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The wind continuing in the same quarter, but being more moderate, we passed close to the Lizard, cleared the Rundstone a little before daybreak, May 27, and hauled up for the Longships, the wind being now directly against us. These last days had been employed by the engineer in examining the machinery, and it was thus discovered that one of the guide wheels of the piston rod on the starboard side was so much worn, as to require a piece to be brazed to it, to restore its thickness, while the connecting keys of the main shaft were also found to be loose. It was plain that these defects were or ought to have been known to the manufacturer, who had nevertheless omitted to inform us of them, and his concealing his negligence in not supplying spare keys, or any mode of remedying the impending evil, of which he must or ought to have been fully aware, was in my opinion most unjustifiable.

Holding on, we, on the 28th, passed between the Longships and the Wolf rock, and standing to the westward, observed the latitude at noon in $50^{\circ} 24' N$. On the 29th, another observation at the same hour gave us $50^{\circ} 21' N$, and as we were nearly in the same longitude, we found, that during the last twenty-four hours, we had lost three miles in beating against a steady foul wind. The engine being, however, supposed capable of being again used, we put on the steam, and as the wind had shifted to the ENE, began to make some way to the north. In the night, however, it was repeatedly stopped, by the keys of the main shaft becoming loose; and on the 30th, at 4 A. M., the principal one on the starboard side broke, so as to render the whole machine useless. On examination, it was found to have been formed of a bad piece of steel; and there being none on board sufficiently large to make a new one, we constructed one from iron, which, as might have been expected, gave way very shortly; so that it was not till after two days, and having made three new keys, that we were enabled to replace the machinery in what we hoped to prove a workable condition.

By our observations we found that we had gained twenty miles against the wind, and on this day spoke a fishing boat from Kinsale, from which we procured a supply of fish. The thirtieth, being Sunday, was made a day of rest by us, as it had been made such by nature herself, since it was an absolute calm; our latitude being $50^{\circ} 43'$, and our longitude, west, by the chronometer, 7° .

The three new iron keys being ready, and the weather moderate, the fires were lighted and the engine again set to work June 1st; but each of them broke after about an hour's trial, so that we were obliged to give up our hopes for such expedients, with all further attempts at repairing the evil in our present situation. Independently of this, the performance of the engine was most unsatisfactory. Even with a pressure of forty-five pounds on the inch, we could never obtain more than fifteen strokes in the minute; and as it thence followed, that the outer edge of the paddles had no greater velocity than five miles in the hour, that of the vessel could not possibly exceed three. The boilers also continued to leak, though we had put dung and potatoes in them, by Mr. Erickson's direction. The men were, moreover, so fatigued by the work required at the extra pump, for the supply of the boiler, that I contrived to get it wrought from the lower deck; though, even with this alteration, the labour continued too severe to be endured.

This, however, did not include the whole of our nearly fruitless attempts to remedy the evil inflicted on us by the discredit of our engine manufacturers. Finding, further, that the condensing apparatus was defective, inasmuch as the air pump always drew a quantity of water, and the feeding pump was insufficient to supply the boiler, we disconnected the whole apparatus, except the latter, which we proceeded to supply by a cock, and having led the steam from the condensation pipe, by tubes and hose to the upper deck, we put the engine in motion, and thus, by means of a pressure of forty-seven pounds on the inch, obtained a velocity of sixteen strokes in the minute, being one more than when the condensing apparatus was in action. It was thus shown that power had been wasted, partly in this part of the contrivance, and partly through the vacuum pump; but whatever our correction was, it could have availed us nothing at sea, from the great loss of water to which it gave rise.

In addition to these unproductive corrections, we next tried the effect of disengaging the great bellows; yet though we saved considerable power in this manner, we found that it did not last, and that the small one was quite incapable of maintaining the requisite heat, while it was now also plain, that they were wearing so fast as to threaten to become utterly useless in no long time. Every thing, in fact, was imperfect, since even the cylinders were too small to perform the duties required of them, so that, if I had not been satisfied of it before, I was now convinced that we had little to expect from the assistance of an engine which, at the best, could, if acting alone, scarcely move our ship three miles in the hour, and was therefore utterly inadequate to aid us in taking in tow our consort the John, as had been contemplated in planning this expedition; or could not at least have towed her faster than her own boats.

In blaming the execution and workmanship of this engine, I must, however, do justice to the principle, which was judicious, and, under a careful execution, might have rendered this machinery of great service to us on many of the occasions which occurred in our voyage. The diminutions of weight, and the removal of inconvenience, caused by the omission of a funnel, constituted a manifest advantage; and a still greater one was the reduced consumption of fuel involved in the plan of this newly contrived engine. And while the plan of lifting the paddles out of the water, and thus out of the reach of eventual ice, was well suggested, so was the execution of this part of the machinery correct, even to superfluity, since we were enabled to take away the counterpoises and guide rods, and thus to diminish both the weight and the trouble. The pieces of timber placed to keep out the sea, above and below the shaft, succeeded perfectly; but finding that the scuppers on the lower deck would not let out the water from that and from the pumps, without also letting in the sea, we were obliged to invent a remedy by carrying a pipe from the pump to the scupper, which proved effectual.

The ship, as I had expected, had now become less leaky, and was easily kept clear by one pump. As to the engine, I need not now say, being perfectly useless, we were compelled to trust to our sails, under which we made but little way. In fact, we were not only a steadily advancing, but we were beaten by every vessel that we saw. Our passage thus far, upon a wind, was irksome; but, on the second of June, a gale from the south-west, found ourselves off Wicklow on the 3rd, and on the third, it then blowing from the south, fetched the Cape of Mann in time to get under its lee and shelter ourselves from the increasing gale.

On this morning, June 4, we came to anchor in Douglas bay; when still desirous to make another attempt with our engine, I here procured proper materials, so as to construct two new keys for the shaft; writing also to London and to Liverpool for supply of other spare ones, in case we should at all succeed in carrying this machinery further on our destination. We were here detained two days! yet losing nothing by the detention, since it blew a storm from the north-west the whole time, while we were thus also enabled to lay in a supply of beef, vegetables, and water.

As we had had good opportunities of observing the efficacy of our rigging during our passage, we found that our present method of managing the after-sails admitted of some improvement. I therefore purchased some spars, together with some canvas, to replace the square sail, which we had lost during our voyage; here also receiving the visits of many friends, and others, all more or less interesting themselves in our success. Every thing being completed on the evening of the fifth, we waited for a change of weather, which accordingly took place with a shift of wind on the following morning, June 6, enabling us to weigh our anchor at six o'clock, with a breeze from the north-east. We stood towards the Cape of Mann, but, the wind falling light, made little progress, though working the engine, as we had attempted to do before, without the condensing apparatus. Yet, even thus, succeeding in obtaining only fifteen strokes in the minute, and being unable to make some intended repairs while the engine was at work, we had once more to depend on our sails alone, and against a wind which was now adverse.

On Sunday, June 7, we were off the harbour of Peel, when