THE FRENCH CABLE.

A Detailed History of the Enterprise and Description of the Route—The European and American Termini.

The monopoly enjoyed by the directors of the Anglo-American cable, together with the high rates charged for the transmission of messages, and the almost certainty that in the event of a rupture in the friendly relations now existing between Great Britain and this country, the British Government, having both ends of the line resting on British soil, would take control of the cable and thus debar us from the privilege of European telegraphic communication, have led to the establishment of a new line of cable, directly connecting the shores of France with those of our own land.

THE COMPANY

was granted its first charter two years ago by the French Government, having been assured of assistance from business men and capitalists in this country. On the 6th day of July, 1868, a concession was given to the Baron Emile d'Erlanger, of Paris, and Mr. Julius Reuter, of London, by the French Government, to establish and maintain this line for a period of twenty years from the first day of September next, the concession stipulating that none but French and United States soil should be touched by the cable, and furthermore that the charge for a despatch of twenty words should not exceed twenty dollars in gold. The French Government bound itself not to grant any other concessions for lines of telegraph from France to any part of North America during the time of the concession granted to this line. The capital stock of the company amounts to £1,200,000, or $6,000,000, and is divided into 60,000 shares, valued at $100 each, in gold. The company has an organized Board of Directors in London and Paris, and agencies in the principal European cities, as well as in New York. No sooner were subscriptions for the stock opened in London and Paris than the liveliest interest was manifested in the enterprise. But a short time over a week, and all the shares were taken and selling at a premium, and on the day the subscription was closed the first payment of £200,000 was made to the English Company who had contracted for the manufacture of

THE CABLE,

which is almost twelve hundred miles longer than the one now so successfully working. It looked upon as far superior, and every advantage has been taken of previous experience. It is one-third larger than the old cable, is more heavily covered with iron, mixed with a serving of yarn, diminishing the specific gravity of the water. Insulation has been made more perfect, the wires being imbedded in a new compound and covered with four layers of gutta-percha, around which is an inch of steel wires, wound spirally, each wire first being bound with fine strands of hemp, well soaked in a preserving compound. Though unusually strong, the flexibility of the cable is such as to enable it to yield readily to the workings of the waves and currents. It is divided into sections: the two shore ends, the deep sea portion from off Brest to St. Pierre, the eastern and western shore ends at that island, and the section to be laid from St. Pierre to the shore end off Massachusetts, near Duxbury.

A COMMISSION

of scientific men connected with the undertaking, at the request of Baron d'Erlanger and Mr. Reuter, made a report on the cable, in which its estimated strength was placed at 7¾ tons, while the strain required for its immersion could be only fourteen hundred weight. This commission further promise that it will be a matter of certainty to send through the cable at least twelve words per minute, while by improved methods of signalling it is confidently predicted that even this number of words will be exceeded. The power of transmitting messages through long lines of submarine cable is now perfectly understood, and no more a matter of doubt. In laying the cable defective portions have been found, where the insulation was imperfect, but it is singular that these breaks have not been discovered till the cable has lain in the water for some three hours and a half, that time being required for the water to force itself through the various substances composing the cable till it reaches the copper conductor. In all cases, however, these breaks have been speedily and satisfactorily overcome. Everything being in readiness,

