FIELD HENRY MARTYN

THE STORY OF THE ATLANTIC TELEGRAPH

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Содержание

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PREFACE

The recent death of Mr. Cyrus W. Field recalls attention to the great enterprise with which his name will be forever associated. "The Atlantic Telegraph," said the late Chief Justice Chase, "is the most wonderful achievement of civilization, and entitles its author to a distinguished rank among public benefactors. High upon that illustrious roll will his name be placed, and there will it remain while oceans divide, and telegraphs unite, mankind." The memory of such an achievement the world should not let die. The story of its varied fortunes reads like a tale of adventure. From the beginning it was a series of battles, fighting against the elements and against the unbelief of men. This long struggle the new generation may forget, profiting by the result, but thinking little of the means by which it was attained. What toil of hand and brain had gone before; what days and nights of watching and weariness; how often hope deferred had made the heart sick: how year after year had dragged on, and seen the end still afar off – all that is dimly remembered, even by those who reap the fruits of victory. And yet in the history of human achievements, it is necessary to trace these beginnings step by step, if we would learn the lesson they teach, that it is only out of heroic patience and perseverance that anything truly great is born.

Twelve years of unceasing toil was the price the Atlantic Telegraph cost its projector; and not years lighted up by the assurance of success, but that were often darkened with despair: years in which he was restlessly crossing and recrossing the ocean, only to find on either side, worse than storms and tempests, an incredulity which sneered at every failure, and derided the attempt as a delusion and a dream. Against such discouragements nothing could prevail but that faith, or fanaticism, which, believing the incredible, achieves the impossible. Such a tale, apart from the results, is in itself a lesson and an inspiration.

In attempting to chronicle all this, the relation of the writer to the prime mover has given him facilities for obtaining the materials of an authentic history; but he trusts that it will not lead him to overstep the limits of modesty. Standing by a new-made grave, he has no wish to indulge in undue praise even of the beloved dead. Enough for him is it to unroll the canvas on which the chief actor stands forth as the conspicuous figure. But in a work of such magnitude there are many actors, and there is glory enough for all; and it is a sacred duty to the dead to recognize, as he did, what was due to the brave companions in arms, who stood by him in disaster and defeat; who believed in him even when his own countrymen doubted and despaired; and furnished anew men and money and ships for the final conquest of the sea. If history records that the enterprise of the Atlantic Telegraph owed its inception to the faith and daring of an American, it will also record that all his ardor and activity would have been of no avail but for the science and seamanship, the capital and the undaunted courage, of England. But when all these conditions were supplied, it is the testimony of Englishmen themselves that his was the spirit within the wheels that made them revolve; that it was his intense vitality that infused itself into a great organization, and made the dream of science the reality of the world. This is not to his honor alone: it is a matter of national pride; and Americans may be pardoned if, in the year in which they celebrate the discovery of the continent, they recall that it was one of their countrymen whom the Great Commoner of England, John Bright, pronounced "the Columbus of our time, who, after no less than forty voyages across the Atlantic in pursuit of the great aim of his life, had at length by his cable moored the New World close alongside the Old." How the miracle was wrought, it is the design of these pages to tell.

CHAPTER I.
THE BARRIER OF THE SEA

When Columbus sailed from the shores of Spain, it was not in search of a New World, but only to find a nearer path to the East. He sought a western passage to India. He had adopted a traditionary belief that the earth was round; but he did not once dream of another continent than the three which had been the ancient abodes of the human race – Europe, Asia, and Africa. All the rest was the great deep. The Florentine sage Toscanelli, from his knowledge of the world so far as then discovered, had made a chart, on which the eastern coast of Asia was represented as lying opposite to the western coast of both Europe and Africa. Accepting this theory, Columbus reasoned that he could sail direct from Spain to India. No intervening continent existed even in his imagination. Even after he had crossed the Atlantic, and descried the green woods of San Salvador rising out of the western seas, he thought he saw before him one of the islands of the Asiatic coast. Cuba he believed was a part of the mainland of India; Hayti was the Ophir of King Solomon; and when, on a later voyage, he came to the broad mouth of the Orinoco, and saw it pouring its mighty flood into the Atlantic, he rejoiced that he had found the great river Gihon, which had its rise in the garden of Eden! Even to the hour of his death, he remained ignorant of the real extent of his magnificent discovery. It was reserved to later times to lift the curtain fully from the world of waters; to reveal the true magnitude of the globe; and to unite the distant hemispheres by ties such as the great discoverer never knew.

It is hard to imagine the darkness and the terror which then hung over the face of the deep. The ocean to the west was a Mare Tenebrosum – a Sea of Darkness, into which only the boldest voyagers dared to venture. Columbus was the most successful navigator of his time. He had made voyages to the Western Islands, to Madeira and the Canaries, to Iceland on the north, and to the Portuguese settlements in Africa. But when he came to cross the sea, he had to grope his way almost blindly. But a few rays of knowledge glimmered, like stars, on the pathless waters. When he sailed on his voyage of discovery, he directed his course, first to the Canaries, which was a sort of outstation for the navigators of those times, as the last place at which they could take in supplies; and beyond which they were venturing into unknown seas. Here he turned to the west, though inclining southward toward the tropics (for even the great discoverers of that day, in their search for new realms to conquer, were not above the consideration of riches as well as honor, and somehow associated gems and gold with torrid climes), and bore away for India!

From this route taken by the great navigator, he crossed the ocean in its widest part. Had he, instead, followed the track of the Northmen, who crept around from Iceland to Greenland and Labrador; or had he sailed straight to the Azores, and then borne away to the north-west, he would much sooner have descried land from the mast-head. But steering in darkness, he crossed the Atlantic where it is broadest *and deepest*; where, as submarine explorers have since shown, it rolls over mountains, lofty as the Alps and the Himalayas, which lie buried beneath the surface of the deep. But farther north the two continents, so widely sundered, incline toward each other, as if inviting that closer relation and freer intercourse which the fulness of time was to bring.

As the island of Newfoundland is to stand in the foreground of our story, we observe on the map its salient geographical position. It holds the same relation to America that Ireland does to Europe. Stretching far out into the Atlantic, it is the vanguard of the western continent, or rather the signal-tower from which the New World may speak to the Old.

And yet, though large as England, and so near our coast, few Americans ever see it, as it lies out of the track of European commerce. Our ships, though they skirt the Banks of Newfoundland, pass to the south, and get but occasional glimpses of the headlands. Even what is seen gives the country rather an ill reputation. It has a rockbound coast, around which hang perpetual fogs and mists, through

which great icebergs drift slowly down, like huge phantoms of the deep, gliding away to be dissolved by the warm breath of the Gulf Stream: dangers that warn the voyager away from such a sea and shore.

Sailing west from Cape Race, and making the circuit of the island as far as the Straits of Belle Isle, one is often reminded of the most northern peninsula of Europe. The rocky shores are indented with numerous bays, reaching far up into the land, like the fiords along the coast of Norway; while the large herds of Caribou deer, that are seen feeding on the hills, might easily be mistaken for the flocks of reindeer that browse on the pastures and drink of the mountain torrents of ancient Scandinavia.

The interior of the island is little known. Not only is it uninhabited, it is almost unexplored, a boundless waste of rock and moor, where vast forests stretch out their unbroken solitudes, and the wild bird utters its lonely cry. Bears and wolves roam on the mountains. Especially common is the large and fierce black wolf; while of the smaller animals, whose skins furnish material for the fur-trade, such as martins and foxes, there is the greatest abundance. But from all pests of the serpent tribe, Newfoundland is as free as Ireland, which was delivered by the prayers of St. Patrick. There is not a snake or a frog or a toad in the island!

Yet, even in this ruggedness of nature, there is a wild beauty, which only needs to be "clothed upon" by the hand of man. Newfoundland, in many of its features, is not unlike Scotland, even in its most desolate portions, where the rocky surface of the country, covered with thick moss, reminds the emigrant Scot of the heather on his native moors. In the interior are lakes as long as Loch Lomond, and mountains as lofty as Ben Lomond and Ben Nevis. There are passes as wild as the Vale of Glencoe, where one might feel that he is in the heart of the Highlands, while the roar of the torrents yet more vividly recalls the

> Land of the brown heath and shaggy wood,
> Land of the mountain and the flood.

Yet in all this there is nothing to repel human habitation. By the hand of industry, these wild moors might be transformed into fruitful fields. We think it a very cold country, where winter reigns over half the year, as in Greenland; yet it is not so far north as Scotland, nor is its climate more inhospitable. It only needs the same population, the same hardy toil: and the same verdure would creep up its hill-sides, which now makes green and beautiful the loneliest of Scottish glens.

But at present the country is a *terra incognita*. In the interior there are no towns and no roads. As yet almost the whole wealth of the island is drawn from the sea. Its chief trade is its fisheries, and the only places of importance are a few small towns, chiefly on the eastern side, which have grown up around the trading posts. Besides these, the only settlements are the fishermen's huts scattered along the coast. Hence the bishop of the island, when he would make his annual visit to his scattered flock, is obliged to sail around his diocese in his yacht, since even on horseback it would not be possible to make his way through the dense forests to the remote parts of the island. This first suggested the idea of cutting across the island a nearer way, not only for internal intercourse, but for those who were passing to and fro on the sea.

It was in one of these excursions around the coast that the good Bishop Mullock, the head of the Roman Catholic Church in Newfoundland, when visiting the western portion of his diocese, lying one day becalmed in his yacht, in sight of Cape North, the extreme point of the province of Cape Breton, bethought himself how his poor neglected island might be benefited by being taken into the track of communication between Europe and America. He saw how nature had provided an easy approach to the mainland on the west. About sixty miles from Cape Ray stretched the long island of Cape Breton, while, as a stepping-stone, the little island of St. Paul's lay between. So much did it weigh upon his mind that, as soon as he got back to St. John's, he wrote a letter to one of the papers on the subject. As this was the first suggestion of a telegraph across Newfoundland, his letter is here given in full:

To the Editor of the Courier:

> Sir: I regret to find that, in every plan for transatlantic communication, Halifax is always mentioned, and the natural capabilities of Newfoundland entirely overlooked. This has been deeply impressed on my mind by the communication I read in your paper of Saturday last, regarding telegraphic communication between England and Ireland, in which it is said that the nearest telegraphic station on the American side is Halifax, twenty-one hundred and fifty-five miles from the west of Ireland. Now would it not be well to call the attention of England and America to the extraordinary capabilities of St. John's, as the nearest telegraphic point? It is an Atlantic port, lying, I may say, in the track of the ocean steamers, and by establishing it as the American telegraphic station, news could be communicated to the whole American continent forty-eight hours, *at least*, sooner than by any other route. But how will this be accomplished? Just look at the map of Newfoundland and Cape Breton. From St. John's to Cape Ray there is no difficulty in establishing a line passing near Holy-Rood along the neck of land connecting Trinity and Placentia Bays, and thence in a direction due west to the Cape. You have then about forty-one to forty-five miles of sea to St. Paul's Island, with deep soundings of one hundred fathoms, so that the electric cable will be perfectly safe from icebergs. Thence to Cape North, in Cape Breton, is little more than twelve miles. Thus it is not only practicable to bring America two days nearer to Europe by this route, but should the telegraphic communication between England and Ireland, sixty-two miles, be realized, it presents not the least difficulty. Of course, we in Newfoundland will have nothing to do with the erection, working, and maintenance of the telegraph; but I suppose our Government will give every facility to the company, either English or American, who will undertake it, as it will be an incalculable advantage to this country. I hope the day is not far distant when St. John's will be the first link in the electric chain which will unite the Old World and the New.
> *J. T. M.*
>
> St. John's, November 8, 1850.

This suggestion came at the right moment, since it quickened, if it did not originate, the first attempt to link the island of Newfoundland with the mainland of America. For about the same time, the attention of Mr. Frederick N. Gisborne, a telegraph operator, was attracted to a similar project. Being a man of great quickness of mind, he instantly saw the importance of such a work, and took hold of it with enthusiasm. It might easily occur to him without suggestion from any source. He had had much experience in telegraphs, and was then engaged in constructing a telegraph line in Nova Scotia. Whether, therefore, the idea was first with him or with the bishop, is of little consequence. It might occur at the same time to two intelligent minds, and show the sagacity of both.

But having taken hold of this idea, Mr. Gisborne pursued it with indomitable resolution. As the labors of this gentleman were most important in the beginning of this work, it is a pleasure to recognize his untiring zeal and energy. In assurance of this we could have no higher authority than the following from the late Mr. E. M. Archibald, who was at the time Attorney-General of Newfoundland, and afterwards for many years British Consul at New York:

> "It was during the winter of 1849-50, that Mr. Gisborne, who had been, as an engineer, engaged in extending the electric telegraph through Lower Canada and New Brunswick to Halifax, Nova Scotia, conceived the project of a telegraph to connect St. John's, the most easterly port of America, with the main continent. The importance of the geographical position of Newfoundland, in the event of a telegraph ever being carried across the Atlantic, was about the same time

promulgated by Dr. Mullock, the Roman Catholic Bishop of Newfoundland, in a St. John's newspaper.

"In the spring of the following year (1851), Mr. Gisborne visited Newfoundland, appeared before the Legislature, then in session, and explained the details of his plan, which was an overland line from St. John's to Cape Ray, nearly four hundred miles in length, and (the submarine cable between Dover and Calais not having then been laid) a communication between Cape Ray and Cape Breton by steamer and carrier-pigeons, eventually, it was hoped, by a submarine cable across the Gulf of St. Lawrence. The Legislature encouraged the project, granted £500 sterling to enable Mr. Gisborne to make an exploratory survey of the proposed line to Cape Ray, and passed an act authorizing its construction, with certain privileges, and the appointment of commissioners for the purpose of carrying it out. Upon this, Mr. Gisborne, who was then the chief officer of the Nova Scotia Telegraph Company, returned to that province, resigned his situation, and devoted himself to the project of the Newfoundland telegraph. Having organized a local company for the purpose of constructing the first telegraph line in the island, from St. John's to Carbonear, a distance of sixty miles, he, on the fourth of September, set out upon the arduous expedition of a survey of the proposed line to Cape Ray, which occupied upward of three months, during which time himself and his party suffered severe privations, and narrowly escaped starvation, having to traverse the most rugged and hitherto unexplored part of the island.[1] On his return, having reported to the Legislature favorably of the project, and furnished estimates of the cost, he determined to proceed to New York, to obtain assistance to carry it out… Mr. Gisborne returned to St. John's in the spring of 1852, when, at his instance, an act, incorporating himself (his being the only name mentioned in it) and such others as might become shareholders in a company, to be called the Newfoundland Electric Telegraph Company, was passed, granting an exclusive right to erect telegraphs in Newfoundland for thirty years, with certain concessions of land, by way of encouragement, to be granted upon the completion of the telegraph from St. John's to Cape Ray. Mr. Gisborne then returned to New York, where he organized, under this charter, a company, of which Mr. Tebbets and Mr. Holbrook[2] were prominent members, made his financial arrangements with them, and proceeded to England to contract for the cable from Cape Ray to Prince Edward Island, and from thence to the mainland. Returning in the autumn, he proceeded in a small steamer, in November of that year, 1852, to stretch the first submarine cable, of any length, in America, across the Northumberland Strait from Prince Edward Island to New Brunswick, which cable, however, was shortly afterward broken, and a new one was subsequently laid down by the New York, Newfoundland, and London Telegraph Company. In the spring of the following year, 1853, Mr. Gisborne set vigorously to work to complete his favorite project of the line (which he intended should be chiefly underground) from St. John's to Cape Ray. He had constructed some thirty or forty miles of road, and was proceeding with every prospect of success, when, most unexpectedly, those of the company who were to furnish the needful funds dishonored his bills, and brought his operations to a sudden termination. He and

[1] "On the fourth day of December, I accomplished the survey through three hundred and fifty miles of wood and wilderness. It was an arduous undertaking. My original party, consisting of six white men, were exchanged for four Indians; of the latter party, two deserted, one died a few days after my return, and the other, 'Joe Paul,' has ever since proclaimed himself an ailing man." —*Letter of Mr. Gisborne.*

[2] Horace B. Tebbets and Darius B. Holbrook.

