue, and in this respect it is expected that every railway man should give his best service to the Department. They are paid to do their job. That is my aim, and that is what I strive to get from the men. I try to give them a fair deal. Four or five years ago I was the best foreman the men had. I have always treated the men well under me, and I try to obtain the best results from the staff at all times, and I expect a fair deal from the men.

To Mr. Mack: I am well aware that I am on my oath, and I say that everything that I have stated in my examination in chief is absolutely true in letter and detail. I have been about thirty-seven years in the service and have been connected with shunting for twenty years. I have a medal for shunting from the leading engine-drivers in Greymouth. I can produce it. [Shunting medal exhibited to Board.] I can prove that this medal is a medal for shunting. J. Orr was the leading engineman at Greymouth at the time. The inscription says, "Presented to Mr. J. Sweeney by J. Orr." I say that the inscription on the medal although it does not say that it was presented for shunting qualifications was presented to me by J. Orr on behalf of the other drivers at Greymouth. There is nothing on the medal to indicate that it was for shunting. I have had more than twenty years shunting. I have been connected with shunting all my life. I joined the railway at eighteen years of age. Therefore I was not connected with shunting all my life—that is, before I reached the age of eighteen—only during my railway life or career. When I came to Palmerston North I was then a foreman, and I had behind me approximately thirty years' shunting experience. It is quite natural on coming to Palmerston North I was coming to new surroundings. I did my best to pick up the work and local conditions of the yard. When I arrived I recognized that the yard was congested and that the traffic had outgrown the capacity of the yard. I recognized the difficulties that both the shunters and myself would have in carrying on the work successfully. I did not recognize that everything possible that could be done should be done to facilitate the shunting in the yard. I did not recognize at that time that more room was required. When I got more knowledge I recognized that more room was

necessary. That was after I had been at Palmerston North two or three years. Up to that time everything was not satisfactory. The yard was a bit congested during my first three years at Palmerston North. I did not recognize that any extra accommodation was necessary earlier than three years after coming to Palmerston North. I kept in touch with everything that went on in the Palmerston railway-yard. I have been an active gentleman. I do not think that I read Mr. Hiley's report of 1914 regarding the Palmerston North yard and the inadequacy of the yard accommodation. I do not agree with the extract from the report read before the Board regarding the inadequacy of the accommodation at Palmerston North. I have always the welfare of the loyal men in the yard at heart. I have the interests of the loyal men at heart, but the interests of the disloyal men only to a certain extent, and I decline to say to what extent. There may be a feeling between myself and the men whom I call disloyal. I am not prepared to answer the question as to whether I think that everything that can be done ought to be done in the interests of the lives of the men in the shunting-yard at Palmerston North. I decline to answer. If I saw anything that would safeguard the lives of the shunters in the yard I would certainly make representation in that direction to the Department. I know all the points in the yard. I think the conditions of the points as they are at present are safe for shunters to work over. It may be and it may not be an improvement to cover over or board these sleepers at the points. I am not prepared to say whether it would not be an improvement to cover them over. I do not know that all points that are uncovered are a danger to shunters. Notwithstanding that I am the smartest shunter that ever stood upon a brake, and that I am a wonderful shunter, I still say that all the points are not a danger to shunters. I have made written representations to the Department suggesting improvements to the Palmerston North yard. I made application to the Department, as far as my memory carries me, to put a couple of feet of ballast from the north end of No. 2 road, exchange road, to the south end of the same road. Two feet high of good ballast. That was done by the Department. Latterly this was removed by some one else in authority. I have already detailed the suggestion made by me about lights and which suggestion was acted upon and lights provided. I think I made some representations to shorten the long trains that were coming into Palmerston North. I made a recommendation for a shunter's box at the Cook Street Crossing, and this was given. About four and a half years ago I put in two special reports about eight new hand shunting-lamps, and I do not know what happened, and I never heard any more about my application. I did not see any lamps come to hand. I recommended that the R.R. train coming from Wellington, due to arrive at 12.30 p.m. or thereabouts, should be altered to arrive at 2.30 p.m. After some consideration and a little time this suggestion was put into effect. I was instrumental in providing a shed for the shunter's bicycles on the railway premises. There may have been other suggestions for improvements, but I cannot just remember at the moment. Summed up, I have had 2 ft. of ballast put on No. 2 road, and somebody took this away; I suggested that big trains coming in here should be split up; and I applied for extra hand-lamps for the benefit of the shunters which did not come to hand; and these are all that I recommended as far as I can remember. The box for shunters and the bicycle-shed were provided also for the convenience of the shunters. I have not any recommendation for any extension of the yard, as it is not my duty to do so. I have not made any recommendation that the points should be covered over. I have not made any representations to have the yard more properly drained. I have not made any recommendations for lighting other than that made when I first came to Palmerston North. Since my application for additional hand-lamps I followed up the application for a while, but it did not come to anything, and I did not get the lamps. I admit that I said in my evidence previously that I was the smartest shunter who ever stood on a truck in the Greymouth yard. This is an estimate of my own ability, and also an estimate of the people of Greymouth at that time. This is from hearsay. I did say that I gave Shunter Roberts good advice on his arrival at Palmerston North yard, and that he ran spare man for about three weeks. If Roberts says that he ran spare man for only one week, then I think he is untruthful in this statement. I cautioned Roberts on his arrival, and warned him not to expose himself to any danger, and Roberts thanked me for it. I did not tell him that tail-roping was dangerous work. I did not show him how a tail-rope should be adjusted. I do not think that this came within my province as a foreman to see that Roberts understood that. It is not laid down in any outline of my duties that I should see that the men thoroughly understand the work they are called upon to perform. I say that Rule 27 covers the matter of instruction of employees in their work. This rule says: "In every case where any member does not understand his duty he must immediately apply for instruction to his immediate superior officer, and no excuse of want of knowledge will be admitted in extenuation of any irregularity or neglect." This rule does not exonerate me, but the ordinary intelligence of the men ought to make them appeal to me and not me to them. I did not say that I always wait for the men to come to me, but I do not instruct them in the use of the tail-rope and other work. I told you that before. Rule 3 does not apply to me until after Rule 27 is carried out and provided for. It would not necessarily follow that a man shall apply to me before I see that he understands the duties assigned to him. If I see a man making a mistake I tell him. I regard it as my duty to supervise the men as foreman in charge of them. I consider it is my duty to supervise my men in shunting-work to the best of my ability as foreman in charge of the men. I know that there are Traffic Inspectors. I have seen them on the Classification List. I do not think that I have seen the Traffic Inspector in the yard during the last six months on an average of twice a week, but I have seen him in the yard pretty often during this last fortnight. That is since Carmichael's death. I know that there are men known as Signal Inspectors. I have an idea of their duties. I consider that their duties are to inspect and report on the duties of signalmen. They could not see that the signalmen performed their duties satisfactorily, but I take it that their duty is to see that the signalmen understand their duty. I say that they visit the signalmen occasionally, and I know that they visit the same signalmen very often. I know that there are Road Foremen in the Locomotive Department. I do not

know what their duties are. I would like to know. I would not deny that their duties are to instruct the firemen to fire their engines economically. I know that there are Ticket Inspectors. I know that their duties are to hold classes to instruct the porters and others how to punch tickets and various classes of tickets issued. I do not know one man whose job it is to instruct shunters in the use of the tail-rope and other work of shunting. It is not my job. Never in your life! I knew Shunter Carmichael well—poor fellow. He gave me every satisfaction. He was a practical young gentleman. There was no occasion for me to bustle him in his work, and I never did. I was a friend to Carmichael. I do not think there was any occasion for anybody else to bustle him. I say that Porter Lepper did not have as much shunting experience as Carmichael. I would say that he does not know what he is talking about. If Foreman Robertson stated that Lepper is one of the best shunters in the yard and capable of taking charge of any engine I would say that part of such statement is right and part is wrong. Lepper could take charge of an engine very easily, but he could not do practical shunting. He is an amateur. The man in charge of the engine is expected to control the shunting-gang, but he does not do it. It is a mix-up between three of them. Sometimes the shunters have a consultation among themselves as to which man will cut off and which road it will go on. In connection with the incident regarding Porter Hunt refusing to lift a brake on a J wagon, the engine started off from the south end of the yard with fourteen or fifteen trucks, and as it was passing the south end of the goods-shed I instructed Porter Hunt to lift a brake on the side of the wagon. The handle of the brake was trailing as the engine went out. I was on the right-hand side facing Cook Street. I was over on the station side of the goods-shed and of the trucks that were running out. It would not be dangerous for a man to lift a brake trailing after the train had left Cook Street and reached the goods-shed with a brake down. Porter Hunt did tell me that I would not look after his wife and family if he were killed. I do not know what Hunt thought—it was what I thought—and Hunt might have rebuked me in that way for fun, apart from the alleged risk which he might have attached to doing it. I insisted upon Hunt doing it. That is what I am there for. I remember subsequently asking him to look at the number of the truck. I did that because Hunt is such a slippery gentleman that he would have confused that number with another one. I have stated Hunt refused to lift the brake. I instructed him to lift the brake. It does make a difference to the fact that the right number was taken. Hunt might have told a deliberate lie about the matter. I mean that Hunt might have disputed the number of the truck if I had written it down, and if he had disputed the number that would have made all the difference in the world. How can we deal with the correspondence if the truth is not told? How can recommendations be made if the correct information is not given?

To the Board: I asked Hunt to take the number in the capacity of Yard Foreman and in the course of my duty.

To Mr. Mack: If I gave one number in my report to the Department and Porter Hunt gave another there would be a discrepancy and the Department could not adjudicate on it. If Hunt had denied that I had instructed him to lift the brake, I would not say what position I would be in. Hunt is telling a deliberate untruth if he says that I instructed him to get across the vehicles to lift the brake. Hunt told me that he wanted to see the Stationmaster, and I told him that he would see the Stationmaster soon enough. I told him that he would have the pleasure of seeing the Stationmaster if he did not do as he was told. I do not know whether it would have been a pleasure for Hunt to have seen the Stationmaster. That was not a little sarcasm on my part towards Hunt. I said that the wagons were going at three miles an hour and that an old man from the Old Men's Home could have lifted the brake at the speed it was going. This is not an exaggeration: it is a comparison. This is not an exaggeration to say that an old man from an Old Men's Home could lift a brake on a moving vehicle going at three miles per hour. All my statements are truthful. I do admit that I called in the police to Porter Cunneen, and Shunter Y. S. Lucas. My reason for doing so was that they might have had some ulterior motive for remaining on the premises. It might be assumed by me. I had no suspicion on either of the men concerned. When they did not go off when they were told I could only assume that there was some ulterior motive. They did decline to go off. I would not say that their rebehind carried with it some ulterior motive, but I considered that their absence from the premises would be better for both of them. I was kindly disposed towards them in that respect. I had to get somebody to help me, and notwithstanding this I called the policeman. These men disobeyed me. I did not get the policeman with the object of ejecting them from the premises. I wanted the policeman as a witness of my action and not as a help. I do not think that this is a rather peculiar way of showing my kindness towards these two men. Not in the slightest. I had not the remedy in my own hands of reporting them to my superior officer—the Stationmaster. This was the only remedy I had at the time. The schedule for this particular shift was made out for these men to finish at midnight. I was not ordering them off the premises an hour before their schedule time. The schedule shows the shift to finish at 12 midnight, and I was ordering them off the premises at 11 p.m. I could not tell the men before starting their shift that they were to be booked off an hour earlier that night. My instructions are from the Stationmaster to the effect that I am to reduce overtime, and I was carrying out my instructions. I have the power to book the men off immediately they have finished their work, irrespective of the schedule hours of the shift or not. I do not know whether this is calculated to get the best out of the men. The officer giving me the instructions can tell that. I would not say whether this is an incentive for the men to string out or lengthen the shift or to do what is commonly called "go slow." It is not true that on this occasion that these men had got a bustle on and had finished their work before their schedule time. In connection with the signalling incident and the bringing-in of a train hereinbefore described it is a fact that the responsibility rests on the signalman and not on me. I rather admire a man who would not take the responsibility of bringing in a train over unheld points and therefore obviate risks. If the signalman

in charge of the signals sees that the road is not clear and not safe he is justified in pulling the train up. This is not what the signalman did upon the occasion in question. In the first place, he did not give me proper information as to the arrival or the whereabouts of the train between Bunnythorpe and Palmerston North. The train was pulled up—before I was acquainted of the fact—near Palmerston. Previous to this I had my men ready, and I had to dismiss them again from that position although I had the road set all the time and the points ready to be held on proper information. Signalman Lucas, when I approached him, disbelieved me, and would not listen to my request that I was right. Lucas did not send a message to me that the train was coming. I anticipated the arrival of the train, and in consequence arranged the men accordingly. I was not told anything about the train not coming, and I had to let the men get on with the work. I took precaution to tell the men that I would want them to hold the points—about seven sets of points—as soon as the train arrived. There were three shunters, three porters, and myself available to hold the points. The shunters I told to be ready to hold these points were Shunter Worthington, Shunter Whitmell, and Shunter Gillespie, Porters Hunt, Bodle, and a shed porter whose name I cannot remember. I arranged for these men to be at the points when I wanted them. I told Shunter Worthington in charge of the gang that I would want his two men. I made arrangements with the man in charge for the men I wanted to help to get this train in. These men I have mentioned were, as far as I can remember, the men I was going to use on this occasion. I made the arrangements. I told Shunter Gillespie to get one or two men—I am not sure how many—that the train would be received on No. 9, and to give my message. I told Mr. Worthington to hold No. 1 points. I did not tell Mr. Hunt to hold No. 2 points. I cannot say who did. I do not know who should have told him. I did not tell Mr. Whitmell to hold No. 5. I think Worthington told him. I am not sure. I may have told Mr. Bodle to hold No. 7 points. I am not sure just now. I think Bodle was one of Worthington's gang and that he was responsible for telling him to hold the points. I sent a message to the shed porter. I sent a message for him by Shunter Gillespie, I think. I may have told Shunter Gillespie. I am not sure. Either Shunter Worthington or myself were responsible for telling Shunter Gillespie, but I am not sure whether Worthington or myself did do so. I was present all the time. It is not a fact that, although I told Signalman Lucas that I was ready to receive the train, I had left a good deal to chance. It is a fact that notwithstanding that I do not know who was responsible for telling some of them, and I am not sure whether myself or Worthington did or did not do so. I would have looked for the train had I got advice about it. The first time I knew of the train she was at the stick. I anticipated the arrival of the train and made arrangements, but I did not look to see whether the train was coming. When the train arrived the men were on the points. The signalman stopped the train in the goods-yard, and at that time the men were at the points, and I do not know why the signalman stopped the train. He is the signalman. It was previous to this that I had the men arranged and dismissed. I saw the train, and then the men were put on the points. The train came close up to me where I was standing on the main line, and I could not help seeing it. If the signalman swears that he stopped the train because there were no men on the points I say that that statement is not the truth. If a signalman unnecessarily stops a train at the signal there is a remedy. I think that I brought the matter under notice in the proper way. I am not sure—there were so many incidents connected with this gentleman. If this signalman was commended by the late General Manager for averting loss of life I would say that it must have been a long time ago. I do not know of it. I do not know that this particular signalman was commended for saving a fire in the goods-shed. I do not know whether he was commended by the General Manager for being instrumental in removing the gas-holder in a case of fire. I decline to answer the question as to whether I have enumerated all the bad points of the particular signalman in question. I did not say that I knew all his bad points and not his good points. Every word of the statement made previously at this inquiry by myself relating to the putting-on of an "AB" engine with a tail-rope is true. I do not think it is right to say that, leading up to this derailment of the "AB" engine, an "H" wagon was put off another train for repairs, and that I instructed the shunters to pick it up before it had been repaired and place it on the train it was going by. I do not think this is a fact that my attention was drawn to this wagon by a train-examiner and that it had to be repaired before it could proceed. There was a wagon of stock to be repaired, but I am not sure that this was the day, and I am not sure of the time of the day. Instead of lying for the special the points were lying for another, and the front engine was derailed in consequence. The engine was slightly derailed, and I got busy with the tail-rope, helped to get the engine on the road, and finally sent the train away with very little delay. I did my best. I think that just as we got the engine on the rail one part of the rope gave way, and, of course, the rope flew. There were four parts of the rope. I am quite sure of all this. It is not a fact that this engine was wholly derailed, did not go on the train, and was not put on the road until some time after the train departed. There might have been two incidents.

To the Board: I note all derailments down in my book on the date they occur, and I am giving a truthful account of the particular engine I refer to.

To Mr. Mack: If the driver comes forward and makes a statement that this engine was wholly derailed and did not go away with the train and was not put on the road for some time after, I can only say what engines I put on the train were despatched.

To the Board: I put my report in, and the Department would have the reports in regard to the incident.

To Mr. Mack: I am still of the opinion that the train left as stated by me in my evidence. The Board will judge my evidence as they think best. I have never given instructions to Boyd or any one else, and deny that I gave a signal when Shunter Gillespie was in uncoupling, and I say that he is not telling the truth. I do not think that he is conspiring to give evidence against me. I have a naturally loud voice and in addressing them the men may take it as aggressiveness on my part. I

walk around in my capacity as foreman. I interfere with the men, but I do not harass them. I do not chase them about. I walk around the yard. I say that it was through the lack of knowledge that my efforts were not understood. I mean by "efforts" when I point out how work should be done and done properly in my capacity as foreman. I say that my knowledge is superior to all of the fifteen or twelve shunters in the yard, and I say that all the fifteen or twenty shunters in the Palmerston North yard lack knowledge. I said that they do not know what is in the foreman's mind. I would not interfere with the shunter after he had planned his work unless it was to give him orders. I have to necessarily let the shunter plan out his own work. He is no use there unless he does. The shunters have got sufficient knowledge to plan out their work. I say that some of the men did not want to do the work. I heard Foreman Robertson giving evidence to the effect that he had no trouble with the men. I heard him say that under the seven hour twenty minute day the men gave excellent service. I do not agree with that. There has been a comparison made between Foreman Robertson and Foreman Sweeney, and I would like to make a statement in that connection. I do not agree with the statement that under the seven hour twenty minute day the efficiency of the service given was increased. I understand Foreman Robertson made that statement. I have heard in evidence that an engine books forty miles for her day's work shunting for eight hours daily. If an engine does forty miles in a shunting-yard in one day I would say that the shunter would do about twenty miles on foot taking the day on a whole. If a shunter runs twenty miles in one day combined with the risks he would run he would have a pretty anxious day. An extra three-quarters of an hour over eight hours should not affect a shunter in his work on the next day, except in very hot weather. I said previously that some of the men try to dictate to me about the shunting, and I do not allow it. I do not resent the shunter offering suggestions to me. It is not a fact that when a shunter offers a suggestion to me that I think he is dictating to me. As far as I know, all the men under my control are respectable men. In my evidence in chief when I said I expected respectability I meant respectfulness. I did not intend to cast any reflection upon their respectability. I cannot help what men say about me. Some of the men have evidently lied about me. I will not say this about all of them. The majority of the men under my control are truthful men, and obedient. For those men who are disobedient I have my remedy. It is true, as previously stated, that my knowledge is criticized and ridiculed by members who are not connected with shunting. They are in the yard of which I am in charge of, and I do not want to hear men passing reflections on me while I am going through the yard, and I resent such imputations. I think that these men poison the atmosphere, and the porters and shunters take notice of what they say, and I consider that these men should show a better example. I know the men who are responsible for this. I think that the majority of the men who are respectful and obedient take notice of such imputations. The influence is upon them. The shunters have mostly a good deal of service. I think that these shunters are influenced by the one or two men who have no connection whatever with shunting-work. I have heard these men tell men under my charge to take no notice of my orders. I have never reported this to the Department, as reports are no good without witnesses. I have never found the Department declining to receive a report without a witness. My reason for saying that the Department would not take up this matter is that I have reported matters and the Department has written to me and informed me that there was no good going on with the case unless I had witnesses. I cannot answer the question as to whether I think the Department are blind to their own interests in refusing to take up a matter where one member of the Department advises another member not to take any notice of the orders of his foreman. I still maintain that I have a wonderful knowledge of shunting. I could not say whether I am 100 per cent. efficient as a shunter. I am proud of my record. It is a fact that I am praising myself. It is not a fact that my conceit in the matter of shunting leads me to think that nobody else knows anything about it. It is not right and contrary to fact to say that I would not allow the shunters to know anything about shunting. I still say that about four or five years ago I was the best foreman the men had. That was the opinion of the men who were working under me at that time. There is no difference in my attitude towards the men at the present day than it was four or five years ago. There is a difference in my standing now as regards the men. I was the foreman directly in charge of the men at that time, and I am not to-day. I got along well with the men then, and my status to-day is altered, and I do not get along so well with the men now. In the first place, I was dealing with experienced shunters and porters—men who had a good knowledge of shunting—and when I gave them instructions they carried them out and did what I told them in those days. Since then my position as foreman was altered by Mr. A. K. Harris, District Traffic Manager, Wanganui, and Mr. J. L. Morgan, Stationmaster, Palmerston North. I was put on the night shift in the goods-yard for two and a half years or thereabouts, continuously on night-work, and the men naturally drifted from under me, and were put under Foreman Robertson. I think that was the first instance of dual control. The reason why I was taken off the day shift and put on the night shift was that they wanted a reliable man in the yard at night-time to safeguard the Department's interests from pilfering goods, &c. That is as far as I know. I was not exactly satisfied with the reason given for putting me on the night shift. The doubt regarding the reason was that I considered that Mr. A. K. Harris had me "set." About that time Mr. Harris had a roving commission for the North and South Island reviewing men's ability in different positions held in the Department, and he slated dozens, and was the means of slating dozens of railway men and getting them reduced in rank. I do not know whether Mr. Harris would slate men and get them reduced without some real reason, but he did so in my case. Mr. Harris was the cause of me being reduced in position, but not in pay. I think so, but I am not quite sure whether he did it all on his own. I think he was assisted by Mr. Morgan. I suppose that the matter would have to go before the General Manager, and he would be influenced in the matter of deciding the matter of my reduction in position. I was superseded, and other men who were below me went ahead of me. The Heads of the Department act upon recom-

