necting shaft and screw. At full speed the engines travel at about 240 revolutions a minute; and on the trial for speed over the measured mile the boat averaged eight knots an hour. The dredging-engines are fitted to the top of the boiler; they are a direct-acting horizontal pair, the cylinders at the after-end of the boiler, and the crank-shaft forward. The shaft extends beyond the boiler on both sides, and at each end a drum is fixed. The drums are constructed with two sheaves, and it is to the greater or the lesser of these that the dredging-line is led.

It is impossible, in the limited space at present at my disposal, to do more than sketch the more prominent of our equipments and methods; but even now, after nearly a year's experience, I feel justified in expressing my opinion that the arrangements for scientific work on board leave very little to be desired.

The *Challenger* was ready for sea early in December, 1872, and, before she left Sheerness, some of the Lords of the Admiralty and the committee of the Royal Society visited the ship.

A party of sixty sat down in the handsome ward-room where we now have our general mess, and good wishes and hopeful anticipations were warmly exchanged. We shall not soon forget the hearty British cheer of encouragement which rang out from a chorus of the voices which most influence the destinies of their country and their time, as our illustrious guests bid farewell to the *Challenger* from the deck of the steamer which was to take them to the shore.

Thus, with every possible advantage, and in the highest hope of being able to fulfill her difficult mission, the *Challenger* cast off from the jetty at Portsmouth at 11.30 A.M. on Saturday, the 21st of December, 1872. Leaving England with the drum up, in the middle of an unusually trying winter, it was not to be expected that we should escape without roughing it a little. This we certainly did for a week or so in the mouth of the Channel and the Bay of Biscay, and with this good result, that