

of an hydraulic ram, which is fed by a water-race, half a mile long, from Boundary Creek, has been installed.

Goods traffic has been carried on over the unopened line between Waihoaka and Te Tua since December, 1908.

SURVEYS OF NEW LINES OF RAILWAY, LAND-PLAN SURVEYS, ETC.

Kawakawa-Hokianga Railway.—A flying examination has been made of a route in a westerly direction from the ballast-pit at Scoria Flat, Kawakawa, to Kaikohe, and Hokianga Harbour, at Horeke, near Utikura; also of an alternative route to deep water in the Hokianga Harbour, *via* Taheke.

Trial and Location Surveys.—The trial survey has been carried from 100 m., near McCarroll's Gap, to 135 m. 28 ch., on the eastern route, where the junction with the western route occurs. The trial survey of the Bickerstaffe or western route has been completed, and this survey has been continued on to McCarroll's Gap, and thence to the westward of Tangahua Range, junctioning near 135 m. with the eastern route as above. A connection between the two routes has been surveyed at the Wairere Valley. All these are trial lines, the plans for which have been completed. The western route having been approved, the permanent survey thereof has been put in hand across the Bickerstaffe Estate from 86 m. 50 ch. onwards. Some detours of the route near Kaiwaka are still being tried, and as soon as the line here is decided upon the permanent survey will be joined up to that on Bickerstaffe. A trial junction line was run from Brynderwyn to Huirau, and another connecting-line sought for between 127 m. on the eastern route and 133 m. on the western route. From 135 m. 28 ch. onwards the trial survey has been carried up the Maungakawhia Valley towards Kaikohe as far as 142 m., and partly prospected for another four miles further north.

Waihi-Tauranga-Opotiki Trial Survey.—The country which this route would traverse has been explored, the line fixed, and the trial survey completed during the year from 16 miles from Waihi (2 miles north of Katikati) to 79 m. 42 ch., a little beyond Matata, a total length of 63 miles 42 chains. Plans have been completed for the first 22 miles. Preparation of further plans as far as 54 m. 36 ch. are nearing completion. Owing to departmental retrenchment further field-work on this survey has been suspended.

Kaimai Saddle.—A reconnaissance survey has been made over the Kaimai saddle for the East Coast-Waikato Railway. Examination of the country has demonstrated that the saddle is unsuitable as a route, being 1,423 ft. high, with an abrupt and unworkable descent on the Waikato side. The country along the route is also much broken by ravines and deep gullies, and gives steep grades on the Tauranga side.

Paeroa-Pokeno Permanent Survey.—This survey was completed during the year, having been run from 19 m. 55 ch. on the Waitakararu Valley down the Maramarua and Maungatawhiri Valleys to Pokeno. The total length of the line from Paeroa to Pokeno is 40 miles 13 chains. Plans of this survey have been completed, and the necessary action is being taken for reservation of 5 chains width along the route on Crown lands.

Gisborne-Rotorua.—The line is now permanently pegged up to 34 m., 7 miles having been completed and plans made during the year. The permanent location of a further section of the line is now in hand.

Stratford-Ongarue.—The location-survey-work has been completed up to 33 m. 10 ch., and the plans finished. Further survey-work will be put in hand as soon as an officer is available.

Puketutu-Mangaroa.—A trial survey was made from towards the north end of the previous line to carry the line more to the west and join the Trunk line to the north of Ongarue either at Puketutu or Te Kumi, the object being to serve the country in the Mokau and Upper Awakino Valleys, the route being that originally explored in 1884.

Mount Egmont Branch.—A party has been engaged prospecting for rock on the site of the proposed quarry at Waingongoro Spur, which has been surveyed, and all results of the prospecting operations recorded. An estimate of the probable quantity of rock available has also been prepared. The result showed a not-altogether-satisfactory quarry. A survey of a proposed alternative incline to the Manganui Quarry site, higher up the mountain on the Surrey Road track, was therefore put in hand. This has not yet been completed.

Midland (Nelson End).—A survey of a short deviation of this line, three-quarters of a mile in length, in order to avoid two crossings of the Tadmor River near 52 m., has been completed.

Plans of the finished line between Tadmor and Kiwi are still incomplete, as some further survey-work must be done.

Westport-Inangahua Railway.—During the year a party has been examining and locating this line from Te Kuha Station, 6 m., on to 10 m. It is most difficult country, and has taken some time to do.

Reefton-Inangahua Railway.—Some small deviations have been surveyed between Cronadun and Inangahua Landing, which have enabled the line to be constructed more satisfactorily.

Blenheim-Waipara (South End).—Trial surveys have been run as far as Tugmutton Flat, across the Conway, and the line has been permanently located to 57 m. (from Waipara—that is, just beyond the Gelt saddle between the Leader and Conway Rivers. From Tugmutton Flat a reconnaissance survey has been made to Green Burn, from which point a trial line was run as far as Hapuka River, a little north of Kaikoura. An examination was also made of the Whale's Back route from Culverden to Kaikoura.

Lawrence-Roxburgh.—It was considered probable that an improvement in the location of the line beyond the Big Hill tunnel could be effected by placing it on the opposite side of the valley from that originally surveyed. A trial line was therefore run from the mouth of the tunnel to a possible ballast-pit site just beyond Beaumont Stream—a distance of 6 miles 45 chains. This