mendations, and no doubt the Department would have a reason for superseding me. I felt being superseded like every other man does, and I fought against it. I asked them the reason why I was superseded, and I kept them going by correspondence, and the reason given me for being superseded was to the effect that mostly I did not come up to the standard for promotion, and that they regretted I was not recommended. This was signed by the District Traffic Manager. The reason given why I was superseded was to the effect that I did not have the qualifications for the next grade in the meantime. I believe that they did tell me that I lacked tact. They did not tell me to my knowledge that I was excitable. I was not satisfied when they told me that I lacked tact, and I fought on and wrote to the District Traffic Manager, Wanganui, spoke to him at Palmerston North, and a straight talk at that. I wrote to Mr. McVilly, the General Manager of Railways, at Wellington. I had personal interviews with Mr. McVilly, and he promised me consideration, and eventually kept his word, and through the assistance of Mr. O'Shea, Stationmaster, Palmerston North, I got the other grade. In connection with this matter I appealed to the Appeal Board at Wanganui. The same reason was given at Wanganui—that I lacked tact and did not come up to the standard. I defended the appeal case myself and had a good go, and the case was dismissed. The Department's chief reason for my being superseded was that I lacked tact. I defended the case myself from start to finish. At the beginning of the case I approached the Amalgamated Society of Railway Servants to defend my case for me. They did not tell me that, in their opinion, they considered that I could not succeed. They did not decline to appear for me; they promised to plead my case for me here in Palmerston North. I was a member of the Union then. For years I had been a paid-up financial member, and this was the first case where I asked them to assist me. Other matters happened previous to this. Word was given to me by a responsible person here that my case was being taken up, and for about three or four months I was under that impression. Meetings were held in the Social Hall and my name cropped up. Members of the deputation going through from Auckland to Wellington were approached in my presence to delegate, and they said they would do all they could for me. Matters went on and still I got no definite advice, till finally I got to hear that my business was transacted in a meeting at Palmerston North in my absence, and by accident I heard that my chance was finished three months previously, and I was not advised. I got word about a week after. Turned down badly after paying to the Union for about twenty-eight years. I thought that the Union should have given me some assistance whether my case was sound or otherwise, and, if not, to let me know and not string me on for three or four months under a misapprehension. I considered that at that time when I was put out at night-work the Union should have taken up my case. I was in the society then paying good money. I expected the assistance of the Union and approached them when I was put on all-night work. It is not a fact that I have had no love for the Union or members ever since. I complain about the unjustness of the whole matter. They were not just to me. I had a grievance against them then, but it has gone out of my mind since. Mr. Morgan, the late Stationmaster, was quite the reverse of being a just man. He was a very unjust man. I did not have the pleasure of knowing Mr. Morgan personally for a long while, and I do not know what he might do, but what I do know is that I have done a lot of good work for Mr. Morgan, and I got nothing for it. That is what I do know. I would not like to say that Mr. Morgan said things about me which were not true. I remember a departmental inquiry being held at Palmerston North regarding a man named Drain. I have good reason for remembering that business. I think Mr. Morgan gave evidence at this inquiry. Perhaps he did say at that inquiry that owing to my bombastic manner he had had a lot of trouble with me. I do not remember him saying that he had inquired into at least a dozen complaints and found me at fault in all of them. I do not think he said that it was only the loyalty of the men which prevented serious trouble. If he did say that he was not right. It is not a fact that the Union refusing to take up my two cases has caused me to be resentful ever since. I do not think that all of the men would come along and say the same thing along the same lines wilfully to damage me in my position, but some of them would, but the remainder would be honest. I do not think that all of the men who have given evidence would be so wicked as to wilfully try and do me an injury. Some of those men are truthful and have got a bit of principle, and others have not and falsify me to prejudice me in the eyes of the Department. In other words, I am a bit too straight for them. I cannot account for some of the men who have no complaint with me at all saying that they have seen my attitude towards other men which was of a harassing nature.

Palmerston North, 5th September, 1925.

In connection with the previous evidence given by me to the effect that I have heard men in the Palmerston North yard tell men under my charge not to take any notice of my orders, I am unable to say who O'Donnell or Lucas or Eckersley told not to take any notice of my orders. It was in conversations. A long time has elapsed, and I cannot remember incidents which date back some four or five years. I only took the names of Lucas, O'Donnell, and Eckersley down in my book, as these men referred to me, and the persons to whom they spoke did not refer to my name. I certainly do not think that I should have taken down the names of the men to whom they spoke. I did not know that there was a shunting inquiry coming on. I cannot note down everything that may happen. I do not consider that these men named should have spoken as they did, and I cannot say what my object was in taking down the names of these men. I cannot tell you any further. I took those names down in my book for my own purpose. I decline to say what my purpose was in taking down the names of these men who advised other men under my charge not to take any notice of my orders.

To Mr. Carnachan: In connection with the previous evidence given regarding the derailment of "AB" engine in the Palmerston North yard, I referred to "AB" 774, the Palmerston North engine. The second engine which had the buffer broken was the Taihape engine. After "AB" 774 was pulled on the line again it was placed in the rear of the two engines. The Taihape engine with its broken

buffer was then placed in the lead. Both the engines were then coupled in readiness to run the special to Taihape. This was about midday when this happened. I then went off for my dinner, and was under the impression that both engines went to Taihape. I since understand that this is incorrect. It is true that the derailed engine was subsequently returned to the shed. I was not aware of this fact at the time I gave my previous evidence. To the best of my knowledge the evidence I gave at this inquiry yesterday was true and correct in every particular. I understood yesterday when being questioned on this subject that it was merely a question of the method of tail-roping adopted in placing the engine on the line. After the engine was placed on the rails, I know that the engine was returned to the shed.

To the Board: I know now that the engine returned to the shed.

To Mr. Carnachan: I first came to Palmerston North about the year 1918. The year 1919 was a slump year. When I stated that I did not recognize that more siding-room was required at that time my assumption was based on the volume of traffic dealt with at that particular slump period. Since 1919 the traffic handled at Palmerston North has been gradually on the increase. I now recognize that more accommodation should be provided. When I stated previously in my evidence that I had the interests of the loyal men at heart I meant by that men who were loyal to the Department. It is no concern of mine whether the men are loyal to their union or not. The fact of whether a man was a unionist or a non-unionist would have no effect on me when it came to a question of protecting his interests and seeing that he did not endanger his life. My previous record shows that in my thirty-eight years' service in the Department I have never had a man injured while under my charge, and if I still can maintain this happy record until the end of my service I shall be a proud and happy man, and shall conceive it a greater achievement than any material advancement I have made in the service. I consider it my duty to instruct all newcomers coming into the yard and give them full particulars of the work they are required to undertake. If a man had any doubt in performing any class of work I would give him all the necessary information to enable him to carry out the work properly. At the same time I would also expect every member to come to me for instruction in accordance with Rule 27. I consider it is my duty to instruct men in the proper use of the tail-rope. I have other duties to perform in the yard besides instructing the men in the use of the tail-rope. There are dozens of other duties that require careful attention. When I stated previously that the men in the shunting-gang confer amongst themselves as to who shall cut off and as to what roads the loads should be placed on, I mean that they confer when the yard is in a congested state. Each man's duties in the shunting-gangs are clearly defined. It would be the first man's duties to cut off. The second man would turn the points, and the third man would catch the brakes. This is the recognized procedure in the yard, and each man clearly understands his duty in that respect. In connection with the arrival of C. 9 special on the 29th November, 1924, previously referred to by Signalman Lucas, I cannot inform the Board as to what time this special was timed to arrive at Palmerston North. This train was running under telegraph train-advice No. 1196, and was timed to run from Marton to Palmerston North as soon as ready. I would not, therefore, know at what time the train would arrive at Palmerston North. I would look to the signalman to supply me with that information. This train was actually signal-checked for about half a minute. I still maintain that even this small delay would have been avoided if the signalman advised me the time the train left Bunnythorpe.

To the Board: In rainy weather there is no difference between Palmerston North yard and any other yard. The water lies about the yard and floods the points, and there is difficulty in the water getting away. There is nothing wrong with the lighting at present at Palmerston North for this time of the year, but in the winter-time the yard is partially a dark dirty hole, and I consider, without fear or hesitation, that electric light should be put in without delay. For the winter-time the lights are insufficient. The hand-lamps are in a bad condition at the present time. They have been bad for years. They are lamps of the old type, but the majority of them are fitted with triggers. They are the same type of lamps as when I joined the service with the exception of the triggers. When giving orders I usually give them to the leading man in the gang if possible. The important verbal orders are given to the leading hand, but sometimes on emergencies or in a hurry I give orders to the second man, and later qualify the order and see that the first man understands the order. In connection with the speed of the train and the trailing brake on the "J" wagon as previously detailed in this evidence, I say that I was at the south end of the goods-shed and Porter Hunt was standing near the corner of the goods-shed. I was near No. 9 points when I instructed Porter Hunt to lift the brake. If Porter Hunt stated that he was up at the north signal-box when I asked him to lift the brake I will say that Porter Hunt has made a mistake. From memory I think the shunt was coming up No. 11 road. Porter Hunt was on the station side of the vehicles. The wheel that the brake was jammed down on was skidding, and by the engine labouring I knew that the brake was hard on, and had the brake been on the opposite side of the wheel to me I would not have been able to see the sparks. The fifteen "J" wagons were going on No. 592 train. The engine hauling the empty "J" wagons would come to a stand about the weighbridge before setting back on No. 7 road to No. 592 train. The bend in the track would not have enabled me, from the position where I stood, to see the sparks fly from the skidding wheel if the brake were down on the opposite side to where I was standing. It was a trailing brake. I was a little bit distant from Porter Hunt when I first gave him my order, and the rake was being pulled slowly past me when I gave him my order the second time. The brake would be quite alongside me at this time, and I am absolutely certain that these particulars describe the incident correctly. When putting the Ab engine on the rails with the use of a tail-rope I will say that we were working some time with the tail-rope before the tail-rope broke. I did not know how many wheels of the engine were off the rails. While I was present I think the engine was off about fifteen or twenty minutes. I had the tail-rope doubled first to shorten it up for the leverage, and I hooked

one part on the derailed engine hooks of the side chain, and the other part on the hooks of the engine which was on the road, and I had four parts adjusted. Carmichael was inclined to be of a nervous temperament. Through the shortage of good lamps the old lamps are being continually patched up for the men, and the practice has got to this stage and the supply so inadequate that very often damaged lamps handed in are replaced with a very poor class of lamp for shunting-work by night. When I referred to Mr. Harris previously in evidence and said that he had a roving commission to review positions I do not mean that he reduced grades, but men in their then positions were superseded by men in their present positions the same as myself. In connection with the derailment incident, I do not think that both engines were coupled before I left for dinner. I cannot say that the engines were actually coupled on the wagons when I left for lunch. I gave certain instructions in connection with putting the damaged engine in the front and the other one at the rear. After doing this I went for dinner. I understood that the derailed engine was on the road when I left for dinner. I cannot say definitely whether the engine was on or not before I left for dinner. In connection with the brake on the J wagon being drawn through the yard and the sparks which I saw coming from the brake, I cannot say whether the sparks were coming from the wheel on the rail or the brake-block on the wheel. It is a very difficult question to answer. The wheel was skidding and continued to do so while the wagon was drawn to me, and I was satisfied, also, that the wheel was skidding by the fact of the smell from the skidding wheel. . I have seen sparks fly from the wheels on the Rimutaka Incline. In connection with my statements in evidence yesterday on pages 159 and 160, and page 164 of to-day's evidence, I will state that I called attention to the Board regarding the manner in which Mr. Mack put his questions to me, and I told him to put a straight question, and this is one of the questions that he has not put right to me, and I have answered it to the best of my ability. What I consider he refers to is that the Shunting-yard Foreman at Palmerston North should go to a shunting-gang, take one of the men away, get a tail-rope, and start instructing him in the use of it. Now, sir and gentlemen, you are broad-minded thinking men—what chance has a Yard Foreman to do that in Palmerston North? There is not a foreman in charge of any yard in the Dominion who does not instruct the men in the performance of their work, and that is what I have always tried to do. I consider the question was not put plainly. The question as I understood it was whether I was a teacher, and it was on this assumption that I answered the question, and I apparently misunderstood Mr. Mack's question. A man could easily take charge of an engine in Palmerston North and still be an amateur.

JOSEPH DE ROSA sworn saith.

To Mr. Carnachan: I occupy the position of Yard Foreman at Palmerston North. I have been at Palmerston North for about eighteen months in the capacity of Yard Foreman. I remember Shunter Roberts arriving in Palmerston North. I did issue instructions in regard to his duties. He was running spare man and then third man. His duties as third man consisted braking wagons, coupling up, marking and chalking of wagons, &c., and during the time he was running as fourth man he would be in the position of learner in the gang. I advised him to look after himself. Driver Firth yelled out to me one day in going past and referred to the late Shunter Carmichael, and said something to the effect that "Why don't you keep out of the way? Every time Carmichael sees you he seems to get excited." Driver Firth never did tell me to leave Carmichael alone or he would get killed. I think I had Carmichael for about four or five weeks in charge of a gang. He has been under my supervision during the whole of my stay in Palmerston North. I considered him a competent shunter. He was doing all right and gave every satisfaction. I understand that Carmichael had a year and nine months' experience in Palmerston North and one year in Dunedin shunting. I have warned Carmichael to be careful in his work. He always gave me every satisfaction. To my knowledge Shunter Lepper's statement that he has had more shunting experience than Carmichael is not correct so far as I am aware. It is not correct, as has been stated, that Shunter Carmichael was unduly harassed by the foremen. I give that statement an absolute denial. I am not in the habit of harassing any of the men in the gang. I was not on duty at the time of Carmichael's accident. I went off duty about thirty-nine or forty hours prior to the accident. I was on good terms with Carmichael. I think that I have had Porter Lepper as second man shunting in the yard under my control. Porter Lepper refused on one occasion to bring out an engine for No. 663, which instruction I had given him. I went out of the hut and asked him to bring the engine out for No. 663 train. He was having supper at the time, and he remarked, "It would not hurt you to do it yourself." I said, "I want you to do it." His first man then told him to go and do it, and Lepper walked out of the hut, and I also went out with him, and he said to me, "No, I am damned if I will do it. I am entitled to half an hour for supper, and I am going to have it." With that I went to Worthington, who was in charge of the gang which Lepper was in, and told him that this man refused to bring the engine out. Worthington said, "I will go and do it myself." I said, "No; I insist on Lepper going now," and Worthington said, "Go on, Ernie; go and get the engine." With that Lepper turned to me and said, "A man ought to knock your bloody head off with a hand lamp." Lepper then went and got the engine, and after the train was away I took Coaching Foreman Cavanagh down to Lepper, who I called over from the yard to the platform, and I repeated to Mr. Cavanagh what Lepper had stated to me, and Lepper did not deny it. He apologized, and said he was very sorry, that he had been suffering with neuralgia and was irritable, and that it would not occur again. Mr. Cavanagh gave him a good talking to in my presence and drew under his notice the seriousness of the offence, and with my consent we decided to let the matter drop. I am aware that this is being brought forward as an instance of the manner in which I harass the men. I might say that Lepper is a good boy and does his work well. On another occasion I had to speak to Lepper

about bleeding some wagons in the yard. On that occasion he told me that it would not hurt me to do the work myself. This is the same man who in his evidence at this inquiry accuses me of being indirectly the cause of the fatal accident to the late Shunter Carmichael. I have a good idea why this man should make such statements about me. I was a member of their organization — the Amalgamated Society of Railway Servants—at the time of the strike, and also a member of the Railway Officers' Institute. I remained loyal to the Department, working through the period of the strike. I was approached to go out on strike, and I refused to do so. I remember the Stationmaster calling all the foremen together during the strike period and addressing them on the subject. He advised us that he considered that we should all remain loyal to the Department. All the foremen remained on duty during the strike period. I always got on well with the men before the strike. I never had any trouble with them at all. I consider that this trouble is due to the recent industrial trouble, and also to another incident I had with a prominent member of the union. The other trouble was that I had occasion to report the matter of a member using filthy language to me. The result of my report regarding this member was that he was dismissed from the service. The man referred to was Mr. Stan Lucas. I have had experience in another yard in the capacity of foreman. This was at Frankton Junction. I do not consider the conditions are worse here than they are at Frankton Junction. When I was at Frankton Junction the authorized gang was two men in a gang, and I understand that now there are three men in the gangs. There were seven two-men gangs at Frankton Junction when I was there, and the gangs were strengthened whenever possible. I had to report Shunter Tapp for insolence and not giving me proper information when I was inquiring regarding the damage to a van. This was in connection with the damage to a door of a van and Tapp was leading man in the gang. Sometimes he was first, sometimes second, and sometimes third, and sometimes main-line shunter, and he would probably deal with this train on which the van was damaged. I wrote to him a couple of times and could not get any satisfaction out of his reports, and I made inquiries personally. He tried to side step the issue. I had again to write to him for the necessary information, and he refused to give the information. Finally the matter was settled by the Stationmaster, and I was agreeable to let the matter drop. His work has been satisfactory ever since. I am aware that this is another instance which has been cited as another instance where I harass the men. I remember instructing Shunter Biggs to clear the loop to get ready to receive a special train which was due to arrive from Marton. I had instructions from the Coaching Foreman that a special was coming in to cross the "Limited" at Palmerston North, and it was necessary to clear a special off the loop to berth the train. I instructed Shunter Biggs to do so. In the meantime the crossing had been altered, and the train was held at Feilding. I had nothing to do with the alteration of the crossings of these trains. I was simply giving Biggs an ordinary order which was given to me to pass on, and I gave it to him in the ordinary manner. I am aware that this is being brought forward as an instance of the manner in which I am alleged to have harassed the men. I remember giving Shunter Biggs instructions *re* cars for No. 641. On arrival of No. 507, owing to a crowd, it was found necessary to attach an extra car to train. I was instructed by the Stationmaster to get the necessary car. I gave the order to Shunter Biggs. In the meantime it was found necessary in order to avoid delay to attach a car ex No. 641 service on to No. 507 to avoid delay in getting car from No. 3 road. We got the car out, and I found it necessary to get another one out to replace the one on No. 641. One was a first and the other a compo, and it was found necessary to get out another class of car. I was acting on the Stationmaster's orders and simply passed the instructions on to Shunter Biggs. I am aware that this is another instance brought forward in evidence as another instance of the manner in which I am alleged to have harassed the men. I have a recollection of Guard Goudie taking up duties one day as foreman of a shift. I did not tell him when he took over that he would have to chase the men if he wanted promotion. I absolutely deny that. I walk round the yard and am always in the yard, and I consider that it is my duty to walk round the yard. I have to keep in close contact with the work. It is my duty to arrange for the making up, marshalling, and despatch of trains. I am responsible for any late departures, and I do all the correspondence in regard to the late departures of trains while in charge. It is my duty to see that perishable loads are not delayed, and also to see that live-stock receives prompt despatch. According to the conditions, work has to be varied, and one cannot lay down any special schedule in regard to the carrying-out of the work. I have never had any accidents to men while they have been under my control. I never ask a man to do anything that I would not do myself. There is not a great deal of tail-roping done in the Palmerston North yard. I have on occasions seen the tail-rope used in the Palmerston North yard. I consider that it would be my duty to instruct any man in the use of the tail-rope when they appeal to me. When a new arrival comes along I introduce him to the leader of the gang, and tell him to instruct the new arrival to the best of his ability. At the same time I would consider it to be my duty to instruct any man in any duty that I thought he did not thoroughly understand. I know Shunter Pepperill. He is a man one cannot get on with. He does not carry out my orders without a lot of resentment and criticism. He has a method of criticizing everybody but himself—the Department, the Department's officers—and thinks he is the only capable man on the job. He adopts a dominating attitude. His chief trouble is arguing and always arguing. He resents being given his instructions, although I have never taken any serious action in reporting him. I have had on several occasions to call him away by himself and take him to task for his attitude. I tried to get him to realize the necessity of doing his work with a good grace and not setting a bad example to the other men. I have told him that I have been surprised at his conduct, and that I had taken him for an intelligent man and expected better of him. He has had to admit that "a man gets ruffled sometimes, and being up against it he might do things that he had no intention of doing," and I let the matter drop at that. I bear no vindictiveness or

malice towards any man. The feeling is all on their part. I consider that the attitude adopted by Shunter Pepperill creates a very bad impression on the other men. He holds his superior officer up to ridicule. I consider that he is the type of man who considers that he knows more about the work than the foreman does, and wants to run the whole show. I would like to say in fairness to him that he is a good worker, and other than the incidents enumerated I have nothing else against him. He is inclined to criticize not only my actions, but the actions of all his superior officers. I think that he is the type of man who considers himself that he would make a good Minister of Railways. He thinks that he could ably hold that position.

