

ing for steeping them, we thought it desirable to adopt a plan of fitting the top-masts and, after a great deal of consideration given to the subject by Captain Coles and ourselves, we decided to submit to the Admiralty a modified arrangement of spars and sails. As in the case of the *Captain* the power submitted was only 22 feet to area of midship section, as compared to 35 or 36 feet in high freeboard ships. Am I to infer that, in your opinion, low freeboard ships are not able to carry so large an area of canvas as ordinary ships?—The area of sail proposed for the *Captain* was based on a consideration of the areas of sail usually adopted in full rigged armor-plated ships. I think the area named for the *Immortalité* is very much greater than has ever been applied to an armor-plated ship.

By Captain Rice: We did not consider it necessary to reduce the scale in consequence of the low freeboard of the ship. The area of the sail I have spoken of does not include the very large gaff sails the ship had, as well as the usual square sails, jib and spanker. Our firm built the *Agincourt* and the *Vanguard* by contracts. I am not aware whether the word "responsibility" is mentioned in those contracts. If it is, it would not be in the same sense or to the same extent as that for the *Captain*. The responsibility which I consider we had for the *Captain* was of two kinds, one relating to the proper construction of the ship, and of the materials and workmanship, which we undertook to provide, in accordance with the plans and specifications agreed upon, and I consider that this responsibility ended so soon as the ship was satisfactorily surveyed. The second kind of responsibility, viz., that of the ship's performance, carrying out what was proposed by the design which we undertook the responsibility of recommending their Lordships to adopt, would extend until the trial of the ship. I do not mean to limit the word "trial" to the mere steaming trial trip. The responsibility of the design, so far as we accepted it, we still acknowledge.

By Captain Boys: I have no information to guide me in forming an opinion as to her precise draught of water when she was lost. When I was on board, during her cruise, the space under her double bottom was not filled with water. I do not consider that tripod masts tend more to the upsetting of the ship than the usual masts, with the same sail area, would have done.

By Captain May: In our original design we did not calculate the point of vanishing stability. The heels I gave, as having myself noted them, were invariably by marked batten on the bridge. I think our firm has constructed seven iron clad vessels for foreign governments. In some of these cases a special clause was introduced on the point of stability, and we were responsible so far as the clauses in the contract arranged. The contracts adopted by the Admiralty are fuller and more complete than is generally considered necessary. Would you expect a foreign government to receive a vessel one foot ten inches more draught than her original design was?—It would depend to a very great extent upon the completeness of the information and the plans agreed upon at the time the contract was undertaken. As a fact, we have never had a case of a vessel being rejected for any such cause, out of a very large number built.

By Captain Commerell. Was it in consequence of any doubt as to the accuracy of your calculations that you requested the Admiralty to heel the ship in February, 1870?—The letter which has been handed into

the Court I think fully explains the reasons that induced us to make this application. It has been stated to the Court that you did not furnish the Admiralty with sufficient data to enable them to compute for themselves the centre of gravity and the angle stability?—We furnished the designs in 1866, also those data which we understood to be required for the thorough investigation of the design, which was to be approved or not by their Lordships. These data contained all the information which we have had for making any calculations for the ship that were considered necessary. Can you form any opinion why the *Captain* heeled so much more than the *Monarch* on the last cruise, while she unquestionably heeled rather less than the *Monarch* on her first cruise?—I have not heard anything as to the comparative amount of heel on the last cruise, excepting from the report of Admiral Milne, on the day previous to her loss, and I know nothing that should have caused such an increase in the *Captain's* heel as Captain Commerell estimates. The only way in which, now hearing this, I can form an opinion, is, either an alteration in the positions of some of the weights, or water being in the ship unknown, and therefore not so regulated as to prevent its injurious action on her stability.

By Captain Goodenough: A witness has stated to the Court that in his opinion the foundering of the *Captain* was assisted by the inundation on the under surface of the hurricane deck. Do you believe this to be true as a mechanical position?—The action of the wind on the underside of the hurricane deck would certainly have a certain but, in my opinion, a very limited effect; and I am borne out in my opinion by a calculation we made to ascertain this. I will hand in that calculation, accompanied by a corresponding one, showing the effect if the side had been carried as far as the hurricane deck.

