X. The timber was of a quality corresponding to first quality in the market, and the grain for the most part was parallel with the axis. It contained a few season cracks. On the tension face of the beam the fibres receded from back to front in a distance of 3½ ft., commencing about five feet one end. The beam contained the heart of the tree, the annular rings being as in the Figure.

Under a load of 35,800 lbs. the beam failed by the tearing apart of the fibres on the tension face.

The maximum skin stress corresponding to this load is 5498 lbs. per square inch.

The co-efficient of elasticity, as determined by an increase in the deflection of .545-ins. between the loads of 2500 and 15,500 lbs., is 1,770,563 lbs.

Table D shows the several readings.

The weight of the beam was 595 lbs. 2 ozs., or 37.76 lbs. per cubic foot on October 3rd, and 583 lbs., or 36.99 lbs. per cubic foot on Nov. 14th, showing a loss of weight in the laboratory at the rate of .0183 lbs. per cubic foot per day.

Table D shows the several readings.

The time occupied by the test was 29 minutes.

Beam XII was tested Nov. 18th, 1893, with the annular rings as in Fig. 17. This beam was cut from a log 28 ins. in diameter, grown probably about 30 feet above the sea-level at Port Grey, about eight miles from Vancouver. The tree was felled in August, 1892; it remained in salt water nine months, being alternately wet and dry according to the tide; it was then towed to the mill and cut up.

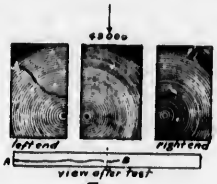

Fig. 17.

The grain was straight and parallel to the axis, and the timber was of good quality corresponding to first quality in the market. It shewed several knots of medium size and a few season cracks. The beam contained the heart of the tree, the annular rings being as in Fig.

Under a load of 49,000 lbs. the beam failed by shearing longitudinally along the season crack AB.

Under this load the maximum skin stress is 7,645 lbs. per sq. in.

The co-efficient of elasticity as determined by an increment in the deflections of .545 ins. between the loads 2,500-lbs. and 15,000 lbs. is 1,678,300 lbs.

Table D shews the several readings.

The time occupied by the test was 37 minutes.

The weight of the beam was 572 lbs., or 35.65 lbs. per cubic foot on Oct. 3rd, and 558 lbs. 4 ozs., or 34.79 lbs. per cubic foot on Nov. 17th showing a loss of weight in the laboratory at the rate of .0191 lbs. per cubic foot per day.

Beam XIII. The history of this beam is the same as that of Beam IX. The beam was tested on Nov. 17th, 1893. The heart of the tree was in one of the faces, the annular rings being as in Fig. 18.

The timber was in good condition and of a quality corresponding to first quality in the market; there were small season cracks along the back of the beam, in the neighbourhood of the neutral plane, and there were also small season cracks along the whole of the front about 3-ins. above the face in compression.

Under a load of 29,300 lbs. this beam failed by the crippling of the fibres on the compression face, commencing at a small knot at the back, Fig. 19.