To Mr. Mack: I have been a shunter myself. I shunted at the Lower Hutt. I was never a shunter in the Thorndon yard. I was stationed at Lambton, but my shunting experience is confined to Lower Hutt. I was appointed foreman first at Palmerston North. At that time I knew Palmerston North pretty well. I have about seventeen years' experience at Palmerston North as guard and foreman. I would not compare Lower Hutt with Palmerston North in so far as the shunting-yard is concerned. Of course, Lower Hutt was pretty busy in those days with gravel, &c., but we never had the same marshalling there as we had at Palmerston North. With my limited experience at Lower Hutt I would know whether things were safe or unsafe in the matter of shunting. When I was appointed as foreman at Palmerston North I would naturally have the interests of the shunters at heart. I know that shunting is a risky occupation, and probably the most risky occupation in the Railway service, and I would, when I thought necessary, take any steps within reason to make the job as safe as it could be made. I would not expect a shunter to stop his engine every time he wanted to cut a vehicle off, and when the shunter does step in to cut off vehicles which are moving he does run some risk. It is all the more risky if the permanent-way is not satisfactory for him to run over. I think it would be a good idea if frogs of the turnouts were filled up. I do think that it would increase the safety of the shunters if the points in this yard were boxed over. The water does lie about a bit in the yard, but it gets away pretty quick. I think that it would improve conditions if the yard was properly drained. I often get wet-footed myself when running about. I do not say that the shunters would be worse than me, as I am about a lot, but in a way the shunters would be worse than I am in this respect. I would like to see electric light in the yard to make it satisfactory. Some additional lights to what there are at present are necessary. Having inspected the plan of the yard I agree that the lights in the positions as suggested by the shunters would be of advantage. I agree that in the busy season the yard is much too small and too congested to handle the traffic. At the present time of the year it is all right. Some additional roads would help us in this respect and facilitate shunting and reduce the risk to shunters. Knowing the yard as I do and having worked here as foreman and guard I have never made any representations to the Department along the lines which I have stated would be beneficial and reduce the risk to shunters, but I understand it has been done. I cannot say positively that this has been done. I have understood that this has been done, and I left the matter at that. I do not remember 2 ft. of ballast being put along No. 2 road, and I do not remember it being taken away. I cannot call to mind that this ballast was put there. It may have been done while I was away, but it is not there now. I knew Carmichael, and I considered him a capable shunter, and he gave me every satisfaction. He was willing, conscientious, and always did his work in a good spirit. He was not a man who was frightened of the foreman or anybody else. He was intelligent and gave me an impression that he was a man who would stand on his dignity. It is a fact that to a certain extent when a new man came into the yard I talked with him and warned him to be careful in the performance of his duties. I would tell him that he was going as a spare man and instruct him in the work generally, brake-catching, and what he had to do. I would keep him as spare man from two or three weeks or a month according to the ability of the man. As fourth man he is practically doing the third man's work. As soon as he is trained he is put in as third man in the gang. There is always four men in the top-end gang. I think that it would be a good idea to place a new man first as fourth man for a month, followed by a month as third man, and in turn a further month as second man under the control of the second man in the gang. Some of the shunters change the men themselves, and I give them credit for it. This would be done when the work was slack. This would be done among themselves. I have not instructed them to do it. I encourage them, as it is a good idea. When the new men come to me I ask them what experience they have had. I ask them the stations they come from, what shunting they have had to do, and questions like that. When Roberts came here he said he was in charge of a tablet station previously, and said that he was shunting there and had assisted with the shunting off the Portland Company's siding. I told him that he would find things a bit different to that in Palmerston North. I never mentioned the tail-rope to him. I do not encourage the use of the tail-rope, and on rare occasions only it is used. It is essential that a man should know how to use it when it crops up, and if a man does not know how to use it and makes a request we instruct him. If I was not there when a man wanted instruction it is always taken that the leading man in the gang is an experienced shunter with a knowledge of tail-roping. I am always pretty sure that the man in charge of the gang has a knowledge of tail-roping. I am always about the yard.

PALMERSTON NORTH.—7TH SEPTEMBER, 1925.

I agree that it is essential that a man should know how to use a tail-rope, but I have not instructed the men in the use of the tail-rope, as I have not had occasion to. I wait until they ask me. I am satisfied that Carmichael knew how to use a tail-rope. When Worthington had some derailments in the yard on one occasion we all had the tail-rope to work. This was a good while ago. The tail-rope is not always used in the same way. I was not present, and I do not know how Carmichael had the tail-rope affixed when he was killed. If it is stated that he attached the eye of the tail-rope

behind the hook to the side chain of the wagon, behind the engine, and carried the tail-rope around between some other wagons on another road and put the hook of the side chain through the eye of the tail-rope at that end, I would say that that would not be a safe operation. That does not indicate that he did not know how to use the tail-rope. Carmichael was a good shunter and gave me every satisfaction so far as I was concerned. I did not chase him round the yard nagging to him all the time. If all of the men who have said that I did do so—I say that they are all lying. I did not say that they lied because I was loyal to the Department during the strike. I gave it as my opinion that they were lying on that account. This is not a contradiction. Mr. Robertson was in control before the strike, and he had not that feeling to contend with, and when I took over I had the strike, and through the result of the strike the men were penalized in a way—they lost their night rates and the forty-four-hour week—and I take it that there has been an undercurrent and a feeling against me. Mr. Shinkwin is in a different position altogether. He is in charge of me, but he does not come into direct contact with men, and that accounts for the fact that he has not had any differences with the men. Mr. Shinkwin, I admit, exercises a general supervision over the staff in the yard. If I had any difficulty in the yard with the men I would bring it under the notice of Mr. Shinkwin. I heard Mr. Shinkwin say that he was on the best of terms and on good relationships with the staff, and so am I as far as I am concerned. I consider that it was the effects and the after-effects of the strike which has caused the men to become dissatisfied and raised an undercurrent. Mr. Firth was loyal to the Department as far as I know. He did not go out on strike. I cannot say whether he lost his eight-hour day and night rates. I could not say whether he was a member of the Locomotive Association. I cannot say why Mr. Firth, who was not out on strike, who did not lose night rates or the eight-hour day or was affected in these conditions, came here to give evidence against me. I know Porter Lepper. He has been in the shunting-yard for five or six years. He was a good man. I do not agree with Mr. Sweeney that he is an amateur. I do not think that an amateur could take charge of a shunting-gang in a shunting-yard. I would not ask a man out of the Old Men's Home to lift a brake which was skidding on a moving vehicle attached to a rake of wagons being moved quickly through the yard. I am not prepared to say that it is an exaggeration if Mr. Sweeney says that a man out of the Old Men's Home could lift a brake under such conditions. Mr. Stan Lucas, referred to previously in this evidence as being reported by me for using filthy language and having been subsequently dismissed, has not given evidence against me. This incident has not been referred to as one of the charges against me. I always got along well with this man. There was only one fault with him, that was all. He was always dictating, slinging off, and criticizing, and that sort of thing. He became intolerable. I gave him every opportunity. I tried to talk him over and tried to reason with him, recognizing that a man does get irritable sometimes, but apart from that he was satisfactory in his work. I might state that I reported the incident, but I was very sorry for it afterwards. I state this in fairness. Lucas was a good friend to me. He helped me through the work in the yard. He did not teach me my work when I came into the yard. I knew the yard-work. He did not keep me straight in that light. The man did his work, and I had nothing to find fault with as far as that goes. On one occasion when I was in very serious difficulty he gave evidence for me. I refuse to answer what the incident referred to was. I admit that it was that I was suspended by the Traffic Inspector for being under the influence of liquor whilst being in charge of a train. The Traffic Inspector was Mr. Curtis. I am not going to say that Mr. Curtis was influenced by the strike. I was cleared of the charge against me. Mr. Curtis made a false statement in this matter when giving evidence against me. I was not at one time reduced from a first-grade guard to a second-grade guard. There was a special grade created, and I was left out of the special grade. I put in a notice of appeal against this. I was superseded. I asked for the reasons why I was superseded. I cannot recollect what they told me. Not to my knowledge did the Traffic Manager tell me that I was insubordinate. Not to my knowledge did he tell me that he would not recommend me because he did not consider me fit to control staff. I think that he did give an instance regarding train-delays and that time taken by me in shunting was excessive. I have no recollection of him telling me that my conduct was insubordinate and that I was not fit to control staff. Having read a letter (produced) written by myself in which I stated I was told by Mr. O'Loughlin that I was not recommended for promotion to special-grade guard as I had no special ability, I asked for cause and why he considered me so, and I was told that my conduct was insubordinary, and I was not fit to control staff. I admit that this letter was written by me.

To the Board: The date of the letter was the 12th August, 1921.

To Mr. Mack: I swear that I did not tell Goudie that if he wanted promotion he would have to chase the men. I do not know why Goudie said that. I did not tell him so. It is untrue that I told Tapp that Carmichael would get killed. I consider that Rule 3 and Rule 27 should be read in conjunction with one another, placing Rule 27 first. I consider that this is a reasonable interpretation. I consider that a man should be instructed, and if he does not understand the work he should apply for instruction. If I instructed a man I might forget to tell him something, and then he should apply to me. I have said that Rule 27 should be placed before Rule 3 in this connection. I was foreman at Frankton Junction for about twelve months. I got along with the staff all right there. To the best of my knowledge my attitude was friendly towards them. I would be surprised to learn that not a man at Frankton Junction has not any time for me. I had a little to say about Mr. Pepperill. He has been a shunter in this yard too long. I am not going to say that he has had more experience at shunting than I have. I suppose that he has in a way had more experience in the yard in charge of a gang than I have. It is not a fact that he has done the work at Palmerston North while I looked on. I have had occasion to direct him and request him to do certain work, and that is where the trouble arises. I give him the orders, and I have to alter some order as the occasion arises. I do not control the shunting. I give him instructions and he does the work. I have got

to see that the work is done. I give help myself at times. I see that the work is done. That is not "looking on." This man is a good worker. He has got a nasty way with him and I do not like it. He has a nasty way of criticizing and dictating when orders are given to him. I have asked him to realize that the work has got to be done. A good man does what he is told; it is all in the day's work, and when he has finished his shift he is done. As foreman I never ask that a man should be a mere machine and have no initiative. That is not what I have previously implied. I go along to a man and give him a job and give him a reasonable time to do it, and when I come back if there has been anything held up in consequence of it I insist on it being done right away. I stop the engine to do it, and I think I am entitled to do it, and that is the cause of the whole trouble. I do not want the men under my control to do only just what they are told. I want them to display initiative. When they display initiative by showing how work could be done quicker I do not resent it. I reason with them. I have no personal feeling against Mr. Pepperill at all. All I take exception to is his manner. It is not a fact that my alleged dislike is due to his having had greater experience in shunting than myself. It is not a fact that I am always impressing on him the fact that I am in authority. I have not read Henry Ford's book, "My Life and Work." The quotation from Henry Ford's "Life and Work," page 265, reads. "Every man of common-sense knows that there are men whom he dislikes who are really more capable than he is himself." That is not the case between myself and Pepperill. I do not dispute him in his work. It is necessary in the interests of good work to try and avoid any friction. I have later on, when he has cooled down, had a good talk with him about his attitude. It may be in some cases that when men are promoted to positions of authority they make things irksome for the men. In other words, they get "swelled heads." In connection with the following extract from page 93 of Henry Ford's "Life and Work," "The moment a man starts to swell with authority he is discovered, and he goes out or goes back to a machine," I would say that this may be so in some cases. It is not a fact that all the trouble as far as I am concerned is due to the fact that the men have discovered that I am swelling with authority. I worked under Mr. Morgan. I found Mr. Morgan a good man to work under—fair and just in every particular. Speaking for myself, if anything has been said at this inquiry to the contrary I disagree with it. Summed up, I say that everything that has been said by other men at this inquiry against me has been untrue. I am on oath and I speak the truth when I say this.

To Mr. Carnachan: I consider that under ordinary conditions a man would need twelve or eighteen months' shunting in the Palmerston North yard before he would be placed in charge of a gang. I consider that a man with four or five years' experience shunting should be able to take charge of an engine. I do not think it is likely or possible that a man would work for four or five years in the yard without seeing the tail-rope used. I think that a man with that experience in the yard must have seen the rope used on several occasions. It would be used in this yard about once in every two months on an average. He would probably have experience in using the tail-rope himself. In connection with the Inquiry, previously mentioned, into a difficulty in which I was connected, I was completely exonerated by the Department.

To the Board: When urgent orders come out the work has to be varied, and I would have to take the shunters off their work. I do not do this unnecessarily. I recognize that Mr. Shinkwin is in charge, and if he tells the shunters to do the work I recognize that this has to be done, as I am not always available, and he may not know where to find me. I do not disregard Mr. Shinkwin's orders, and if shunters carry out Mr. Shinkwin's orders they do not suffer in consequence from me. It often happens when I am not present that orders go direct to the shunters, and as far as I am concerned the practice works all right, and there is no friction over it. The shunters sometimes resent the changing of the work or varying of orders which interrupts them in their work. The changing of work is only done when necessary, and this cannot be avoided. In a case where the shunter is making up a train and it is necessary that the work should not be held up, any order received by the shunter from Senior Foreman Shinkwin in regard to the carrying-out of some other urgent work in the yard—the shunter would probably mention to Mr. Shinkwin that the Yard Foreman had already given instructions for other urgent work to be carried out, and Mr. Shinkwin would decide which work was to be given preference. At times Mr. Shinkwin would consult me if I were handy before deciding what work to go on with. I do not think that the shunter would suffer any injustice and become a chopping-block between the orders of the two foremen—the Senior Foreman and the Yard Foreman. I think the arrangement at present is satisfactory. At busy times all time is taken up keeping in close contact with the work. It is necessary to write to men on occasions regarding matters in which they have been concerned, as at times they may not be on the same shift. Matters are also dealt with verbally. The sending-out of letters to the staff is kept down to facts which the foreman is not aware of. Train-delays are dealt with directly by the foreman. Generally it is advisable to write, as men may make statements and later on deny certain particulars, and this would cause discrepancies in the different accounts.

MICHAEL SHINKWIN sworn saith.

To Mr. Carnachan: I occupy the position of Senior Goods Foreman at Palmerston North. I have been in Palmerston North two years and five months. Before coming to Palmerston North I occupied the position of Yard Foreman at Wellington for five years. I am in charge of the goods-shed, yard, and staff of these yard and shed staffs. I exercise a general supervision of the yard and shed work and allot hours of duty for the staff. I also draw up all the duty-sheets for the shunters in the yard. The Yard Foremen are also under my immediate control. I think this arrangement

works very satisfactorily. I consider that it is in the best interests of the Department that the Yard Foremen should be under my control. I am the Senior Foreman, and I have got direct telephone communication with the Stationmaster, Transport, and the public. If any extra orders are received I am in a position to expedite them and give them my own personal attention. It is not possible for the public to get into direct touch with the Yard Foremen. It is not possible for the Transport Office to get into direct touch with the Yard Foremen. The foreman is constantly moving up and down the yard, and it would take them a good deal of moving about to get into direct touch with the Yard Foremen. It is also necessary for me at times to give orders to the shunters direct in order to have urgent loads placed into the shed, also urgent loads placed direct into loop. If I had to go and find the Yard Foreman every time I wanted to execute an urgent order it might result in delay and consequent complaints from the public. It is not a fact to state that by giving orders direct to the shunters this has led to a practice of dual control creeping in as between the Yard Foreman and myself. If the Yard Foreman was to be found I would give him the order to execute. If the Yard Foreman is not to be found I would give the order to the shunter, and then advise the Yard Foreman of the action that I had taken. I only issue orders direct to the shunters in the Yard Foreman's absence. I in my capacity of Senior Goods Foreman am prepared to accept full responsibility for any orders I may issue to the shunters. I find that this system works very satisfactorily. I am able to carry on without any serious delays, and I am also able to carry on without receiving any serious complaints from the public. I have never received any complaints from the public, and I presume that the service I have rendered has been quite satisfactory.

To Mr. Mack: The shed-work monopolizes most of my time, and I do not have a great deal of time to go around the yard. At one stage I was much junior on the D.-3 to Mr. Sweeney, and I subsequently superseded Mr. Sweeney, and following that I was transferred to Palmerston North as Senior Foreman. If Mr. Sweeney says that my taking control has reduced the efficiency of the shunting staff I do not agree with this view. The matter has never cropped up, and whatever his thoughts were on the question he has never made them known to me. I do not know that I have had any differences with Mr. Sweeney over what may be termed interference with the shunters. I find that I was just a little bit incorrect in my previous statement. I have had occasion to call in the Stationmaster in regard to this matter. I have not had any differences with the staff in the shunting-yard. As far as I know I have been on the best of relationships with them. I know Porter Lepper. He has had a good deal of experience in this yard. I would not regard Lepper as an amateur in the shunting-yard. I do not think that an amateur could take charge of a gang in Palmerston North yard. If Mr. Sweeney says that an amateur could take charge I would not agree with him. I would not like to ask a man from the Old Men's Home to lift a brake on a rake of moving vehicles in the yard going at the rate of three miles per hour and the wheel on which the brake was down was skidding.

MICHAEL CAVANAGH sworn saith.

To Mr. Carnachan: I am Coaching Foreman at Palmerston North. I have been in Palmerston North since 1894 with a break of four and a half years. My experience of Palmerston North covers a period of thirty-one years. I remember an incident where Foreman De Rosa came over to me and made a complaint *re* Lepper refusing to obey orders. I arranged for Mr. De Rosa to bring Lepper over to me after departure of No. 663. The three of us got together, De Rosa, Lepper, and myself, and I asked De Rosa to lay his complaint and which he did. Mr. De Rosa said that he had asked Lepper to bring an engine out for No. 663 and Lepper had refused to do so. He said that Lepper said he should hit him over the head with a lamp. I questioned Lepper on this subject. He admitted making the statement, and said he was sorry for doing so, as he was suffering from either toothache or neuralgia at the time. I gave him a little advice as to how he should treat his foreman, and if he had any complaints I advised him to put it in writing. After he admitted that he was sorry and was suffering from neuralgia I then asked Mr. De Rosa if he were satisfied, and he said he was. Mr. De Rosa was then quite willing to let the matter drop. After hearing Lepper he accepted Lepper's apology.

To Mr. Mack: I do not know what took place between Mr. De Rosa and Lepper prior to Lepper being brought to me. Mr. De Rosa told me that Lepper's remark was, "You ought to be hit over the head with a lamp." This is as far as I can recollect.

ALBERT WYLIE sworn saith.