By the President: As you had constructed about nine turret ships of different dimensions before building the *Captain*, how do you account for the error in her flotation, such as has never been equalled before?—The turret ships constructed before building the *Captain* were of a very different size and arrangement. Only five had been commenced before the *Captain*. The portions in which weight had been exceeded are indicated in the papers handed in, and arise from weights introduced that were not originally provided for, and also in an excess of weights forming part of the construction, as originally intended, but which exceeded what was allowed for. I would wish to add that there was great difficulty in estimating the weights of some portions of so novel a design, and, in fact, several had to be increased beyond that allowed for, in consequence of experiments made and information obtained after the design was decided upon. I believe there are many instances of vessels, and especially those of novel and peculiar construction, exceeding their draughts, and some among the ships built for Her Majesty's Navy—I would mention the *Warrior*, the *Agincourt*, and also the *Bellerophon*. I would also state that whilst I believe the Admiralty have in some late cases, exercised a very wise discretion in reducing the scantling of vessels in construction where it appeared desirable from the weights going in that they should do so, we were not encouraged in some early efforts that we made to do this in the *Captain*. I think I may explain the relative position of Captain Coles and our firm as that of Controller and Chief Constructor. Captain Coles possessed, I should say, a very good

general knowledge of all the essentials required in the design of a ship, but I do not think that he had any very great theoretical knowledge as to ascertaining by actual calculations the results that he knew he wished for.

Do you think he was impressed with the very great importance of having all these calculations properly made, to ensure the ship being seaworthy?—I think he was.

This closed Mr. Laird's evidence.

(To be continued.)

LIEUT.-COLONEL S. B. JARVIS, commanding the 1st Battalion, Ontario Rifles, and commandant of the whole Canadian force now in garrison in the Province of Manitoba, is an officer of considerable service in the regular army, in which he holds the rank of Lieut.-Colonel. Active, intelligent, and a thorough soldier, he is and always has been a great favorite with the men under his command, and was selected for the present position he fills because of his thorough knowledge and fitness for a delicate and onerous command. The third class, or *companionship* of the order of Sts. Michael and George recently conferred on Lieut.-Colonel Jarvis has been well and hardly earned, and was justly his due. His services are as follows:—Major Jarvis served with the 82nd Regiment throughout the Indian campaigns of 1857–59; was in temporary command of three companies, during the relief of Lucknow by Lord Clyde; present at the defeat of the Gwalior Contingent at Cawnpore on the 6th December, action of Kodagunge and occupation of Fatchghur, capture of Bareilly, relief of Shahjehaipoor Jail, and action of Khaukur. (Brevet of Major, Medal and Clasp). Gazetted Lieut.-Colonel, June 4th, 1870.—From *Hart's Annual Army List* of 1866–70.

Lieut.-Colonel L. A. Casault, commanding the 2nd Battalion, Quebec Rifles, now in garrison at the Lower or Stone Fort, in Manitoba, has also served in the regular army, went through the whole Crimean campaign in the French service, and afterwards entered the 100th or Prince of Wales Regiment, in which he filled the post of Adjutant with great credit to himself and advantage to the service. He was selected to command the 2nd Battalion for precisely the same reasons that Lieut.-Colonel Jarvis was selected to command the 1st Battalion, and earned the third-class of Sts. Michael and George in a similar manner.

Brigade Major Jas. Macleod is a volunteer officer of considerable standing; has first class certificates from the Cavalry, Artillery, and Infantry Schools, is a thorough soldier, well posted in all the duties of his profession, and was selected as Brigade Major for the Canadian contingent because he was a fair representative of the educated officers of that force. Active, vigilant, and thoroughly industrious, a great favorite with the men under his command, the third class of Sts. Michael and George could not have been conferred on a better or more capable