A SURVEY

was made for the most direct route from Brest to the terminus on the coast of the United States, which was determined to be the neighboring town of Duxbury, from which place a direct line from this city connects with the cable. The main cable extending from Brest to St. Pierre lies one of the great plateaus which exist at the bottom of the Atlantic ocean; this plauteau being much higher than that on which the English cable rests. By keeping in the five hundred fathom line upon Milne Bank, and around the southern edge of the Grand Bank there is no possibility of ice, or of anything else to injure the cable; the northern edge of the Grand Bank was avoided on account of the impossibility of ascertaining at what depths the icebergs ground. Sometimes icebergs ground in ninety fathoms; then again vessels employed in the sealing trade might drop their anchors and thus injure the cable, and to avoid either or both of these dangers, the southern edge of the Grand Bank was selected as the place to lay the cable. Moreover, the track from the southern edge of the Grand Bank to St. Pierre, and from thence to Duxbury, is entirely safe from any danger from ice, and does not cross the anchorage place of any fleet of vessels. The cable upon Milne Bank, from the Grand Bank to St. Pierre, and from thence to Duxbury, is laid in water of such comparative shallowness that repairs, if needed in the future, can be made with the greatest facility. The cable, as now laid, starts in very shallow water from Minou Bay, but in four or five miles it deepens from 17 to 20 fathoms, and then gradually shelves from 30 to 68 and 90 fathoms. At this level, but on the whole gradually deepening, it continues till in a line with the westernmost part of the Irish coast, where, taking a northern course, it passes down a gentle slope of sand that continues descending till the depth increases from 200 to 800 and 900 fathoms, and then in a short distance to 1700 fathoms. Over all the rest of the course to mid-ocean the bottom is mud, shells and sand, and with a uniform depth of about 2000 and 2100 fathoms. At these great depths there is an absolute cessation of all motion. Over such a bottom the line is taken in an arc of a large circle, the most southerly point of the cable being in 42 degrees north latitude, and the most northerly 48 degrees. Along the southern end of the Newfoundland Bank it is sunk in about 150 to 200 fathoms, the water on the bank itself varying from 50 to 90 fathoms. Thus it is completely sheltered from ice, which, if the icebergs pass the bank at all must clear the cable, which lies under its lee by some hundred fathoms or more. From this point it is taken up due north in the channel between the Green Bank and the St. Pierre Bank in an almost unvarying depth of 500 fathoms. From this point out the course is over very regular shoal water, so to speak, being at no part less than 100 fathoms, and generally over 150 to its termination. For laying the deep-sea cable—that portion of the line between Brest and St. Pierre—the company wisely made selection of

THE GREAT EASTERN,

in which, to answer all requirements, a number of judicious changes were made, all looking to the duty she was called upon to perform. She is now deeper by a foot than she has ever been. She is cumbered by deck houses, and has, in other respects, been made to resemble a floating hotel. Great improvements have been made in her mechanism. Her rudder, formerly worked by twelve men, now answers the bidding of steam machinery. A single helmsman turns the wheel. All that he does is to act upon certain valves, and to set in motion the power by which in reality the vast hull is guided through the sea. The paying-out machinery has also been perfected, and there is less chance of injury to the cable than there ever has been. The cable having been coiled on board the great ship, on the 11th of June, the day before she left the Medway, where she was lying, a short distance from London, to proceed on her work, a grand banquet was given on her, at which some one hundred ladies and gentlemen were present, among whom were Sir David Gooch, M. P., Chairman of the Telegraph Construction and Maintenance Company; Messrs. John Pender, Ralph Elliot, Thomas Brassey, M. P.; Captain Sherard Osborne, Sir Samuel Canning, Mr. Julius Reuter, Sir James Anderson, Mr. Varley, Professor Jenkin, Baron d'Erlanger, Lord Hay, Lord Houghton, Mr. Elliot, Mr. J. B. Burke, Secretary of the Anglo-Mediterranean Company; Mr. B. Slater, Secretary French Cable Company; Mr. T. Crompton, the layer of the first successful submarine cable, and many others. The visitors examined the various details of the arrangements for laying the cable, and after having been seated at the table Mr. Gooch proposed the toast, "Prosperity to the French Cable Company." This was warmly responded to by Lord Hay, who stated that the company had the highest reason to be grateful to the Construction Company for the manner in which they had performed their work. The cable was excellent in its work, and had been completed eighteen days under the stipulated time. Baron d'Erlanger proposed the toast of the day. "Success to the great work of laying down the cable." This was briefly responded to by Mr. Bender and Lord Houghton.

