

THE ATLANTIC TELEGRAPH CABLE.

OFFICIAL REPORT.

To the Directors of the Atlantic Telegraph Company.

LONDON, Tuesday, Aug. 18.

Gentlemen:—I forwarded by the Leopard a brief statement of the circumstances attending the fracture of the cable on the 11th inst., and I have now to lay before you the full particulars connected with the expedition.

After leaving Valentia on the evening of the 7th inst., the paying out of the cable from the Niagara progressed most satisfactorily until immediately before the mishap.

At the junction between the shore and the smaller cable, about eight miles from the starting point, it was necessary to stop to renew the splice; this was successfully effected, and the end of the heavier cable lowered by a hawser until it reached the bottom, buoys being attached at a short distance apart to mark the place of union.

By noon of the 8th we had paid out 40 miles of cable, including the heavy shore end, our exact position at that time being in lat. $51^{\circ} 59' 37''$ N., long. $11^{\circ} 19' 15''$ W., and the depth of water, according to the soundings taken by the Cyclops, whose course we nearly followed, 90 fathoms.

Up to 4 p.m. on that day the egress of the cable had been sufficiently retarded by the power necessary to keep the machinery in motion at a rate a little faster than the speed of the ship; but, as the water deepened, it was necessary to place some further restraint upon it by applying pressure to the friction drums in connection with the paying out sheaves, and this was gradually and cautiously increased from time to time as the speed of the cable, compared with that of the vessel, and the depth of the soundings showed to be requisite.

By midnight 85 miles had been safely laid; the depth of water being then a little more than 200 fathoms.

At 8 o'clock in the morning of the 9th, we had finished the deck coil in the after part of the ship, having paid out 120 miles. The change to the coil between decks forward was safely made.

By noon we had laid 136 miles of cable, the Niagara having reached lat. $52^{\circ} 11' 40''$ N., long. $13^{\circ} 10' 2''$ W., and the depth of water having increased to 410 fathoms.

In the evening the speed of the vessel was raised to five knots per hour. I had previously kept down the rate at from three to four knots for the small cable, and two for the heavy end next the shore, wishing to get the men and machinery well at work prior to attaining the speed which I had anticipated making.

By midnight 189 miles had been laid. At 4 o'clock in the morning of the 10th, the depth of water began to increase rapidly from 550 fathoms to 1,750 in a distance of eight miles. Up to this time 7 cwt. strain sufficed to keep the rate of the cable near enough to that of the ship; but as the water deepened the proportionate speed of the cable advanced, and it was necessary to augment the pressure by degrees until in the depth of 1,700 fathoms, the indicator showed a strain of 15 cwt., while the cable and ship were running 5½ and 5 knots respectively.

At noon on the 10th we had paid out 255 miles of cable, the vessel having made 214 miles from shore, being then in lat. $52^{\circ} 27' 50''$ N., long. $16^{\circ} 0' 15''$ W. At this time we experienced an increasing swell, followed later in the day by a strong breeze.

From this period, having reached 2,000 fathoms water, it was necessary to increase the strain to a ton, by which the rate of the cable was maintained in due proportion to that of the ship.

At 6 in the evening some difficulty arose through the cable getting out of the sheaves of the paying out machine, owing to the tar and pitch hardening in the grooves, and a splice of large dimensions passing over them. This was rectified by fixing additional guards and softening the tar with oil.

It was necessary to bring up the ship, holding the cable by stoppers until it was again properly disposed around the pulleys. Some importance is due to this event, as showing that it is possible to lie to in deep water without continuing to pay out the cable—a point upon which doubts have been frequently expressed.

Shortly after this the speed of the cable gained considerably upon that of the ship, and up to 9 o'clock, while the rate of the latter was about 3 knots by the log, the cable was running out from 5½ to 5¾ knots per hour. The strain was then raised to 25 cwt.; but the wind and sea increasing, and a current at the same time carrying the cable at an angle from the direct line of the ship's course, it was not found sufficient to check the cable, which was at midnight making 2½ knots above the speed of the ship, and sometimes imperilling the safe uncoiling in the hold.

The retarding force was therefore increased at 2 o'clock to an amount equivalent to 30 cwt., and then again, in consequence of the speed continuing to be more than it would have been prudent to permit, to 35 cwt. By this the rate of the cable was brought to a little short of 5 knots, at which it continued steadily until 4.45, when it parted, the length paid out at that time being 335 miles.