To Mr. Carnachan: I occupy the position of timber-checker, Palmerston North. I have been in Palmerston North since 1912. I go away from Palmerston North occasionally. On an average I would spend three days per week at Palmerston North, and during that time I would be constantly in and around the station-yard. I would frequently come in contact with the foremen while they were carrying out their duties in the yard. I would very often hear them giving orders to the men. I would not actually hear what they were saying each time. I would hear Foreman Sweeney and Foreman De Rosa issuing orders to the men. I have not noticed any harassing of the men by the foremen while I have been in the yard. During the time I have been in the yard I have never noticed these foremen on any occasion harassing the men. As far as I have been able to observe they always treated the men in a proper manner. I would come into contact with the men employed in the yard. I have heard the men making complaints about the foremen about the manner in which they have been treated. I remember the incident, but I do not remember the man's name. I told the man

not to worry about it as it was all in the day's work. The trouble on this occasion was something to do with rough shunting. The foreman had occasion to speak to the shunter *re* rough shunting. The shunter considered that the foreman had been rather harsh with him. I have heard the men talking amongst themselves in the yard stating that they were not being treated properly. I did not know what the trouble was. I have not seen the foremen harassing the men, but I have seen Mr. Sweeney rush out from his hut when he had heard a rough shunt and speak to the men. This has occurred many a time. When he went out and spoke to the men about rough shunting I certainly think that he had good grounds for speaking to them. That is what he is there for. He would only be carrying out his ordinary duties and exercising ordinary supervision over the work in the yard.

To Mr. Mack: Apart from what I have stated, the foremen would have ample opportunity of harassing the men without my seeing it. It would not be more or less by accident that I would see the incidents that I have mentioned. My duty is to check the timber. The whole of my time while I am in the yard is taken up checking timber. I was carrying out my work and these things just happened about where I was working. On the occasion where a man was complaining to me about the way he was worried I told him not to worry as it was all in the day's work. I think I said that these things would happen, and that it was all in the day's work. The man was angry and felt like hitting somebody at the time. Mr. Sweeney was not there at the time. I do not suggest that he wanted to hit me. I did not suggest that the men should not take any notice of Mr. Sweeney. That was not suggested at all. The incident, I presume, had something to do with rough shunting. I know that it is very difficult with long rakes of wagons to brake them just down to a nicety. Sometimes in these cases the man who is braking the wagons has difficulty to get to the wagons to brake them down in time. These sort of things are inevitable in every shunting-yard. I am not very well acquainted with the names of the men in the yard, but I know them by sight. I speak to them occasionally. I do not remember having any difficulty with them.

By order of the Board a test was made with engine J 81 and fifteen empty deckers attached, one brake being pinned down on one wagon.

The shunt was carried out as described in evidence and commenced as on the previous occasion, from Cook Street to clear of No. 7 points.

The time occupied in running the 2 chains south of the north signal-box occupied five seconds. This would work out eighteen miles an hour for that portion of the movement.

THOMAS QUIRKE, Detective-sergeant of Police, Palmerston North, sworn saith.

To Mr. Carnachan: I have been stationed at Palmerston North for about nineteen years. For a number of years past it has fallen to my lot to have to institute a considerable number of inquiries into railway matters relating to the loss of goods and the stealing of goods. I am aware that about three years ago things were exceptionally bad in connection with thefts at Palmerston North railway. I was engaged about that time investigating several reported cases of theft. In the course of my inquiries I got considerable help in my inquiries from the foremen in charge of the yard—past and present foremen included—particularly Foreman Sweeney. At certain periods about that time Foreman Sweeney was in charge of the night shift in the yard. I found that Foreman Sweeney was taking a special interest in the protection of the Department's property in the yard, and he was exercising a keen supervision over the work in the yard in this direction. Undoubtedly the lessening of the volume of the thefts was due to Foreman Sweeney and other foremen's supervision. Foreman Sweeney was very anxious to catch the thief or thieves. I had to arrest a man at Palmerston North here some years ago, but he was acquitted of the charge. This was before Foreman Sweeney was at Palmerston North. I also received every possible assistance from the other foremen which considerably assisted the police, and the police would have been helpless without the assistance rendered by the foremen. I am quite satisfied that owing to the keen supervision afforded by the foremen in the yard thieving in the Palmerston North yard has been reduced to a minimum.

To Mr. Mack: I know nothing about the departmental methods or the way in which the foremen treat the men. I say that in the course of my inquiries all the foremen, past and present, have given me assistance, and I mentioned Mr. Sweeney particularly in this respect. So far as anything else that is going on in the yard is concerned I know nothing.

To the Board: I do not wish to make any reflection on any of the members of the Railway service at Palmerston North. The yards are very open to the public and persons could come in off the street and take away a case of benzine, &c., whenever they like.

GEORGE NEWTON sworn saith.

To the Board: I am a signalman stationed at Palmerston North. In regard to the evidence given by Mr. T. E. Pepperill in his evidence before the Board, I would point out that No. 15 lever controls two lock-bars referred to therein. These two lock-bars control No. 14, leading from goods yard to main-line, and No. 13 points, leading from loop to main line. I would suggest that No. 13 points be fitted the same as No. 8 points. No. 8 lever controls lock-bar and points combined. No. 13 should be the same as No. 8. If that were done it would obviate pulling loads further than was necessary. The lock-bars at the north end which the shunters require altering are No. 36 lever, locking No. 27, 37, and 35 points. It would save a lot of fouling of the crossings at The Square if the lock-bars were worked independently, and this would avoid the engine having to pull across the scissors. I do not think I have any other suggestions to offer.

JOHN JOSEPH O'SHEA sworn saith.

To Mr. Carnachan: I occupy the position of Stationmaster at Palmerston North. I have been in charge of Palmerston North Station for about two years and ten months. I remember Shunter Carmichael being transferred to Palmerston North. I was advised that he had had 313 days' shunting experience in Dunedin before arriving in Palmerston North. I understand that he was also acting guard at Cromwell before coming to Palmerston North. When he first arrived in November, 1923, he was placed as spare man in the yard for a week or two, and from December to January he was acting as third man in the gang, and from January until July, 1925, he was second man in the gang. From about the 13th July, 1925, he was placed in charge of a gang. Summed up, he had had eighteen months experience in the shunting-yard in Palmerston North, in addition to his previous experience of 313 days in Dunedin yard, before he was placed in charge of a gang at Palmerston North. On the 24th December, 1924, Carmichael received his appointment as shunter. He was acting as second man in the gang for seven months after the time he received his promotion to shunter. I do consider that the late Shunter Carmichael was fully qualified to carry out the duties of shunter. I have heard it stated that the late Mr. Carmichael was unduly harassed by his foremen, and I do not consider this statement to be correct. Carmichael was a man above the ordinary intelligence, and I am quite sure he was capable of looking after his own business, and he would not allow, without protest, foremen to harass him. I have discussed the work with Mr. Carmichael several times—particularly in connection with one or two shunting mishaps—and he never on any occasion complained or said anything about the foremen harassing him. I did discuss Carmichael's capabilities with the Traffic Manager. On the 15th May, 1925, I wrote a letter to the District Traffic Manager, in reply to a query from him as to whether Carmichael was exercising sufficient care, and I then stated that Carmichael was a good, honest, and energetic worker, and I put down these particular derailments as to being over-anxious in the performance of his duties. I also reported that his foremen spoke very highly of him. I have heard Porter Lepper's statement in evidence that he considered the harassing methods of Foreman De Rosa were indirectly responsible for Carmichael's death. I do not consider this statement to be correct. I consider that Carmichael's death was purely accidental, and I might say in the whole of my thirty-six years' experience in the Railway service I have never known of a similar accident to take place while men were operating the tail-rope. Prior to the two recent fatalities, I find, after very careful inquiries from the oldest members of the staff in Palmerston North, that they cannot remember any shunting accidents in the Palmerston North yards during the last twenty-five years—that is, men actually engaged in shunting operations. I consider that everything possible was done in connection with the accident which Carmichael sustained. I remember Foreman De Rosa reporting Shunter Tapp to me for being insolent. I called Shunter Tapp into my office, and I told him that as main-line shunter I looked upon him as having charge of the south end of the yard, and that when the foreman desired any information he should have given it to him. The foreman's inquiries were in connection with damage to a guard's van. Tapp knew all about it, but he was not the shunter in charge and was not responsible for the damage. I pointed out to Tapp that he should have supplied the information to the foreman, and after giving him some good advice he was quite satisfied, and since that incident he has got on well with his foremen. I did not receive any report from Foreman J. Sweeney reporting Hunt for failing to lift a brake on a "J" wagon. I remember Porter Joseph Cole leaving the Railway service. I asked him to reconsider his resignation. I did not ask him to do this as a personal favour to myself. Cole allowed a UG wagon to bump very heavily into another wagon, and, as far as I remember, the headstock of one of the wagons was broken. Mr. Sweeney, the foreman in charge, told Cole that he was too lazy to put down the brakes. Cole took umbrage at this and resigned. He came into my office, and I told him that he had done very good work, as far as I was concerned, on the platform, and as this was the first occasion where Cole had been reported to me for doing any damage in the yard I told him that he should not resign on the spur of the moment because the foreman had spoken to him like that. Cole was a rather big and heavy man and very seldom got out of a walk. He withdrew his resignation, and later on he resigned the service to take on a wine and spirit business. The statement that he was twelve months in the shunting-yard is absolutely incorrect. He was third man for one week, fourth man for six weeks, spare man for one week, and pilot for nineteen weeks. Half of that time he would be under the charge of Mr. Sweeney, and during the time he was piloting, the greater part of his time would be at the south end of the yard under the main-line shunter. When the incident in connection to the damage to the trucks was being investigated Cole stated that the brakes were defective. An examination was made of the brakes, and they were found to be in good order. The brakes were examined by Mr. Cavanagh, the Coaching Foreman. I heard it stated in evidence by Shunter Worthington that four thousand wagons passed through the yard in the slack period. That is not correct. The average number of wagons per day for twelve months was 1,163 per day. That is the total number of vehicles handled. In connection with the incident outlined by Shunter Biggs in which he considered that unnecessary work was performed in bringing cars from the loop, and that he considered this an instance of the manner in which the men were harassed by the foremen, I personally dealt with that matter. No. 507, New Plymouth–Wellington mail, required an extra car. I instructed Foreman De Rosa to get a car cut out. I anticipated that there would be some delay, and as the train-engine of No. 507 was standing in the south dock I brought it back on to No. 641 and cut off the front car of that train, ran out, and brought it back on to No. 507. At about that time a compo car had been shunted down the loop. I despatched No. 507 and saved perhaps five or six minutes' delay. The car I took off No. 641 was a long first-class car. This had to be replaced with a long first. The compo car was then placed back on No. 3 siding, and I think car A 1222 was cut out from the north end of No. 3 and attached to No. 641 to replace the car taken off. Foreman De Rosa was acting under my instructions during the whole of the time. Shunter Biggs would not understand the reason for the alteration. Orders were given direct to the foreman, and Shunter Biggs would not understand the reason for the alterations which crop up every day. I am always willing at all times to accept suggestions from any of my staff. It is not correct that I reject suggestions

from the junior members. Guard Aldridge interviewed me regarding his being victimized by Foreman Robertson. The particulars of this case were: Some wagons arrived in Palmerston North from Hawke's Bay on either the day before or the day I first arrived at Palmerston to take up duties as Stationmaster at the end of October, 1922. The Stationmaster, Marton, reported that the sheets on the wagons had not been adjusted at Palmerston North. I made the usual inquiries, and, as far as I can recollect, Shunter Aldridge was the man responsible for shunting those particular wagons. I reported on the 16th November, 1922, in a letter to the Manager in reply to his inquiry. This matter had been brought up at former departmental inquiry, and as far as I recollect he then stated what he has stated before this Board. that I would uphold my foremen whether they were right or wrong. I denied that at the time before the departmental inquiry, and I now again publicly deny the statement made that I would uphold my foremen whether they were right or wrong. As far as I can recollect, Guard Aldridge was the man who made this statement at a previous inquiry. Guard Aldridge was not the only man who was asked for an explanation in regard to the non-attention to the sheets. His evidence is not correct in so far as it applies to this particular matter. I have been approached by members of the Second Division with suggestions with a view to improving the working-conditions. Wherever possible I have always met them fairly. When I came to Palmerston North I was approached by two representatives members of the Second Division, and they asked me whether I would receive any deputation in connection with improvements and suggestions regarding working-conditions, and I told them I would gladly do so, and that had been my practice at places where I had previously been stationed as Stationmaster, and that this had worked very satisfactorily. I told them that I would adjust any local differences where it was possible, and any matter that I could not adjust I would refer to the District Traffic Manager. That arrangement worked out very satisfactorily and was in operation for quite eighteen months, and I am pleased at any time to receive any deputations from the men and do anything for them where possible. My own opinion is that the present attitude of the staff is caused through the men having to work a forty-eight hour week instead of forty-four, and also the loss of night rates which they were receiving prior to eighteen or nineteen months ago. That, in my opinion, is the real cause of the trouble. I do not consider it necessary to have three classified shunters in each gang. I do not know about Auckland, but there are no gangs with three classified shunters at New Plymouth, Marton, Wellington (with the exception of one gang), and that is only when the wharf shunt is not working. I cannot speak for the South Island. At Wellington when the wharf shunt is working they detach a shunter and replace a porter in the three-men gang of shunters. Foreman Sweeney brought me over to the foreman's office on one occasion in connection with a charge laid by Mr. Sweeney that Shunter Cunneen had misbehaved towards him. I investigated the case. I think the incident took place in May, 1924. At that particular time there was a little feeling in existence, and I had to use a certain amount of tact, and told Cunneen that I would view the matter very seriously if there was an occurrence of a similar nature. I gave him a good talking to, and both he and the foreman appeared to be satisfied. Under the circumstances I allowed the matter to drop. Shunter Cunneen did make application to me to be allowed to remain in Palmerston North. When he received his appointment as shunter he was appointed to Wellington. He called into my office and asked me if I would recommend that he be allowed to remain in Palmerston North. I considered that Cunneen was one of the best shunters we had in the yard. I think that it is generally agreed amongst the foremen that he was the quickest man we had to work the points. I naturally did not want to lose him, and he was satisfied to remain here. I told Cunneen to make application to be allowed to remain in Palmerston North, and after receiving a recommendation from my foreman I sent the application forward and recommended that Cunneen be allowed to remain in Palmerston North. This the Department agreed to do. I remember a derailed engine in the yard on the 11th November, 1924. The derailment would probably take place about 10.45 a.m. I was in the yard some of the time while the derailed engine was being placed on the rails. As far as I can remember, it took some considerable time to put it on the rails again. I saw Foreman Sweeney in the yard assisting. Mr. McKee, Locomotive Foreman, was in the yard in charge of the operations of placing the derailed engine on the road. That is the usual practice when an engine becomes derailed—for the driver or the Locomotive Foreman to take charge. A tail-rope was used. On this occasion we broke a coupling-bar, and, as far as I can recollect, the engine—an AB engine—to run No. 610 was brought up early to try and place the derailed engine on the road. The AB could not shift the derailed engine, and I think we got a BB engine—probably the engine for No. 584—and as far as I recollect they doubled the tail-rope on the BB and the derailed engine, and they pulled her over sufficiently to couple up another bar and couple on to a wagon which was behind the BB engine and pulled the derailed engine on to the road. The special was running to Marton. We had an assisting engine off No. 221, and that usually returned light or attached to a train. We were sending the Taihape engine forward as a second engine on the special. When the derailment took place the buffer in front of the Taihape engine was stove in, but we eventually despatched the train with the Taihape engine to Marton, and I suppose the engine would run light from Marton to Taihape. The derailed engine was returned to loco. The train went forward with the Taihape engine, which had a broken buffer. During the time I have been at Palmerston North I have only had two direct complaints from the shunters. One complaint was from Shunter Pederson, who is not at Palmerston North at present. The matter was very fully investigated. Independent outside evidence was obtained, and from the evidence the shunter in that case was found to be in the wrong. The case was finally dealt with by the District Traffic Manager. The matter was dealt with personally by the District Traffic Manager, but I understand that the shunter in question admitted that he was in the wrong.

PALMERSTON NORTH.—8TH SEPTEMBER, 1925.

In another case which came under my knowledge Shunter Gillespie was concerned in this second case, and that matter was also referred to the Traffic Manager. The Traffic Manager ruled, as far as I can remember, that Gillespie was in the wrong, and that he should not have

argued the point with his foreman. I think Gillespie admitted this in his evidence at this inquiry. I remember the incident in connection with the signal checking of C 9 special by Signalman J. Lucas on the 28th November, 1924. I noticed the check from the platform. I wrote to the signalman and asked him why the train had been checked. He advised me in the first place that the road was not clear. I made further investigations into the delay, and later on the signalman stated that the points were not all held. I made inquiries from the foreman as to whether the points were held, and the foreman advised me that he had the road clear at 3 p.m. and his men ready to man the points. The signalman asked for a ruling as to whether he was responsible for bringing the train in if the points were not held, and I referred him to Rule 118. I gave him a ruling in writing that he was responsible and referred him to Rule 118. In connection with the first order of reference, No. 1, which relates to the length of shifts which the shunters are required to work, I desire to state as follows:—

Gang No. 1: 11.30 p.m. to 7.30 a.m. continuous time. Eight hours paid for. Meal-time taken as convenient, for which no deduction is made.

Gang No. 2: 8 a.m. to 4 p.m. continuous time. Meals as convenient, for which no deduction is made.

Gang No. 3: 3.45 p.m. to 11.45 p.m. continuous time. Meal-time as convenient, for which no deduction is made.

Gang No. 4: 5.30 a.m. to 3 p.m. for four days and 5.30 a.m. to 1 p.m. for two days. Allowed time off for breakfast, which time is not deducted, and booked off for one hour for dinner. The working-hours being seven and a half each for two days and eight and a half each for four days. Total, forty-nine hours for the week. When time is deducted for breakfast the actual time employed shunting would not exceed forty-six hours per week.

Gang No. 5: 2.45 p.m. to midnight—one hour for tea booked off between 5 p.m. and 7 p.m., and it is understood the men may have a spell off for supper, for which no deduction is made. Total for the week 49½ hours. When supper-time is deducted the actual time employed at shunting would not exceed forty-eight per week. This is the only shift that men may be called upon or find it necessary to work more than the scheduled time.

No. 16, main-line shunter: 5.45 a.m. to 2 p.m. Equal to 49½ hours per week. He takes time off for breakfast, which is not deducted. This man assists Yard Foreman, chiefly at the south end.

No. 17, main-line shunter: Two days 9.15 a.m. to 7.15 p.m., and four days 12 noon to 7.15 p.m. Total, forty-nine hours per week. Both the main-line shunters' time is continuous, but they are allowed time off for meals, which is not deducted.

No. 18: Four days 9 a.m. to 7 p.m. Two days 12 noon to 7 p.m., one hour off for meals. Total, forty-eight per week. This man is attached to the north-end shunting-gang. On a special recommendation made by the Senior Foreman to myself it was decided No. 18 duty as the junior position. This position to be filled by young members coming into the yard, practically the training school for young shunters, and for new shunters arriving at Palmerston North, to enable them to learn the yard and conditions before placing them in the gangs.

No. 19, pilot: 3 a.m. to 11.45 a.m. booked three-quarters of an hour off for meals. Equal to forty-eight hours per week.

No. 20, pilot: 11.45 a.m. to 7.45 p.m. continuous time, but allowed time off for meal-hour, which is not deducted.

These two latter men are employed piloting engines from loco. and assisting shunting-yard generally as directed by the Yard Foreman.

Order of reference No. 2, "The number of employees composing shunting-gangs": The shunting staff allowed to work at Palmerston North Station is as follows: Two Yard Foremen; fourteen classified shunters; six porters; two pilots (porters). The shunting staff is divided into five gangs of three men each—namely No. 1, shunter in charge; No. 2, shunter, pointsman; No. 3, porter, brakesman. Two main-line shunters and one porter attached to the north-end gang for training. Two pilotmen who are not engaged piloting assist the shunters. I estimate pilotman and two main-line shunters are equal to another man in the yard and would make both the day shifts equal to a four-man basis. In comparison with other stations I consider Palmerston North to have the best staffed shunting-gangs. Particulars of the shunting-gangs at Palmerston North are as follows: Five gangs—three men each (two shunters and one porter), with the assistance of an extra man at the north end and two pilots when not otherwise engaged. I desire to make a statement giving particulars of the number of wagons handled from the year 1916 to 1924 in the Palmerston North yard, and giving particulars of the shunting staff employed, and the average number of wagons handled per man. The word "wagons" included all classes of vehicles.

Year.	Vehicles handled.	Staff employed.			Average Number of Wagons handled per Man per Year.
		Shunters.	Porters.	Total.	
1915	294,475	11	6	17	17,322
1916	307,398	11	6	17	18,082
1917	296,126	11	6	17	17,419
1918	304,118	11	6	17	17,888
1919	270,960	11	6	17	15,939
1920	323,686	14	8	22	14,713
1921	325,493	14	8	22	14,795
1922	208,195	14	8	22	12,736
1923	308,046	14	8	22	14,002
1924	339,154	14	8	22	15,416

The following are particulars of the weekly average of the cars and wagons shunted at Palmerston North, giving the yard capacity: Shunting-yard capacity, 591 wagons; cars shunted, 706; wagons shunted, 6,275; weekly average, 6,981. This weekly average covers a period of fifty-two weeks.

