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HER MAJESTY'S SHIP "CAPTAIN."

PROCEEDINGS OF THE COURT MARTIAL ON THE
CAUSE OF HER LOSS.

(From the Broad Arrow.)

[CONTINUED.]

On Monday, the 3rd of October, the Court resumed:

Mr. HENRY LAIRD, of the firm of Messrs. Laird, Birkenhead, examined by the President: It has been stated in evidence that no moment of sail, but merely the sail area, was calculated for the ship, and that the ship's stability was not calculated by Attwood's formula, which alone would have given the true stability, and hence the effect of the sail power you gave the ship could not have been estimated on any accurate power. Is that so?—The height of the centre of the effort of the sails, as shown on the original design submitted in July, 1866, was calculated, and the ratio of stability of the ship with that area, and the moment given by the height of the centre of effort, as calculated, was estimated, and is shown on a paper which will be handed in, as one of the papers respecting the estimate made in 1866 as to the probable height of the centre of gravity of the weight of the ship. The stability of righting force of the ship at the angles of seven and ten degrees was estimated by the meta-centre, which is the means we usually employ to obtain this result, considering it to be practically correct. I made the voyage from Liverpool to Portsmouth in the *Captain*, and was present at two of the steam trials, and when the ship proceeded to sea on her first cruise, on the 10th May, 1870, I went in her on Captain Burgoyne's invitation, and having, through the kindness of Admiral Robinson, been promised a passage home with him in the *Helicon*, as, owing to my business arrangements, I could not remain with the ship for the whole of the cruise. On the voyage round from Liverpool, when in a beam sea, resulting from a strong south-west gale, which had detained us for three or more days at Holyhead, I noticed that the ship rolled seven or eight degrees each way; that she rolled easily, and, I believe, about eight rolls in the minutes. When on the cruise after the 10th of May I watched the movements of the ship attentively, and made notes occasionally of the amount of heel under different sail, and in different states of the wind. I had good opportunities for doing this, because the weather, whilst I was on board, varied from a strong breeze, as I believe, recorded for six to seven with

a heavy sea, to light airs and calm, but with on some days, considerable swell. The ship was under sail and steam, and under sail alone on several days. The first day after leaving we had only fore and aft sails set. I believe that the heel of the *Captain* was 4 degrees, and that the heel of the *Monarch* at the same time was, if anything, rather more. I believe it was signalled to us at 5 degrees. On the following day, the 12th of May, we were ordered to put the ship under sail, there being a strong breeze, and what, from my experience, I should call a confused sea. The *Monarch*, I believe, set double-reefed topsails; the *Captain* set treble-reefed fore and main topsails, and, I believe, close-reefed mizen topsails and foretopmast staysail. She remained under this sail for some two or three hours, and then, although I do not think the breeze was less, a reef was taken out of each topsail and the jib set, and I think, the spanker, and we continued under this sail till the evening. The heel of the ship during the day, and more particularly the latter part of the day, I watched carefully, and it was about 8 degrees. The extreme heel that I noticed was when wearing the ship lurched to between 13 and 14 degrees. On the following day, the 13th, we were still under canvas, wind recorded at force of 5. In giving the strength of the wind I gave it as I noted it down from inquiries at the time; it will of course be accurately recorded in the log. On this day the *Captain* had fore and main topsails, single-reefed, with topgallant sails set; the mizen topsail double-reefed; jib and foretopmast staysail and forecourse. The heel of the ship, as I have noted, was about 7 degrees. On subsequent days we had all plain sail set with light breeze. I do not appear to have a note of the actual heel; I believe it was about 4 degrees. Generally from my observation, I consider that the amount of heel was very nearly the same as the *Monarch's* under similar sail. As far as my judgment went I considered that the heel of the ship was what we had expected, from calculations we had made as to her sail-carrying power. I would say that the calculations which I refer to are those which we had made when the final estimate of the centre of gravity was made when the ship was completed. If the Court would allow me I would add that I obtained further information on the performance of the ship during the latter part of the cruise that I commenced in her, with a view to seeing how far my observations was borne out after I was obliged to leave her. This information I obtained on board the ship after her arrival at Plymouth. The most important was that with reference to the gale of wind which the

Captain, in company with the fleet, encountered, and I found the force of wind was recorded nine to ten; the sail the ship was under was close-reefed maintopsail and reefed foresail. Her heel was recorded at nine degrees mean; maximum heel thirteen degrees. I believe that all the papers containing calculations on this subject were handed in by Mr. William Laird on Saturday, and we are to furnish copies to the Court.

By the President: Had the ship had two feet more freeboard, the angles of maximum and vanishing stability would have been greater; but if the question refers to the *Captain* having floated two feet lighter and thereby having two feet more freeboard, the centre of gravity remaining in the same position, I am not sure whether the actual righting force at any given angle would have been much, if any greater, because the meta-centre would have been slightly approached to the centre of gravity, and the displacement of the ship would have been some eight hundred tons less.

The President: And, therefore, the diminution of weight and meta-centric distance would have counterbalanced, roughly speaking, the advantage of the two feet of additional side—is that so?—I think so, I am unable to say exactly to what extent.

Do you consider that the fact of the *Captain* having been two feet deeper in the water than you intended made her less able to carry the sail power she possessed?—To the extent indicated by my last answer.

By Captain Harcock: There was submitted with the original design in 1866, a sail drawing such as is supplied by us in every case of submitting a design in which the sail power is included, and similar to the sail plan usually provided, so far as our experience goes, by the Admiralty, in the case where the spars of a ship are to be provided by a contractor, subject to the more detailed plans of the actual construction of the masts and spars, which are subsequently prepared, and which, in this case, we prepared and submitted to the Admiralty after consultation with Captain Coles. On the original plan submitted to the Admiralty the area of the sail, as estimated, was marked. This arrangement of sail was not the one actually carried out in the ship, because this particular part of the ship was the subject of a great deal of subsequent correspondence. In the area originally shown it was, so far as we could arrange it, substantially altered in the plan actually carried out. I would explain that the original plan provided for the lower masts and top-masts being made in one piece, as all previous tripod masts had been made. In 1868, when it came to a question of making these masts and arrang-