

every occasion, even at the greatest depths, he felt distinctly the shock of the arrest of the weight upon the bottom communicated to his hand. A careful sounding was always taken immediately before letting go the dredge. I will take as an example the sounding which determined the depth of the deepest haul of the dredge yet made, in 2,435 fathoms in the Bay of Biscay on the 22nd of July, 1869, and describe the *modus operandi*.

The 'Porcupine' was provided at Woolwich with an admirable double cylinder donkey-engine of 12-horse power (nominal), placed on the deck amidships, with a couple of surging drums. This little engine was the comfort of our lives; nothing could exceed the steadiness of its working and the ease with which its speed could be regulated. During the whole expedition it brought in with the ordinary drum, the line, whether sounding-line or dredge-rope, with almost any weight, at a uniform rate of a foot per second. Once or twice it was over-strained, and then we pitied the willing little thing panting like an over-taxed horse; and sometimes we put on a small drum for very hard work, gaining thereby additional power at some expense of speed.

Two powerful derricks were rigged for sounding and dredging operations, one over the stern and one over the port bow. The bow derrick was the stronger, and we usually found it the more convenient to dredge from. Sounding was most frequently carried on from the stern. Both derricks were provided with accumulators, accessory pieces of apparatus which we found of great value. The block through which the sounding-line or dredging-rope passed was not