To the Board: The largest number of vehicles which have been handled at Palmerston North for any one day would be about one thousand six hundred. This would be the maximum. Taking the busy season the average would perhaps be about one thousand four hundred. The average number handled during the slack period would be about one thousand.

To Mr. Carnachan: Order of reference No. 3, "Time allowed for making up trains": There is no set time allowed for making up trains. Loads from shed and loop sidings are shunted out at specified times during the day. Outward loads are placed in the respective roads where trains are made up. Wagons arriving by inward trains are transferred from the north to the south end, and *vice versa*. These wagons are then picked up and shunted into their respective roads. Marshalling is going on practically the whole day under the direction and supervision of the Yard Foreman. It would be impossible to set a time for making up trains at this station, as conditions vary from day to day—namely, late running, special trains, and variations in tonnage.

Order of reference No. 4, "Supervision that is afforded over shunters' work": Two Yard Foremen—No. 1 duty, 7.45 a.m. to 4.45 p.m.; No. 2 duty, 4.45 p.m. to 12.45 a.m. or clear. Yard Foreman during the day is assisted at south end by main-line shunter. The bulk of the work is at the north end. The main-line shunter, under direction of the Yard Foreman, directs and assists operations at the south end at busy times of the day. Coaching Foreman on night duty supervises the work of the yard from 12.45 a.m. or when Yard Foreman goes off duty until the morning, when No. 1 Foreman arrives to take charge of the yard. Coaching Foremen are fully qualified to direct the operations in the yard at night.

Order of Reference No. 5, "General control of work in the shunting-yard": The work in the shunting-yard is under the control of the Yard Foreman, who acts under the supervision and control of the Senior Goods Foreman. The practice here is for Transport Officer to issue instructions covering the day's work. These instructions are issued at 8 a.m., 1 p.m., and 5 p.m. daily. The Yard Foreman is thus aware of the requirements for the day and arranges the work in the yard accordingly. In order to further the work the shunter is supplied with a copy of these instructions so as to ensure co-ordination between Yard Foreman and members in the shunting-gangs. The Yard Foreman is placed in the yard by the Department in order to direct and assist the gangs, and really acts as a coach to the men. He personally points out any weaknesses that exist, not with the idea of irritating but with the idea of protecting the men from exposing themselves to unnecessary dangers. I have heard the foremen telling them not to take unnecessary risks and to keep out of danger. Whilst on the one hand the primary duty of the foreman is to arrange for the prompt and rapid transit of all goods, on the other hand the Department places him in the yard to supervise and look after the direct interests of the men. In addition to supervision of shunters and work in the yard the foreman has also to carefully watch rolling-stock of the Department and see that same is not damaged by any unnecessary rough shunting or failure of the shunters to promptly attend to the brakes. Where there are three and very often four men working in a gang there should be no necessity for rolling-stock to be damaged in a shunting-yard. Close supervision is always kept on this class of work by the Yard Foreman. In addition to the above duties the interests of the Department's clients have to be closely watched and their goods safeguarded, and the action taken by the Goods Foremen in the past, and also the Yard Foremen in the past, has led to the detection of thefts, and as a direct result of this action thefts have practically ceased during the past three years. After the regular Yard Foreman finishes duty the supervision of the yard shunting between the hours of 12.45 a.m. and 7.45 a.m. is taken over by the Coaching Foreman. This officer is a man of wide experience, and has all the qualifications necessary to supervise and direct the work of the yard. I have been in charge of the Palmerston North Station for two years and ten months, and have had thirty-five years and eight months' experience in the Railway Department. In my capacity as Stationmaster I am frequently in the yard, and make inspection of same and observe the progress of the work and the conditions under which the men are working. I have never had any complaints from the men indicating that they considered the conditions under which they were working were dangerous or that they were in any way dissatisfied with them.

Order of reference No. 6, "Lighting of shunting-yards": The Palmerston North shunting-yard is lighted with six three-light Humphrey gas-lamps, each lamp 250 candle-power, placed as follows: One on the bridge near Cook Street, one at repair-sheds, one at No. 9 road, one at each end of the goods-shed, and one at the weighbridge. I have an experienced man who inspects the lights every morning, and he is supplied with mantles. He lights the lamps every morning and tests them to ensure that they are in good working-order. I consider the yard well lighted. If electric lights were provided it would be a decided improvement. I have received no complaints from the men in regard to the lighting of the yard.

Order of reference No. 7, "Lay-outs and proposed lay-outs of shunting-yards": The lay-out of the shunting-yard is according to standard, and I have had no complaints from the staff in connection therewith. I understand that the Department are obtaining the very best expert advice in the lay-out of the shunting-yard for the proposed new station.

Order of reference No. 8, "Drainage of shunting-yard": In comparison with other yards I would say that the Palmerston North shunting-yard was well drained. At times when heavy rain falls the yard is temporarily under water, but as there is a good fall on the west side of the yard surface water soon disappears.

Order of reference No. 9, "The matter of employees inexperienced in the shunting-work being employed thereon": The question of selecting men for the shunting-gangs at this station is in the

hands of the Senior Coaching Foreman, an officer of very wide and varied experience and one who has a good shunting record obtained in the principal yards of the Dominion. This officer also examines all members of the staff in rules and regulations, and when he places a man in a shunting-gang in addition to being physically adapted for the work he is also aware that the member concerned has the necessary knowledge of the rules and regulations, and that he thoroughly understands that the Department strictly warns him not to expose himself to any unnecessary danger. In the staff at Palmerston North there is a staff of about thirty porters available for the Coaching Foreman to select from. Before he places the man in the yard he is quite satisfied that the man selected is the best available man for the position. Young, active, and intelligent men are picked for this work, and any member who is considered in any way unsuitable for shunting duties is not placed in the yard for training purposes. It is the ambition of every young member to become fully qualified, and it is the general practice to give these men every opportunity to become proficient, and they welcome the opportunity. A knowledge of shunting is necessary to qualify for higher promotion in the Second Division of the service.

Order of reference No. 10, "Generally any other matters which in my opinion affect the conditions of work of shunters as bearing on the risks involved in their employment": In view of the statements made in regard to the many changes in the shunting-gang I desire to make a statement which will indicate the changes which have been made and which are not frequent. The statement which I will hand to the Board as Exhibit B, giving particulars covering three different periods, will indicate to the Board the various changes that have been made in the composition of the shunting-gangs as it relates to the personnel. In regard to complaints, during the two years and ten months that I have been in charge of this station I have received very few complaints from the members of the staff. In every station where a large staff is handled and heavy goods and passenger traffic is dealt with there is bound always to be slight friction at times between members of the staff. Unless these complaints are of a serious nature they are dealt with by me on the spot and settled immediately. This procedure has always proved satisfactory to all members concerned, and I have never had any complaints from members of the staff stating that they considered their grievances not being satisfactorily dealt with. In addition to bringing matters under my notice members also have the assistance and protection of their society. The society is the recognized medium by which all members are able at all times to have their grievances and complaints forwarded direct to the Railway Board by an independent channel. In connection with the charges against the foremen, until the recent inquest held on the late Shunter Carmichael I was under the impression that the work was going on in the yard in a satisfactory manner, and I never received any serious complaints from the shunters *re* the manner in which the foremen were carrying out their duties. In reference to time worked in excess of eight hours by shunters, I have a statement covering six months showing occasions on which the shunters worked in excess of eight hours per day. The particulars are as follows:—

Shunter Shirley: 13 occasions—1 day 9¼ hours, 1 day 9¾ hours, 10 days 10 hours, 1 day 11¼ hours.

Shunter Tapp: 35 occasions—1 day 9 hours, 32 days 10 hours, 1 day 12¾ hours, 1 day 14¾ hours.

Shunter Pederson: 9 occasions—5 days 9 hours, 4 days 10 hours.

Shunter Leslie: 7 occasions—4 days 9 hours, 1 day 9½ hours, 1 day 10 hours, 1 day 12¾ hours.

Shunter Gillespie: 10 occasions—1 day 9¼ hours, 2 days 9½ hours, 1 day 9¾ hours, 4 days 10 hours, 1 day 10½ hours, 1 day 11 hours.

Shunter Worthington: 12 occasions—2 days 8 hours 55 minutes, 1 day 9 hours, 4 days 9¼ hours, 2 days 9¾ hours, 1 day 10 hours, 1 day 10¼ hours, 1 day 10¾ hours.

Shunter Gordon: 13 occasions—5 days 8¾ hours, 3 days 9 hours, 2 days 9½ hours, 1 day 9¾ hours, 1 day 10 hours, 1 day 10¼ hours.

Shunter Pepperill: 16 occasions—2 days 8¾ hours, 1 day 9 hours, 1 day 9¼ hours, 6 days 9½ hours, 1 day 9¾ hours, 1 day 10 hours, 2 days 10¼ hours, 2 days 11 hours.

Shunter Biggs: 17 occasions—7 days 8¾ hours, 1 day 9 hours, 2 days 9½ hours, 2 days 9¾ hours, 3 days 10 hours, 1 day 10½ hours, 1 day 11 hours.

Shunter Whitmill: 7 occasions—2 days 8¾ hours, 2 days 9 hours, 1 day 9¼ hours, 1 day 9¾ hours, 1 day 10 hours.

Shunter Brown: 19 occasions—6 days 8¾ hours, 4 days 9 hours, 1 day 9¼ hours, 6 days 9½ hours, 1 day 10 hours, 1 day 10½ hours.

Shunter Carmichael: 15 occasions—4 days 8¾ hours, 3 days 9 hours, 2 days 9¼ hours, 3 days 9½ hours, 2 days 10¼ hours, 1 day 10½ hours.

Shunter Shand: 3 occasions—2 days 8¾ hours, 1 day 9½ hours.

Shunter Roberts: 5 occasions—5 days 9 hours.

Shunter O'Dea: 9 occasions—9 days 9 hours.

Shunter Cunneen: 26 occasions—7 days 8¾ hours, 8 days 9 hours, 5 days 9¼ hours, 2 days 9¾ hours, 3 days 10 hours, 1 day 10¼ hours.

To Mr. Mack: I have been at Palmerston North about two years and ten months. I came from New Plymouth to Palmerston North. Before that I was three years Chief Clerk at New Plymouth before being appointed Stationmaster there. I was Stationmaster at New Plymouth for about three years. Before being stationed at New Plymouth I was a Relieving Officer in the Wanganui and Wellington Sections. I have had some experience at quite a number of stations before being appointed Stationmaster, Palmerston North. When a member is transferred to my staff I do not get any record of his qualifications prior to coming to me. I usually make inquiries of the work the new member has done previously from the member himself. The information received regarding the 313 days shunting experience of Carmichael was the official information given by the Manager. That was for

the purpose of guiding me as to the rate of pay he would receive. His increments as a shunter depended upon the number of days he was engaged on shunting-work. I could not say that Carmichael would have had to perform 313 days relieving a classified shunter before he could get the increment attaching to such position. He would be entitled to the increments if he had put in 313 days shunting at different intervals. Carmichael was not a classified shunter when he came to me. He arrived here in November, 1923. He received his appointment on the 24th December, 1924, a year later. For a year previous to this this member was classified as a porter in a shunting-gang but performing shunting duties. In my opinion a man to have the necessary qualifications for a shunter should be able to uncouple wagons, manipulate points, brake wagons, direct them on to the different roads, marshal and make up trains, and generally any duties required to be performed in a shunting-yard. The third man in the shunting-gangs at Palmerston North has to operate points, uncouple and brake wagons. He is acting as a shunter and yet he is classified as a porter. I would not say that it was a misnomer to call him a porter. The third man is placed for training. Coming down to the logical conclusion the man is doing shunting-work. He is doing shunting-work and apart from his designation he is a shunter. I remember saying that Carmichael was understood to have been an acting-guard at Cromwell. I think he told me this himself. I go about the yard frequently and I observe the conditions as they obtain in the yard, and I am naturally very anxious for the safety of the men. I have seen the point-switches in the yard bare. During the whole of my experience I would say that these points are similar to others which I have experienced in other places. Now that the matter has been brought under my notice the points could be made safer. It did not occur to me that the points-levers should be painted. If the matter had been brought under my notice I would certainly have made representations on the subject. Considering that we have handled or shunted for the last twenty-five years from five to seven million vehicles in this yard and there have been no accidents to my knowledge—that is, prior to the recent fatalities—and these were not caused through the condition of the points, it did not occur to me that the points were a danger to shunters. It is possible for men to fall over points and yet not be hurt. I know that points-levers are painted periodically, but they have not been painted in my time at Palmerston North. I agree with every other witness, with the exception of Mr. Sweeney, that there could be better lighting in the yard. I agree with every other witness that some extra siding-accommodation is necessary. I have made representations to the Department to that effect. This was made in January, 1924. This was a special report. I have not made representations to the Department that the points should be painted, better lighting should be provided, and that points-switches should be covered over. As I said previously, I consider the lighting is as good and perhaps better than I have seen in other yards, and no complaints have been made in regard to lighting, and these matters enumerated have not come under my notice. I consider that everything that can be done ought to be done to prevent accident as far as possible. It did not occur to me that there was any danger to shunters through the points not being covered and the levers painted. I consider the yard is well drained. It did not occur to me that representations should be made regarding drainage. I have never known on any occasion in the yard generally where the water was over the boot-tops. This might occur at the points at different periods. I disagree to a certain extent with all the other witnesses who have stated that some extra drainage is required. In connection with the use of the tail rope, it is a matter for the foremen to satisfy themselves that the new men coming into the yard know how to use a tail-rope. The foremen are there to see that the men are taught in the carrying-out of the various operations connected with shunting, and I have to be guided by their reports. I cannot personally see that every man is competent in all his duties. I can ask the foreman as to whether the men understand their work, but I do not know that I specially ask them about the tail-rope. I was not present when Foreman Sweeney said that the instruction in tail-roping was not his job—" Never on your life." I consider that it is the duty of the foreman to direct operations relating to all shunting duties. This is the first case in my experience where I have known an accident as a result of the tail-rope. I know how a tail-rope is adjusted. I do not know how the tail-rope by which Carmichael was killed was adjusted. I do not consider that the method used by Carmichael as described in evidence was a correct one. I know that the hook of the side chain would be too large for the eye of the tail-rope and that it would jam. It is a difficult thing to understand why a man of Carmichael's intelligence should have done such a thing. I could not say whether he would have done it that way if he had had some previous experience. I did not know that De Rosa was harassing Carmichael. I do not know that it had been stated that " If he was not left alone he would be killed." Nobody ever mentioned it to me. I have been going round the yard constantly. I state absolutely that I did not know that this was the case or not. I know that a letter was written to the Minister of Railways in connection with the harassing alleged against De Rosa, but that was after the accident to Carmichael. I positively swear that that was after the accident when that letter was shown to me. The letter was shown to me by Mr. Foote at the Luncheon Club. I cannot say whether Mr. Fergie also showed the letter to me. As far as I can remember this was after the accident. As far as I am personally concerned I did not know that Carmichael was harassed by De Rosa, notwithstanding the fact that I was going round the yard and notwithstanding the fact that other witnesses have stated that De Rosa did harass Carmichael. I knew Carmichael. I knew that he was performing his duties very well. Only the week before he died I was discussing him with the Traffic Manager in my office. There was no occasion for anybody to chase him. I found him truthful. I do not think he would say something which was not true. I knew Roberts, but he was only here a short time. I do not know whether Roberts would wilfully concoct a story to the effect that Carmichael was continually discussing the attitude of De Rosa towards him with Roberts on their way home after work. I do not know whether Mr. Firth would wilfully concoct such a story as to

say that he had told De Rosa that if he did not cease worrying Carmichael he would be killed. I know Tapp. Tapp is a truthful man. I do not think that he would concoct the story that De Rosa told him to look after Carmichael or he would get killed. I should hope not. During my inquiries into accidents during the last twenty-five years I found records of two other accidents at Palmerston North. One was caused to a man oiling points in the shunting-yard, and the other related to a storeman, I think, who was pushing wagons into the shed. There have been some narrow escapes from accident, including myself. With regard to the failure of Porter Hunt to lift the brake on the J wagon hereinbefore described, I do not agree with Mr. Sweeney that a man from the Old Men's Home could lift the brake at the speed the wagons were going yesterday during the test. I do not agree that such a man could have lifted it if the wagons were going at half the speed the vehicles travelled yesterday. I do not consider it would be safe for Mr. Sweeney to have lifted the brake at the speed the vehicles travelled yesterday. I do not know that there is any shunter that I know who could have lifted the brake yesterday at the speed the vehicles were travelling. Mr. Sweeney did not report Hunt to me. He did not take Hunt to me. The matter never came under my notice at all. I have no knowledge of the incident, and I have no record of it. I do not know what Hunt would say in connection with the matter. I have no record of it, and I do not think that an incident of that sort would take two sheets of foolscap. I say that my clerk keeps the records, and this matter is not recorded there, although Hunt may say so. I have no knowledge of it. Mr. Sweeney sends reports to the staff for their explanations direct from himself. His list of duties provides that he has got to make inquiries in connection with shunting mishaps from the staff, and it is optional on his part whether he forwarded the matter on to me after he had completed his inquiries. Mr. Sweeney could write and write and write to the staff if he liked, but I do not think he would do such a thing. I remember Porter Cole resigning. When Cole came to me with a report setting out a reason for resigning I told him to reconsider it. The report stated that he was resigning over a damage to a wagon and Mr. Sweeney's charge of laziness, not over Mr. Sweeney's general attitude. I am sure about that. I persuaded him to think it over. I did not want to lose Cole. I spoke to Mr. Sweeney about Cole's attitude in connection with the damage to the wagon, and I cannot remember whether I spoke to Mr. Sweeney about his attitude towards Cole. I did not actually see the accident in question. I do not know what the circumstances were in connection with it from my own personal knowledge. Mr. Sweeney reported to the effect that Cole was too lazy to put the brake down, and that the damage would have been avoided if he had put the brake down. Cole stated that the brake was defective, which statement was not correct according to reports. The Coaching Foreman examined the brake, and I got a report from him, and he said the brake was in good working-order. The whole of the reports in connection with the matter were referred to the District Traffic Manager, and, as far as I can recollect, the Traffic Manager advised Cole that the brakes were not defective, and that the damage was apparently caused through Cole misjudging the distance and not putting the brake down in time. Cole noted the papers without comment, as far as I remember. The fact was that Cole did put down the brake, but not in time, and I consider Mr. Sweeney's idea was that Cole did not move himself to put the brake down in time. We all know what should have been done after an accident has happened. The Department has not taken any very serious notice of a large number of accidents in the yard. The Traffic Manager has been very lenient—very often on my recommendations. I cannot say when it was that Mr. Cavanagh, the Coaching Foreman, made the inspection of the brake, but I take it that he would do so directly after the accident. I am not sure about that. The usual practice is to inspect the brake straight away after an accident. As I do not know when it was examined it might have been some time after when the brake was examined. I got reports from both Cole and Foreman Sweeney. As far as I remember—I think Cole would be asked for a report in the first place. I could not say when I received Cole's report. The examination of the brake would not necessarily take place after the report was received, as it might have been stated at the time that the brake was defective, but I am not sure about that. I still am of the opinion that the real cause of the trouble in the Palmerston North yard is that the men have to work a forty-eight-hour week instead of forty-four, and also the loss of the night rates which they were receiving prior to eighteen or nineteen months ago, and that, in my opinion, is the real cause of the trouble. I did not hear Mr. De Rosa make the same statement. I think that Mr. De Rosa has been at Palmerston North on the last occasion about eighteen months. Mr. De Rosa, Mr. Sweeney, and myself are in no way responsible for the loss of the night rates. I cannot say why the men are vindictive, but I think that the reasons outlined above are the cause of the trouble. I am still of the opinion that the cause of the trouble is the loss of the night rates and the forty-four-hour week, even if you can show me that the trouble was there before the strike.

At this stage the following letters were read over to the Board and, by consent, handed in by Mr. M. J. Mack as evidence:—

(182–24.)

SIR,— 20th March, 1924.

I am instructed to ask if you will be good enough to cause an inquiry to be held into the working of the Palmerston North goods-yards. It is definitely stated—

That Goods Foreman Sweeney is not a fit and proper person to hold the position of Goods Foreman at Palmerston North.