THE INSTRUMENT

used on board the Great Eastern is that universally adopted in working all submarine lines—the reflecting galvanometer. The principle of this most delicate instrument was discovered a few years ago by a German electrician named Weber. It consists of a small mirror with a magnet laid across its back; and that the two are very small indeed, may be judged from the fact that both together weigh less than three-eighths of a grain. This small reflector, which is intensely bright, is suspended by a silk thread as fine as a hair, in the midst of a small circular coil of insulated wires. Directly a current is sent through this circular coil, no matter how slight, it induces another electric current within its circle, which acts in an opposite direction, and this causes the little magnet at the back of the mirror to turn to the right or left, and, of course, to turn the little mirror with its reflecting ray of light with it. By a very simple arrangement, this fine ray of light is thrown upon a horizontal graduated scale, about three feet long and three feet distant from the mirror. Thus, when a current is sent through the little circular coil round the mirror, the magnet is acted upon, and turns the mirror with its ray of light—say on the left of the scale in front of it. When the current is reversed, and that is instantly done by pressing a little key in the speaking instrument, the current in the circular coil is reversed and sent in the opposite direction, and this in turn sends the ray of light from the mirror on to the opposite side of the scale to the right. When the ray of light rests stationary on any part of the scale it means a dot; when it moves rapidly to the right or left it means so many dashes, according to the distance it goes. Thus the little pencil of light makes dots or dashes on the scale, just as the old Morse instrument used to make them in visible ink on paper, and any combination of words or letters or figures can be formed and read with the utmost ease by the receiving clerk, who is watching how the light moves and dictating the letters and words it sends. When the cable is at rest the light remains stationary in the centre of the scale at zero. When a fault occurs the loss of electricity is shown by the currents, or the reverse currents, turning the light more to the right or left of the centre of the scale than it should do. When a total fault occurs—that is, when the cable has parted—the little ray of light flies off the scale altogether, and is never seen again till the mischief is repaired. So exquisitely delicate is this instrument that most distinct messages have been sent through the whole length of the present French cable with no greater battery power than that afforded by a lady's thimble filled with weak sulphuric acid and water. It was by this reflecting galvanometer that the watchers at Brest knew whether the Great Eastern at the other end of the long rope of hemp and steel was steady or not. Each roll of the ship produced a slight magnetic current in her vast coils, which, transmitted through the cable to the sensitive instrument, turned the ray of light to the right or to the left of the scale, thus showing in a fraction of a second of time the precise degree and rapidity at which the vessel was rolling. This unceasing vibration follows the voyage of the ship, marking its progress and incidents to the close. The same kind of instrument is also made use of on all the stations of the line.

BREST.

The eastern terminus of the cable is a fortified town of France, 370 miles W. SW. from Paris, in the department of Finisterre, and is the chief station of the French marine, and one of the first naval and military ports of Europe. It is about three miles in circuit, and is surrounded with ramparts planted with trees. Its outer harbor is unsurpassed for safety, and is exceeded in extent only by those of Constantinople and Rio Janeiro. It communicates with the sea by a single long and narrow passage, divided by a rock in its centre, so that vessels are obliged to pass immediately under the batteries. Its inner harbor can accommodate sixty frigates, and is most strongly fortified. Brest is divided into the upper and lower towns. The prison for galley slaves is the largest in France, containing about three thousand convicts. The place was first rendered formidable by Cardinal Richelieu, and in 1694 it withstood a combined attack of the British fleet and army. Its total population is not far from 65,000.

ST. PIERRE,

the first landing place of the cable, is one of a group of three French islands, consisting of St. Pierre and Great and Little Miquelon, off the south coast of Newfoundland and opposite the Gulf of St. Lawrence: it has an area of 106 square miles and a population not far from 2000. It is of great importance to France as a fishing rendezvous, employing, with the two other islands, as many as 12,000 men. The island is scarcely anything more than a rock, with a soil so scarce as almost entirely to preclude vegetation.

DUXBURY,

selected as the western terminus, is a town in Plymouth county, and is 36 miles S. SE. of Boston. Here, at "Rouse's Hummock," the western end of the cable will connect with the shore line built from Boston. This is situated near the Gurnet light, at the entrance of Plymouth harbor, and in a direct line is about one mile and a half from the village, but it cannot be approached without driving around the beach a distance of five or six miles, unless one feels disposed to cross marshes and rivers, which in a direct line intervene between it and the village. The Hummock is a conical shaped hill, and embraces about thirty or forty acres of land, covered with a slight growth of wood. Its highest point is about fifty feet above the level of the ocean, from which a beautiful view of the majestic ocean and the surrounding country can be had. The cable company have erected a building at this place, in which the ocean cable will be placed. A man will constantly be stationed in the building, to guard the cable against danger, and in case of a break it will be tested at this point.