I had, up to this time, attended personally to the regulation of the breakers; but, finding that all was going on well, and that it being necessary that I should be temporarily away from the machine to ascertain the rate of the ship, and to see how the cable was coming out of the hold, and also to visit the electrician, the machine was for the moment left in charge of a

mechanic who had been engaged from the first in its construction and fitting, and was acquainted with its operation.

I was proceeding to the fore part of the ship when I heard the machine stop; I immediately called out to ease the break and reverse the engine of the ship, but when I reached the spot the cable was broken.

On examining the machine, which was otherwise in perfect order, I found that the breaks had not been released, and to this or to the handwheel of the break being turned the wrong way may be attributed the stoppage, and the consequent fracture of the cable. When the rate of the wheels grew slower as the ship dropped her stern in the swell, the break should have been eased; this had been done regularly before whenever an unusually sudden descent of the ship temporarily withdrew the pressure from the cable in the sea; but owing to our entering the deep water the previous morning, and having all hands ready for any emergency that might occur there, the chief part of my staff had been compelled to give in at night through sheer exhaustion, and hence, being short-handed, I was obliged for the time to leave the machine without, as it proves, sufficient intelligence to control it.

I perceive that on the next occasion it will be needful, from the wearing and anxious nature of the work, to have three separate relays of staff, and to employ, for attention to the breaks, a higher degree of mechanical skill.

The origin of the accident was no doubt the amount of retarding strain put upon the cable, but had the machine been properly manipulated at the time it could not possibly have taken place.

It has been suggested as a cause of the failure that the machinery is too massive and ponderous. My experience of its action teaches otherwise; for three days in shallow and deep water, as well as in rapid transition from one to the other, nothing could be more perfect than its working, and since it performed its duty so smoothly and efficiently in the smaller depths, where the weight of the cable had less ability to overcome its friction and resistance, it can scarcely be said to be too heavy for deep water, where it was necessary for the increased weight of cable to restrain its rapid motion by applying to it a considerable degree of additional friction. Its action was most complete, and all parts worked well together. I see how it can be improved by a modification in the form of sheave, by an addition to the arrangement for adjusting the breaks and some other slight alterations; but with proper management, without any change whatever, I am confident that the whole length of cable might have been safely laid by it, and it must be remembered, as a test of the work which it has done, that, unfortunate as this termination to the expedition is, the longest length of cable ever laid has been paid out by it, and that in the deepest water yet passed over.

After the accident had occurred soundings were taken by Lt. DAYMAN, and the depth found to be 2,000 fathoms.

It will be remembered that some importance was attached to the cables in the Niagara and Agamemnon being manufactured in opposite lays. I thought this a favorable opportunity to show that practically the difference was not of consequence in affecting the junction in mid-ocean. We therefore made a splice between the two vessels, and several miles were then paid out without difficulty.

I requested the commanders of the vessels to proceed to Plymouth, as the docks there afford better facilities than any other port for landing the cable, should it be necessary to do so.

The whole of the cable on board has been carefully tested and inspected, and found to be in as perfect a condition as when it left the works at Greenwich and Birkenhead.

One important point presses for your consideration at an early period; a large portion of the cable already laid may be recovered at a comparative small expense. I append an estimate of the cost, and shall be glad to receive your authority to proceed with this work.

I do not perceive in our present position any reason for discouragement, but I have, on the contrary, a greater confidence than ever in the undertaking. It has been proved beyond a doubt that no obstacle exists to prevent our ultimate success, and I see clearly how every difficulty which has presented itself in this voyage can be effectually dealt with in the next.

The cable has been laid at the expected rate in the great depths; its electrical working through the entire length has been most satisfactorily accomplished, while the portion laid actually improved in efficiency by being submerged, from the low temperature of the water, and the close compression of the texture of the gutta percha.

The structure of the cable had answered every expectation that I had formed of it, and if it were now necessary to construct another line I should not recommend any alteration from the present cable, which in its working has confirmed my belief that it is expressly adapted to our requirements. Its weight in the water is so adjusted to the depth that the strain is within a manageable scope, while the effect of undercurrents upon its surface proves how dangerous it would be to attempt to lay a much lighter rope, which would, by the greater time occupied in sinking, expose an increased surface to their power.

I have the honor to remain, gentlemen,

Yours very faithfully,

CHARLES T. BRIGHT.