> the creditors of the company were for several months buoyed up with promises of forthcoming means from his New York allies, which promises were finally entirely unfulfilled; and Gisborne, being the only ostensible party, was sued and prosecuted on all sides, stripped of his whole property, and himself arrested to answer the claims of the creditors of the company. He cheerfully and honorably gave up every thing he possessed, and did his utmost to relieve the severe distress in which the poor laborers on the line had been involved."

This is a testimony most honorable to the engineer who first led the way through a pathless wilderness. But this Newfoundland scheme is not to be confounded with that of the Atlantic Telegraph, which did not come into existence until a year or two later. The latter was not at all included in the former. Indeed, Mr. Gisborne himself says, in a letter referring to his original project: "My plans were to run a subterranean line from Cape Race to Cape Ray, fly carrier-pigeons and run boats across the Straits of Northumberland to Cape Breton, and thence by overland lines convey the news to New York." He adds however: "Meanwhile Mr. Brett's experimental cable between Dover and Calais having proved successful, I set forth in my report, [which appeared a year after his first proposal], that 'carrier-pigeons and boats would be required only until such time as the experiments then making in England with submarine cables should warrant a similar attempt between Cape Ray and Cape Breton.'" But nowhere in his report does he allude to the possibility of ever spanning the mighty gulf of the Atlantic.

But several years after, when the temporary success of the Atlantic Telegraph gave a name to everybody connected with it, he or his friends seemed not unwilling to have it supposed that this was embraced in the original scheme. When asked why he did not publish his large design to the world, he answered: "Because I was looked upon as a wild visionary by my friends, and pronounced a fool by my relatives for resigning a lucrative government appointment in favor of such a laborious speculation as the Newfoundland connection. Now had I coupled it at that time with an Atlantic line, all confidence in the prior undertaking would have been destroyed, and my object defeated." This may have been a reason for not announcing such a project to the public, but not for withholding it from his friends. A man can hardly lay claim to that which he holds in such absolute reserve.

However, whether he ever entertained the *idea* of such a project, is not a matter of the slightest consequence to the public, nor even to his own reputation. Ten years before Professor Morse had expressed, not a dreamer's fancy, but a deliberate conviction, founded on scientific experiments, that "a telegraphic communication might with certainty be established across the Atlantic Ocean;" so that the idea was not original with Mr. Gisborne, any more than with others who were eager to appropriate it.

It is a part of the history of great enterprises, that the moment one succeeds, a host spring up to claim the honor. Thus when, in 1858, the Atlantic Telegraph seemed to be a success, the public, knowing well who had borne the brunt and burden of the undertaking, awarded him the praise which he so well deserved; but instantly there were other Richmonds in the field. Those who had had no part in the labor, at least claimed to have originated the idea! Of course, these many claims destroy each other. But after all, to raise such a point at all is the merest trifling. The question is not who first had the "idea," but who took hold of the enterprise as a practical thing; who grappled with the gigantic difficulties of the undertaking, and fought the battle through to victory.

As to Mr. Gisborne, his activity in the beginning of the Newfoundland telegraph is a matter of history. In that preliminary work, he bore an honorable part, and acquired a title to respect, of which he cannot be deprived. All honor to him for his enterprise, his courage, and his perseverance!

But for the company of which he was the father, which he had got up with so much toil, it lived but a few months, when it became involved in debt some fifty thousand dollars, chiefly to laborers on the line, and ended its existence by an ignominious failure. The concern was bankrupt, and it was plain that, if the work was not to be finally abandoned, it must be taken up by stronger hands.

CHAPTER II.
CAN THE OCEAN BE SPANNED?

Mr. Gisborne left Halifax and came to New York in January, 1854. Here he took counsel with his friend Tebbets and others; but they could give him no relief. It was while in this state of suspense that he met, at the Astor House, Mr. Matthew D. Field, an engineer who had been engaged in building railroads and suspension bridges at the South and West. Mr. Field listened to his story with interest, and engaged to speak of it to his brother, Cyrus W. Field,[3] a merchant of New York, who had retired from business the year before, and had spent six months in travelling over the mountains of South America, from which he had lately returned. Accordingly, he introduced the subject, but found his brother disinclined to embark in any new undertaking. Though still a young man, his life had been for many years one of incessant devotion to business. He had accumulated an ample fortune, and was not disposed to renew the cares, the anxieties, and the fatigues of his former life. But listening to the details of a scheme which had in it much to excite interest, and which by its very difficulty stimulated the spirit of enterprise, he at length consented to see Mr. Gisborne, and invited him to his house. Accordingly he came, and spent an evening describing the route of his proposed telegraph, and the points it was to connect. After he left, Mr. Field took the globe which was standing in the library, and began to turn it over. *It was while thus studying the globe that the idea first occurred to him, that the telegraph might be carried further still, and be made to span the Atlantic Ocean.* The idea was not original with him, though he was to carry it out. It was indeed new *to him*; but it had long been a matter of speculation with scientific minds, though their theories had never attracted his attention. But once he had grasped the idea, it took strong hold of his imagination. Had the Newfoundland scheme stood alone, he would never have undertaken it. He cared little about shortening communication with Europe by a day or two, by relays of boats and carrier-pigeons. But it was the hope of further and grander results that inspired him to enter on a work of which no man could foresee the end.

An enterprise of such proportions, that would task to the utmost the science and the engineering skill of the world, was not to be rashly undertaken; and before giving a definite reply to Gisborne, Mr. Field determined to apply to the highest authorities in his own country.

The project of an Atlantic telegraph involved two problems: Could a cable be stretched across the ocean? and if it were, would it be good for anything to convey messages? The first was a question of mechanical difficulties, requiring a careful survey of the ocean itself, fathoming its depth, finding out the character of its bottom, whether level, or rough and volcanic; and all the obstacles that might be found in the winds that agitate the surface above, or the mighty currents that sweep through the waters below. The second problem was purely scientific, involving questions as to the laws of electricity, not then fully understood, and on which the boldest might feel that he was venturing on uncertain ground.

Such were the two elements or forces of nature to be encountered – the ocean and the electric current. Could they be controlled by any power of man? The very proposal was enough to stagger the faith even of an enthusiast. Who could lay a bridle on the neck of the sea? The attempt seemed as idle as that of Xerxes to bind it with chains. Was it possible to combat the fierceness of the winds and waves, and to stretch one long line from continent to continent? And then, after the work was achieved, would the lightning run along the ocean-bed from shore to shore? Such were the questions which had puzzled many an anxious brain, and which now troubled the one who was to undertake the work.

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[3] Born November 30, 1819, in Stockbridge, Massachusetts, the son of a Congregational minister, of whom three sons are still living: Mr. David Dudley Field, of New York; Mr. Justice Stephen J. Field, of the Supreme Court of the United States; and the writer of the present volume.

To get some light in his perplexity, Mr. Field, the very next morning after his interview with Gisborne, wrote two letters, one to Lieutenant Maury, then at the head of the National Observatory at Washington, on the nautical difficulties of the undertaking, asking if the sea were itself a barrier too great to be overcome; and the other to Professor Morse, inquiring if it would be possible to telegraph over a distance so great as that from Europe to America?

The mail soon brought an answer from Lieutenant Maury, which began: "Singularly enough, just as I received your letter, I was closing one to the Secretary of the Navy on the same subject." A copy of this he inclosed to Mr. Field, and it is given here. It shows the conclusions at which, even at that early day, scientific men were beginning to arrive:

"National Observatory,
Washington, February 22, 1854.

"Sir: The United States brig Dolphin, Lieutenant Commanding O. H. Berryman, was employed last summer upon especial service connected with the researches that are carried on at this office concerning the winds and currents of the sea. Her observations were confined principally to that part of the ocean which the merchantmen, as they pass to and fro upon the business of trade between Europe and the United States, use as their great thoroughfare. Lieutenant Berryman availed himself of this opportunity to carry along also a line of deep-sea soundings, from the shores of Newfoundland to those of Ireland. The result is highly interesting, in so far as the bottom of the sea is concerned, upon the question of a submarine telegraph across the Atlantic; and I therefore beg leave to make it the subject of a special report.

"This line of deep-sea soundings seems to be decisive of the question of the practicability of a submarine telegraph between the two continents, *in so far as the bottom of the deep sea is concerned*. From Newfoundland to Ireland, the distance between the nearest points is about sixteen hundred miles;[4] and the bottom of the sea between the two places is a plateau, which seems to have been placed there especially for the purpose of holding the wires of a submarine telegraph, and of keeping them out of harm's way. It is neither too deep nor too shallow; yet it is so deep that the wires but once landed, will remain for ever beyond the reach of vessels' anchors, icebergs, and drifts of any kind, and so shallow, that the wires may be readily lodged upon the bottom. The depth of this plateau is quite regular, gradually increasing from the shores of Newfoundland to the depth of from fifteen hundred to two thousand fathoms, as you approach the other side. The distance between Ireland and Cape St. Charles, or Cape St. Lewis, in Labrador, is somewhat less than the distance from any point of Ireland to the nearest point of Newfoundland. But whether it would be better to lead the wires from Newfoundland or Labrador is not now the question; nor do I pretend to consider the question as to the possibility of finding *a time calm enough, the sea smooth enough, a wire long enough, a ship big enough*, to lay a coil of wire sixteen hundred miles in length: though I have no fear but that the enterprise and ingenuity of the age, whenever called on with these problems, will be ready with a satisfactory and practical solution of them.

"I simply address myself at this time to the question in so far as *the bottom of the sea* is concerned, and as far as that, the greatest practical difficulties will, I

[4] From Cape Freels, Newfoundland, to Erris Head, Ireland, the distance is sixteen hundred and eleven miles; from Cape Charles, or Cape St. Lewis, Labrador, to the same point, the distance is sixteen hundred and one miles.

apprehend, be found after reaching soundings at either end of the line, and not in the deep sea…

"A wire laid across from either of the above-named places on this side will pass to the north of the Grand Banks, and rest on that beautiful plateau to which I have alluded, where the waters of the sea appear to be as quiet and as completely at rest as at the bottom of a mill-pond. It is proper that the reasons should be stated for the inference that there are no perceptible currents, and no abrading agents at work at the bottom of the sea upon this telegraphic plateau. I derive this inference from a study of a physical fact, which I little deemed, when I sought it, had any such bearings.

"Lieutenant Berryman brought up with Brooke's deep-sea sounding apparatus specimens of the bottom from this plateau. I sent them to Professor Bailey, of West Point, for examination under his microscope. This he kindly gave, and that eminent microscopist was quite as much surprised to find, as I was to learn, that all those specimens of deep-sea soundings are filled with microscopic shells; to use his own words, *not a particle of sand or gravel exists in them*. These little shells, therefore, suggest the fact that there are no currents at the bottom of the sea whence they came; that Brooke's lead found them where they were deposited in their burial-place after having lived and died on the surface, and by gradually sinking were lodged on the bottom. Had there been currents at the bottom, these would have swept and abraded and mingled up with these microscopic remains the *débris* of the bottom of the sea, such as ooze, sand, gravel, and other matter; but not a particle of sand or gravel was found among them. Hence the inference that these depths of the sea are not disturbed either by waves or currents. Consequently, a telegraphic wire once laid there, there it would remain, as completely beyond the reach of accident as it would be if buried in air-tight cases. Therefore, so far as the bottom of the deep sea between Newfoundland, or the North Cape, at the mouth of the St. Lawrence, and Ireland, is concerned, the practicability of a submarine telegraph across the Atlantic is proved…

"In this view of the subject, and for the purpose of hastening the completion of such a line, I take the liberty of suggesting for your consideration the propriety of an offer from the proper source, of a prize to the company through whose telegraphic wire the first message shall be passed across the Atlantic.

"I have the honor to be respectfully yours.

"M. F. Maury,

"Lieutenant United States Navy.

"Hon. J. C. Dobbin, Secretary of the Navy."

The reply of Professor Morse showed equal interest in the subject, in proof of which he wrote that he would come down to New York to see Mr. Field about it. A few days after he came, and saw Mr. Field at his house. This was the beginning of an acquaintance which soon ripened into friendship, and which henceforth united these gentlemen together in this great achievement. Professor Morse, in conversation, entered at length into the laws of electricity as applied to the business of telegraphing, and concluded by declaring his entire faith in the undertaking as practical; as one that might, could, and would, be achieved. Indeed, this faith he had avowed years before. In a letter written as early as August tenth, 1843, to John C. Spencer, then Secretary of the Treasury, Professor Morse had detailed the results of certain experiments made in the harbor of New York to show the power of electricity to communicate at great distances, at the close of which he says – in words that now seem prophetic:

> "The practical inference from this law is, that a telegraphic communication on the electro-magnetic plan may with certainty be established across the Atlantic Ocean! Startling as this may now seem, I am confident the time will come when this project will be realized."

It was the good fortune of Mr. Field – at that time and ever since – to have at hand an adviser in whose judgment he had implicit confidence. This was his eldest brother, David Dudley Field. They lived side by side on Gramercy Park, and were in daily communication. To the prudent counsels, wise judgment and unfaltering courage of the elder brother, the Atlantic Telegraph is more indebted than the world will ever know, for its first impulse and for the spirit which sustained it through long years of discouragement and disaster, when its friends were few. To this, his nearest and best counsellor, Mr. Field opened the project which had taken possession of his mind; and being strengthened by that maturer judgment, he finally resolved that, if he could get a sufficient number of capitalists to join him, he would embark in an enterprise which, beginning with the line to Newfoundland, involved in the end nothing less than an attempt to link this New World which Columbus had discovered, to that Old World which had been for ages the home of empire and of civilization. How the scheme advanced through the next twelve years, it will be our province to relate.

CHAPTER III.
THE COMPANY ORGANIZED

And so the young New York merchant set out to carry a telegraph across the Atlantic Ocean! The design had in it at least the merit of audacity. But whether the end was to be sublime or ridiculous time alone could tell. Certain it is that when his sanguine temper and youthful blood stirred him up to take hold of such an enterprise, he little dreamed of what it would involve. He thought lightly of a few thousands risked in an uncertain venture; but never imagined that he might yet be drawn on to stake upon its success the whole fortune he had accumulated; that he was to sacrifice all the peace and quiet he had hoped to enjoy; and that for twelve years he was to be almost without a home, crossing and re-crossing the sea, urging his enterprise in Europe and America. But so it is, that the Being who designs great things for human welfare, and would accomplish them by human instruments, does not lift at once the curtain from the stern realities they are to meet, nor reveal the rugged ascents they are to climb; so that it is only when at last the heights are attained, and they look backward, that they realize through what they have passed.

