

Ship "Northfleet" $\frac{895}{951}$ Tons.

It is respectfully submitted that the estimate of the total weight of this Vessel with Cargo, given in the appended documents, viz. 1750 tons may be considered as a very fair approximation.

The sides of the Vessel in the neighbourhood of where she could receive a blow ^{amidships} from an approaching vessel with an upright stem are composed as follows:—

outside planking of Teak 6 ins thick, frames of English Oak $10\frac{1}{2}'' \times 10''$ with openings between them 5 inches wide, the inside lining being Teak $3\frac{1}{2}$ ins thick, with large Shelf Waterway, Clamps and a complete Deck.

For the "Northfleet" to withstand the blow of an Iron Steamer striking fair between two of her timbers near the waterline, with an iron stem, say of from 2 to 3 inches thickness rounded off, the strength of the outer planking to resist being cut into would alone be available, since, if the outside planking were perforated, water could pour down between the timbers into the Hold and fill the ship, although the bow of the Steamer may not have driven in any large area of side, or pierced the inside lining. The presence of a complete deck at the level of the part struck would tend to make the damage of the character above indicated; and while the timbers and inside planking immediately adjacent would probably be disturbed so as to admit water as high

high up as the leak, the bulk might flow down between the timbers.

To obtain with exactitude the resistance of 6 ins Teak plank to being cut through in the way indicated would be impossible, as we believe no data exist for computing the resistance of Timber to being cut across the grain with a blunt instrument at moderate speeds. On the one hand we have gunnery experiments showing the resistance to being pierced by large shot at high velocities, and on the other there are experiments on the resistance of Timber to being pierced by large round headed iron spindles being forced steadily through it.

After consulting these, it is concluded that a fair approximation to the Resistance which the Wales of the "Northfleet" could offer to being perforated for a length up and down of 3 feet, would be from 600 to 700 ft. tons. This would be about equal to the blow that could be struck by a Vessel of 1700 tons weight moving at the rate of 3 knots an hour.

J Beap Maill

St. Morish.

Wm. John

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