THE DISTANCES

by water are from Brest to St Pierre, 2325 nautical miles; and from St. Pierre to Duxbury, 722 nautical miles; the other sections will make the total length 3407 miles. The portion of the cable between Brest and St. Pierre was successfully laid by the steamship Great Eastern; that from St. Pierre to Duxbury by the steamers Scanderia and Chiltern.

THE MAIN OFFICE

is in the old bank building at Duxbury village. This office will be under the charge of Mr. L. G. Watson, of New York, the General Superintendent and Managing Agent of the company, assisted by Mr. R. T. Brown, of London, the manager of the land lines. Mr. M. J. Gaines, formerly Consul-General for the United States at Tripoli, but who for the past seven or eight years has been engaged in telegraphic service in the Mediterranean, is to be the chief clerk in charge of the cable, and a force of about twelve electricians will be required to perform the duties of the cable and land lines.

LAYING THE CABLE.

On the 18th of June the shore end of the cable was submerged at Brest. On the 21st the Great Eastern arrived, the splice was made, and the expedition started for St. Pierre at an early hour in the morning. At noon on the 22d, 174 nautical miles had been run; on the 24th, 377 miles; the 26th, 574 miles (during this day there was a detention of over three hours, caused by an interruption of the signals, which difficulty was successfully overcome); the 27th, 697 miles; the 28th, 823 miles; the 29th, 920 miles; at 9 o'clock on the morning of the 30th, a message was received that those on board the Great Eastern were going to cut and buoy the cable; communication was not had with the steamer again until July 2 at noon, when it was ascertained that a fault was discovered in the cable on Wednesday, June 30, and the Great Eastern was obliged to stop and locate it, and remove it. A heavy gale prevailed, and in order to avoid the probability of a serious accident to the cable, it was decided to cut and buoy it, which was done with success—the cable was recovered July 2, the fault removed, and the work of paying out recommenced; July 3, at noon, 1146 knots run, and 1281 knots of cable paid out; July 6, at 10 o'clock A. M., the Great Eastern arrived in American waters; up to noon of which day she had run 1524 knots, and paid out 1700 knots of the cable; at noon, July 7, 1639 knots run, and 1840 knots of cable paid out; at noon, July 8, 1754 knots run, 1977 knots of the cable paid out; at noon, July 10, 2023 knots run, 2287 knots of cable paid out; on the morning of July 12 the steamer was off Newfoundland, and only thirty miles distant from the place where the splice was to be made; July 13, the Great Eastern arrived off the island of St. Pierre, and on the 14th the splice was made with the shore end, and communication opened from St. Pierre to Brest, the first message sent being a sealed message which was prepared by the Emperor of the French and placed in the hands of Sir James Anderson, by whom it was transmitted.

The short cable from St. Pierre to Duxbury was then laid by the Chiltern, the shore end being landed on Friday evening, July 23.—*Boston Traveler.*

King Arthur.

The London *Athenæum*, in reviewing a curious old romance entitled "Merlin; or, the Early History of King Arthur," recently published in London from an unique manuscript, remarks as follows:—

"The historical starting-point for the elucidation of the life of King Arthur is a single page in the old writer Nennius. It is as minute a point as that of the needle on which the dreamer saw thousands of angels dancing. And on the Arthurian historical point, truth and fancy have combined to find standing-room for as many legends. Nennius only tells us that Arthur means, in other words, the "horrible bear." We hear, too, from Geoffrey of Monmouth, that when Vortigern had seen a fight between a white and red dragon, in which the latter was ignominiously crumpled up, he asked young Ambrosius Merlin what it meant. It means, said the youthful soothsayer, that the Saxon white worm will overcome the British red one, and that the Britons will have their necks under the Saxon heels till a boar (or a bear), *Arthur*, shall come out of Cornwall and do right to the down-trodden. Nennius gives two other of Arthur's surnames. *Mab Uter*, British for "dreadful little one," a name which was fixed on the not too calm-minded chief for his cruel doings when a boy. As the "*iron hammer*," Arthur is, of course, the crusher of all his foes. All of this, it hardly need be said, is to be taken for what it is worth.