But could he find anybody to join him in his bold undertaking? Starving adventurers there always are, ready to embark in any Quixotic attempt, since they have nothing to lose. But would men of sense and of character; men who had fortunes to keep, and the habit which business gives of looking calmly and suspiciously at probabilities; be found to put capital in an enterprise where, if it failed, they would find their money literally at the bottom of the sea? It seemed doubtful, but he would try. His plan was, if possible, to enlist ten capitalists, all gentlemen of wealth, who together could lift a pretty heavy load; who, if need were, could easily raise a million of dollars, to carry out any undertaking.

The first man whom he addressed was his next-door neighbor, Mr. Peter Cooper, in whom he found the indisposition which a man of large fortune – now well advanced in life – would naturally feel to embark in new enterprises. The reluctance in this case was not so much to the risking of capital, as to having his mind occupied with the care which it would impose. These objections slowly yielded to other considerations. As they talked it over, the large heart of Mr. Cooper began to see that, if it were possible to accomplish such a work, it would be a great public benefit. This consideration prevailed, and what would not have been undertaken as a private speculation, was yielded to public interest. The conference ended by a conditional agreement to engage in it, if several others did, and, as we shall see, when the Company was organized, he became its President.

The early accession of this gentleman gave strength to the new enterprise. In all the million inhabitants of the city of New York there was not a name which was better known, or more justly held in honor, than that of Peter Cooper. A native of the city, where he had passed his whole life, he had seen its growth, from the small town it was after the War of the Revolution, and had himself grown with it. Beginning with very small means and limited opportunities, he had become one of its great capitalists. Many who thus rise to wealth, in the process of accumulation, form penurious habits which cling to them, and to the end of their days it is the chief object of life to hoard and to keep. But Mr. Cooper, while acquiring the fortune, had also the heart of a prince; and used his wealth with a noble generosity. In the centre of New York stands to-day a massive building, erected at a cost of nearly a million of dollars, and consecrated "To Science and Art." This was Mr. Cooper's gift to his native city. Remembering his own limited advantages of education, he desired that the young men of New York, the apprentices and mechanics, should have better opportunities than he had enjoyed. For this he endowed courses of lectures on the natural sciences; he opened the largest reading-room in America, which furnishes a pleasant resort to thousands of readers daily; while to help the other sex, he added a School of Design for Women, which trains hundreds to be teachers, and some of them

artists; who go forth into the world to earn an honest living, and to bless the memory of their generous benefactor. This noble institution, standing in the heart of the city, is his enduring monument.

Yet while doing so much for the public, those who saw Peter Cooper in his family knew how he retained the simple habits of early life – how, while giving hundreds of thousands to others, he cared to spend little on himself; how he remained the same modest, kindly old man; the pure, the generous, and the good. His was and that was sadly missed when, nearly thirty years after, in 1883, at the age of ninety-two, he was borne to his grave. It is a pleasant remembrance that the beginning of this enterprise was connected with that honored name.

"The good gray head that all men knew,"

Mr. Field next addressed himself to Mr. Moses Taylor, a well-known capitalist of New York, engaged in extensive business reaching to different parts of the world, and whose daily observation of all sorts of enterprises, both sound and visionary, made him perhaps a severer judge of any new scheme. With this gentleman he had then no personal acquaintance, but sent a note of introduction from his brother, David Dudley Field, with a line requesting an interview, to which Mr. Taylor replied by an invitation to his house on an evening when he should be disengaged. As these two gentlemen afterwards became very intimately associated, they often recurred to their first interview. Said Mr. Field: "I shall never forget how Mr. Taylor received me. He fixed on me his keen eye, as if he would look through me: and then, sitting down, he listened to me for nearly an hour without saying a word." This was rather an ominous beginning. However, his quick mind soon saw the possibilities of the enterprise, and the evening ended by an agreement – conditional, like Mr. Cooper's – to enter into it.

Mr. Taylor, being thus enlisted, brought in his friend, Mr. Marshall O. Roberts – a man whose career has been too remarkable to be passed without notice. A native of the City of New York, (though his father was a physician from Wales, who came to this country early in this century,) he found himself, when a boy of eight years, an orphan, without a friend in the world. From that time he made his way purely by his own industry and indomitable will. At the age of twenty he was embarked in business for himself, and his history soon became a succession of great enterprises. If we were to relate some of the incidents connected with his rise of fortune, they would sound more like romance than reality. He was the first to project those floating palaces which now ply the waters of the Hudson and the great lakes. He was one of the early promoters of the Erie Railroad. When the discovery of gold in California turned the tide of emigration to that coast, he started the line of steamers to the Isthmus of Panama, and controlled largely the commerce with the Pacific. Thus his hand was felt, giving impulse to many different enterprises on land and sea. His whole course was marked by a spirit of commercial daring, which men called rashness, until they saw its success, and then applauded as marvellous sagacity.

Mr. Field next wrote to Mr. Chandler White, a personal friend of many years' standing, who had retired from business, and was living a few miles below the city, near Fort Hamilton, at one of those beautiful points of view which command the whole harbor of New York. He too was very slow to yield to argument or persuasion. Why should he – when he had cast anchor in this peaceful spot – again embark in the cares of business, and, worst of all, in an enterprise the scene of which was far distant, and the results very uncertain? But enthusiasm is always magnetic, and the glowing descriptions of his persuader at length prevailed.[5]

There were now five gentlemen enlisted; and Mr. Field was about to apply to others, to make up his proposed number, when Mr. Cooper came to ask why *five* would not do as well as *ten*? The question was no sooner asked than answered. To this all agreed, and at once fixed an evening when

[5] Although it is anticipating a year in time, I cannot resist the pleasure of adding here the name of another eminent merchant, who afterward joined this little Company, Mr. Wilson G. Hunt. Mr. Hunt is one of the old merchants of New York who, through his whole career, has maintained the highest reputation for commercial integrity, and whose fortune is the reward of a long life of honorable industry. He joined the Company in 1855, and was a strong and steady friend through all its troubles till the final success.

they should meet at Mr. Field's house to hear his statements and to examine the charter of the old company, find out what it had done, and what it proposed to do, what property it had and what debts it owed; and decide whether the enterprise offered sufficient inducements to embark in it. Accordingly they met, and for four nights in succession discussed the subject. It was in the dining-room of Mr. Field's house, and the large table was spread with maps of the route to be traversed by the line of telegraph, and with plans and estimates of the work to be done, the cost of doing it, and the return which they might hope in the end to realize for their labor and their capital. The result was an agreement on the part of all to enter on the undertaking, if the Government of Newfoundland would grant a new charter conceding more favorable terms. To secure this it was important to send at once a commission to Newfoundland. Neither Mr. Cooper, Mr. Taylor, nor Mr. Roberts could go; and it devolved on Mr. Field to make the first voyage on this business, as it did to make many voyages afterwards to Newfoundland, and still more across the Atlantic. But not wishing to take the whole responsibility, he was accompanied at his earnest request by Mr. White, and by Mr. D. D. Field, whose counsel, as he was to be the legal adviser of the Company, was all-important in the framing of the new charter that was to secure its rights. The latter thus describes this first expedition:

> "The agreement with the Electric Telegraph Company, and the formal surrender of its charter, were signed on the tenth of March, [1854,] and on the fourteenth we left New York, accompanied by Mr. Gisborne. The next morning we took the steamer at Boston for Halifax, and thence, on the night of the eighteenth, departed in the little steamer Merlin for St. John's, Newfoundland. Three more disagreeable days, voyagers scarcely ever passed, than we spent in that smallest of steamers. It seemed as if all the storms of winter had been reserved for the first month of spring. A frost-bound coast, an icy sea, rain, hail, snow and tempest, were the greetings of the telegraph adventurers in their first movement toward Europe. In the darkest night, through which no man could see the ship's length, with snow filling the air and flying into the eyes of the sailors, with ice in the water, and a heavy sea rolling and moaning about us, the captain felt his way around Cape Race with his lead, as the blind man feels his way with his staff, but as confidently and as safely as if the sky had been clear and the sea calm; and the light of morning dawned upon deck and mast and spar, coated with glittering ice, but floating securely between the mountains which form the gates of the harbor of St. John's. In that busy and hospitable town, the first person to whom we were introduced was Mr. Edward M. Archibald, then Attorney-General of the Colony, and now British Consul in New York. He entered warmly into our views, and from that day to this, has been an efficient and consistent supporter of the undertaking. By him we were introduced to the Governor, (Kerr Bailey Hamilton,) who also took an earnest interest in our plans. He convoked the Council to receive us, and hear an explanation of our views and wishes. In a few hours after the conference, the answer of the Governor and Council was received, consenting to recommend to the Assembly a guarantee of the interest of £50,000 of bonds, an immediate grant of fifty square miles of land, a further grant to the same extent on the completion of the telegraph across the ocean, and a payment of £5,000 toward the construction of a bridle-path across the island, along the line of the land telegraph."

This was a hopeful beginning; and, though the charter was not yet obtained, feeling assured by this official encouragement, and the public interest in the project, that it would be granted by the colony, Mr. Field remained in St. John's but three days, when he took the Merlin back to Halifax on his way to New York, there to purchase and send down a steamer for the service of the Company, leaving his associates to secure the charter and to carry out the arrangements with the former company. To

settle all these details was necessarily a work of time. First, the charter of the old Electric Telegraph Company had to be repealed, to clear the way for a new charter to the Company, which was to bear the more comprehensive title of "New York, Newfoundland, *and London*." This charter – which had been drawn with the greatest care by the counsel of the Company, while on the voyage to Newfoundland – bore on its very front the declaration that the plans of the new Company were much broader than those of the old. In the former charter, the design was thus set forth:

> "The telegraph line of this company is designed to be strictly an 'Inter-Continental Telegraph.' Its termini will be New York, in the United States, and London, in the kingdom of Great Britain; these points are to be connected by a line of electric telegraph from New York to St. John's, Newfoundland, partly on poles, partly laid in the ground, and partly through the water, *and a line of the swiftest steamships ever built from that point to Ireland*. The trips of these steamships, it is expected, will not exceed five days, and as very little time will be occupied in transmitting messages between St. John's and New York, the communication between the latter city and London or Liverpool, will be effected *in six days*, or less. The company will have likewise stationed at St. John's a steam yacht, for the purpose of intercepting the European and American steamships, so that no opportunity may be lost in forwarding intelligence in advance of the ordinary channels of communication."

But the charter of the New York, Newfoundland, and London Telegraph Company, which was now to be obtained, began by declaring, in its very first sentence: "Whereas it is deemed advisable to establish a line of telegraphic communication between America and Europe by way of Newfoundland." Not a word is said of fast ships, of communications in less than six days, but every thing points to a line across the ocean. Thus one section gives authority to establish a submarine telegraph across the ocean, from Newfoundland to Ireland; another section prohibits any other company or person from touching the coast of Newfoundland or its dependencies [which includes Labrador] with a telegraphic cable or wire, from any point whatever, for fifty years; and a third section grants the Company fifty square miles of land upon the completion of the submarine line across the Atlantic.

In other respects the charter was equally liberal. It incorporated the associates for fifty years, established perfect equality, in respect to corporators and officers, between citizens of the United States and British subjects, and allowed the meetings of the stockholders and directors to be held in New York, in Newfoundland, or in London.

To obtain such concessions was a work of some difficulty and delay. The Legislature of the province were naturally anxious to scan carefully conditions that were to bind them and their children for half a century. I have now before me the papers of St. John's of that day, containing the discussions in the Legislature; and while all testify to the deep public interest in the project, they show a due care for the interests of their own colony, which they were bound to protect. At length all difficulties were removed, and the charter was passed unanimously by the Assembly, and confirmed by the Council.

This happy result was duly celebrated, in the manner which all Englishmen approve, by a grand dinner given by the commissioners of the new Company, to the members of the Assembly and other dignitaries of the colony, at which there were eloquent prophecies of the good time coming, showing how heartily the enterprise was welcomed by all classes; and how fond were the anticipations of the increased intercourse it would bring, and the manifold benefits it would confer on their long-neglected island.

No sooner were the papers signed, than the wheels, so long blocked, were unloosed, and the machinery began to move. Mr. White at once drew on New York for fifty thousand dollars, and paid off all the debts of the old company. A St. John's newspaper of April 8th, 1854, amid a great deal on

the subject, contains this paragraph, which is very significant of the dead state of the old company, and of the life of the new:

> "The office of the new Electric Telegraph Company has been surrounded the last two or three days by the men who had been engaged the last year on the line, and who are being paid all debts, dues, and demands against the old association. We look upon the readiness with which these claims are liquidated as a substantial indication on the part of the new Company that they will complete to the letter all that they have declared to accomplish in this important undertaking."

In the early part of May, the two gentlemen who had remained behind in Newfoundland rejoined their associates in New York, and there the charter was formally accepted and the Company organized. As all the associates had not arrived till Saturday evening, the 6th of May, and as one of them was to leave town on Monday morning, it was agreed that they should meet for organization at six o'clock of that day. At that hour they came to the house of Mr. Field's brother Dudley, and as the first rays of the morning sun streamed into the windows, the formal organization took place. The charter was accepted, the stock subscribed, and the officers chosen. Mr. Cooper, Mr. Taylor, Mr. Field, Mr. Roberts, and Mr. White were the first directors. Mr. Cooper was chosen President, Mr. White, Vice-President, and Mr. Taylor, Treasurer.

This is a short story, and soon told. It seemed a light affair, for half a dozen men to meet in the early morning and toss off such a business before breakfast. But what a work was that to which they thus put their hands! A capital of a million and a half of dollars was subscribed in those few minutes, and a company put in operation that was to carry a line of telegraph to St. John's, more than a thousand miles from New York, and then to span the wild sea. Well was it that they who undertook the work did not then fully realize its magnitude, or they would have shrunk from the attempt. Well was it for them that the veil was not lifted, which shut from their eyes the long delay, the immense toil, and the heavy burdens of many wearisome years. Such a prospect might have chilled the most sanguine spirit. But a kind Providence gives men strength for their day, imposes burdens as they are able to bear them, and thus leads them on to greater achievements than they knew.

CHAPTER IV.
CROSSING NEWFOUNDLAND

There is nothing in the world easier than to build a line of railroad, or of telegraph, *on paper*. You have only to take the map, and mark the points to be connected, and then with a single sweep of the pencil to draw the line along which the iron track is to run. In this airy flight of the imagination, distances are nothing. A thousand leagues vanish at a stroke. All obstacles disappear. The valleys are exalted, and the hills are made low, soaring arches span the mountain streams, and the chasms are leaped in safety by the fire-drawn cars.

