

ozs., or 30.83 lbs. per cubic foot, showing a loss of weight between Vancouver and the laboratory at the rate of .1192-lbs. per cubic foot per day, and a loss of weight while in the laboratory at the rate of .0149 lbs. per cubic foot per day.

The time occupied by the test was $18\frac{1}{2}$ mins.

OLD DOUGLAS FIR.

Beams XXII-XXV were sent to the Laboratory by Mr P. A. Peterson, Chief Engineer of the Canadian Pacific Railway.

These beams were four old stringers taken from trestles numbered 428, 35, 316 and 789.

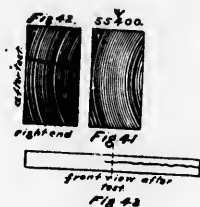
Trestle 428 is about half way between Cisco Cantilever Bridge and Lytton. It was erected in the early summer of 1884, and the timbers had consequently been in position for nine years. It is in a dry country, with very little rainfall, and subject to a hot sun in summer. The stringer from this structure was cut out of a log probably grown on a flat about three miles west of Hope, where most of the trees were wind-shaken.

Trestle No. 35 is about one mile west of Port Moody, and was built in the early spring of 1887, so that the stringer was in position for a period of $6\frac{1}{2}$ years in a place subject to the heaviest rainfall in the province. The stringer was cut from a log most probably grown at Point Grey, about eight miles from Vancouver.

Trestle No. 316 is two miles east of Spuzzum. The stringer from this trestle was cut from a log grown on a bench near Spuzzum about 500 feet above the sea level. It was prepared and framed in 1881, and erected in 1882, so that it was eleven years in position in a district with a climate similar to that of Nova Scotia. As the railway here runs north and south, the sun had not the same effect upon the stringers as on other parts of the line.

Trestle No. 789 is on Kauloops Lake, six miles east of Savona, and was erected in the spring of 1885, so that the timbers had been in service for a period of eight years. The neighbourhood is dry, but the trestle, being situated under a high bluff, is protected from the afternoon sun. The stringer from this structure was cut out of a log probably grown about three miles west of Hope, at the same place as the timbers used in structure No. 428.

Beam XXII from Trestle 428, was tested Nov. 25th, 1893, with the annular rings as in Fig. 41.



There were two vertical 1-in. bolt holes in the timber,—one near the centre and one at the end. There were also several season cracks in the timber, one being somewhat large.

The load upon the beam, was gradually increased until it amounted to 55,400 lbs., when the beam failed by a longitudinal shear, as in Figs. 42, 43.

The distance between the portions of the beam above and below the plane of shear at the end was $\frac{3}{8}$ ths of an inch.

The tensile skin stress corresponding to the breaking load is 7086 lbs. per square inch.

The total compression of the timber at the centre was .63-in., so that taking the effective depth at 15.0575-ins., the maximum skin compressive stress is 7264 lbs. per square inch, the corresponding tensile skin stress being 7898 lbs. per square inch.