That his attitude and abusive manner towards members of the staff who come in contact with him is such as to cause serious trouble among the men working in the yard.

That he interferes with the shunting-work without warning in any way the shunters who are conducting it. This the shunters submit has on more than one occasion endangered the lives of the shunters concerned.

That he has even gone so far as to bring the police into the yard to remove members of the shunting staff whilst they were yet on duty.

That he has invited members of the staff out to fight.

That he is known to keep a supply of liquor in his locker in the Goods Foreman's office, which the men have reason to believe is largely responsible for his attitude on many occasions towards the staff.

In view of the above I trust that you will be good enough to have the inquiry asked for set up as early as possible.

Thanking you in anticipation,

I have, &c.,

M. J. MACK,

General Secretary.

The General Manager, New Zealand Railways, Wellington.

(217–34.)

SIR, — 8th May, 1924.

I shall be glad to receive a reply to my communication of the 20th March last asking for an inquiry to be held into the working of the Palmerston North goods-yard.

I have, &c.,

M. J. MACK,

General Secretary.

The General Manager New Zealand Railways, Wellington.

(1920-5264, No. 16643.)

SIR,— Head Office, Railways, Wellington, 8th July, 1924.

With reference to your letter of 8th May last regarding the request of your Society that an inquiry should be held into the Palmerston North goods-yard, and particularly in respect of the work of Goods Foreman J. Sweeney, I have to inform you that it will be necessary for your Society to supply me with full information regarding the specific acts on which the charges are based. It will be obvious to your Society that without this information I am not in a position to decide as to the necessity for the inquiry asked for.

Yours, &c.,

R. W. MCVILLY, General Manager.

The General Secretary, Amalgamated Society of Railway Servants, Wellington.

I still think that the cause of the trouble is as stated. To my knowledge there has been no harassing of the men. I am still of the opinion that the cause of the trouble is the taking-away of night rates, &c. I know Mr. Robertson, the foreman. He is a very capable officer. I would place a good deal of weight on anything he might say. I agree with him in the statement that when the men were working a seven hours twenty minutes day they gave very excellent service, and that seven hours twenty minutes is enough for a shunter in any one day. In connection with my statement regarding the composition of the shunting-gangs at Wellington, I do not know this of my own personal knowledge. I remember the incident in connection with the derailed AB engine. I was present only part of the time. I think I got a report on the matter from Foreman Sweeney. I am prepared to put the report in if I got one from him. If Mr. Sweeney has said that the two engines left on the train with the damaged engine in front, and that the derailed engine was put on the road in a few minutes and the train despatched with very little delay, I would say that that was not true. That happened in November last. I cannot recollect the men standing by with hats off in reverence on Armistice Day, and that this was the date of the incident. The time of the derailment was about 10.45 a.m. I would say that it was easily an hour afterwards that the engine was replaced on the rails. The engine was all off the road, and the tender was also off, I think. I cannot remember seeing the tail-rope used. I saw the coupling-bar used. The first bar used was broken, and in the meantime I had other duties to attend to and cannot say whether there was another coupling-bar used. The following is a copy of the letter previously referred to which was received by me from Mr. Sweeney in connection with the incident referred to.

SIR,— Palmerston North, 11th November, 1924.

This morning while despatching C 2 special at north end of goods-yard Porter Corlett was ordered by me to remove wagon H 345, loaded with cattle, and ordered to be cut off train by Train-examiner Nicholas at 10.45 a.m., and while doing so Porter Corlett did not see that the points were set for proper road. No. 7 points were turned by some one and the leading engine got on two roads. The second engine was damaged. This occurrence caused a lot of trouble, blocking yard, but I done the best possible to despatch trains. 584 was late away. The engine was placed on rails again by Loco. Foreman and his men at 12.15 p.m. The road was torn up, and also caused delay, and was not put right to work over by the ganger and his men till 3.15 p.m. Truck of stock sent on No. 586 after getting repairs effected in yard. Porter Corlett's report to follow.

J. SWEENEY,

Yard Foreman, Palmerston North.

To the Stationmaster, Railways, Palmerston North.

Summed up, all I know about the engine was that she was all off the road, and not partly off as stated, and that she did not go with the train, and this is as far as I recollect. When I stated that in comparison with other stations the Palmerston North shunting-gangs were the best staffed I meant that we had more men in the gangs and good men. I do not know the composition of shunting-gangs at Auckland. I compared the gangs at Palmerston North with other stations that I knew. I did not know personally the composition of the Frankton Junction, Christchurch, Dunedin, and Invercargill shunting-yards. I knew none of the big yards except Wellington. I do not know how the gangs in Wellington last week compared with those in Palmerston North. I speak from information received when I refer to Frankton and Wellington. The statistics supplied in regard to the number of vehicles handled per man show that 1924 was the highest with the exception of the war period. The 1924 figures show the average number of wagons handled per man was 15,416. I agree that it would take a gang of men to handle a wagon in a shunting-yard such as Palmerston North, and it is necessary to strike an average. I based the average on the twenty-two men. The official records supply the information regarding the shunting-capacity. The standing-room in the yard is 591 wagons. This is the holding-capacity, and I do not suggest that wagons could be handled in the yard when it is full

up. Although the capacity of this yard is 591 wagons, in the whole twenty-four hours of the day we put through some sixteen hundred wagons, which is the maximum number handled, and this would be some three times the holding-capacity of the yard. This is a splendid performance, and a lot of this is due to the men and the foremen. Undoubtedly the success is due to the men and the foremen. It is a fact that there is not a set time allowed for the making-up of trains at this station. It would be impossible for the foreman to say to the men, "You have got so-and-so minutes to make up that train." It is entirely dependent on the varying conditions of the work, and the late running of trains, and the tonnage handled. Generally if a train arrives twenty minutes late the train would probably be correspondingly late away. But in some cases where a train arrives twenty minutes late the men have to get a bustle on and they must put their best foot forward—everybody is on the job, as the time is curtailed by the late arrival of the train. I do not think that in such cases it is necessary for the foremen to chase the men at their work, and they do not do so. I am very often in the yard. I am not there all the time. They may do it when I am not there. I would not let them do it if I saw them. I do consider that where there are three and four men in a gang in a shunting-yard that there should be no necessity for damage to rolling-stock except in cases of pure accident. What I mean by this is through brakes not being properly applied in time. There are plenty of men to look after the brakes, and if that is done this avoids the bump. It is a fact that draw-gears get sprung by bad stops on the road and rough shunting in another yard, but I do not mean this to apply to cases where possible slight damage is done at other stations and slight bumps finally break the gear and the shunter held responsible. I could not say that all of the damage in this yard could be avoided. In connection with my previous statement that the action taken by the Goods Foremen and also the Yard Foremen in the past has led to the detection of the thefts, I mean by that one of the present Yard Foremen. I do not know of one actual theft where the man was detected and convicted in the Court. I will not say that the thefts were not detected. I consider that the yard is well lighted, but it would be better if there was electric light. This would improve conditions. With reference to the lay-out of the yard, the standard lay-out is a matter for the Engineers to deal with. The yard at Palmerston North was laid out in 1903—twenty-two years ago—to meet conditions existing then, and I cannot say whether there have been little or no improvements since then.

To the Board: There have been improvements since I have been here.

To Mr. Mack: We have had a new siding provided a short time ago, and this saves a good deal of shunting-work. Some improvements have been made for the convenience of the shunters. We have also had some small improvements in the way of bicycle-shed and hangers, &c. Mr. Sweeney might have had something to do with these improvements. I do not know anything about the provision of a hut for the shunting-gang at the south end of the yard, as this was before my time.

When I stated that in comparison with other shunting-yards the Palmerston North shunting-yard was well drained I referred to Marton. I was stationed at Marton on several occasions—one occasion I was there perhaps two years. When I say it compares well with other yards I mean Marton, where I was stationed nine or ten years ago. I know nothing about how it compares with Marton to-day. This yard at Palmerston North compares well with New Plymouth. It is two years and ten months since I was at New Plymouth. I cannot say how New Plymouth compares with Marton and Palmerston North to-day. I am not in a position to compare the draining of Palmerston North with any of the big yards to-day. I referred to Mr. Robertson as the foreman who selects trainees for the shunting-yard. He has been at Palmerston North for about thirteen years. He would select Lepper. Lepper is not a classified shunter. I would say that Lepper is an apprentice at shunting. If Mr. Robertson said that he was one of the best men in the yard I would not deny it. Mr. Robertson has had more knowledge of that than I have. I heard the men speak very highly of Mr. Robertson when he was in charge. I did not hear the evidence of Mr. Shinkwin, the Senior Goods Foreman. In connection with Mr. Shinkwin's and Mr. Robertson's statements that they have not had any trouble with the men in the yard, these two men do not come into direct contact with the men to the same extent as other foremen. These two foremen named have not been in the yard for some time. I cannot understand why the men should say these things about Messrs. Sweeney and De Rosa and not about Mr. Shinkwin and Mr. Robertson. The two latter men are not brought into direct contact with the men to the same extent. I cannot say why the grudge against the foremen in regard to the loss of night rates, &c., should not apply equally against Foremen Robertson and Shinkwin. Mr. Shinkwin and Mr. Sweeney had a difference of opinion as to the relative importance of certain work, and they came to me to settle the matter. Both men were anxious to carry out the work on their own lines. I have no knowledge of Mr. Shinkwin calling me to settle any difference of opinion regarding the shunters and interference with them. The only incident I can recall is a difference of opinion as to which was the most important work, and I settled the matter. The dual control did interfere with the work on that occasion. I hold one foreman responsible for the prompt despatch of trains, and I hold another foreman responsible for the despatch and delivery of goods from the shed. It is not to be surprised at if Mr. Sweeney, who had a difference with his Senior Foreman, has differences with the men. It all depends upon the men as to whether a man should be taken at the age of twenty-eight from an unimportant station and placed in an important shunting-yard to carry out shunting-work. I think it would be better to give a member his shunting experience shortly after he comes on rather than ten years later. I do not know what experience Shunter O'Dea and Shunter Roberts had in shunting before they came to Palmerston North. I did say that I made inquiries as to experience and qualifications of new members. I inquired from O'Dea as to his experience, and he told me that he had experience at a tablet station, and the same applied to Roberts, and I then understood that they had had experience, but not experience in a big yard. These men get a good deal of experience at a tablet station. In many cases tablet porters have a good deal of shunting experience at tablet stations. There are shunters and shunters. We have them here. I say that Lepper is serving his apprenticeship at shunting. I will not say that there is any tablet porter in New Zealand to-day

who gets the experience in shunting that Lepper gets to-day. I have not had a great number of differences between the staff to settle. I have had some differences to settle between the foremen and the staff. I have had more than one. I have had to settle, say, half a dozen differences. I have settled differences in favour of the men. I have settled differences between two men. There was one such instance recently between the storeman and another member. When there is a difference of opinion some one must be wrong, and some one must be right. What I mean is that I have settled differences to the satisfaction of both parties. I am expected to exercise tact. I have settled these matters amicably between both parties. I denied that I told Aldridge that I would uphold the foreman right or wrong. I did not tell Worthington when he went to me on one occasion that all I wanted was the foreman's reports. I have no knowledge of telling Lepper that Mr. Sweeney was a hard man to get on with. Cunneen did not, as far as I can remember, come to me regarding Mr. Sweeney's attitude, saying that he was full up of him, and that I told him to go back to his work. I have no recollection of the report which was sent through the Senior Foreman and alleged to have been replied by Hunt. I have no recollection of Mr. Shinkwin bringing me to Mr. Sweeney twice in one week. I do not remember ordering Sharman and Eckersley out of my office when they came to complain about Mr. Sweeney. Now that I remember there was a case where Mr. Sweeney reported Eckersley, and I cannot remember whether they came to see me about it. They might have discussed the matter at the office, and I might have told them that the matter was referred to the Car and Wagon Inspector. I do not recognize that right through my evidence I have remembered everything in favour of the foremen, while, on the other hand, I have not remembered one single thing in favour of the men. I do not recognize or agree with this view.

To the Board: Referring to the particulars given previously regarding the overtime worked by shunters, this covers a period of six months ending in July last. Each man in a shunting-gang is provided with a hand-lamp, and we have five or six spare lamps for relief purposes or when lamps are broken. I cannot remember getting new lamps since I have been here. We always have enough to go round. I have had no complaints regarding insufficiency of supply of hand-lamps. I consider the present arrangement of control by the foremen referred to as dual control is very satisfactory, and I have had better results in many ways since I organized that system than during the time previous to its inauguration. We have all the necessary first-aid equipment kept in a cupboard at the station. It is readily accessible. In regard to the practice of coaling engines at the cattle-yards, I have represented that matter to the Locomotive Foreman, and was informed that this would be avoided as much as possible. The foremen are directed to obtain all the necessary information in connection with shunting-work and institute inquiries. When I said previously that inquiries instituted by the foremen could be carried out without my knowledge and the matter not referred to me at all, I meant that this could be done, but I did not infer that they actually did so.

PALMERSTON NORTH, 9TH SEPTEMBER, 1925.

FRANK HERBERT HILDRETH sworn saith.

To the Board: I am a motor salesman at Palmerston North. Prior to this I was at Auckland. I knew the late Shunter Carmichael. I have known him personally since 1911. I was at the railway-station at Palmerston North on the morning of the accident to the late Mr. Carmichael. I came down to post a letter on the "Limited." After the departure of the train I walked off the platform on the town end, and just when I got to the end of the buildings on the street I noticed the ambulance outside the ticket-lobby, and I went along to see what the trouble was. I then saw that there was a man lying on a stretcher which was then in the ambulance. The stretcher was immediately taken out of the van and placed on the roadway. I than noticed Mr. Carmichael and spoke to him as he lay on the stretcher. I asked him what was the matter. He said it was all right. He was then transferred from one stretcher to another stretcher, which had been brought from the ambulance-van. Deceased was then replaced back in the van. When removed from the stretcher he was first lying on I noticed a large quantity of blood spilled in the bottom of the first stretcher, which gave me the idea straight away that he had been seriously hurt and was bleeding freely. After he was placed in the ambulance one or two of the railway men made inquiries as to who was going to the Hospital with deceased, and as nobody seemed to be allowed to enter the van I immediately got in the van myself. On the way to the Hospital Carmichael was quite conscious. He conversed over general matters, and he requested that I go and see his wife, who also is a friend of mine, in order to notify her what had happened, because he wanted me to be there before any of the railway men got there, as he said that she would take the information easier from some one she knew. Deceased also stated that she was very much afraid of accidents happening to him while at his work owing to reports that he had given her from time to time where he was being pushed by the Heads. He also stated, when I inquired how the accident happened, that he was just attending to the rope when he slipped and was jammed between the rope and the truck. I do not know exactly what this refers to. He said that he had been "tailing" the wagons. Deceased also stated that he did not wish to go away from the yard because he was very very pleased with his mates, who had done so much for him, and that he had never worked with a better set of men in any yard he had been in. This completes everything that took place between us. I knew Mr. Carmichael well. I should say he was a man of nervous temperament, very highly strung—a man who objected to anything in the way of unpleasantness or arguments or anything like that. I know from personal experience when having an argument with him that he was liable to get agitated. In a sort of way he would lose his head for the time being. Deceased was quite conscious when he arrived at the Hospital, and was conscious all the time going to the Hospital. From the remarks I heard amongst the men it appeared to me that nobody would be allowed to enter the ambulance-van. It seemed

as if they were under some order not to go up, as I heard three different people make remarks to the effect that they could not go up. There was an attendant inside the van in addition to the driver of the van outside. The attendant was a young fellow of about nineteen or twenty, and he was not a man fit and proper to attend to any injured person. He appeared to have the wind up. I also turned round to the driver and told him to drive more slowly, as the vibration of the old ambulance-van was too much for the man. I have knowledge of St. John ambulance-work. I was surprised to learn that a doctor had attended to the patient at the station, as I saw nothing that would lead me to believe that he had previously had medical attention at the station. I would say that it took twenty minutes to go from the station to the Hospital.

To Mr. Mack: Nobody seemed keen on going in with the injured man, and one of the railway men said, "Yes, you are a friend of his, you go in." I knew Carmichael, and I consider he was a truthful man. I consider that he would be truthful in his statement that he was pushed by the Heads. I asked him how the accident happened. He just passed the remark to me and asked me to see his wife; he said that it was on account of her worrying over reports that he had taken home in regard to being pushed by the Heads. I do not think that deceased would say this unless this was the case.

To Mr. Carnachan: When the ambulance came down the attendant was in private clothes. I hardly think that the foreman would be likely to assume that I was also an attendant. I did not assist to lift deceased into the ambulance. I was given to understand that the doctor had been present prior to my arrival on the scene. The statement of deceased regarding the Heads pushing him was quite vague to me. I handed a letter in yesterday to Mr. Mack, the advocate for the men, which was received from Mr. Nash, M.P., in reply to a letter I wrote complaining of the treatment meted out to Carmichael after his accident, dealing mainly with the ambulance and the Hospital. The reply was to the effect that I should submit the matter to the Inquiry Board now sitting at Palmerston North, and that he (Mr. Nash) had shown the letter to the Minister of Railways. The letter also stated that the conditions at Palmerston North were most unsatisfactory, and that this would be remedied as soon as the new yards were constructed, but that meantime men have to run a great risk every day. Regret was also expressed regarding the unfortunate accident.

WILLIAM JOHN OLSEN sworn saith.

To Mr. Carnachan: I occupy the position of fireman and acting engine-driver at Palmerston North. I was the driver of AB 774, which was derailed at the Palmerston North yard in November last. I was booked out to run the train from Palmerston North to Marton. My engine became derailed in the Palmerston North yard. The engine was off the road for about two hours. All wheels were derailed. We finally got on the road again. We then returned to the loco.

To Mr. Mack: I was on the leading engine. I had previously been coupled up to the train. I found out afterwards that the real cause of uncoupling and pulling out of the siding was that a "Not to run" stock-wagon, the first wagon on the train, had to be put off. I ran out through the points which were laying set for No. 7 road. The shunting-engine had just gone in, and gone out and left the points as they were. It was when I received a signal to kick the wagon off that the engine became derailed. The points were lying set for the wrong road immediately under the cab, and when the engine was derailed the tender was pulled off the road also. The statement made by Mr. Sweeney in parts is correct. The correct part refers to the tail-rope. It is not correct to say that we were partly off, or that the engines were reversed. It is not correct to say that the two engines departed with the train. There was a delay of forty minutes, and the engine was off the road two hours. I was assisted by three engines altogether to get the derailed AB engine on the road. Three different engines were used in the endeavour to get the derailed engine on the road. The date was Armistice Day, last November.

To the Board: Independent to the engine attached three different engines were used at different times in an endeavour to put the engine on the road again. As a rule the driver takes charge of rerailing of locomotives. A locomotive man was in charge of this rerailing. The engine was pulled on by a stout draw-bar. It was not pulled on by a tail-rope.

The following additional evidence was, by consent, taken on behalf of the men concerned:—

GEORGE ECKERSLEY sworn saith.

To Mr. Mack: I am a train-examiner stationed at Palmerston North. I have never in my life told any man or counselled any man in this yard to take no notice of Mr. Sweeney. I am positive.

(Mr. Mack asked permission to ask a question from Mr. Eckersley as to his being ordered out of the Stationmaster's office by the Stationmaster, and the Board ruled that such a question could not be asked as both cases had then been closed, and permission was only given for Mr. Eckersley to be called to enable him to give evidence relative to one particular charge of counselling members to disobey Foreman Sweeney's orders.)

The following evidence was taken by direction of the Board:—

WILLIAM ALEXANDER GORDON sworn saith.

To the Board: I am Inspector of Permanent-way. I was a ganger in the Palmerston North yard for some years. I know all about the drainage, I think. As far as I know, there is only one main

drain in the yard, and the majority of the points at the south end are drained into it. There is no pipe drainage at all at the north end. There are one or two sumps at the north end. There is no proper means of getting the water away from the yard at the north end other than to the sumps. During my time as ganger I have found that there are parts of the yards of a porous nature—there is 12 ft. of shingle in places. There are two wagons of limestone in the yard now to be used in filling up holes between tracks where the men run up and down. Wherever a pool of water is noticed the limestone will be used to make up the low places. The main drain runs between No. 1 and No. 2 roads (not counting the main line) from the scissors to the south box. It is roughly six years since I occupied the position of ganger at Palmerston North. I have not personally attended to the drains since then. I do not consider the drainage here any worse than any other yard I know of. We cannot have good drainage and a good surface in the yard for the shunters to run on. If we have loose shingle, which gives drainage, the shunters complain, and when the shingle is blinded the drainage is spoiled to some extent.

