along the annular rings for a distance of 24 ins. on each side of the centre as in the figure.

The maximum skin stress corresponding to the breaking load of 6500 lbs. is 5442 lbs. per square inch.

The co-efficient of elasticity, as deduced from an increment in the deflection of 1.085 ins. between the loads of 2000 lbs. and 5000 lbs., was 1,618,900 lbs.

Table L shews the several readings.

This beam when first placed in position, also had a camber of .35 ins. in a central length of 14 ft. 6 ins.

The weight of the beam on May 4th, the date of test, was 165 lbs. 6 ozs., or 34.97 lbs. per cubic foot.

Beams XXXII to XXXV might perhaps more properly be designated 3 ins. planks.

Beam (Plank) XXXII was tested May 7th, 1894. The heart was in one of the faces, and the annular rings were situated as in Fig. 72.

The load upon the beam gradually increased until it amounted to 5200 lbs., when it failed by a crippling of the fibres on the compression side. The crippling occurred about 1½ ins. away from the centre of the beam and extended upwards about 1.5 ins. The load was still increased, and when it amounted to 5850 lbs. the beam again failed by the tearing apart of the fibres on the tension side. A line of crippling also extended upwards a further distance of about 2 ins., or about 3½ ins. from the skin.

The maximum skin stress corresponding to the breaking load of 5200 lbs. is 6928 lbs. per square inch.

The co-efficient of elasticity, as deduced from an increment in the deflection of 1.67 ins. between the loads 1000 lbs. and 4000 lbs., is 1,575,200 lbs. per square inch.

Table L shews the several readings.

The weight of this beam on May 7th, the date of test, was 102 lbs., or 31.56 lbs. per cubic foot.

Beam (Plank) XXXIII was tested May 7th, 1894, with the annular rings as shewn in Fig. 73.

The load upon the beam was gradually increased to 9250 lbs., when failure took place by the crippling of the fibres on the compression side, Figs. 74, 75. There were two lines of crippling on the front and one at the middle of the beam at the back. The crippling at the back probably occurred first, as the folding of the timber extends across the section of the beam along the central line at the lower edge, but not up to the point where the failure due to compression was apparently the greatest. In the neighbourhood of the crippling in front, the timber was clear, and the grain ran straight and parallel with the axis; at the back there were three knots, which were primarily the cause of the crippling.

When the load on the beam had been increased to 9900 lbs., fracture occurred on the tension side.

The maximum skin stress corresponding to the breaking load of 9250 lbs. is 6551 lbs. per sq. in.

The co-efficient of elasticity, as determined by an increment in the deflection of .76 in. between the loads 2600 and 6200 lbs., is 1,618,000 lbs.

Table M shews the several readings.