

Hauling in was done rapidly, as will be seen from the following extracts :—

Station 79, depth 2025 fathoms. The dredge was lowered at 11 A.M., and 2800 fathoms of line paid out ; at 4 P.M. commenced hauling in, and the dredge came up at 5.45 P.M. Time required for dredging and trawling.

Station 244, depth 2900 fathoms. The trawl was lowered at 4 A.M., and 3500 fathoms of line paid out ; commenced hauling in at noon, and the trawl came up at 3.50 P.M.

Thus in the course of twelve hours it was possible to carry out a successful trawling at a depth of about 3000 fathoms.

With such means as they had then at their disposal—a sailing ship with auxiliary engine and hemp lines—it was scarcely possible to devise a more thorough system of working. During the whole three and a half years, when trawlings and dredgings were made at 354 stations, there were only eleven cases of the parting of the dredge or trawl line. But gear of this kind necessitated lavish space and a large number of hands, both of which were generally to be had on the old sailing ships. It entailed ample space on deck for the coils of line and high masts for the accumulators, while numbers of men were needed to coil the lines and to hold on abaft the end-drums of the winch. A sailing ship, however, required much less coal than a steamer, which is a great advantage on a voyage round the world.

In the Narrative of the “Challenger” Expedition it is mentioned that at the time the vessel was being got ready for her cruise, Sir William Thomson (Lord Kelvin) was engaged in trying once more to solve the problem of taking soundings with wire instead of with a hemp line, and that a sounding apparatus constructed by him was placed on board just before the ship sailed ; the drum, however, collapsed when first used. Notwithstanding this Sir William Thomson continued with the utmost energy, and eventually with complete success, to develop his method, and it was employed by the American sounding vessels “Tuscarora” (Captain Belknap) and “Blake” (Captain Sigsbee). Wire has great advantages over a hemp line, firstly, because it enables soundings to be taken more quickly, since the steel wire meets with far less friction in the water ; and secondly, because it requires much less space.

Recent methods.
Lord Kelvin's experiments on sounding with wire.

Fig. 4, which is taken from Sigsbee's, excellent book,¹ represents sections of the hemp lines used by the “Challenger,” Advantages of wire over hemp line.

¹ Sigsbee, *Deep-Sea Sounding and Dredging*, Washington, 1880.