The maximum skin stress due to this load is 8382 lbs. per square inch.

The co-efficient of elasticity, as determined by an increase in the deflection of .32-in. between loads of 1000 lbs. to 5500 lbs., is 1,559,950 lbs.

Table B shows the several readings.

The weight of this beam on May 11th was 44 lbs., or 36.76 lbs. per cubic foot, and its weight on May 22nd was 42 lbs. 14 ozs., or 35.74 lbs. per cubic foot, showing a loss of weight in the laboratory at the rate of .0927-lb. per cubic foot per day.

Beams IX to XVI were sent to the laboratory by Mr. P. A. Peterson, chief engineer of the Canadian Pacific Railway.

Beam IX was grown on the mainland half way between Vancouver and New Westminster, in a flat country not much above the sea level. It was cut from a log 26 ins. in diameter and 34 feet in length, which was felled about the month of May, 1892. The log was floated to the mill at Vancouver, and lay in fresh water for ten months.

The timber corresponded to first quality in the market, its grain being straight and running parallel to the axis. It contained a season crack on the widest face, about 11 feet long, 3½ ins. below the edge, and about 1½ in. deep. The beam was tested Nov. 13th, 1893, with the annular rings as in Fig. 13, the heart of the tree being in one of the vertical faces. Under a load of 51,600 lbs. this beam failed at the support by the tearing apart at the centre of the fibres on the tension face.

The maximum skin stress corresponding to this load is 7974 lbs. per square inch.

The co-efficient of elasticity, as determined by an increment in the deflection of .77-in. between the loads of 1000-lbs. and 20,000-lbs., is 1,767,990 lbs.

Table C shows the several readings.

The weight of the beam was 603 lbs., or 36.49 lbs. per cubic foot on Oct 3rd, 590 lbs. 13 ozs., or 35.76 lbs. per cubic foot on Nov. 10th, and 590 lbs. on Nov. 13th, showing a loss of weight while in the laboratory at the rate of .0195-lb. per cubic foot per day.

Beam X. This beam was tested Nov. 14th, 1893, with the annular rings as in Fig. 14. It was cut from a log 32 ins. in diameter grown on the mainland 120 miles north and west of Vancouver, on a hill side about 100 feet above the sea-level. The log was felled in the winter of 1892–93, and was then towed to the mill, and remained in salt water six months.

The grain in this beam ran crosswise, and it failed by a cross fracture along the plane AB, Fig. 15.

The fracture occurred under a load of 18,000 lbs., corresponding to a maximum skin stress of 4027 lbs. per square inch. The co-efficient of elasticity, as determined by an increase in the end deflections of .84-in. between the loads 1000-lbs. and 15,000 lbs., is 1,637,806 lbs.

Table C shows the several readings.

The weight of the beam was 407 lbs. 2 ozs., or 38.94 lbs. per cubic foot on Oct. 3rd, 406 lbs. 8 ozs., or 37.80 lbs. per cubic foot on Nov. 10th, and 404 lbs. 13 ozs., or 37.79 lbs. per cubic foot on Nov. 13th, showing a loss of weight in the laboratory at the rate of .03-lbs. per cubic foot per day.

Beam XI. This beam was tested November 7th, 1893, with the annular rings as in Fig. 16. Its history is the same as that of Beam

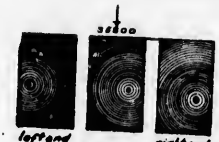

Fig. 16.