was 3-10ths of an inch. Figs. 23 and 24 are sections at the end and at the centre showing the nature of the fractures.

The total compression of the material was 1.83 ins., and the maximum skin compressive stress, taking 13.295 ins. as the effective depth, is 5193 lbs. per square inch, the corresponding stress in the tension skin being 6851 lbs. per square inch.

Assuming the ordinary law to hold good for the whole of this effective depth, the maximum skin stress would be 6350 lbs. per square inch.

The co-efficient of elasticity as determined by an increment in the deflection of .335-ins. between the loads 10,000-lbs. and 30,000 lbs., is 1,259,600 lbs.

Table F gives the several readings.

The weight of the beam, when shipped from Vancouver about April 21st, was 428 lbs., or 37.21 lbs. per cubic foot; on reaching the Laboratory on June 9th, the weight was found to be 411 lbs. 10 ozs., or 35.78 lbs. per cubic foot, and on the day of the test, namely, June 24th, the weight was 404 lbs. 8 ozs., or 35 17 lbs per cubic foot, showing a loss at the rate of .02918-lb. per cubic foot per day between Vancouver and the laboratory, and a loss at the rate of .04067-lb. per cubic foot per day while in the laboratory.

Beam XVIII. This beam was coarse grained, and contained several large and small knots; it was cut from the heart of the tree. It was tested Sept. 28th, 1894, with the annular rings as in Fig 26.

The load on the beam was gradually increased to 12,000 lbs. The beam was now gradually relieved from strain until the load had been reduced to 1000-lbs. without showing any set. The load was again gradually increased from 1000 lbs. up to 19,000 lbs., when the beam was again relieved from load and the readings were taken for each difference of 1,000 lbs.

When the load had been reduced to 1000 lbs, the deflection at the centre was observed to be .015-in as compared with .005-in. in the forward movement, and as soon as the beam was relieved of this 1000 lbs., it returned to its initial condition without showing any set whatever.

The time occupied by the first loading was 10 minutes, by the second loading 12 minutes, and by the relieving from load 8 minutes.

In the final test the load was gradually increased from nil until it amounted to 69,400 lbs., when the beam failed by shearing longitudinally, the shear being immediately followed by the tearing apart of the fibres on the tension face, Figs 27 28, 29.

Fig 27. 69400. Fig 28
Fig 26.
left end   right end
front view after test
Fig. 29.
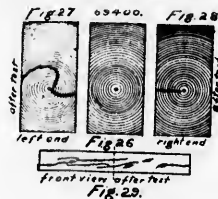
The maximum skin stress corresponding to the breaking load was 5196 lbs. per square inch.

The co-efficient of elasticity, as deduced from an increment in the deflection of 1-10th of an inch between the loads of 2000 lbs. and 12,000 lbs., being 1,329,900 lbs.

Table F gives the several readings.

The weight of the beam at the date of shipment from Vancouver, April 21st, was 512 lbs., or 39 68 lbs. per cubic foot. On reaching the laboratory, on June 9th, this weight was 492 lbs. 10 ozs., or 37.60 lbs. per cubic foot, and the weight on Sept. 25th was 466 lbs. 6 ozs., or 35.59 lbs. per cubic foot, showing a loss in weight between Vancouver and the laboratory at the rate of .0302-lb. per cubic foot per day, and a loss of weight in the laboratory at the rate of .0181-lb. per cubic foot per day.   12