[From the London Times, August 20.]

A very full meeting of the directors of the Atlantic Telegraph Company was held at their offices this day, (Wednesday.)

The fullest investigation into the events which have led to the present pause in the undertaking, into the sufficiency of the appliances for paying out the cable, and into the ad-

ditional arrangements and precautions which the valuable knowledge and experience gained by the late attempt will dictate in respect to future operations has been committed to the charge of sub-committees appointed for the purpose, to report to the General Board.

The directors will sit in permanence till their future plans have been fully discussed and determined on.

The appeal of the directors to the commanders of the several ships composing the Atlantic telegraph squadron, to come forward and aid the undertaking at this juncture with their advice and experience, has been cordially responded to, and the following officers have arrived in town, and will be in consultation with the directors to-morrow:—

Captain Wainwright, Her Majesty's ship Leopard; Captain Sands, United States frigate Susquehanna; Captain Hudson, United States frigate Niagara; Master Commander Noddall, Her Majesty's ship Agamemnon, and Lieutenant Commander Dayman, Her Majesty's ship Cyclops.

Sufficient information has already been obtained to show clearly that the present check to the progress of the work, however mortifying, has been purely the result of an accident, and is no way due to any obstacle in the form of the cable, nor of any natural difficulty, nor of any experience that will in the future affect in the slightest degree the success of the enterprise. The only sudden declivity of any serious magnitude from 410 fathoms to 1,700 fathoms had been safely overcome, the beautiful flexibility of the cable having rendered it capable of adapting itself, without strain, to circumstances which would probably have been its ruin had it been more rigidly constructed. The combined influence of the low temperature of the water and the compression of the pores of the insulating medium had practically shown that the action of a telegraphic cable, so far from being impaired, is materially improved by being sunk in deep water.

The only difficulty worthy of consideration which remained was to demonstrate the practicability of making the splice in mid-ocean. This was put to experimental test by the engineer in a heavy sea, subsequent to the accident, and before the return home of the ships. The two ends on board the Niagara and Agamemnon were joined together, and the splice let down to the bottom into soundings of 2,000 fathoms, and during a heavy sea. The experiment was perfectly successful, and these and all other circumstances which have been wrought out by the recent expedition have made more and more cheering and certain the prospect of complete success on the next occasion.

[From the London Times, August 21.]

The commanding officers of the several ships composing the Atlantic squadron, and Captain Harrison, who has recently been appointed to the future command of the Great Eastern steamship, attended a meeting of the Board at the company's offices yesterday, having been specially invited, to express to the directors their opinions and advice, drawn from their several observations and experience, as to the efficiency of the form of cable adopted by the company, as to the suitability of the machinery and appliances for paying out, as to any obstacles of a nautical or physical character that exist in the way of the enterprise, and as to the alterations and amendments it is desirable to make in all or any of the plans for performing the work with greater safety and security on the next occasion.

There is but one unanimous expression on the part of the naval officers in reference to the cable itself. They are with one consent of opinion that a form of submarine telegraph could not be devised more suitable in every respect to the object intended to be accomplished. Its lightness, toughness and flexibility adapt it in every way for Transatlantic purposes, and they are unwilling to recommend its modification or alteration in any way. They are also of opinion that no natural obstacles of any moment exist to prevent its being successfully laid, and their views as to the future, based upon past experience, are sanguine.

With regard to the machinery, they are of opinion also, unanimously, that the form of controlling power adopted and the mode of lubricating and adjusting the brakes are capable of considerable improvement, and, in conformity with this opinion, the directors have forthwith ordered an inspection and report to be made by three independent nautical and mechanical engineers upon the best means of accomplishing its object.

With regard to future operations during the present year, the directors had the advantage of Captain Harrison's great knowledge of the state of the weather, fogs, ice, &c., in the North Atlantic, and his experience enables him to say that the month of October and the first portion of the month of November, more particularly when the equinoctial gales have been severe, are usually free from any state of sea or atmosphere that would be injurious to an expedition like the present.

Somewhat diverse opinions were prevalent among the officers present as to the practicability of recovering a large portion of the cable already submerged; but all agreed that the shore end may be taken up and buoyed, and that a further length of the smaller portion can be hauled in, but with what extent of injury to its electrical value experience only can determine.

Eight or ten days will yet elapse before the various matters of detail referred to the inquiry and investment of sub-committees can be reported upon to the general board, and consequently before any authoritative statement can be made as to future proceedings.