To Mr. Mack: I know that the water lies around the points, from the top of the sleepers up, that being the lowest part. I had a look at the majority of the points in the yard this morning. I did not observe a pair of points this morning with 4 in. of water well below the top of the sleepers. To reduce the depth of the water it could be filled in with ballast. The water could be taken away by putting in sufficient drains, but with great expense. The placing of 2 ft. of ballast in the yard and the subsequent removal of the ballast did not take place in my time. I have no recollection of 2 ft. of ballast being placed and removed from No. 2 road in this yard, neither when I was here as ganger or as Inspector of Permanent-way. In my opinion if the road was 2 ft. below the ballast it would constitute a danger to the shunters, and if the road was lifted 2 ft. on to the ballast it would be very awkward and inconvenient.

The following additional evidence was by consent taken on behalf of the men concerned.

WILLIAM O'DONNELL sworn saith.

To Mr. Mack: I occupy the position of train-examiner at Palmerston North. In connection with Foreman Sweeney's statement before this Board to the effect that I have told men under his charge to take no notice of him and his orders, I absolutely deny this statement, and challenge Mr. Sweeney or any other foreman to produce any man to prove his statement.

JOHN WILLIAM LUCAS recalled, sworn saith.

To Mr. Mack: I recognize that I am on my former oath. In connection with Foreman Sweeney's statement before this Board to the effect that I have told men under his charge to take no notice of him and his orders, I never have told any man to take no notice of Mr. Sweeney. I recognize that in counselling these men as alleged that I would be implicated myself, and I say that I never have counselled any men in the manner stated. I would be pleased if Mr. Sweeney would bring forward some man who is able to corroborate the statement alleged. If permitted, I can show how Mr. Sweeney has lost the respect of the staff, and how he was ridiculed, and is ridiculed, by members of the staff.

In connection with the suggestion made previously in evidence that Mr. O'Shea, Stationmaster, Palmerston North, was aware of the existence of a letter addressed to the Minister of Railways regarding the harassing of Carmichael prior to Carmichael's death, Mr. Mack (advocate for the men) explained that he was now in a position to say that the letter referred to was written on the Sunday prior to the accident to Carmichael—the accident occurred on the following day, Monday—and Mr. O'Shea did not see the letter referred to until the following day, Tuesday—that is, the day after the accident occurred.

CONCLUDING ADDRESSES.

Mr. J. CARNACHAN (Advocate for Officers concerned).

Mr. Chairman and gentlemen of the Board: In connection with this Board of Inquiry which was set up to inquire into the conditions of work of shunters in various yards throughout the Dominion, I would like to state that the scope of this inquiry has been enlarged to deal with special conditions which have arisen in Palmerston North. In opening I would like to refer to the regrettable accident which took place and which resulted in the death of the late Shunter Carmichael. It might have been inferred from what has been said that Mr. Carmichael commenced his duties without having proper knowledge of shunter's duties and work required to be performed in a shunting-yard, but when we make an analysis of the evidence we find that the late Mr. Carmichael, prior to his transfer to Palmerston North, had 313 days' experience in shunting duties in Dunedin yard, and after his arrival at Palmerston North he had an additional eighteen months' experience in the local yard before he met with the fatal accident which caused his death. During that time the late Mr. Carmichael would have every opportunity of making himself conversant with the local conditions and work in the yard, and generally become efficient in all the routine work of a shunting-yard. We find that the unfortunate cause of his death was the result of an operation that he carried out in connection with the use of a tail-rope, and it is rather regrettable that of the four members present

on the morning of the accident not one of them actually stated how the accident happened. We find that neither the driver, the shunter, nor Porter Lepper actually saw what happened, and it can only be assumed that the late Mr. Carmichael was caught by the tail-rope which fouled a points-lever as the engine was moving forward. In connection with the use of the tail-rope I think page 15 of the sworn evidence throws a good deal of light on the matter. Here Shunter Lepper states that he had used the tail-rope three days in succession, and I think that during the time the late Shunter Carmichael was working in the yard he must have noticed these operations performed. We have also the sworn evidence of Shunter Shirley, who also had occasion to use the tail-rope in the Palmerston North yard about that time. Carmichael was in the same gang as Shirley then, and he should have known how the tail-rope was being used. In actual practice it has been found that various shunters have various methods of using a tail-rope, and if the rope is used in the proper manner it does not necessarily follow that it is a dangerous operation. According to the evidence in this case, the late Mr. Carmichael had fastened the tail-rope from the hook of the wagon to the eye of the rail-tope, and again he had attached the hook of the wagon attached to the engine to the other eye of the tail-rope, and when the movement went forward the rope caught in the points, and that was the cause of Mr. Carmichael's death. At the inquest held into the death of Mr. Carmichael I do not think that the Coroner had the full facts of the case in his possession, and in consequence certain remarks were made which would otherwise not have been made. In his sworn evidence before the Board Dr. Bett states that the case was hopeless from the outset, and that he recognized that everything possible was done in order to relieve the suffering of the injured man while he was waiting to be conveyed to the Hospital. The evidence of all the witnesses bears this out. It was unfortunate that the railway stretcher would not fit the Palmerston North Hospital ambulance. Notice has been taken of this matter by the proper authorities. The matter has been represented, and a stretcher which will meet all the requirements of the local ambulance will be built and supplied in due course. In giving his evidence in connection with this accident we have the sworn evidence of one of the shunters—I do not propose to name him—in which he stated that one of the foremen was either directly or indirectly responsible for the death of the late Mr. Carmichael. I do not think, gentlemen, that anything has been brought before the Board during this sitting here which will lead you to form that conclusion. I think that as regards the shunter who made this statement—I have not the slightest doubt that he made the statement in the utmost good faith at the time. In making that statement he was under stress and felt very deeply on the subject, and due allowance should be made for his statement that the foreman was directly or indirectly responsible for Carmichael being killed. At all times it must be remembered that the safety of the men is the first consideration of all concerned. Evidence has been brought before the Board wherein it has been stated that the men have been harassed by the foremen. I do not think this evidence is of such a nature to allow you, gentlemen, to assume that the men had been so treated by the foremen placed in charge of them. I will just briefly go into one or two cases where harassing has been alleged, and I will bring under review the evidence brought forward by the various witnesses. In the first place, one shunter stated, as an instance of harassing methods alleged to be adopted by the foremen, that he was ordered to bring out an engine during the time he was having supper at night, and he objected to going out during the time he was having a cup of tea. Gentlemen, I think you can hardly attach any importance to such an incident. On the other hand, we have this witness denying that on one occasion he refused to go and bring an engine out of loco. for No. 663 train; but if you peruse the sworn evidence you have before you, gentlemen, you will find that this statement is contradicted by Coaching Foreman Cavanagh, who stated that this member in question was brought before him, and he not only admitted refusing to carry out the foreman's orders, but apologized for having done so, and the foreman accepted the apologies and allowed this man to go on with his work. I think on that occasion that the foreman took up a very lenient attitude towards a member under his control, but at the same time I think he acted rightly and properly. When he expressed regret for his action the matter was allowed to drop. That was an incident where the foreman was alleged to have harassed the man, whereas it has been proved that this man was treated in a right and proper manner, and very reasonable consideration was given to him. Another case was brought before the Board where a porter stated that he had been harassed by his foreman, and on investigation of the facts by this Board it has elicited the information that the man in this case was reported by the foreman for refusing to supply information to him *re* a vehicle damaged in the shunting-yard. It will be recognized that a damaged vehicle getting into traffic again without proper examination might entail serious accidents and loss of life. It is most essential that proper and full information should be given to the foreman, and this member was failing seriously in his duty in not doing so in this case. We find that this matter was investigated by the Stationmaster, and after taking the member in question to task, and telling him that he took a very serious view of the action of a senior man refusing to give information, and that he expected better from him in future, the man was allowed to go back to his ordinary duties. I am simply bringing this matter up as a rebuttal of the charges made against the foreman. With reference to the statement alleging that the foreman instructed a member to go in between trucks moving at twenty-five miles per hour to lift a brake, this statement received a flat contradiction by the foreman, and as you are aware, gentlemen, the test carried out under your instructions under conditions described in evidence with the same engine pulling the same number of vehicles the same distance showed that the maximum speed attained was eighteen miles per hour, and I ask, Is it reasonable to assume that during the course of ordinary shunting operations the driver would get up a speed of twenty to twenty-five miles per hour considering the short distance which he had to run along the yard. I think I can leave that statement for the Board to decide, and the weight of evidence will furnish a reply. Following the evidence further we come to a case where a shunter states that he received instructions to lift a car out of No. 3, and he considered there was

no necessity for this operation. We have the evidence from the Stationmaster on this point. He states that he personally gave the order to the foreman that it was necessary to have the car, and that the foreman was merely carrying out orders from his superior officer. This was an instance cited where the foremen were alleged to have harassed the men under their charge. It can readily be seen that by these incidents the shunters are no doubt doing their work to the best of their ability, but they have a very limited outlook as to the general requirements of the yard. They only know what is going on in the part of the yard where they are working, and a man at the north end would have no knowledge of the requirements of the south, and *vice versa*, and it is the work of the foremen to co-ordinate the control of the yard. It can readily be seen what the foremen are up against in a yard of this nature. Then we have another case, gentlemen, where a witness came before the Board and stated that he was not harassed but victimized. Under cross-examination he stated that he had been asked for an explanation as to why he had failed to turn tarpaulins on a truck of chaff going out of this yard to Marton. This incident happened two years and ten months ago, on the very first day Mr. O'Shea took charge of Palmerston North as Stationmaster, and the witness in this case stated that he was the only member asked for an explanation in connection with this matter. The Stationmaster in his sworn evidence has denied this statement, and stated that this man was only one of a number who were asked for an explanation, and that his statement made before the Board was quite incorrect. I think it will be admitted that that member has nursed a grievance, and has gone back three years and brought forward incorrect statements, and this evidence can be judged for what it is worth. It will be recognized by such statements the difficulty the foremen have in meeting all the requirements of the Department without a little friction with the men. Quite a number of shunters in giving evidence have stated that they have received good advice from the foremen when they first went into the yard—they admitted that they were warned not to expose themselves unnecessarily to danger. The foremen have at no time asked the men to expose themselves to any unnecessary danger. They have stated that they have instructed the men in the performance of the work they are required to perform. If any of the men lacked tuition, all they had to do was to apply to the foremen and they would be put right in the matter. We have had a considerable amount of evidence brought before the Board in connection with the character and methods adopted by both foremen, Mr. Sweeney and Mr. De Rosa. In Mr. Sweeney we have a foreman of very wide and varied experience—a man of excellent character, and one who is highly thought of in the service, and one who has done very good work for the Department in the past. It must always be recognized amongst men in charge that every one has their own little peculiarities, and no doubt Mr. Sweeney has his as well as the rest of us. He is a man with a bluff, loud voice, and is inclined to shout out his orders to the men, and not one tithe of evidence has been brought forward to show that he had ever unduly harassed the men in any shape or form. On the other hand, we have the evidence of some of the senior shunters who state that they got on with him very well, and in that respect I think they have very little to complain of, while some of the junior men have stated that they did not get on so well with Mr. Sweeney. Then we find men, who say they get on quite well with Mr. Sweeney, stating that they do not get on quite so well with Mr. De Rosa, and we can only take from that that in issuing orders the foremen have to deal with men of different type, some of whom are difficult to deal with, and the foremen are trying to do their duty according to their own light. They have stated in evidence before the Board that they have done nothing except what they considered to be their actual duty. They have to issue orders to the men in their capacity of foremen. They issue necessary orders, and are required to see that the work is carried out expeditiously in order that trains are not delayed. Of course, it must be recognized that where men are in control of a large body of men a little friction will at times creep in. Unfortunately, men sometimes have little domestic grievances amongst themselves, and this is apparent in all walks of life. If you look at the *Railway Review* of the 24th July you will find there a report of a meeting held at Palmerston North. I will just read a few remarks made by the then president of the Amalgamated Society of Railway Servants to members of Palmerston North branch of the society (page 419): "In answer to a question, he stated that he was not surprised the general secretary did not visit this branch—in fact, he was very dubious himself about coming, but he could assure them that it would be the last time during his term of office." I have no doubt some of these men have criticized Mr. Mack quite a lot, and probably will do so in future. Domestic grievances crop up in most organizations. Mr. Mack told them a lot of things——

Mr. Mack: Quote what Mr. Mack told them.

Mr. Carnachan: Mr. Mack told them a lot of little things. However, these things do crop up, and I have quoted that incident to show that these incidents do happen from time to time. Now to get down to the question of staffing of stations, we find that, according to the statistics placed before the Board by the Stationmaster, in comparison with other stations Palmerston North is well staffed in respect to the staff in the shunting-yard. In fact, I may claim that it is the only yard, so far as I am aware, that has four-men gangs in operation. This refers to the North Island, anyway. Palmerston North is practically the only training-school for shunters in the North Island, and I think the Board should take that fact into consideration when dealing with the conditions of shunters when that subject comes under review at the conclusion of this inquiry. I think it right that every man in a shunting-yard should be placed for some time at least as spare man in a gang, and Palmerston North has done its best in that direction. Every man receives the best possible training before being placed as third man in a gang in order to take up the ordinary routine duties of a shunter. In comparison with other large shunting-yards in the Dominion Palmerston North compares very favourably. The training of the men here is a question that has received the deepest thought and consideration from the Stationmaster. Men are never placed out in the yard until and unless they are specially selected

by the Senior Coaching Foreman, who after examination certifies that they are competent in rules and regulations, and also considers them fit physically to take up duties in a shunting-yard. It has been brought out in evidence that some men come here appointed as shunters from tablet stations and that many of these men are well on in years. Well, that is a matter over which the local Stationmaster has absolutely no control whatever. A man may be transferred from quite another section and come to Palmerston North as a classified shunter and be placed in the yard to take up the ordinary routine duties of a shunter. We have a case of a man of nine years' experience coming here as a shunter, and in giving evidence before this Board this member stated that he knew little or nothing about shunting duties when he came here. A review of his service will show that for five years he was stationed at one of the busiest tablet stations in New Zealand. He was stationed on the main line where he would become well acquainted with shunting-work, and he would probably have little difficulty in taking up routine shunting-work at this station. It must be admitted that one object of all parties engaged in operating our State railways—the Minister of Railways, the Board of Management, the officers, and all other workers—should be to develop such a spirit of co-operation and emulation among all sections as will result in good and efficient service to the public, and at the same time give to all grades of employees all they can reasonably expect in wages, labour conditions, and other surroundings that would satisfy a man's ambitions and enable him to bring up a family.

Mr. Mack: Are you quoting from the *Review* again?

Mr. Carnachan: No. That is too good for the *Review*. Now, in connection with these various matters which have been brought before the Board, it is for you, gentlemen—it is your duty to sum up the evidence placed before you, to assess the value of the various witnesses who have given evidence before you, and decide as between the men on the one side and the foremen on the other, and I have no doubt that you will, in your wisdom, be able to come to a just and proper decision on all the subjects coming under review. I personally in my position of advocate have simply pointed out to you what I considered were discrepancies in the evidence of the various witnesses who have come before the Board. I do not for one moment suggest that any of these witnesses have made any deliberate statement which they considered to be untrue, but, on the other hand, it must be recognized that during cross-examination it is quite a simple thing for a witness to contradict himself. I hope that as a result of your deliberations something will be done which will improve conditions, and I feel sure that whatever your decision is it will give satisfaction to all members concerned here to-day, and I safely leave the matter in your hands. I hope that after this inquiry has blown over all the men will get back to work again, and that the good feeling that has been in existence in the past between all members of the Railway service in the First and Second Divisions will continue, and that we will all come together not only in the interests of the service, but also in the interests of the Department.

MR. M. J. MACK (Advocate for Men concerned).

Mr. Chairman and gentlemen: I may just say at the outset that you are well aware that this Board was set up and made public, in so far as Palmerston North is concerned, owing to quite a number of accidents which have occurred in the shunting-yards of the Dominion and which culminated here by the death of the late Shunter Carmichael. I do not propose to deal with that matter until the conclusion of what I have to say. I rather propose to deal with the order of reference, but before doing so I want to say this: that one of the outstanding features of this inquiry has been the almost complete unanimity of the witnesses that harassing methods have gone on. It has been shown conclusively that it existed prior to 1924. The reason given for the trouble that existed—acknowledged trouble that existed!—was the strike of 1924. I have, I think, proved conclusively without a shadow of a doubt that the evidence of Mr. O'Shea, Stationmaster, and Mr. Sweeney and Mr. De Rosa, the foremen, who stated, in their opinion, the strike was the matter which caused the trouble, was strangely consistent, but they did not know when they made that statement that written representations had been made in regard to this matter before the strike. How was it possible for the loss of the night rates, the loss of the forty-four-hour week, &c., to be the cause of the trouble when the complaint was made before the strike?—before the strike took place and before the loss of the conditions I have mentioned, and for which neither of these gentlemen had anything to do with and were in no way responsible. Dealing with the order of reference, No. 1 refers to the length of shifts shunters are required to work. The length of shifts in this yard compare very favourably with the length of shifts in other yards, but it is impossible under the forty-eight-hour week to make the shifts less on an average than eight hours, and it has been definitely stated by the most experienced foreman—a foreman who the Stationmaster eulogizes as having a long and varied experience in the Railway service—that when the shifts of seven hours twenty minutes were in operation they obtained the best results, that the work of the men was highly satisfactory; and if that is so—if better results can be got from the seven-hour-twenty-minutes shift than from an eight-hour shift, then by all that is reasonable in the interests of the Department no shift should be longer than that time. The next item on the order of reference relates to the number of employees composing shunting-gangs, and with that, sir, I will take in conjunction No. 9, referring to the matter of employees inexperienced in shunting-work being employed thereon. True it is that there are three men in the gang, and occasionally a fourth man, but true it is also that for the majority of the time there are only two actual shunters, with one porter and the other man temporarily in the gang to learn the local conditions occasionally. Do not forget, sir, that the Stationmaster himself characterized the third man as an apprentice, whilst the Senior Foreman, the man upon whom he relies, says that one at least of these men is one of the most capable men in the yard; and if this is so, then it is quite patent that the third man is running in the gangs—as Lepper is running third man—with all the qualifications of a shunter but not getting a shunter's pay. He gets 6d. per day allowance for the risk he runs and the service he gives. The Stationmaster himself had to admit that he was not doing porter's duties, and

f he was not doing porter's duties he certainly must have been doing shunter's duties and taking the risk of other shunters, which is surely worth more than 6d. per day allowance. Referring to the question of inexperienced men in shunting-gangs, my friend opposite had something to say about two men being brought into this yard from tablet stations. I am not going to labour the question, because any man with any knowledge of railway-service conditions knows that no tablet porter gets any experience in practical shunting—that is, shunting as it is required in the Palmerston North yard, or any other yard for that matter; and I say further—speaking as one who has had a long and varied experience in the Railway service—that it is wrong, absolutely wrong, and I say it was never intended that a man should go on at twenty-seven or twenty-eight years of age and be kept clear of the shunting-yard until he reaches the age of thirty-six or thirty-seven years before he is given an opportunity to qualify. That, sir, is against the interest of the Department themselves. That man, were he ever so capable, could not hope to obtain any position worth while in the Railway service. With ten years as a shunter and probably another ten years before he gets to the head of the shunters to get into the grade for second-grade guards, and then he would have to work through all the hundreds of second-grade guards before he gets into the position of first-grade guard, and a further ten years before he gets from first-grade guard to a higher position—why, he would have to be 100 years old before he could reach a position carrying a decent wage. No. 3, sir, deals with the time allowed for the work of making up trains. It is impossible—one of the very few things which are impossible—to give a fixed time for the making-up of trains if the trains are to depart on their schedule times. There are very many things which interfere with this. Trains may run late. Anything may happen which would cause a train to arrive at Palmerston North late, and consequently, if the train is an average train, it will depart late by reason of the fact that it has been stated that trains do not arrive here in anything like marshal order. The men here are expected to marshal trains, and it has been stated that the yard here handled three times its standing-capacity in any one day, and that three times is only three times the number of wagons it will hold—it does not mean three times the shunting-capacity of the yard. One wagon which is regarded as having passed through may be handled five or six times before it is despatched, and we must take that into consideration when judging the evidence of the witness who stated that there were about four thousand vehicles going through the yard, and this witness would be more correct than the Stationmaster, who says that the number is one thousand six hundred. The next item refers to the supervision that is afforded shunters' work. The whole trouble we have gone through comes under this heading. The whole difficulty in this yard is that there is too much supervision of the men and too little consideration given to those things which go to make a contented staff. Witness after witness has come forward and stated that he has been harassed by one or other of the foremen, or he has seen other men being harassed although he himself may not have been so treated. The Stationmaster says he did not see it, but he says he cannot see everything, and it is possible that it has happened in his absence. Mr. Wylie, the Timber Inspector, was brought forward to show that he had seen no harassing going on, but he also admitted that it could go on and he would not see it, and he did say—and I want to impress this upon you, gentlemen—that the men in the yard had come to him and complained about the manner in which they had been talked to by the foreman, and he had told them not to worry, and that it was all in their day's work. So that the witness brought forward by the other side actually gave evidence in support of what the men said. So engrossed were the foremen in supervising the men and attending to the conditions that they failed to see that the points were bare and dangerous; they failed to see that the points-levers had not been painted; they failed to recognize that more lights were required; and with the exception of Mr. Sweeney they failed to see that a proper and sufficient supply of good hand-lamps were available, and even Mr. Sweeney, after making one representation, allowed the matter to drop; and the Stationmaster, when questioned as to why he did not see it, did recognize that it was so now that it was brought under his notice. Is it necessary for some man to get killed before attention is brought to this matter? It has been stated definitely in evidence that no men have been killed at the points. I have the report on the recent New Plymouth accident, and the man actually lay at the points and was killed there! Everything that can be done should be done to minimize any risk, because when the most is done there is still a grave risk of the men losing their lives. What is wanted, sir, is less interference with the men. The instances quoted by my friend opposite were not cited as instances of harassing. They were cited by the men as instances of interference, which is a totally different thing. The men have made statements that they have been harassed. Not one single witness has been shaken upon his evidence—not a single man! They have said so, and not one witness can be brought forward to dispute these statements. Would they all, sir—one after another—in his own way come along and say, "I saw So-and-so being harassed" or "So-and-so harassed me." Other men have not been harassed, but have stated that they have seen other men being harassed. Would they concoct such a story? Would all these fourteen or fifteen men—would each and all of them say, "He has harassed me." Each of them would have told the same story; but the only men who told the same story were the Stationmaster and the foremen, Mr. Sweeney and Mr. De Rosa. Why, they repeated word for word the same story, like a child saying its A B C, that it was the strike and the consequent loss of conditions which caused the trouble; but I had not revealed to them that I had represented the matter prior to the strike, otherwise they would have concocted some other story. No. 5 refers to the general control of the work in the shunting-yards. It is not possible for any man to read in the mind of a shunter, when he is carrying out his work, as to what he proposes to do, and it is a most unwise thing to interfere with that man when he has got his work mapped out. It is not possible, however, to lay down any set rule as to the way in which any particular job has got to be done. That has got to be left to the shunter. The man knows his job, and he should as far as possible, apart from the giving of orders, be left alone. It is singular that it has been found that when the foremen are absent work gets along just as well; there is no delay, and "everything in the garden is lovely."