Very different is it to construct a line of railroad or of telegraph in reality; to come with an army of laborers, with axes on their shoulders to cut down the forests, and with spades in their hands to cast up the highway. Then poetry sinks to prose, and instead of flying over the space on wings, one must traverse it on foot, slowly and with painful steps. Nature asserts her power; and, as if resentful of the disdain with which man in his pride affected to leap over her, she piles up new barriers in his way. The mountains with their rugged sides cannot be moved out of their place, the rocks must be cleft in twain, to open a passage for the conqueror, before he can begin his triumphal march. The woods thicken into an impassable jungle; and the morass sinks deeper, threatening to swallow up the horse and his rider; until the rash projector is startled at his own audacity. Then it becomes a contest of forces between man and nature, in which, if he would be victorious, he must fight his way. The barriers of nature cannot be lightly pushed aside, but must yield at last only to time and toil, and "man's unconquerable will."

Seldom have all these obstacles been combined in a more formidable manner to obstruct any public work, than against the attempt to build a telegraph line across the island of Newfoundland. The distance, by the route to be traversed, was over four hundred miles, and the country was a wilderness, an utter desolation. Yet through such a country, over mountain and moor, through tangled brake and rocky gorge, over rivers and through morasses, they were to build a road – not merely a line of telegraph stuck on poles, but "a good and traversable bridle-road, eight feet wide, with bridges of the same width," from end to end of the island.

But nothing daunted, the new Company undertook the great work with spirit and resolution. Gisborne had made a beginning, and got some thirty or forty miles out of St. John's. This was the easiest part of the whole route, being in the most inhabited region of the island. But here he broke down, just where it was necessary to leave civilization behind, and to plunge into the wilderness.

Intending to resume the work on a much larger scale, Mr. White, the Vice-President, was sent down to St. John's to be the General Agent of the Company; while Mr. Matthew D. Field, as a practical engineer, was to have charge of the construction of the line. The latter soon organized a force of six hundred men, which he pushed forward in detachments to the scene of operations.

And now began to appear still more the difficulties of the way. To provide subsistence for man and beast, it was necessary to keep near the coast, for all supplies had to be sent round by sea. Yet in following the coast line, they had to wind around bays, or to climb over headlands. If they struck into the interior, they had to cut their way through the dense and tangled wood. There was not a path to guide them, not even an Indian trail. When lost in the forest, they had to follow the compass, as much as the mariner at sea.

To keep such a force in the field, that, like an army, produced nothing, but consumed fearfully, required constant attention to the commissary department. The little steamer Victoria, which belonged to the Company, was kept plying along the coast, carrying barrels of pork and potatoes, kegs of powder, pickaxes and spades and shovels, and all the implements of labor. These

were taken up to the heads of the bays, and thence carried, chiefly on men's backs, over the hills to the line of the road.

In many respects, it had the features of a military expedition. It moved forward in a great camp. The men were sheltered in tents, when sheltered at all, or in small huts which they built along the road. But more often they slept on the ground. It was a wild and picturesque sight to come upon their camp in the woods, to see their fires blazing at night while hundreds of stalwart sleepers lay stretched on the ground. Sometimes, when encamped on the hills, they could be seen afar off at sea. It made a pretty picture then. But the hardy pioneers thought little of the figure they were making, when they were exposed to the fury of the elements. Often the rain fell in torrents, and the men, crouching under their slight shelter, listened sadly to the sighing of the wind among the trees, answered by the desolate moaning of the sea.

Yet in spite of all obstacles, the work went on. All through the long days of summer, and through the months of autumn, every cove and creek along that southern coast heard the plashing of their oars, and the steady stroke of their axes resounded through the forest.

But as the season advanced, all these difficulties increased. For nearly half the year, the island is buried in snow. Blinding drifts sweep over the moors, and choke up the paths of the forest. How at such times the expedition lay floundering in the woods, still struggling to force its way onward; what hardships and sufferings the men endured – all this is a chapter in the History of the Telegraph which has not been written, and which can never be fully told. The

> Gentlemen of England,
> Who dwell at home at ease,

and who are justly proud of the extent of their dominions, and the life and power which pervade the whole, may here find another example of the way in which great works are borne forward in distant parts of their empire.

But to carry out such an enterprise, requires head-work as well as hand-work. Engineering in the field must be supported by financiering at home. It was here the former enterprise broke down, and now it needed constant watching to keep the wheels in steady motion. The directors in New York found the demand increasing day by day. The minds which had grasped the large design must now descend to an infinity of detail. They had to keep an army of men at work, at a point a thousand miles away, far beyond their immediate oversight. Drafts for money came thick and fast. To provide for all these required constant attention. How faithfully they gave to this enterprise, not only their money, but their time and thought, few will know; but those who have seen can testify. In the autumn of that year, 1854, the writer removed to the city of New York, and was almost daily at the house of Mr. Field. Yet for months it was hardly possible to go there of an evening without finding the library occupied by the Company. Indeed, so uniformly was this the case, that "The Telegraph" began to be regarded by the family as an unwelcome intruder, since it put an interdict on the former social evenings and quiet domestic enjoyment. The circumstance shows the ceaseless care on the part of the directors which the enterprise involved. As a witness of their incessant labor, it is due to them to bear this testimony to their patience and their fidelity.

When they began the work, they hoped to carry the line across Newfoundland in one year, completing it in the summer of 1855. In anticipation of this, Mr. Field was sent by the Company to England at the close of 1854, to order a cable to span the Gulf of St. Lawrence, to connect Cape Ray with the island of Cape Breton. This was his first voyage across the ocean on the business of the Telegraph – to be followed by more than forty others. In London he met for the first time Mr. John W. Brett, with whom he was to be afterward connected in the larger enterprise of the Atlantic Telegraph. Mr. Brett was the father of submarine telegraphy in Europe, though in carrying out his first projects he was largely indebted to Mr. Crampton, a well-known engineer of London, who aided him both

with advice and capital. With this invaluable assistance, he had stretched two lines across the British channel. From his success in passing these waters, he believed a line might yet be stretched from continent to continent. The scientific men of England were not generally educated up to that point. The bare suggestion was received with a smile of incredulity.[6] But Mr. Brett had faith, even at that early day, and entered heartily into the schemes of Mr. Field. To show his interest, he afterward took a few shares in the Newfoundland line – the only Englishman who had any part in this preliminary work.

The summer came, and the work in Newfoundland, though not complete, was advancing; and the cable in England was finished and shipped on board the bark Sarah L. Bryant to cross the sea. Anticipating its arrival, the Company chartered a steamer to go down to Newfoundland to assist in its submersion across the Gulf of St. Lawrence. As yet they had no experience in the business of laying a submarine telegraph, and did not doubt that the work could be accomplished with the greatest ease. It was therefore to be an excursion of pleasure as well as of business, and accordingly they invited a large party to go with them to witness the unaccustomed spectacle.

As we chanced to be among the guests, we have the best reason to remember it. Seldom has a more pleasant party been gathered for any expedition. Representing the Company were Mr. Field, Mr. Peter Cooper, Mr. Robert W. Lowber, and Professor Morse; while among the invited guests were gentlemen of all professions – clergymen, doctors and lawyers, artists and editors. In the groups on the deck were the venerable Dr. Gardiner Spring and Rev. J. M. Sherwood; Dr. Lewis A. Sayre, Bayard Taylor, the well-known traveller, Mr. Fitz-James O'Brien, and Mr. John Mullaly – the three latter gentlemen representing leading papers of New York.[7] Besides these, the party included a large number of ladies, who gave life and animation to the company.

Well does the writer recall the morning of departure – the seventh day of August, 1855. Never did a voyage begin with fairer omens. It was a bright summer day. The sky was clear, and the water smooth. We were on the deck of the good ship James Adger, long known as one of the fine steamers belonging to the Charleston line. She was a swift ship, and cut the water like an arrow. Thus we sped down the bay, and turning into the ocean, skimmed along the shores of Long Island. The sea was tranquil as a lake. The whole party were on deck, scattered in groups here and there, watching the sails and the shore. A rude telegraph instrument furnished entertainment and instruction, especially as we had Professor Morse to explain his marvellous invention, which some who listened then for the first time understood.

At Halifax, several of us left the ship, and came across Nova Scotia, passing through that lovely region of Acadia which Longfellow has invested with such tender interest in his poem of Evangeline. Thence we crossed the Bay of Fundy to St. John in New Brunswick, and returned by way of Portland.

The James Adger went on to Newfoundland, steering first for Port au Basque, near Cape Ray, where they hoped to meet the bark which was to come from England with the cable on board. To

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[6] One or two exceptions there were, not to be forgotten. Professor William Thomson, of the University of Glasgow, then a young man, but full of the enthusiasm of science, was already prepared to welcome such a project, with confidence of success. As early as October and November, 1854, he wrote to the Secretary of the Royal Society of London, declaring his belief in its practicability. The letters are published in the Proceedings of the Royal Society for 1855. Such faith was not visionary, for it was based on clearer knowledge and more thorough investigation, and gave promise of those eminent services which this gentleman was afterwards to render to the cause of electrical science. Mr. C. F. Varley, also, was one of the first to perceive the possibility of an ocean telegraph, as he was to contribute greatly to its final success.

[7] The letters of Mr. Taylor, which first appeared in The New York Tribune have been since collected in one of his volumes of travel. Mr. O'Brien, a very brilliant writer, who afterward fell in our civil war, fighting bravely for his adopted country, furnished some spirited letters to The Times. But Mr. Mullaly, who appeared for The Herald, was the most persevering attendant on the Telegraph, and the most indefatigable correspondent. He accompanied not only this expedition, but several others. He was on board the Niagara in 1857, and again in both the expeditions of 1858; and on the final success of the cable, prepared a volume, which was published by the Appletons, giving a history of the enterprise. This contains the fullest account of all those expeditions which has been given to the public. I have had frequent occasion to refer to his book, and can bear witness to the interest of the narrative. It is written with spirit, and doubtless would have had a longer life, if the cable itself had not come to an untimely end.

their disappointment, it had not arrived. Mr. Canning, the engineer who was to lay the cable, had come out by steamer, and was on hand, but the bark was not to be seen. Having to wait several days, and wishing to make the most of their time, they sailed for St. John's, where they were received by the Provincial Government and the people with unbounded hospitality, after which they returned to Port au Basque, and were now rejoiced to discover the little bark hidden behind the rocks. It was decided to land the cable in Cape Ray Cove. After a day or two's delay in getting the end to the shore, they started to cross the Gulf of St. Lawrence, the Adger towing the bark. The sea was calm, and though they were obliged to move slowly, yet all promised well, till they were about half-way across, when a gale arose, which pitched the bark so violently, that with its unwieldy bulk it was in great danger of sinking. After holding on for hours in the vain hope that it would abate, the captain cut the cable to save the bark; and thus, after they had paid out forty miles, it was hopelessly lost, and the Adger returned to New York.

This loss was owing partly to the severity of the gale, and partly to the fact that the bark which had the cable on board was wholly unfitted for the purpose. It was a sailing-vessel, and had to be towed by another ship. In this way it was impossible to regulate its motion. It was too fast or too slow. It was liable to be swayed by the sea, now giving a lurch ahead, and now dragging behind. Experience showed that a cable should always be laid from a steam vessel which could regulate its own motion, running out freely when all went smoothly, and checking its speed instantly when it was necessary to ease up the strain, or to pay out more slack to fill up the hollows of the sea.

This first loss of a submarine cable was a severe disappointment to the Company. It postponed the enterprise for a whole year. To make a new cable would require several months, and the season was so far advanced that it could not be laid before another summer. Was it strange if some of the little band began to ask if they had not lost enough, and to reason that it was better to stop where they were, than to go on still farther, casting their treasures into the sea?

But there was in that little company a spirit of hope and determination that could not be subdued; that ever cried: "Once more unto the breach, good friends!" After some deliberation, it was resolved to renew the attempt. Mr. Field again sailed for England to order another cable, which was duly made and sent out the following summer. This time, warned by experience, the Company invited no party and made no display. The cable was placed on board a steamer fitted for the purpose; from which it was laid without accident, and remained in perfect working order for nine years.

Meanwhile the work on land had been pushed forward without ceasing. After incredible labor, the Company had built a road and a telegraph from one end of Newfoundland to the other, four hundred miles; and, as if that were not enough, had built also another line, one hundred and forty miles in length, in the island of Cape Breton. The first part of their work was now done. The telegraph had been carried beyond the United States through the British Provinces to St. John's in Newfoundland, a distance from New York of over one thousand miles.

The cost of the line, thus far, had been about a million of dollars, and of this the whole burden, with but trifling exceptions, had fallen upon the original projectors – Mr. Field having put in over two hundred thousand dollars in money – and Mr. Cooper, Mr. Taylor, and Mr. Roberts each a little less. No other contributors beyond the six original subscribers had come, except Professor Morse, Mr. Robert W. Lowber, Mr. Wilson G. Hunt, and Mr. John W. Brett. The list of directors and officers remained as it was at first, except that this year, 1856, Mr. White died, and his place as director was filled by Mr. Hunt, and that Mr. Field was chosen Vice-President, and Mr. Lowber Secretary. In all the operations of the Company thus far, the various negotiations, the plan of the work, the oversight of its execution, and the correspondence with the officers and others, mainly devolved upon Mr. Field.

And so at length, after two long and weary years, these bold projectors had accomplished half their work. They had passed over the land, and under the Gulf of St. Lawrence, and having reached the farthest point of the American coast, they now stood upon the cliffs of Newfoundland, looking off upon the wide sea.

CHAPTER V.
THE DEEP-SEA SOUNDINGS

When a landsman, born far away among the mountains, comes down to the coast, and stands for the first time on the shore of the sea, it excites in him a feeling of awe and wonder, not unmingled with terror. There it lies, a level surface, with nothing that lifts up its head like a peak of his native hills. And yet it is so vast, stretching away to the horizon, and all over the sides of the round world; with its tides and currents that sweep from the equator to the pole; with its unknown depths and its ceaseless motion; that it is to him the highest emblem of majesty and of power – a not unworthy symbol of God himself.

In proportion to its mystery is the terror which hangs over it. A vague dread always surrounds the unknown. And what so unknown as the deep, unfathomable sea? For thousands of years the sails of ships, like winged birds, have skimmed over it, yet it has remained the one thing in nature beyond alike man's knowledge and his power:

> Man marks the earth with ruin,
> His control stops with the shore.

And the little that has been known of the ocean has been chiefly of its surface, of the winds that blow over it, and the waves that are lifted up on high. We knew somewhat of its tides and currents as observed in different parts of the earth. We saw off our coast the great Gulf Stream – that steady flow of waters, so mighty and mysterious, which, issuing out of the tropical regions, poured its warm current, sixty miles broad, right through the cold waters of the North Atlantic; and sweeping round, sent the airs of a softer climate over all the countries of Western Europe. Old voyagers told us of the trade-winds that blew across the Pacific, and of terrible monsoons in China and Indian seas. But all that did not reveal what was going on a hundred fathoms below the surface. These old sailors had marvellous tales of Indian pearl-divers, who, holding their breath, plunged to the depth of a few hundred feet; but they came up half-dead, with but little to tell except of the frightful monsters of the deep. The diving-bell was let down over sunken wrecks, but the divers came up only with tales of riches and ruin, of gold and gems and dead men's bones that lay mingled together on the deep sea floor. Was the bottom of the sea all like this? Was it a vast realm of death, the sepulchre of the world? No man could tell us. Poets might sing of the caves of ocean, but no eye of science had yet penetrated those awful depths, which the storms never reach.