[From the London Gazette, August 21.]

The directors of the Atlantic Telegraph Company have met the recent failure in the attempt to deposit the cable in a spirit which augurs well for the future success of the undertaking. Instead of permitting the irritation naturally created by so mortifying a casualty to lead to idle complaints and recriminations, they have set to work like men to extract whatever is valuable from the experience of the expedition, and to concert measures for insuring future success. With this view they have brought together all the commanding officers of the Atlantic squadron, together with Captain Harrison, the future commander of the Great Eastern, whose knowledge of the Western ocean is perhaps equal to that of any living individual.

The collective opinions of these gentlemen have already been taken with reference more especially to the quality of the cable as tested by the late experiment, and they appear to be unanimous in their approval of its form and adaptability for the service for which it is designed.

The nautical and other physical difficulties have also been discussed, and the deliberations have been assisted by the very able report of Mr. C. T. Bright, the Engineer to the company. Mr. Bright had perhaps a better opportunity than any one else for testing the practicability of the undertaking, for, apart from his high professional attainments, we learn that from the time the Niagara left Valentia till the accident occurred, he was in constant attendance upon the paying-out machinery.

The cause of the accident was simple enough. It was occasioned by the ignorance of a mechanic who acted as brakesman, and who put on 'dead nip' when he should have eased off the cable. No doubt the employment of any such person in so critical a capacity was a serious mistake; but the excuse is that Mr. Bright's staff was short-handed—a state of things in some measure attributable to the novelty of the undertaking, and which cannot by any possibility occur in any future attempt.

The facts of importance arrived at by the recent experiment are, that the cable is sufficiently strong to bear the necessary strain, 35 cwt. having been applied with safety before the casualty; that the apprehended difficulty of depositing it in the greatest depth (2,000 fathoms) was overcome with comparative ease; that the Niagara was able to lie to with the cable in the deep sea; and that a junction of the cables of the Niagara and Agamemnon was effected with complete success in mid-ocean. From all we can learn, therefore, derived from sources which we must consider authentic, there is every reason to suppose that, but for a casualty in no way resulting from the experiment itself, the object of the expedition would have been completely successful.

The practicability of depositing all ocean cable has been satisfactorily demonstrated, and experience derived from the late failure will enable the next expedition, it may be hoped, to command success. Whether it is the intention to make another attempt this year or not has not been announced. Captain Harrison, it would seem, is favorable to making another effort in the early part of November inasmuch as, during the first portion of that month, shortly after the equinoctial gales, both the sea and the atmosphere in the Atlantic are favorable to the work of depositing the cable. We shall, of course, watch the future proceedings of the directors and their advisers with interest.

TO THE EDITOR OF THE LONDON TIMES.

SIR,—England, having once put her hand to the plough, cannot leave it until the furrow is completed.

It has been England's destiny to make the Transatlantic cable, and will, I trust, be hers to send her electric tongue "to earth's remotest bound."

The grand project has been commenced in a most enthusiastic manner, and in cordial connection with the nation that has sprung from us—one of the "multitude of nations" that are to be developed according to old Jacob's predictions.

But, however laudably and spiritedly it has been undertaken, it has not yet been accomplished, and it remains to be acknowledged the hand of Providence helpeth when man faileth, where his object is the amelioration and civilization of his race.

Who would have thought, while wandering over that astonishing fabric now building, the Great Eastern, that this was to be her mission, and which I verily believe must be, if ever it is accomplished? How strange that the monster should have been slowly growing to maturity, and now, just in the nick of time, there she is, ready to accomplish the work—a work which I believe no other vessel in existence can perform.

Thus, while the projectors of this "mighty machine" had outstripped the bounds of mercantile dimensions, as suited to the present requirements, they little dreamt the illustrious mission their mammoth was destined to fulfil, preparing the road for "knowledge to run to and fro on the earth"—nay, and round the earth.

Your able correspondent "N. M." in your paper of the 17th inst., will be glad to dispose of the old cable to carry out his important suggestions, and which ought and must be done, and the fine old Agamemnon, accompanied by her sister of mercy Niagara, must reel off their "mortal coil" in the land-locked Mediterranean, so that both countries may share in the glorious work, a flash through which may save a million souls.

The details I leave to the talented promoters and practical men of the present undertaking, where it has been by all allowed great talent