But the moment they appear upon the scene trouble commences, and they begin to interfere with the men, and I suggest, sir, that when this report is made that you will draw attention to the fact that less interference is necessary. Another matter that was mentioned was the lay-out and proposed lay-outs of shunting-yards. I am going to candidly admit that I do not know anything about it, and I do not think that witnesses who spoke knew anything about it either. I agree with one witness in so far as that is concerned, that he does not know—he only understands so, may be or may not; but I do know that when yards are laid out the men who are going to work them should be consulted, and if there is anything in their recommendations or if there are any suggestions they can make they should be given very serious consideration. Dealing with the draining of shunting-yards, every one has agreed that the drainage of this yard is bad. I do not think it is necessary for me to stress that. I have been up and down this yard. I was up and down the yard this morning and noticed all the points full of water more or less, and I think it will be accepted by you, gentlemen, that some attention is necessary in that direction. Now, sir, I want just to deal with the unfortunate circumstances surrounding the death of the late Shunter Carmichael. We have the evidence in this matter by Roberts, who was working with him. He says that "nagging" was going on always—that is, towards Carmichael—and that he heard it going on, and he got out of the way. He states that he heard De Rosa tell him, "Don't give me any cheek," and that was on the Friday before the accident. He also said that on going home at night the theme of Mr. Carmichael was the manner in which Mr. De Rosa was worrying him. Mr Firth said that it appeared to him that Mr. De Rosa was worrying Carmichael of late, and he states positively that on the Thursday and Friday before his death Mr. De Rosa was harassing Carmichael—so much so that he told Mr. De Rosa that if he did not leave the man alone that he would be killed. That was an unfortunate prophecy. It was indeed! Why would Firth, the engine-driver, a man who had nothing in common with Carmichael, concoct a story of that kind if it were not true? Why would Tapp, who was acknowledged by the Stationmaster to be a truthful man—why would Tapp say that De Rosa told him to keep an eye on Carmichael, otherwise Carmichael would be killed. He, De Rosa, contemplated that Carmichael would be killed; but if the evidence is true he did not let up on this man who he had been harassing for two weeks. He continued until the poor fellow, endeavouring to do his best and recognizing that his conscientious services were not appreciated, came down to work to meet his death. Lepper, who was his mate, said that De Rosa was always worrying him. Undoubtedly he harassed him. Is Lepper concocting a story also? Is Mr. Hildreth, a man who is entirely independent of anybody and not known so far as I am aware to any of us until he walked into this room, concocting a story when he says that Mr. Carmichael asked him to go and see his wife to ease her mind because she was worrying about him "being pushed by Heads" or "pressed by Heads"—worried by Heads! Who can the Heads be? What other interpretation than Mr. De Rosa. Was it the Traffic Manager? Was it the Stationmaster? He meant without a doubt that it was the men immediately in control of him. Mr. Foote, an outsider, the gentleman who wrote the letter, knew of this harassing. He wrote the letter to the Minister of Railways on the Sunday, the day before Carmichael's death, and the following morning Carmichael was killed. The following morning he was killed, and the following morning also Mr. Foote showed the letter to the Stationmaster, but did not send it on. Should not the Stationmaster have made inquiries as to whether it was or was not so? Notwithstanding that he knew that the letter had been in existence, and notwithstanding that his attention had been drawn by an outsider the day after the death of Carmichael, not one word was mentioned of it until he came before this Board and until I asked him. We have had these men, the foremen, telling us that it is not their job to teach the men how to use the tail-rope. Mr. Sweeney admitted, when I pointed out to him, that there were men for every possible purpose to safeguard the revenue of the Department, but not one single man was there who acknowledged that it was his duty to see that the men who worked in the yards—the men who took the risks—understood everything that was required of them in regard to tail-roping! Everything possible to safeguard the revenue, but nothing to safeguard the lives of the men! No attention given to points, crossings, levers, lights, drainage, and extra space. No attention given to them. No attention given to the men, to teach them how to adjust a tail-rope under various conditions, but every consideration given to safeguard the revenue. Let us review for a moment Mr. Sweeney's evidence. Does anybody believe the tale about the medal? Does anybody believe the tale that a man from the Old Men's Home could lift the brake as we saw it the other day? Every member who witnessed the test knows, and Mr. Sweeney knows, that if Mr. Sweeney attempted to lift the brake he would have had a large funeral. Does anybody believe the story of the 2 ft. of ballast in the yard? Does anybody believe the story that Lepper is an amateur? Does anybody now believe the story of the engine derailed? Did he in his report to the Department tell the truth? It was only last November, but he came before this Board with an elaborate story which was so far from the actual facts that I am astounded that any man should attempt to tell such a tale. It may be said that his memory is failing. I will not charge him with wilful lying—his memory may be failing, but if it has failed in so far as the engine is concerned, then surely his memory has failed with regard to quite a number of other things. Does anybody believe that it was a proper thing to bring a policeman on the premises to remove two of the men when he had another remedy altogether? Does anybody believe that it was he who stopped the thefts? Why the shunting-yard is wide open for that very portion of the night when no foreman is on duty at all, from twelve midnight forward. There is no foreman on duty to protect the property of the Department—only the shunters; but what little could be said on behalf of the shunters was not mentioned. We have the evidence of Mr. Shinkwin, who states that the foremen quarrelled amongst themselves, and if, sir, the foremen quarrel among themselves, surely there is some reason for the men saying that they were harassed by these two men. The Stationmaster carefully forgot, or could not remember, anything that was asked him

in so far as the men were concerned if it were in favour of the men, but he remembered carefully everything in regard to the foremen. He is the man who states that he has the interests of the shunters at heart and believes that everything that can be done should be done for their welfare, and yet he never saw the points that are at his front door. He did not see that lights were required; he did not see that the levers wanted painting. He saw nothing, only that which was brought under his notice. Is it not clearly his duty to see that everything that can be done ought to be done? Now, sir, I have said nearly all I want to say, but before concluding I want to ask the Board to just picture to themselves—Carmichael. Here was a man acknowledged by everybody to be conscientious, hardworking, and anxious to do his duty. Picture Carmichael going home at night weary in limb, worried in mind, recounting to his mate the way in which De Rosa was harassing him. Picture in your mind, sir, the wife's anguish when she heard of the death of her husband—realizing that she would never have anything but a memory of him in the future. Picture to yourself the children who will never know what a father's love will be. Picture to yourselves the story that was told of what a fine fellow he was—what satisfaction he was giving to his officers—after he was dead! Would it not have been better if some of this sympathy and some little encouragement had been given him before? Had it been so things might have been different, and, sir, if the recommendation of this Board can prevent one more widow, one child saved from the loss of its father, the time and the expense will have been well spent. I have to thank the Board for their courtesy and the consideration they have extended to me. I may have transgressed, and if I have done so I am sorry. I only wish to say that I thank the Board for what they have done.

Mr. Carnachan: Mr. Chairman and gentlemen: I would like to thank the Board for their kindness and consideration extended to me and the manner in which they have allowed me to bring forward the evidence of my witnesses, and also to the latitude allowed in the cross-examination of witnesses brought before the Board. In conclusion, I would also like to say that I desire to thank Mr. Mack. I think he has been absolutely fair in the conduct of his cross-examinations.

Mr. Mack: I desire to say that I appreciate and reciprocate Mr. Carnachan's remarks.

Mr. J. Brown (Chairman of the Board): Before concluding I would like, on behalf of the Board, to thank both advocates for the assistance they have given to the Board, and I now declare this sitting closed.

(The Board adjourned at 3 p.m. on the 9th September, 1925.)

EXHIBIT A.

No. 2 Goods-yard Foreman.—Day Shift.

Hours of attendance: 8 a.m. to 5 p.m. Lunch-hour as convenient.

Duties.

(1.) In charge of yard and yard staff under the supervision of Senior Foreman.
(2.) See that all trains are made up and ready to be despatched on time.
(3.) Arrange for prompt removal of inward trains from main line and loop so as to avoid delay at signals to subsequent trains.
(4.) Examine all sidings daily. See that empty wagons through or local wagons are not delayed. Through or local loads on hand longest have preference in despatch even if trains have to be reduced of unperishable goods to do so. Empty wagons to be forwarded promptly as directed by Transport Clerk.
(5.) Arrange shunt sheds and sidings at regular hours or as required. Essential that inwards goods be placed in shed or loop promptly.
(6.) Arrange supply shed or loop empty wagons as required.
(7.) Arrange shunt to and from repair-sidings daily. Report to Stationmaster any delay in wagons, especially loaded ones.
(8.) Obtain reports from shunting staff *re* derailments, damage to rolling-stock, &c., which occur during your shift. Append your own covering report, together with a sketch of locality in connection with derailment.
(9.) Arrange for weighing of wagons which have to be weighed.
(10.) Responsible for returning vans on trains to districts to which they are allocated. To assist in this direction Wanganui vans should be placed in loops Nos. 11 and 12, Napier–Woodville vans on No. 10, and Thorndon vans on Nos. 4 and 5.
(11.) Check and initial shunters' time in day-book, and see that correct time has been entered. A very careful watch over the times should be kept.
(12.) See that, as far as is practicable, all trains are marshalled before despatch.
(13.) Confer with Senior Foreman and No. 3 on all matters which require co-operation and in which it is considered an expression of opinion is desirable for obtaining better results.
(14.) See that all Wellington goods-wagons received off Nos. 668 and 662 trains have been placed in shed by No. 1 gang.

EXHIBIT A—*continued.*

No. 3 Goods Foreman.—Night Shift.

Hours of attendance: 4.45 p.m. to 12.45 a.m. Tea-hour as convenient.

(1.) Be at foreman's cabin at 4.45 p.m. and take over charge of yard from No. 2, and obtain particulars as to work in progress and to be performed each night.

(2.) Responsible for general conduct of yard-work each night. Arrange for prompt removal of inward trains from main line. See that outward trains are correctly made up and marshalled and despatched.

(3.) Empty wagons forwarded, shed and delivery siding shunted. Empties removed from loco. and gasworks sidings each night, and responsible for general supervision of the yard staff at night. See that the hours of duty as laid down by Senior Foreman are observed.

(4.) Close observation to be exercised over wagons containing goods likely to be pillaged. Such wagons are not to be placed in a position accessible to thieves. Report promptly to Station-master, or, if necessary, to police, any interference or suspicious circumstances with wagon standing in yard or in transit. It is specially desirous that the Night Foreman should exercise a close vigilance over goods in yard, with view to detecting thieves.

(5.) Check and initial time late-duty staff each night.

(6.) Obtain orders from Transport Office each night about 5 p.m., and see or arrange that the various instructions are carried out.

(7.) Before going off duty instruct early-shift shunter work to be performed, instructions, &c., to be carried out, and hand over charge to Night Shift Coaching Foreman, who will take charge of yard and platform as from 12.45 a.m. or when Goods Foreman completes shift.

(8.) Obtain reports from shunting staff *re* derailments, damage to rolling-stock, &c., which occur during your shift. Append your own covering report, together with rough sketch of locality in connection with derailment.

(9.) Have the wagons of goods received ex Wellington off 640 and 646 trains placed in shed as soon as possible after arrival.

EXHIBIT B.

Composition of Shunting-gangs, Palmerston North, from 5th October to 4th December, 1923.

Gang 1.

Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath
Stockdale	Stockdale	Stockdale	Pauling	Pauling	Pauling	Pauling	Pauling	Pauling	Pauling
Lepper	Lepper	Lepper	Atkinson	Atkinson	Atkinson	Atkinson	Atkinson	Atkinson	Atkinson

Gang 2.

Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen
Pauling	Pauling	Biggs	Biggs	Biggs	Biggs	Biggs	Biggs	Biggs	Biggs
Cunneen	Bodle	Bodle	Bodle	Bodle	Lepper	Bodle	Bodle	Murphy	Murphy

Gang 3.

Kendrick	Kendrick	Shirley	Shirley	Shirley	Shirley	Shirley	Shirley	Shirley	Shirley
Pepperill	Pepperill	Carthy	Carthy	Carthy	Carthy	Carthy	Carthy	Carthy	Carthy
Hunt	Hunt	Murphy	Murphy	Murphy	Murphy	Murphy	Carmichael	Carmichael	Carmichael

Gang 4.

Lucas	Lucas	Kendrick	Aldridge	Aldridge	Aldridge	Aldridge	Aldridge	Aldridge	Worthington
Biggs	Biggs	Pepperill	Lucas	Lucas	Lucas	Lucas	Lucas	Lucas	Lucas
Hunt	Hunt	Hunt	Hunt	Hunt	Hunt	Hunt	Hunt	Hunt	Hunt

Gang 5.

Worthington	Worthington	Worthington	Worthington	Worthington	Tapp	Tapp	Tapp	Tapp	Tapp
Atkinson	Atkinson	Atkinson	Cunneen	Cunneen	Worthington	Worthington	Worthington	Worthington	Cunneen
Bodle	Cunneen	Cunneen	Lepper	Lepper	Cunneen	Cunneen	Cunneen	Cunneen	Lepper

Gang 6.

Tapp	Tapp	Tapp	Kendrick	Kendrick	Kendrick	Kendrick	Kendrick	Kendrick	Kendrick
Shirley	Shirley	Lucas	Pepperill	Pepperill	Pepperill	Pepperill	Pepperill	Pepperill	Pepperill
Murphy	Murphy	Hunt, C.	Hunt, C.	Hunt, C.	Hunt, C.	Hunt, C.	Hunt, C.	Hunt, C.	Hunt, C.

Composition of Shunting-gangs, Palmerston North, from 8th February to 16th May, 1924.

Gang 1.

Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath	Lambrath
Pauling	Pauling	Pauling	Cunneen	Cunneen	Cunneen	Cunneen	Cunneen	Cunneen	Cunneen
Atkinson	Corlett	Philpot	Philpot	Philpot	Philpot	Philpot	Hunt	Hunt	Hunt

Gang 2.

Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen	Pedersen
Biggs	Biggs	Biggs	Biggs	Biggs	Biggs	Biggs	Biggs	Biggs	Biggs
Murphy	Murphy	Murphy	Murphy	Simpson	Simpson	Simpson	Simpson	Leslie	Leslie

Gang 3.

Kendrick	Kendrick	Kendrick	Kendrick	Kendrick	Kendrick	Kendrick	Kendrick	Kendrick	Lucas
Pepperill	Pepperill	Pepperill	Pepperill	Pepperill	Pepperill	Pepperill	Pepperill	Pepperill	Whitmill
Hunt	Hunt	Hunt	Hunt	Gillespie	Gillespie	Gillespie	Gillespie	Whitmill	Barnes

Gang 4.

Worthington	Worthington	Worthington	Worthington	Worthington	Worthington	Worthington	Worthington	Worthington	Worthington
Lucas	Lucas	Lucas	Lucas	Murphy	Murphy	Murphy	Murphy	Murphy	Murphy
Hunt	Hunt	Hunt	Hunt	Hunt	Hunt	Bodle	Bodle	Bodle	Bodle

Gang 5.

Tapp	Tapp	Tapp	Tapp	Lucas	Lucas	Lucas	Lucas	Gillespie	Gillespie
Carmichael	Carmichael	Carmichael	Carmichael	Carmichael	Carmichael	Carmichael	Carmichael	Lucas	Pepperill
Lepper	Lepper	Lepper	Lepper	Lepper	Lepper	Lepper	Lepper	Lepper	Lepper

Gang 6.

Shirley	Shirley	Shirley	Shirley	Shirley	Shirley	Shirley	Shirley	Shirley	Shirley
Cunneen	Atkinson	Atkinson	Atkinson	Atkinson	Atkinson	Hunt	Atkinson	Atkinson	Atkinson
Bodle	Barnes	Corlett	Bodle	Bodle	Bodle	Hunt, C.	Hunt, C.	Hunt, C.	Hunt, C.

EXHIBIT B—*continued.*

COMPOSITION OF SHUNTING-GANGS, PALMERSTON NORTH, FROM 9TH MAY TO 4TH JULY, 1925.

Gang 1.

Carmichael Murphy Lepper	Carmichael Murphy Lepper	Leslie Carmichael Murphy	Leslie Carmichael Murphy	Leslie Carmichael Murphy	Leslie Carmichael Simpson	Leslie Carmichael Simpson	Leslie Carmichael Simpson	Leslie Carmichael Roberts

Gang 2.

Leslie Whitmill Shand	Pepperill Whitmill Shand	Pepperill Atkinson Shand	Pepperill Atkinson Shand	Pepperill Atkinson Shand	Pepperill Atkinson Shand	Pepperill Shand Atkinson	Pepperill Shand Atkinson	Pepperill Shand Atkinson

Gang 3.

Worthington Atkinson Hunt	Worthington Cunneen Atkinson	Worthington Cunneen Lepper	Worthington Cunneen Lepper	Worthington Cunneen Lees	Worthington Cunneen Lees	Worthington Cunneen Lepper	Pedersen Cunneen Lepper	Pedersen Cunneen Lepper

Gang 4.

Biggs Brown Bodle	Biggs Brown Bodle	Biggs Brown Bodle	Biggs Brown Bodle	Biggs Brown Bodle	Biggs Brown Bodle	Biggs Brown Bodle	Biggs Brown Bodle	Biggs Brown Bodle

Gang 5.

Gillespie Gordon Simpson	Gillespie Gordon Hunt	Gillespie Gordon Hunt	Gillespie Gordon Hunt	Gillespie Gordon Hunt	Gillespie Gordon Hunt	Gillespie Gordon Hunt	Gillespie Gordon Hunt	Gillespie Gordon Hunt

Main Line.

Tapp Cunneen	Pedersen Tapp	Tapp Shirley	Shirley Tapp	Shirley Tapp	Shirley Tapp	Shirley Tapp	Shirley Tapp	Shirley Tapp

Fourth Man.

Kelly	Kelly	Kelly	Kelly	Pedersen	Pedersen	Roberts	Roberts	O'Dea

By Authority: W. A. G. SKINNER, Government Printer, Wellington.—1926.