It is indeed marvellous how little was known, up to a very recent date, of the true character of the ocean. Navigators had often tried to find out how deep it was. When lying becalmed on a tranquil sea, they had amused themselves by letting down a long line, weighted with a cannon-ball, to see if they could touch bottom. But the results were very uncertain. Sometimes the line ran out for miles and miles, but whether it was all the while descending, or was swayed hither and thither by mighty under-currents, could not be known.

But this true character of the ocean it was necessary to determine, before it could be possible to pass the gulf of the Atlantic. What was there on the bottom of the sea, where the cable was to find its resting place? Was that ocean-bed a wide level plain, or had it been heaved up by volcanic forces into a hundred mountain-peaks, with many a gorge and precipice between? Such was the character of a part of the basin of the ocean. Here and there, all over the globe, are islands, like the Peak of Teneriffe, thrown up in some fierce bursting of the crust of our planet, that shoot up in tremendous cliffs from the sea. Who shall say that the same cliffs do not shoot down below the waves a thousand fathoms deep? And might there not be such islands, which did not show their heads above the surface,

lying in the track between Europe and America: or perchance a succession of mountain ranges, over which the cable would have to be stretched, and where hanging from the heights it would swing with the tide, till at last it snapped and fell into the abyss below? Such at least were possible dangers to be encountered; and it was not safe to advance a step till the basin of the North Atlantic was explored.

The progress of invention, so rapid on land, at length found a way of penetrating the sea, and even of turning up its bottom to the gaze of men. To measure the depth with something like mathematical accuracy, an instrument was introduced known among nautical men as Massey's Indicator, the method of which is very clearly explained in an article which appeared in one of the New York papers, (The Times,) on the deep-sea soundings made for the Atlantic Telegraph:

> "The old system is with a small line, marked at distances of one hundred fathoms, and with a weight of thirty or fifty pounds, the depth being told by the length of line run out. This is, of course, the most natural apparatus that suggests itself, and has been in use from the earliest ages. Experience has given directions for its use, avoiding some of the grosser causes of error from driftage and other causes. Yet its success in immense ocean depths is problematical, and a problem decided in the negative by many of the first scientific authorities at home and abroad. In the mechanical improvements of the last half-century substitutes for this simple but rather uncertain method began to be devised. It was proposed to ascertain the depth by the amount of pressure, or by explosions under water, with other equally impracticable plans. At last was noticed the perfect regularity of the movements of a spirally-shaped wheel, on being drawn through the water. Experiments proved that this regularity, when unaffected by other causes, could be relied on with perfect accuracy, and that an arrangement of cog-wheels would register its revolutions with mathematical precision. Very soon it came in use as a ship's log. So perfect was their precision, that they were even introduced in scientific surveys. Base lines, where the nicest accuracy is required, were run with them, and we have the highest authority of the Royal Navy for believing that they never failed. At this point it was proposed to apply them in a perpendicular as well as in a horizontal motion through the water. Massey's apparatus promising to solve those problems of submarine geography left unsolved by the old method of obtaining depth with a simple line and sinker, and this more especially as some causes of error, considerable on the surface, disappear in the still water below."

To make our knowledge of the sea complete, one thing more was wanting – a method not only of reaching the bottom, but of laying hold of it, and bringing it up to the light of day. This was now to be supplied.

It is to the inventive genius of a lieutenant of the United States navy, Mr. J. M. Brooke, that the world owes the means of finding out what is at the bottom of the sea. This is by a very simple contrivance, by which the heavy weight, used to sink the measuring line, *is detached as soon as it strikes bottom*, leaving the line free so that it can be drawn up lightly and quickly to the surface without danger of breaking. Below the weight, and driven by it into the ooze, is a rod, in which is an open valve, that now closes with a spring, by which it catches a cupful of the soil, which is thus brought up to the surface, to be placed under the microscope, and be subjected to the sharp eye of science. With this simple instrument the skilful seaman explores the bottom of the ocean by literally feeling over it. With a long line he dives to the very lowest depths, while the clasp at the end of it is like the tip of the elephant's trunk, serving as a delicate finger with which he picks up sand and shells that lie strewn on the floor of the deep. What important conclusions are derived from this inspection of the bottom of the sea, is well stated by Lieutenant Maury in the letter already quoted.

In happy concurrence with this, as an additional preparation, a partial survey of the Atlantic had been made the very year before this enterprise was begun, in 1853. Lieutenant Berryman was the first who applied this new method of taking deep-sea soundings to that part of the Atlantic lying between Newfoundland and Ireland, with results most surprising and satisfactory. But to remove all doubt it seemed desirable to have a fresh survey. To obtain this, Mr. Field went to Washington and applied to the Government in behalf of the Company for a second expedition.

The request was granted, and the Arctic, under command of the same gallant Lieutenant Berryman, was assigned to this service. He sailed from New York on the eighteenth of July, 1856, and the very next day Mr. Field left on the Baltic for England, to organize the Atlantic Telegraph Company. The Arctic proceeded to St. John's, and thence with a clear eye and a steady hand, this true sailor went "sounding on his dim and perilous way" across the deep. In about three weeks he made the coast of Ireland, having carried his survey along the great circle arc, which the telegraph was to follow as the nearest path from the old world to the new. The result fully confirmed his belief of the existence of a great plateau underneath the ocean, extending all the way from one hemisphere to the other.

I cannot take leave of the name of this gallant officer, who rendered such services to science and to his country, without a word of tribute to his memory. Lieutenant Berryman is in his grave. He died in the navy of his country, worn out by his devotion to her service. When the great civil war broke out, he was placed in a position most painful to a man of large heart, who loved at once his country and the state in which he was born. He was a Southerner, a native of Winchester, Va., and was assigned to duty in the South. At the first attack on Southern forts and arsenals, he was in command of the Wyandotte, in the harbor of Pensacola, in Florida. His officers, who were nearly all Southerners, were in secret sympathy with the rebellion. All the influences around him, both on ship and on shore, were such as might have seduced a weaker man from his loyalty. But, to his honor, he never hesitated for a moment. He stood firm and loyal to his flag. Not knowing whom to trust, he had to keep watch day and night against surprise and treachery. It was the testimony of Lieutenant Slemmer, then in command of Fort Pickens, that but for the ceaseless exertions of Lieutenant Berryman not only the ship but the fort would have been lost. But this service to his country cost him his life. His constant exertions brought on a brain fever, of which he died. His wife, also a native of Winchester, when the war came near her early home, removed to Baltimore, saying that "she would not live under any other flag than that under which her husband had lived and died."

It was to the honor of the American navy, to have led the way in these deep-sea soundings. But after this second voyage of exploration, Mr. Field applied to the British Admiralty, "to make what further soundings might be necessary between Ireland and Newfoundland, and to verify those made by Lieutenant Berryman." It was in response to this application that the Government sent out the following year a vessel to make still another survey of the same ocean-path. This was the steamer Cyclops, which was placed under Lieutenant Commander Joseph Dayman, of the British navy, an officer who had been with Captain Sir James Ross when he made his deep-sea soundings in the South Atlantic in 1840, where he attained a depth of twenty-six hundred and sixty-seven fathoms; and who by his intelligence and zeal, was admirably fitted for the work. To speak now of this *third* survey, is anticipating in time. But it will serve the purpose of unity and clearness in the narrative, to include all these deep-sea soundings in one chapter. He was directed to proceed to the harbor of Valentia in Ireland, and thence to follow, as nearly as possible, along the arc of a great circle to Newfoundland. "The soundings for the first few miles from the coast should be frequent, decreasing as you draw off shore."

These orders were thoroughly executed. Every pains was taken to make the information obtained precise and exact. Whenever a sounding was to be taken, the ship was hove to, and the bow kept as nearly as possible in the same spot, so that the line might descend perpendicularly. This was repeated every few miles until they had got far out into the Atlantic, where the general equality of the depths rendered it necessary to cast the line only every twenty or thirty miles. Thus the survey

was made complete, and the results obtained were of the greatest value in determining the physical geography of the sea.

The conclusions of Commander Dayman confirmed in general those of Lieutenant Berryman, though in comparing the charts prepared by the two, we observe some differences which ought to be noticed. Both agree as to the general character of the bottom of the ocean along this latitude – that it is a vast plain, like the steppes of Siberia. Yet on the chart of Dayman the floor of the sea seems *not such a dead level* as on that of Berryman. (This may be partly owing to a difference of route, as Dayman passed a little to the north of the track of Berryman.) There are more unequal depths, which in the small space of a chart, appear like hills and valleys. Yet when we consider the wide distances passed over, these inequalities seem not greater than the undulations on our Western prairies. "This space," says Dayman, "has been named by Maury the telegraphic plateau, and although by multiplying the soundings upon it, we have depths ranging from fourteen hundred and fifty to twenty-four hundred fathoms, these are comparatively small inequalities in its surface, and present no new difficulty to the project of laying the cable across the ocean. Their importance vanishes when the extent of the space over which they are distributed (thirty degrees of longitude) is considered."

According to Berryman and Dayman both, the ocean in its deepest part on this plateau, measured but two thousand and three or four hundred fathoms, or about fourteen thousand feet – a depth of but little over two and a half miles. This is not great, compared with the enormous depths in other parts of the Atlantic;[8] yet that it is *something* may be realized from the fact that if the Peak of Teneriffe were here "cast into the sea," it would sink out of sight, island, mountain and all, while even the lofty head of Mont Blanc would be lifted but a few hundred feet above the waves.

The only exception to this uniform depth, lies about two hundred miles off the coast of Ireland, where within a space of about a dozen miles, the depth sinks from five hundred and fifty to seventeen hundred and fifty fathoms! "In 14° 48' west," says Dayman, "we have five hundred and fifty fathoms rock, and in 15° 6' west we have seventeen hundred and fifty fathoms ooze. This is the greatest dip in the whole ocean."

"In little more than ten miles of distance a change of depth occurs, amounting to seventy-two hundred feet." This is indeed a tremendous plunge from the hard rock into the slime of the sea.

The same sharp declivity was noticed by Berryman, and has been observed in the several attempts to lay the cable. Thus in the second expedition of 1858, as the Agamemnon was approaching the coast of Ireland, we read in the report of her voyage: "About five o'clock in the evening, the steep submarine mountain which divides the telegraphic plateau from the Irish coast, was reached; and the sudden shallowing of the water had a very marked effect on the cable, causing the strain on, and the speed of it, to lessen every minute. A great deal of slack was paid out to allow for inequalities which might exist, though undiscovered by the sounding-line."

This submarine mountain was then regarded as the chief point of danger in the whole bed of the Atlantic, and as the principal source of anxiety in laying a cable across the ocean. Yet, after all, the ascent or descent of less than a mile and a half in ten miles, is not an impassable grade. More recent soundings reduce this still farther. Captain Hoskins, of the Royal Navy, afterwards made a more careful survey of this precipitous sea bottom, and with results much more favorable. The side of the mountain, it is now said, is not very much steeper than Holborn Hill in London, or Murray Hill in New York.[9] But the best answer to fears on this point, is the fact that in 1857, 1858, and 1865,

[8] "The ocean bed of the North Atlantic is a curious study; in some parts furrowed by currents, in others presenting banks, the accumulations perhaps of the débris of these ocean rivers during countless ages. To the west, the Gulf Stream pours along in a bed from one mile to a mile and a half in depth. To the east of this, and south of the Great Banks, is a basin, eight or ten degrees square, where the bottom attains a greater depression than perhaps the highest peaks of the Andes or Himalayas – six miles of line have failed to reach the bottom! Taking a profile of the Atlantic basin in our own latitude, we find a far greater depression than any mountain elevation on our own continent. Four or five Alleghanies would have to be piled on each other, and on them added Fremont's Peak, before their point would show itself above the surface. Between the Azores and the mouth of the Tagus this decreases to about three miles."

[9] The results obtained are thus summed up in the London Times:"The dangerous part of this course has hitherto been supposed

the cable passed over it without difficulty. In 1857 the Niagara was a hundred miles farther to sea, when the cable broke. In 1865 the strain was not increased more than a hundred pounds. In the final expedition, that of 1866, this declivity was passed over without difficulty or danger.

Next to the depth of the ocean, it was important to ascertain the nature of its bottom. What was it – a vast bed of rock, the iron-bound crust of the globe, hardened by internal fires, and which, bending as a vault over the still glowing centre of the earth, bore up on its mighty arches the weight of all the oceans? or was it mere sand like the sea-shore? or ooze as soft as that of a mill-pond? The pressure of a column of water two miles high would be equal to that of four hundred atmospheres. Would not this weight alone be enough to crush any substance that could reach that tremendous depth? These were questions which remained to be answered, but on which depended the possibility of laying a cable at the bottom of the Atlantic.

By the ingenious contrivance of Lieutenant Brooke, the problem was solved, for we got hold of fragments of the under-coating of the sea; and to our amazement, instead of finding the ocean bound round with thick ribs of granite, its inner lining was found to be soft as a silken vest. The soil brought up from the bottom was not even of the hardness of sand or gravel. It was mere ooze, like that of our rivers, and was as soft as the moss that clings to old, damp stones on the river's brink. At first it was thought by Lieutenant Berryman to be common clay, but being carefully preserved, and subjected to a powerful microscope, it was found to be composed of shells, too small to be discovered by the naked eye!

This was a revelation of the myriad forms of animated existence which fill the sea: a plenitude of life that is more wonderful by contrast. As Maury well puts it: "The ocean teems with life, we know. Of the four elements of the old philosophers – fire, earth, air, and water – perhaps the sea most of all abounds with living creatures. The space occupied on the surface of our planet by the different families of animals and their remains are inversely as the size of the individual. The smaller the animal, the greater the space occupied by his remains. Take the elephant and his remains, or a microscopic animal and his, and compare them. The contrast, as to space occupied, is as striking as that of the coral reef or island with the dimensions of the whale. The graveyard that would hold the corallines is larger than the graveyard that would hold the elephants."3

These little creatures, whose remains were thus found at the bottom of the ocean, probably did not live there, for there all is dark, and shells, like flowers, need the light and warmth of the all-reviving sun. It was their sepulchre, but not their dwelling-place. Probably they lived near the surface of the ocean, and after their short life, sunk to the tranquil waters below. What a work of life and death had been going on for ages in the depths of the sea! Myriads upon myriads, ever since the morning of creation, had been falling like snow-flakes, till their remains literally covered the bottom of the deep.

Equally significant was the fact that these shells were *unbroken*. Not only were they there, but preserved in a perfect form. Organisms the most minute and delicate, fragile as drooping flowers, had yet sunk and slept uninjured. The same power which watches over the fall of a sparrow had kept these frail and tender things, and after their brief existence, had laid them gently on the bosom of the mighty mother for their eternal rest.

