

With reference to the cross-girders, instead of 3·2, as given in the report, the section is 3·8, and the strain due to the dead-weight about 10 cwt. against $2\frac{1}{2}$ tons. With a weight of $2\frac{1}{2}$ tons on a wheel the rolling load would give a strain of $16\frac{1}{2}$ tons, or a total for each girder of 17 tons, which is less than 5 tons on the square inch of metal.

In sinking the cylinders of the Rangitata Bridge a bed of boulders about 10 feet thick was met with four feet below the water-level. They ranged from 1 to 8 cubic feet; one taken from the twelfth pier measured 3 feet 6 inches long by 2 feet broad and 16 inches thick.

I have, &c.,

W. N. BLAIR,

Engineer, Rangitata Bridge.

The Chairman of the Timaru and Gladstone
Board of Works.

EXTRACT from REPORT by E. P. BLYTH, Inspecting Engineer, concerning Material for Rangitata Bridge manufactured in England, as to tests applied to Girders.

Two of the girders were tested as follows:—They were placed with bearings and distance apart, as they will be in the structure, and tied together by the bracings. Weight of girders, 11 tons; weight placed on centre bay, 30 tons, equal to 60 tons distributed on a clear span of 63 feet.

The deflection with the load averaged $\frac{1}{16}$ of an inch; the permanent set $\frac{1}{32}$. This was however really the bringing of the girders to their bearing, and not, properly speaking, permanent set. The load was left on for about forty hours.

Other two girders were taken, with a distributed load of 60 tons, and gave a total deflection of $\frac{5}{8}$ ". I considered these tests so satisfactory that I did not think it necessary to test others, as all the parts of the girders were made from templates, so that they would exactly correspond, and those tested were rivetted up completely (instead of being merely bolted), and the rivets afterwards cut out. This, of course, could not have been done to all the girders without great expense and loss of time, so I arranged to have a perfect test of four girders, instead of an imperfect test of each.
