

The past year has been a difficult one in dealing with coal-purchases, owing to the heavy decrease in traffic necessitating a reduction in our requirements. The Hikurangi Mine was flooded on the 29th July, 1930, and did not recommence operations again until January, 1931.

LANGER COMBUSTION APPLIANCE.

During the year tests were carried out with the Langer combustion appliance with a view to enabling a more extensive use to be made of run-of-the-mine New Zealand hard coals and of New Zealand soft coals more particularly—in the case of the soft coals—during the summer months, when such coals cannot be used on account of sparks. The tests which were carried out by the representative of the vendors of this appliance in association with the officers of the Departments of Railways and of Scientific and Industrial Research gave results which indicated that very substantial advantages could be obtained by the use of the appliance.

With a view to proceeding further with tests under ordinary running-conditions, it was decided to purchase twenty sets of this appliance. The sets have now come to hand, and ten sets have been fitted to locomotives in the North Island and ten sets are being fitted to locomotives in the South Island.

Tests of the appliance under general working-conditions are now in progress.

BRIDGE-STRENGTHENING.

During 1929 a comprehensive survey of the bridges throughout the Dominion was made, and a programme of bridge-strengthening and reconstruction work extending over five years was drawn up. The estimated cost of the five-year proposal for strengthening and reconstruction was £521,000, and satisfactory progress has been made with the work during the past year. The provision of new bridges at Ngaruawahia, Waikanae, Otaki, Oroua, and Whenuakura has been completed. A number of small bridges on the Thames and Rotorua Branches and the North Auckland line have been rebuilt, and on the North Island main line and branches a number of bridges have had a new superstructure of rolled-steel joists provided and in the case of others the floor-beams have been strengthened.

ELECTRIFICATION, WELLINGTON-PAEKAKARIKI.

In connection with the construction of the new line between Wellington and Tawa Flat the question of the tractive power to be utilized on this section called for consideration. The longer of the two tunnels by this route will be 2 miles 53 chains long, and the standard of transport service now demanded by the public renders it a practical impossibility to work such a length of tunnel by steam with any reasonable prospect of ensuring the public satisfaction. It is practically unavoidable, therefore, to adopt electric traction for this section of the line. In considering the length of line to be electrified the question of working the Pukerua grade came under review, and it was found that by the adoption of electric traction the economic disadvantage of this grade in the working of the traffic between Wellington and Palmerston North would be very substantially nullified, inasmuch as the electric locomotives would be able to take over the grade a load approximating that which our present standard steam locomotives can work between Paekakariki and Palmerston North. The Pukerua grade is the ruling grade in the Wellington-Palmerston North area, and for some years it has been realized that eventually something would require to be done in connection with the easing of this grade in order to enable this very busy section of the railway to be satisfactorily worked. The adoption of electrification will postpone the necessity of anything being done in this direction for an indefinite period. For these reasons it has been decided to carry the electrification from Wellington to Paekakariki. Another aspect of this question is that the electrification will reduce to a minimum the number of steam locomotives which will require to be stationed at the locomotive-depot at Wellington, and this will, of course, have a direct bearing on the conditions which will exist in the neighbourhood of that depot so far as the same are affected by the smoke that will arise therefrom.