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On the great Strength given to Ships of War by the application of Diagonal Braces. By Robert Seppings, Esq. F.R.S. Read November 27, 1817. [*Phil. Trans.* 1818, p. 1.]

The principle of applying diagonal frame-work to ships of war was first partially and successfully adopted in the Kent, of 74 guns, in the year 1805, and since that period has been successfully employed in the construction of thirty-eight sail of the line and thirty frigates. These circumstances might be deemed conclusive as to the advantages of the new system; but as the Royal Society have already published this author's account of it at a very early period of its adoption, he is induced to offer the result of a new experiment in proof of the correctness of the principles before laid down, which, as far as his knowledge extends, has never been previously applied, nor ever suggested by any continental writer, though, says the author, it has been pretty broadly insinuated that the hint was borrowed from the French.

In the early part of the present year, the *Justitia*, an old 74, was ordered to be broken up; when Mr. Seppings, notwithstanding her shattered condition, determined to apply the trussing principle. Prior to her being taken into dock, sights were placed in the lower and upper gun-deck, to ascertain, when she had grounded on the blocks, how much she deviated from her state afloat. She was then partially trussed, as described by reference to an annexed drawing, and floated out into the basin. After lying one hour, it was found, by the sights placed on the gun-deck, that she had come down in the mid-ship 1 foot; and by those on the upper-deck, 1 foot 2½ inches. In twenty-four hours she further hogged 2¾ inches, and then appeared stationary. The trusses in the hold were then removed, and she further hogged 6 inches, and 3½ inches in removing those in the ports.

In further illustration of the efficiency of the principle, Mr. Seppings adduces the *Nelson*, *St. Vincent*, and *Howe*, three 120-gun ships of the same dimensions; the two former built upon the old plan, the latter upon the diagonal system. The *Nelson*, after she was launched, altered 9½ inches from the original sheer, the *St. Vincent* 9¼, and the *Howe* only 3¾ inches.

The paper concludes with a very favourable report from Captain Coode, of the state of His Majesty's ship the *Albion*, after the memorable battle of Algiers, which, in his opinion, stood the concussion from the firing better than would have been the case had she not been constructed on the diagonal plan; and with an account of the deck of the *Northumberland*, which was laid on one side fore and aft as usual, and on the other side diagonally, the materials on each side being similar. After her return from *St. Helena*, the officers of the Sheerness yard, who were directed to examine her, reported, that having examined the state of the decks and waterways, they found the comparison so much in favour of the larboard side, as to determine in favour of the diagonal system.