5. Stations Include buildings, platforms, signals, urinals, turntables, cattle-pens, loading-banks, water-supply
6. Mile-posts and grade-boards.
7 Rolling-stock.
8. Stores Include material for bridges and permanent-way, as well as ordinary railway stores.

SUMMARY REPORT ON SOUTH ISLAND RAILWAYS.

SIR,— Public Works Department, Wellington, 7th June, 1895.

We have the honour to submit herewith our summary report on the condition of the South Island railways. We have, &c.,

WILLIAM H. HALES,
C. NAPIER BELL.

The Hon. the Minister for Public Works, Wellington.

THE South Island railways, on the whole, are in somewhat better condition than those in the North Island, especially as regards structures in timber this may be partly due to timber lasting better in a colder climate, but it also seems that repairs and renewals have been carried out more thoroughly in the South Island. Rails, sleepers, culverts, and bridges are the principal articles which require renewing, and the amount of repairs and renewals done on these in the South is immense, so much so that in places we remarked that little remained of the original work but the formation. Over a large part of the lines the bridges and culverts are nearly all either rebuilt or extensively repaired in ironbark timber, in concrete or masonry, and, in more recently constructed lines, iron girders are largely used in place of timber bridges. Some large bridges of native timber have been taken down and rebuilt in ironbark, others have been so much repaired in ironbark that little remains of original timber Many have new piers of ironbark piles, concrete, or masonry—especially the long bridges over the larger rivers have great numbers of new ironbark piles. Beams bearing heavy cross-strains, such as stringers, rail-beams, and floor-beams, are almost entirely renewed in ironbark, and very few open culverts have now the totara or matai beams with which they were originally built. A great number of the open culverts have been rebuilt with masonry or concrete walls, but there are still a great many with timber sills and back lining, and many of these are hastening to decay Efforts are being made to overtake this, and we saw many under repair in concrete or ironbark. Great numbers of timber box-culverts are still in the roads in very various states of preservation, some few being very bad a number have been replaced with large concrete pipes, and such renewals are going on now

There are still many bridges and culverts which now, or soon will, require more repairs, especially as in some lines that had been long under construction we noticed that the structures first built had become rotten, and had to be renewed before the lines were finished. This is a serious defect of Native timber, but when all renewals are completed in ironbark it is probable that bridges and culverts will give on further trouble for nearly half a century In addition to the repairs of decaying bridges, most of the embankments have been widened, and this is being done at the present time. In places, curves have been eased by diverting the line, and gradients cut down and made flatter Banks and abutments of bridges have been protected with heavy stone pitching, and a new tunnel built for security of the line at Purakanui Cliffs. Iron rails are replaced by steel, better fastenings put on the iron rails, and a large part of the older lines are now laid with 53lb. or 40lb. steel which originally were iron. Last year 1 mile 10 chains were relaid with 40lb. steel, 23½ miles with 53lb. steel, and a large quantity of new and better fastenings put on the iron rails.

At the rate renewals have been carried out in the past it would not be long before all the lines requiring it are renewed in more durable materials. One or two small lines, or parts of lines, are in a very inferior condition (see body of report) but the traffic is also inferior, so they will do for the present. The rails are a very mixed lot: thus, there are in the South Island 73 miles of 30lb. iron, 302 miles of 40lb. iron, 73½ miles of 52lb. iron, 14½ miles of 56lb. iron, 4 miles of 64lb. iron, 54 miles of 70lb. iron, 164½ miles of 40lb. steel, 6½ miles of 45lb. steel, 25 miles of 52lb. steel, and 488 miles of 53lb. steel. With very few exceptions the lines are kept in excellent running order—straight, well curved, and good level top. On some branch lines, and one or two parts of main line, fast running would not be advisable, chiefly on account of bad joints, and partly on account of poor condition of rails.

The lines are generally well ballasted with shingle, of which there is no scarcity in this Island. Sleepers are maintained in very fair condition, the main lines receiving most attention in the way of renewals. Renewals of sleepers are carried out with much uniformity year by year, the amount of decay being also very regular, renewals vary in different parts from 4 to about 7 per cent. yearly of the total number in the line, which is about 2,000 per mile. Of 114,000 sleepers renewed last year 6 per cent. were matai, 21 per cent. totara, 31 per cent. birch, 2 per cent. jarrah, 1 per cent. puriri, 21 per cent. kamai, 2 per cent. karri, 1 per cent. ironbark, 13 per cent. silver-pine, and 1½ per cent. yellow-pine. Jarrah, karri, and ironbark are used on bridges, native timber being considered by the Railways Department too brittle to be safe. Tunnels are all in very good condition. We made a careful inspection of the two longest, the Lyttelton and Deborah Bay tunnels a detailed account of their condition is given in report.

Fencing is of various kinds, and in different states of repair There are thorn hedges in various places, mostly poor and thin, and of little use, some gorse hedges, which are generally good, some wire fences, with iron standards, good against fire, but weak to resist cattle, but the larger part is post and wire, generally looking very old, but kept in working order by the defective posts being renewed with old sleepers. There are, however, lots of places where the posts are rotten and fallen over, burnt, or otherwise out of repair Many miles of line are unfenced, and many more enclosed by