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to be the sudden dip or bank which occurs off the west coast of Ireland, where the water was supposed to deepen in the course of a few miles from about three hundred fathoms to nearly two thousand. Such a rapid descent has naturally been regarded with alarm by telegraphic engineers, and this alarm has led to a most careful sounding survey of the whole supposed bank by Captain Dayman, acting under the instructions of the Admiralty. The result of this shows that the supposed precipitous bank, or submarine cliff, is a gradual slope of nearly sixty miles. Over this long slope the difference between its greatest height and greatest depth is only eighty-seven hundred and sixty feet; so that the average incline is, in round numbers, about one hundred and forty-five feet per mile. A good gradient on a railway is now generally considered to be one in one hundred feet, or about fifty-three in a mile; so that the incline on this supposed bank is only about three times that of an ordinary railway. In fact, as far as soundings can demonstrate any thing, there are few slopes in the bed of the Atlantic as steep as that of Holborn Hill. In no part is the bottom rocky, and with the exception of a few miles, which are shingly, only ooze, mud, or sand is to be found."

The bearing of this discovery on the problem of a submarine telegraph was obvious. For it too was to lie on the ocean-bed, beside and among these relics that had so long been drifting down upon the watery plain. And if these tiny shells slept there unharmed, surely an iron chord might rest there in safety. There were no swift currents down there; no rushing waves agitated that sunless sea. There the waters moved not; and there might rest the great nerve that was to pass from continent to continent. And so far as injury from the surrounding elements was concerned, there it might remain, whispering the thoughts of successive generations of men, till the sea should give up its dead.

CHAPTER VI.
THE WORK BEGUN IN ENGLAND

Up to this time the Telegraph, which was destined to pass the sea, had been purely an American enterprise. It had been begun, and for over two years had been carried on, wholly by American capital. "Our little company," said Mr. Field ten years after, "raised and expended over a million and a quarter of dollars before an Englishman paid a single pound sterling." Mr. Brett was the first one to take a few shares. But this was not to the discredit of England, for the American public had done no better. Not a dollar had been raised this side the Atlantic, outside of the little circle in which the scheme had its origin. No stock or bonds were put upon the market; no man was asked for a subscription. If they wanted money, they drew their checks for it. At one time, indeed, two hundred and fifty thousand dollars of bonds were issued, but they were at once taken wholly by themselves. But, as the time was now come when the long-meditated attempt was to be made to carry the Telegraph across the ocean, it was fitting that Great Britain, whose shores it was to touch, should join in the work. Accordingly, in the summer of 1856, after finishing all that he could do in America, Mr. Field sailed with his family for England. The very day before he embarked, he had the pleasure to see his friend, Lieutenant Berryman, off on his second voyage to make soundings across the Atlantic.

In London he sought at once Mr. Brett, with whom in his two former visits to England he had already discussed his project, and found in him a hearty coöperator. As we go on with our story, it is a melancholy satisfaction to refer to one and another worker in this enterprise, who lived not to see its last and greatest triumph. Mr. Brett, like Berryman, is dead. But he did not go to his grave till after a life of usefulness and honor. He was one of the men of the new era – of the school of Stephenson and Brunel – who believed in the marvellous achievements yet to be wrought by human invention, turning to the service of man the wonders of scientific discovery. He was one of the first to see the boundless possibilities of the telegraph, and to believe that what had passed over the land might pass under the sea. He was the first to lay a cable across the British Channel, and thus to bring into instantaneous communication the two great capitals of Europe – an achievement which, though small compared with what has since been done, was then so marvellous, that the intelligence of its success was received with surprise and incredulity. Many could not and would not believe it. Even after messages were received in London from Paris, there were those who declared that it was an imposition on the public, with as much proud scorn as some a few years later scouted the very idea that a message had ever passed over the Atlantic Telegraph!

This friendship of Mr. Brett – both to the enterprise and to Mr. Field personally – remained to the last. In every voyage to England the latter found – however others doubted or despaired – that Mr. Brett was always the same – full of hope and confidence. In 1864, when they met in London, he was unshaken in faith, and urgent to have the great enterprise renewed. The triumph was not far off, but he was not to live to see it. But, though he passed away before the final victory, he did his part toward bringing it on, and no history of this great enterprise can overlook his eminent services.

To Mr. Brett, therefore, Mr. Field went first to consult in regard to his project of a telegraph across the ocean. This was a part of the design embraced in the original organization of the New York, Newfoundland, and London Telegraph Company; and when Mr. Field went to England, he was empowered to receive subscriptions to that Company, so as to enlarge its capital, and thus include in one corporation the whole line from New York to London; or to organize a new company, which should lay a cable across the Atlantic, and there join the Newfoundland line.

But before an enterprise so vast and so new could be commended to the commercial public of Great Britain, there were many details to be settled. The mechanical and scientific problems already referred to, whether a cable could be laid across the ocean; and if so, whether it could be worked, were

to be considered anew. The opinions of Lieutenant Maury and of Professor Morse were published in England, and arrested the attention of scientific men. But John Bull is slow of belief, and asked for more evidence. The thing was too vast to be undertaken rashly. As yet there was no experience to decide the possibility of a telegraph across the ocean. The longest line which had been laid was three hundred miles. This caution, which is a national trait of Englishmen, will not be regarded as a fault by those who consider that in proportion as they are slow to embark in any new enterprise, are they resolute and determined in carrying it out.

To resolve these difficult problems, Mr. Field sought counsel of the highest engineering authorities of Great Britain, and of her most eminent scientific men. To their honor, all showed the deepest interest in the project, and gave it freely the benefit of their knowledge.

First, as to the possibility of laying a cable in the deep sea, Mr. Field had witnessed one attempt of the kind – that in the Gulf of St. Lawrence the year before – an attempt which had failed. His experience, therefore, was not encouraging. If they found so much difficulty in laying a cable seventy miles long, how could they hope to lay one of two thousand miles across the stormy Atlantic?

This was a question for the engineers. To solve the problem, required experiments almost without number. It was now that the most important services were rendered by Glass, Elliot & Co., of London, a firm which had begun within a few years the manufacture of sea-cables, and was to write its name in all the waters of the world. Aided by the skill of their admirable engineer, Mr. Canning, they now manufactured cables almost without end, applying to them every possible test. At the same time, Mr. Field took counsel of Robert Stephenson and George Parker Bidder, both of whom manifested a deep interest in the success of the enterprise.

Not less cordial was Mr. Brunel, who made many suggestions in regard to the form of the cable, and the manner in which it should be laid. He was then building the Great Eastern; and one day he took Mr. Field down to Blackwall to see it, and, pointing to the monstrous hull which was rising on the banks of the Thames, said: "There is the ship to lay the Atlantic cable!" Little did he think that ten years after, that ship would be employed in this service; and in this final victory over the sea, would redeem all the misfortunes of her earlier career.

Among the difficulties to be encountered, was that of finding a perfect insulator. Without insulation, telegraphic communication by electricity is impossible. On land, where wires are carried on the tops of poles, the air itself is a sufficient insulator. A few glass rings at the points where the wire passes through the iron staples by which it is supported, and the insulation is complete. But in the sea the electricity would be instantly dissipated, unless some material could be found which should insulate a conductor sunk in water, as completely as if it were raised in air. But what could thus inclose the lightning, and keep it fast while flying from one continent to the other?

Here again it seemed as if Divine wisdom had anticipated the coming of this great enterprise, and provided in the realm of nature every material needed for its success. It was at least a happy coincidence that only a few years before there had been found, in the forests of the Malayan archipelago, a substance till then unknown to the world, but which answered completely this new demand. This was gutta-percha, which is impenetrable by water, and at the same time a bad conductor of electricity; so that it forms at once a perfect protection and insulation to a telegraph passing through the sea. In the experiments that were made to test the value of this material in the grander use to which it was to be applied, no man rendered greater service than Mr. Samuel Statham, of the London Gutta-Percha Works – a name to be gratefully remembered in the early history of the Atlantic Telegraph.

The mechanical difficulties removed, and the insulation provided, there remained yet the great scientific problem: Could a message be sent two thousand miles under the Atlantic? The ingenuity of man might devise some method of laying a cable across the sea, but of what use were it, if the electric current should shrink from the dark abyss?

It was in prosecuting inquiries to resolve this problem, that Mr. Field became acquainted with two gentlemen who were to be soon after associated with him in the organization of the Atlantic

Telegraph Company. These were Mr. Charles T. Bright, afterward knighted for his part in laying the Atlantic cable in 1858, and Dr. Edward O. Whitehouse, both well known in England, the former as an engineer, and the latter for his experiments in electro-magnetism, as applied to the business of telegraphing. He had invented an instrument by which to ascertain and register the velocity of electric currents through submarine cables. Both these gentlemen were full of the ardor of science, and entered on this new project with the zeal which the prospect of so great a triumph might inspire. With them was now to be associated our distinguished countryman, Professor Morse. Fortunately he was at this time in London, and gave his invaluable aid to the experiments which were made to determine the possibility of telegraphic communication at great distances under the sea. The result of his experiments he communicates in a letter to Mr. Field:

"London, Five o'clock a.m.,
"October 3, 1856.

"My dear Sir: As the electrician of the New York, Newfoundland, and London Telegraph Company, it is with the highest gratification that I have to apprise you of the result of our experiments of this morning upon a single continuous conductor of more than two thousand miles in extent, a distance you will perceive sufficient to cross the Atlantic Ocean, from Newfoundland to Ireland.

"The admirable arrangements made at the Magnetic Telegraph Office in Old Broad street, for connecting ten subterranean gutta-percha insulated conductors, of over two hundred miles each, so as to give one continuous length of more than two thousand miles during the hours of the night, when the telegraph is not commercially employed, furnished us the means of conclusively settling, by actual experiment, the question of the practicability as well as the practicality[10] of telegraphing through our proposed Atlantic cable.

"This result had been thrown into some doubt by the discovery, more than two years since, of certain phenomena upon subterranean and submarine conductors, and had attracted the attention of electricians, particularly of that most eminent philosopher, Professor Faraday, and that clear-sighted investigator of electrical phenomena, Dr. Whitehouse; and one of these phenomena, to wit, the perceptible retardation of the electric current, threatened to perplex our operations, and required careful investigation before we could pronounce with certainty the commercial practicability of the Ocean Telegraph.

"I am most happy to inform you that, as a crowning result of a long series of experimental investigation and inductive reasoning upon this subject, the experiments under the direction of Dr. Whitehouse and Mr. Bright, which I witnessed this morning – in which the induction coils and receiving magnets, as modified by these gentlemen, were made to actuate one of my recording instruments – have most satisfactorily resolved all doubts of the practicability as well as practicality of operating the telegraph from Newfoundland to Ireland.

"Although we telegraphed signals at the rate of two hundred and ten, two hundred and forty-one, and, according to the count at one time, even of two hundred and seventy per minute upon my telegraphic register, (which speed, you will perceive, is at a rate commercially advantageous,) these results were accomplished notwithstanding many disadvantages in our arrangements of a temporary and local character – disadvantages which will not occur in the use of our submarine cable.

[10] Professor Morse was fond of the distinction between the words practical and practicable. A thing might be practicable, that is, possible of accomplishment, when it was not a practical enterprise, that is, one which could be worked to advantage. He here argues that the Atlantic Telegraph is both practicable, (or possible,) and at the same time a wise, practical undertaking.

"Having passed the whole night with my active and agreeable collaborators, Dr. Whitehouse and Mr. Bright, without sleep, you will excuse the hurried and brief character of this note, which I could not refrain from sending you, since our experiments this morning settle the scientific and commercial points of our enterprise satisfactorily.

"With respect and esteem, your obedient servant,

"Samuel F. B. Morse."

A week later, he wrote again, confirming his former impressions, thus:

"London, October 10, 1856.

"My dear Sir: After having given the deepest consideration to the subject of our successful experiments the other night, when we signalled clearly and rapidly through an unbroken circuit of subterranean conducting wire, over two thousand miles in length, I sit down to give you the result of my reflections and calculations.

"There can be no question but that, with a cable containing a single conducting wire, of a size not exceeding that through which we worked, and with equal insulation, it would be easy to telegraph from Ireland to Newfoundland at a speed of at least from eight to ten words per minute; nay, more: the varying rates of speed at which we worked, depending as they did upon differences in the arrangement of the apparatus employed, do of themselves prove that even a higher rate than this is attainable. Take it, however, at ten words in the minute, and allowing ten words for name and address, we can safely calculate upon the transmission of a twenty-word message in three minutes;

"Twenty such messages in the hour;

"Four hundred and eighty in the twenty-four hours, or fourteen thousand four hundred words per day.

"Such are the capabilities of a single wire cable fairly and moderately computed.

"It is, however, evident to me, that by improvements in the arrangement of the signals themselves, aided by the adoption of a code or system constructed upon the principles of the best nautical code, as suggested by Dr. Whitehouse, we may at least double the speed in the transmission of our messages.

"As to the structure of the cable itself, the last specimen which I examined with you seemed to combine so admirably the necessary qualities of strength, flexibility, and lightness, with perfect insulation, that I can no longer have any misgivings about the ease and safety with which it will be submerged.

"In one word, the doubts are resolved, the difficulties overcome, success is within our reach, and the great feat of the century must shortly be accomplished.

"I would urge you, if the manufacture can be completed within the time, (and all things are possible now,) to press forward the good work, and not to lose the chance of laying it during the ensuing summer.

"Before the close of the present month, I hope to be again landed safely on the other side of the water, and I full well know, that on all hands the inquiries of most interest with which I shall be met, will be about the Ocean Telegraph.

"Much as I have enjoyed my European trip this year, it would have enhanced the gratification which I have derived from it more than I can describe to you, if on my return to America, I could be the first bearer to my friends of the welcome intelligence that the great work had been begun, by the commencement of the manufacture of the cable to connect Ireland with the line of the New York,

Newfoundland, and London Telegraph Company, now so successfully completed to St. John's.

"Respectfully, your obedient servant,

"Samuel F. B. Morse."

These experiments and others removed the doubts of scientific men. Professor Faraday, in spite of the law of the retardation of electricity on long circuits, which it was said he had discovered, and which would render it impossible to work a line of such length as from Ireland to Newfoundland, now declared his full conviction that it was within the bounds of possibility. The passage of electricity might not be absolutely instantaneous, or have the swiftness of the solar beam, yet it would be rapid enough for all practical purposes. When Mr. Field asked him how long it would take for the electricity to pass from London to New York, he answered: "Possibly one second!"

Thus fortified by the highest scientific and engineering authorities, the projectors of an ocean telegraph were now ready to bring it before the British public, and to see what support could be found from the English Government and the English people.

Mr. Field first addressed himself to the Government. Without waiting for the Company to be fully organized, with true American eagerness and impatience, he wrote a letter to the Admiralty asking for a fresh survey of the route to be traversed, and for the aid of Government ships to lay the cable. He also addressed a letter to Lord Clarendon, stating the large design which they had conceived, and asking for it the aid which was due to what concerned the honor and interest of England. The reply was prompt and courteous, inviting him to an interview for the purpose of a fuller explanation. Accordingly, Mr. Field, with Professor Morse, called upon him at the Foreign Office, and spent an hour in conversation on the proposed undertaking. Lord Clarendon showed great interest, and made many inquiries. He was a little startled at the magnitude of the scheme, and the confident tone of the projectors, and asked pleasantly: "But, suppose you *don't* succeed? Suppose you make the attempt and fail – your cable is lost in the sea – then what will you do?" "Charge it to profit and loss, and go to work to lay another," was the quick answer of Mr. Field, which amused him as a truly American reply. In conclusion, he desired him to put his request in writing, and, without committing the Government, encouraged him to hope that Britain would do all that might justly be expected in aid of this great international work. How nobly this promise was kept, time will show.

While engaged in these negotiations, Mr. Field took his family to Paris, and there met with a great loss in the sudden death of a favorite sister, who had accompanied them abroad. Full of the sorrow of this event, and unfitted for business of any kind, he returned to London to find an invitation to go into the country and spend a few days with Mr. James Wilson, then Secretary to the Treasury, a man of great influence in the Government, at his residence near Bath; there to discuss quietly and at length the proposed aid to the Atlantic Telegraph. Though he had but little spirit to go among strangers, he felt it his duty not to miss an opportunity to advance the cause he had so much at heart. The result of this visit was the following letter, received a few days later:

"Treasury Chambers. Nov. 20, 1856.

"Sir: Having laid before the Lords Commissioners of her Majesty's Treasury your letter of the 13th ultimo, addressed to the Earl of Clarendon, requesting, on behalf of the New York, Newfoundland, and London Telegraph Company, certain privileges and protection in regard to the line of telegraph which it is proposed to establish between Newfoundland and Ireland, I am directed by their lordships to acquaint you that they are prepared to enter into a contract with the said Telegraph Company, based upon the following conditions, namely:

"1. It is understood that the capital required to lay down the line will be three hundred and fifty thousand pounds.

"2. Her Majesty's Government engage to furnish the aid of ships to take what soundings may still be considered needful, or to verify those already taken, and favorably to consider any request that may be made to furnish aid by their vessels in laying down the cable.

"3. The British Government, from the time of the completion of the line, and so long as it shall continue in working order, undertakes to pay at the rate of fourteen thousand pounds a year, being at the rate of four per cent. on the assumed capital, as a fixed remuneration for the work done on behalf of the Government, in the conveyance outward and homeward of their messages. This payment to continue until the net profits of the Company are equal to a dividend of six per cent., when the payment shall be reduced to ten thousand pounds a year, for a period of twenty-five years.

"It is, however, understood that if the Government messages in any year shall, at the usual tariff-rate charged to the public, amount to a larger sum, such additional payment shall be made as is equivalent thereto.

"4. That the British Government shall have a priority in the conveyance of their messages over all others, subject to the exception only of the Government of the United States, in the event of their entering into an arrangement with the Telegraph Company similar in principle to that of the British Government, in which case the messages of the two Governments shall have priority in the order in which they arrive at the stations.

"5. That the tariff of charges shall be fixed with the consent of the Treasury, and shall not be increased, without such consent being obtained, as long as this contract lasts.

"I am, sir, your obedient servant,
"James Wilson.

"Cyrus W. Field, Esq., 37 Jermyn street."

With this encouragement and promise of aid, the projectors of a telegraph across the ocean now went forward to organize a company to carry out their design. Mr. Field, on arriving in England, had entered into an agreement with Mr. Brett to join their efforts for this purpose. With them were afterward united two others – Sir Charles Bright, as engineer, and Dr. Whitehouse, as electrician. These four gentlemen agreed to form a new company, to be called The Atlantic Telegraph Company, the object of which should be "to continue the existing line of the New York, Newfoundland, and London Telegraph Company to Ireland, by making or causing to be made a submarine telegraph cable for the Atlantic."

As they were now ready to introduce the enterprise to the British public, Mr. Field issued a circular in the name of the Newfoundland Company, and as its Vice-President, setting forth the great importance of telegraphic communication between the two hemispheres.

The next step was to raise the capital. After the most careful estimates, it was thought that a cable could be made and laid across the Atlantic for £350,000. This was a large sum to ask from a public slow to move, and that lends a dull ear to all new schemes. But armed with facts and figures, with maps and estimates, with the opinions of engineers and scientific men, they went to work, not only in London, but in other parts of the kingdom. Mr. Field, in company with Mr. Brett, made a visit to Liverpool and Manchester, to address their Chambers of Commerce. I have now before me the papers of those cities, with reports of the meetings held and the speeches made, which show the vigor with which they pushed their enterprise. This energy was rewarded with success. The result justified their confidence. In a few weeks the whole capital was subscribed. It had been divided into three hundred and fifty shares of a thousand pounds each. Of these, a hundred and one were taken in

London, eighty-six in Liverpool, thirty-seven in Glasgow, twenty-eight in Manchester, and a few in other parts of England. The grandeur of the design attracted public attention, and some subscribed solely from a noble wish to take part in such a work. Among these were Mr. Thackeray and Lady Byron. Mr. Field subscribed £100,000, and Mr. Brett £25,000. But when the books were closed, it was found that they had more money subscribed than they required, so that in the final division of shares, there were allotted to Mr. Field eighty-eight, and to Mr. Brett twelve. Mr. Field's interest was thus one-fourth of the whole capital of the Company.

In taking so large a share, it was not his intention to carry this heavy load alone. It was too large a proportion for one man. But he took it for his countrymen. He thought one fourth of the stock should be held in this country, and did not doubt, from the eagerness with which three fourths had been taken in England, that the remainder would be at once subscribed in America. Had he been able, on his return, to attend to his own interests in the matter, this expectation might have been realized; but, as we shall see, hardly did he set foot in New York, before he was obliged to hurry off to Newfoundland on the business of the Company, and when he returned the interest had subsided, so that it required very great exertions, continued through many months, to dispose of twenty-seven shares. Thus he was by far the largest stockholder in England or America – his interest being over seven times that of Mr. Brett, who was the largest next to himself – and being more than double the amount held by all the other American shareholders put together. This was at least giving substantial proof of his own faith in the undertaking.

But some may imagine that after all this burden was not so great as it seemed. In many stock companies the custom obtains of assigning to the projectors a certain portion of the stock as a bonus for getting up the company, which amount appears among the subscriptions to swell the capital. It is indeed subscribed, *but not paid*. So some have asked whether this large subscription of Mr. Field was not in part at least merely nominal? To this we answer, that a consideration *was* granted to Mr. Field and his associates for their services in getting up the Company, and for their exclusive rights, but this was a contingent interest in the profits of the enterprise, *to be allowed only after the cable was laid*. So that the whole amount here subscribed was a *bona-fide* subscription, and paid in solid English gold. We have now before us the receipts of the bankers of the Company for the whole amount, eighty-eight thousand pounds sterling.

The capital being thus raised, it only remained to complete the organization of the Company by the choice of a Board of Directors, and to make a contract for the cable. The Company was organized in December, 1856, by the choice of Directors chiefly from the leading bankers and merchants of London and Liverpool. The list included such honored names as Samuel Gurney, T. H. Brooking, John W. Brett, and T. A. Hankey, of London; Sir William Brown, Henry Harrison, Edward Johnston, Robert Crosbie, George Maxwell, and C. W. H. Pickering, of Liverpool; John Pender and James Dugdale, of Manchester; and Professor William Thomson, LL.D., of Glasgow. With these English Directors were two of our countrymen, Mr. George Peabody and Mr. C. M. Lampson, who, residing abroad for more than a third of a century, did much in the commercial capital of the world to support the honor of the American name. Mr. Peabody's firm subscribed £10,000, and Mr. Lampson £2,000. The latter gave more time than any other Director in London, except Mr. Brooking, the second Vice-Chairman, who, however, retired from the Company after the first failure in 1858, when Mr. Lampson was chosen to fill his place. The whole Board was full of zeal and energy. All gave their services without compensation.

It was the good fortune of the Company to have, from the beginning, in the important position of Secretary, a gentleman admirably qualified for the post. This was Mr. George Saward – a name familiar to all who have followed the fortunes of the telegraph, in England or America, since he has been the organ of communication with the press and the public; and with whom none ever had occasion to transact business without recognizing his intelligence and courtesy.

The Company being thus in working order, proceeded to make a contract for the manufacture of a cable to be laid across the Atlantic. For many months the proper form and size of the cable had been the subject of constant experiments. The conditions were: to combine the greatest degree of strength with lightness and flexibility. It must be strong, or it would snap in the process of laying. Yet it would not do to have it too large, for it would be unmanageable. Mr. Brett had already lost a cable in the Mediterranean chiefly from its bulk. Its size and stiffness made it hard to unwind it, while its enormous weight, when once it broke loose, caused it to run out with fearful velocity, till it was soon lost in the sea. It was only the year before, in September, 1855, that this accident had occurred in laying the cable from Sardinia to Algeria. All was going on well, until suddenly, "about two miles, weighing sixteen tons, flew out with the greatest violence in four or five minutes, flying round even when the drums were brought to a dead stop, creating the greatest alarm for the safety of the men in the hold and for the vessel." This was partly owing to the character of the submarine surface over which they were passing. The bottom of the Mediterranean is volcanic, and is broken up into mountains and valleys. The cable, doubtless, had just passed over some Alpine height, and was descending into some fearful depth below; but chiefly it was owing to the great size and bulk of the cable. This was a warning to the Atlantic Company. The point to be aimed at was to combine the flexibility of a common ship's rope with the tenacity of iron. These conditions were thought to be united in the form that was adopted.[11] A contract was at once made for the manufacture of the cable, one half being given to Messrs. Glass, Elliot & Co., of London, and the other to Messrs. R. S. Newall & Co., of Liverpool. The whole was to be completed by the first of June, ready to be submerged in the sea. The company was organized on the ninth of December, and the very next day Mr. Field sailed for America, reaching New York on the twenty-fifth of December, after an absence of more than five months.

[11] On his return to America, many inquiries were addressed to Mr. Field in regard to the form and structure of the cable, in answer to which he wrote a letter of explanation in which he said: "No particular connected with this great project has been the subject of so much comment through the press as the form and structure of the telegraph cable. It may be well believed that the Directors have not decided upon a matter so all-important to success, without availing themselves of the most eminent talent and experience which could be commanded. The practical history of submarine telegraphs dates from the successful submersion of the cable between Dover and Calais in 1851, and advantage has been taken of whatever instruction this history could furnish or suggest. Of the submarine cables heretofore laid down, without enumerating others, the one between Dover and Calais weighs six tons to the mile; that between Spezzia and Corsica, eight tons to the mile; that laid from Varna to Balaklava, and used during the war in the Crimea, less than three hundred pounds to the mile; while the weight of the cable for the Atlantic Telegraph is between nineteen hundred pounds and one ton to the mile. This cable, to use the words of Dr. Whitehouse, 'is the result of many months thought, experiment, and trial. Hundreds of specimens have been made, comprising every variety of form, size, and structure, and most severely tested as to their powers and capabilities; and the result has been the adoption of this, which we know to possess all the properties required, and in a far higher degree than any cable that has yet been laid. Its flexibility is such as to make it as manageable as a small line, and its strength such that it will bear, in water, over six miles of its own weight suspended vertically.' The conducting medium consists not of one single straight copper-wire, but of seven wires of copper of the best quality, twisted round each other spirally, and capable of undergoing great tension without injury. This conductor is then enveloped in three separate coverings of gutta-percha, of the best quality, forming the core of the cable, round which tarred hemp is wrapped, and over this, the outside covering, consisting of eighteen strands of the best quality of iron-wire; each strand composed of seven distinct wires, twisted spirally, in the most approved manner, by machinery specially adapted to the purpose. The attempt to insulate more than one conducting-wire or medium would not only have increased the chances of failure of all of them, but would have necessitated the adoption of a proportionably heavier and more cumbrous cable. The tensile power of the outer or wire covering of the cable, being very much less than that of the conductor within it, the latter is protected from any such strain as can possibly rupture it or endanger its insulation without an entire fracture of the cable."

CHAPTER VII.
SEEKING AID FROM CONGRESS

When Mr. Field reached home from abroad, he hoped for a brief respite. He had had a pretty hard campaign during the summer and autumn in England, and needed at least a few weeks of rest; but that was denied him. He landed in New York on Christmas Day, and was not allowed even to spend the New Year with his family. There were interests of the Company in Newfoundland which required immediate attention, and it was important that one of the Directors should go there without delay. As usual, it devolved upon him. He left at once for Boston, where he took the steamer to Halifax, and thence to St. John's. Such a voyage may be very agreeable in summer, but in mid-winter it is not a pleasant thing to face the storms of those northern latitudes. The passage was unusually tempestuous. At St. John's he broke down, and was put under the care of a physician. But he did not stop to think of himself. The work for which he came was done; and though the physician warned him that it was a great risk to leave his bed, he took the steamer on her return, and was again in New York after a month's absence – a month of hardship, of exposure, and of suffering, such as he had long occasion to remember.

The mention of this voyage came up a year afterward at a meeting of the Atlantic Telegraph Company in London, when a resolution was offered, tendering Mr. Field a vote of thanks for "the great services he had rendered to the Company by his untiring zeal, energy, and devotion." Mr. Brooking, the Vice-Chairman, had spent a large part of his life in Newfoundland, and knew the dangers of that inhospitable coast, and in seconding the resolution he said:

> "It is now about a year and a half ago since I had the pleasure of making the acquaintance of my friend Mr. Field. It was he who initiated me into this Company, and induced me to take an interest in it from its earliest stage. From that period to the present I have observed in Mr. Field the most determined perseverance, and the exercise of great talent, extraordinary assiduity and diligence, coupled with an amount of fortitude which has seldom been equalled. I have known him cross the Atlantic in the depth of winter, and, within twenty-four hours after his arrival in New York, having ascertained that his presence was necessary in a distant British colony, he has not hesitated at once to direct his course thitherward. That colony is one with which I am intimately acquainted, having resided in it for upward of twenty years, and am enabled to speak of the hazards and danger which attend a voyage to it in winter. Mr. Field no sooner arrived at New York, in the latter part of December, than he got aboard a steamer for Halifax, and proceeded to St. John's, Newfoundland. In three weeks he accomplished there a very great object for this Company. He procured the passage of an Act of the Legislature which has given to our Company the right of establishing a footing on those shores. [The rights before conferred, it would seem, applied only to the Newfoundland Company.] That is only one of the acts which he has performed with a desire to promote the interests of this great enterprise."

The very next day after his return from Newfoundland, Mr. Field was called to Washington, to seek the aid of his own Government to the Atlantic Telegraph. The English Government had proffered the most generous aid, both in ships to lay the cable, and in an annual subsidy of £14,000. It was on every account desirable that this should be met by corresponding liberality on the part of the American Government. Before he left England, he had sent home the letter received from the Lords Commissioners of the Treasury; and thereupon the Directors of the New York, Newfoundland, and London Telegraph Company had inclosed a copy to the President, with a letter asking for the same

aid in ships, and in an annual sum of $70,000, [equivalent to £14,000,] to be paid for the government messages, the latter to be conditioned on the success of the telegraph, and to be continued only so long as it was in full operation. They urged with reason that the English Government had acted with great liberality – not only toward the enterprise, but toward our own Government. Although both ends of the line were in the British possessions, it had claimed no exclusive privileges, but had stipulated for perfect equality between the United States and Great Britain. The agreement expressly provided "that the British Government shall have a priority in the conveyance of their messages over all others, *subject to the exception only of the Government of the United States*, in the event of their entering into an arrangement with the Telegraph Company similar in principle to that of the British Government, in which case the messages of the two governments shall have priority in the order in which they arrive at the stations."

The letter to the President called attention to this generous offer – an offer which it was manifestly to the advantage of our Government to accept – and added: "The Company will enter into a contract with the Government of the United States on the same terms and conditions as it has made with the British Government." They asked only for the same recognition and aid which they had received in England. This surely was not a very bold request. It was natural that American citizens should think that in a work begun by Americans, and of which, if successful, their country would reap largely the honor and the advantage, they might expect the aid from their own Government which they had already received from a foreign power. It was, therefore, not without a mixture of surprise and mortification that they learned that the proposal in Congress had provoked a violent opposition, and that the bill was likely to be defeated. Such was the attitude of affairs when Mr. Field returned from Newfoundland, and which led him to hasten to Washington.

He now found that it was much easier to deal with the English than with the American Government. Whatever may be said of the respective methods of administration, it must be confessed that the forms of English procedure furnish greater facility in the despatch of business. A contract can be made by the Lords of the Treasury without waiting the action of Parliament. The proposal is referred to two or three intelligent officers of the Government – perhaps even to a single individual – on whose report it takes action without further delay. Thus it is probable that the action of the British Government was decided wholly by the recommendation of Mr. Wilson, formed after the visit of Mr. Field.

But in our country we do things differently. Here it would be considered a stretch of power for any administration to enter into a contract with a private company – a contract binding the Government for a period of twenty-five years, and involving an annual appropriation of money – without the action of Congress. This is a safeguard against reckless and extravagant expenditure, but, as one of the penalties we pay for our more popular form of government, in which every thing has to be referred to the people, it involves delay, and sometimes the defeat of wise and important public measures.

Besides – shall we confess it to our shame – another secret influence often appears in American legislation, which has defeated many an act demanded by the public good – the influence of the Lobby! This now began to show itself in opposition. It had been whispered in Washington that the gentlemen in New York who were at the head of this enterprise were very rich; and a measure coming from such a source surely ought to be made to pay tribute before it was allowed to pass. This was a new experience. Those few weeks in Washington were worse than being among the icebergs off the coast of Newfoundland. The Atlantic Cable has had many a kink since, but never did it seem to be entangled in such a hopeless twist as when it got among the politicians.

But it would be very unjust to suppose that there were no better influences in our Halls of Congress. There were then – as there have always been in our history – some men of large wisdom and of a noble patriotic pride, who in such a measure thought only of the good of their country and of the triumph of science and of civilization.

Two years after – in August, 1858 – when the Atlantic Telegraph proved at last a reality, and the New World was full of its fame, Mr. Seward, in a speech at Auburn, thus referred to the ordeal it had to pass through in Congress:

> "The two great countries of which I have spoken, [England and America,] are now ringing with the praises of Cyrus W. Field, who chiefly has brought this great enterprise to its glorious and beneficent consummation. You have never heard his story; let me give you a few points in it, as a lesson that there is no condition of life in which a man, endowed with native genius, a benevolent spirit, and a courageous patience, may not become a benefactor of nations and of mankind."

After speaking of the efforts by which this New York merchant "brought into being an association of Americans and Englishmen, which contributed from surplus wealth the capital necessary as a basis for the enterprise"; he adds:

> "It remained to engage the consent and the activity of the Governments of Great Britain and the United States. That was all that remained. Such consent and activity on the part of some one great nation of Europe was all that remained needful for Columbus when he stood ready to bring a new continent forward as a theatre of the world's civilization. But in each case that effort was the most difficult of all. Cyrus W. Field, by assiduity and patience, first secured consent and conditional engagement on the part of Great Britain, and then, less than two years ago, he repaired to Washington. The President and Secretary of State individually favored his proposition; but the jealousies of parties and sections in Congress forbade them to lend it their official sanction and patronage. He appealed to me. I drew the necessary bill. With the generous aid of others, Northern Representatives, and the indispensable aid of the late Thomas J. Rusk, a Senator from Texas, that bill, after a severe contest and long delay, was carried through the Senate of the United States by the majority, if I remember rightly, of one vote, and escaped defeat in the House of Representatives with equal difficulty. I have said the aid of Mr. Rusk was indispensable. If any one has wondered why I, an extreme Northern man, loved and lamented Thomas J. Rusk, an equally extreme Southern man, he has here an explanation. There was no good thing which, as it seemed to me, I could not do in Congress with his aid. When he died, it seemed to me that no good thing could be done by any one. Such was the position of Cyrus W. Field at that stage of the great enterprise. But, thus at last fortified with capital derived from New York and London, and with the navies of Great Britain and the United States at his command, he has, after trials that would have discouraged any other than a true discoverer, brought the great work to a felicitous consummation. And now the Queen of Great Britain and the President of the United States stand waiting his permission to speak, and ready to speak at his bidding; and the people of these two great countries await only the signal from him to rush into a fraternal embrace which will prove the oblivion of ages of suspicion, of jealousies and of anger."

Mr. Seward might well refer with pride to the part he took in sustaining this enterprise. He was from the beginning its firmest supporter. The bill was introduced into the Senate by him, and was carried through mainly by his influence, seconded by Mr. Rusk, Mr. Douglas, and one or two others. It was introduced on the ninth of January, and came up for consideration on the twenty-first. Its friends had hoped that it might pass with entire unanimity. But such was the opposition, that the discussion lasted two days. The report shows that it was a subject of animated and almost angry debate, which brought out the secret of the opposition to aid being given by the Government.

Probably no measure was ever introduced in Congress for the help of any commercial enterprise, that some member, imagining that it was to benefit a particular section, did not object that it was "unconstitutional"! This objection was well answered in this case by Mr. Benjamin, of Louisiana, who asked:

> "If we have a right to hire a warehouse at Port Mahon, in the Mediterranean, for storing naval stores, have we not a right to hire a company to carry our messages? I should as soon think of questioning the constitutional power of the Government to pay freight to a vessel for carrying its mail-bags across the ocean, as to pay a telegraph company a certain sum per annum for conveying its messages by the use of the electric telegraph."

This touched the precise ground on which the appropriation was asked. In their memorial to the President, the Company had said: "Such a contract will, we suppose, fall within the provisions of the Constitution in regard to postal arrangements, of which this is only a new and improved form."

Mr. Bayard, of Delaware, explained in the same terms the nature of the proposed agreement:

> "It is a mail operation. It is a Post-Office arrangement. It is for the transmission of intelligence, and that is what I understood to be the function of the Post-Office Department. I hold it, therefore, to be as legitimately within the proper powers of the Government, as the employing of a stage-coach, or a steam-car, or a ship, to transport the mails, either to foreign countries, or to different portions of our own country."

Of course, as in all appropriations of money, the question of expense had to be considered, and here there were not wanting some to cry out against the extravagance of paying seventy thousand dollars a year! We had not then got used to the colossal expenditures of war, when we grew familiar with paying three millions a day! Seventy thousand dollars seemed a great sum; but Mr. Bayard in reply reminded them that England then paid nine hundred thousand dollars a year for the transportation of the mails between the United States and England; and argued that it was a very small amount for the great service rendered. He said:

> "We have sent out ships to make explorations and observations in the Red Sea and in South America; we sent one or two expensive expeditions to Japan, and published at great cost some elegant books narrating their exploits. The expense even in ships alone, in that instance, was at the rate of twenty to one here, but no cry of economy was then raised." "I look upon this proposition solely as a business measure; in that point of view I believe the Government will obtain more service for the amount of money, than by any other contract that we have ever made, or now can make, for the transmission of intelligence."

As to the expense of furnishing a ship of war to assist in laying the cable, Mr. Douglas asked:

> "Will it cost anything to furnish the use of one of our steamships? They are idle. We have no practical use for them at present. They are in commission. They have their coal on board, and their full armament. They will be rendering no service to us if they are not engaged in this work. If there was nothing more than a question of national pride involved, I would gladly furnish the use of an American ship for that purpose. England tenders one of her national vessels, and why should we not tender one also? It costs England nothing, and it costs us nothing."

Mr. Rusk made the same point, in arguing that ships might be sent to assist in laying the cable, giving this homely but sufficient reason: "I think that is better than to keep them rotting at the navy-yards, with the officers frollicking on shore."

Mr. Douglas urged still further:

> "American citizens have commenced this enterprise. The honor and the glory of the achievement, if successful, will be due to American genius and American daring. Why should the American Government be so penurious – I do not know that that is the proper word, for it costs nothing – why should we be actuated by so illiberal a spirit as to refuse the use of one of our steamships to convey the wire when it does not cost one farthing to the Treasury of the United States?"

But behind all these objections of expense and of want of constitutional power, was one greater than all, and that was England! The real animus of the opposition was a fear of giving some advantage to Great Britain. This has always been sufficient to excite the hostility of a certain class of politicians. No matter what the subject of the proposed coöperation, if it were purely a scientific expedition, they were sure England was going to profit by it to our injury. So now there were those who felt that in this submarine cable England was literally crawling under the sea to get some advantage of the United States!

This jealousy and hostility spoke loudest from the mouths of Southerners. It is noteworthy that men who, in less than five years after, were figuring abroad, courting foreign influence against their own country, were then fiercest in denunciation of England. Mason and Slidell voted together against the bill. Butler, of South Carolina, was very bitter in his opposition – saying, with a sneer, that "this was simply a mail service under the surveillance of Great Britain" – and so was Hunter, of Virginia; while Jones, of Tennessee, bursting with patriotism, found a sufficient reason for his opposition, in that "he did not want anything to do with England or Englishmen!"

But it should be said in justice, that to this general hostility of the South there were some exceptions. Benjamin, of Louisiana, gave the bill an earnest support; so did Mallory, of Florida, Chairman of the Naval Committee; and especially that noble Southerner, Rusk, of Texas, "with whose aid," as Mr. Seward said, "it seemed that there was no good thing which he could not do in Congress." Mr. Rusk declared that he regarded it as "the great enterprise of the age," and expressed his surprise at the very moderate subsidy asked for, only seventy thousand dollars a year, saying that, "with a reasonable prospect of success in an enterprise, calculated to produce such beneficial results, he should be willing to vote two hundred thousand dollars."

But with the majority of Southern Senators, there was a repugnance to acting in concert with England, which could not be overcome. They argued that this was not truly a line between England and the United States, but between England and her own colonies – a line of which she alone was to reap the benefit. *Both its termini were in the British possessions.* In the event of war this would give a tremendous advantage to the power holding both ends of the line. All the speakers harped on this string; and it may be worth a page or two to see how this was met and answered. When Mr. Hunter, of Virginia, asked, "What security are we to have that in time of war we shall have the use of the telegraph as well as the British Government?" Mr. Seward answered:

> "It appears not to have been contemplated by the British Government that there would ever be any interruption of the amicable relations between the two countries. Therefore nothing was proposed in their contract for the contingency of war.
>
> "That the two termini are both in the British dominions is true; but it is equally true that there is no other terminus on this continent where it is practicable to make that communication except in the British dominions. We have no dominions on the other side of the Atlantic Ocean. There is no other route known on which the telegraphic wire could be drawn through the ocean so as to find a proper resting-place or anchorage except this. The distance on this route is seventeen hundred miles. It is not even known that the telegraphic wire will carry the fluid with

sufficient strength to communicate across those seventeen hundred miles. That is yet a scientific experiment, and the Company are prepared to make it.

"In regard to war, all the danger is this: There is a hazard of war at some future time, and whatever arrangements we might make, war would break them up. No treaty would save us. My own hope is, that after the telegraphic wire is once laid, there will be no more war between the United States and Great Britain. I believe that whenever such a connection as this shall be made, we diminish the chances of war, and diminish them in such a degree, that it is not necessary to take them into consideration at the present moment.

"Let us see where we are. What shall we gain by refusing to enter into this agreement? If we do not make it, the British Government has only to add ten thousand pounds sterling more annually, and they have the whole monopoly of this wire, without any stipulation whatever – not only in war but in peace. If we make this contract with the Company, we at least secure the benefit of it in time of peace, and we postpone and delay the dangers of war. If there shall ever be war, it would abrogate all treaties that can be made in regard to this subject, unless it be true, as the honorable Senator from Virginia thinks, that treaties can be made which will be regarded as obligatory by nations in time of war. If so, we have all the advantages in time of peace, for the purpose of making such treaties hereafter, without the least reason to infer that there would be any reluctance on the part of the British Government to enter into that negotiation with us, if we should desire to do so. The British Government, if it had such a disposition as the honorable Senator supposes, would certainly have proposed to monopolize all this telegraphic line, instead of proposing to divide it."[12]

Mr. Hale spoke in the same strain:

"It seems to me that the war spirit and the contingencies of war are brought in a little too often upon matters of legislation which have no necessary connection with them. If we are to be governed by considerations of that sort, they would paralyze all improvements; they would stop the great appropriations for commerce; they would at once neutralize that policy which sets our ocean steamers afloat. Nobody pretends that the intercourse which is kept up between Great Britain and this country by our ocean steamers would be continued in time of war; nor the communication with France or other nations.

"If we are deterred for that reason, we shall be pursuing a policy that will paralyze improvements on those parts of the coast which lie contiguous to the lakes. The city of Detroit will have to be abandoned, beautiful and progressive as it is,

[12] It is worthy of notice, that when the Bill granting a charter to the Atlantic Telegraph Company was offered in the British Parliament, at least one nobleman found fault with it on this very ground, that it gave away important advantages which properly belonged to England, and which she ought to reserve to herself:"In the House of Lords, on the twentieth of July, 1857, on the motion for the third reading of the Telegraph Company's bill,"Lord Redesdale called attention to the fact that, although the termini of the proposed telegraph were both in her Majesty's dominions, namely, in Ireland and Newfoundland, the American Government were to enjoy the same priority as the British Government with regard to the transmission of messages. It was said that this equal right was owing to the fact that a joint guarantee had been given by the two Governments. *He thought, however, it would have been far better policy on the part of her Majesty's Government if they had either undertaken the whole guarantee themselves, and thus had obtained free and sole control over the connecting line of telegraph, or had invited our own colonies to participate in that guarantee, rather than have allowed a foreign government to join in making it.* At the same time, if the clause in question had the sanction of her Majesty's ministry, it was not his intention to object to it."Earl Granville said this telegraph was intended to connect two great countries, and, as the two Governments had gone hand in hand with regard to the guarantee, it seemed only reasonable that both should have the same rights as to transmitting messages."The bill was then read a third time and passed."

because in time of war the mansions of her citizens there lie within the range of British guns.

"What will the suspension bridge at Niagara be good for in a time of war? If the British cut off their end of it, our end will not be worth much. I believe that among the things which will bind us together in peace, this telegraphic wire will be one of the most potent. It will bind the two countries together literally with cords of iron that will hold us in the bonds of peace. I repudiate entirely the policy which refuses to adopt it, because in time of war it may be interrupted. Such a policy as that would drive us back to a state of barbarism. It would destroy the spirit of progress; it would retard improvement; it would paralyze all the advances which are making us a more civilized, and a more informed and a better people than the one which preceded us."

Mr. Douglas cut the matter short by saying:

"I am willing to vote for this bill as a peace measure, as a commercial measure – but not as a war measure; and when war comes, let us rely on our power and ability to take this end of the wire, and keep it."

Конец ознакомительного фрагмента.