Twelve battles are named by Nennius in which Arthur, with Christ and the Maiden-Mother on his breast-plate, or on the inside of his shield that he might kiss the emblem as he fought, pounded his foemen to dust: the king's wont in all battles. Nennius even carries the war-loving King to Jerusalem, where he fasted, prayed, and won from Heaven the comfortable assurance that he should ever be master into whatever bloody field he bore the Pendragon banner. Arthur brought from the Holy City a likeness in stone of Blessed Mary, bits of which were to be seen, and the faithful worshipping before them, in the religious houses in Woedole in Nennius' own days. This "Vallis doloris" is put down by the writer as being six miles westward of the once famous abbey of Melrose, and then within the bishopric of St. Andrews. These battles range from that at the mouth of the river Glem to the last and greatest fight of Mount Badon, in which King Arthur routed eight hundred and forty-one men with his own hand, or nine hundred, as the less circumstantial put it. One account is as credible as the other.

Such is the outline given by Nennius; and romance has raised upon it a building, the size and the brilliancy of which dazzle the gazérs. As the building is as movable as Aladdin's palace—is here to-day, elsewhere to-morrow, and is, like the great King's grave, in half-a-dozen places at once—the seekers for it are utterly bewildered. Some persons even yield up belief in Arthur and his hundred shifting stories altogether, and become faithless to both reality and romance.

Nennius does not trouble himself or his readers with dates; but we may remark that the last of the Romans, Ambrosius, whom Arthur helped to crush the Saxons, went the way of all flesh at the close of the fifth century; that Uther Pendragon reigned from 500 to 506; and that during the next six-and-thirty years Arthur was himself king in this island of Britain. This is to be taken as something less sure than the year-courses of the Georgian era. At all events, six hundred years later there was strong belief in the man and in his deeds. Amid all the mist of romance, and the clouds built up by fancy, and behind which the Great One was only fitfully yet grandly seen, the British people kept firm to their faith in the bodily being and doing of Arthur. "It is of this Arthur," says Malmesbury, in the book he wrote for the pleasure of his royal scholar, Robert, Earl of Gloucester—"It is of this Arthur that the Britons fondly tell so many fables, even to the present day;" but, he adds, that Arthur was "a man worthy to be celebrated not only by idle fictions, but by authentic history." If Malmesbury had only set apart what was feigned from what was real, as learned folk thought of both in his own time, we should all love him ten times more than we do; but Malmesbury only tells of the great king's might at Mount Badon. It is to be remembered, however, that the monk of Malmesbury wrote his book for Robert Fitzroy, the learned but not lawful son of Henry the First, and Earl Robert knew as much about the prose and the poetry of Arthur's life as William himself.

"The sepulchre of Arthur," says Malmesbury, "is nowhere to be seen, whence ancient ballads fable that he is still to come." That of Arthur's nephew, Walwin, was discovered on the Welsh coast in the reign of William the First; but as the monk says that the grave was fourteen feet long, we may believe that romance has somewhat stretched it. Be this as it may, we find how clearly Malmesbury saw the truth, touching both uncle and nephew, when he says, "Neither of these men was inferior to the reputation they have acquired." A British poet has upheld Arthur's merit in the very spirit of this prose-writer. Hardying tells us that the king was

"Throughout the world approved of his age,
Of wit and strength, beauty and largess;
Of person high above his baronage
And other all of Britain's vassalage,
By his shoulders exceeded in longitude
Of all members, full fair in latitude."

Writers of both poetry and prose made tall fellows of all their heroes. They would bring Nelson and Epaminondas from five feet four to the standard of Arthur and his fourteen feet of nephew, whose grave was discovered in Wales. The belief in the towering height of Arthur may have been grounded on fact; and the passage in the Saint Greale, which tells of the grasses and flowers in the hall, is perhaps but the truth, as it concerns his love of good smells. It is wonderful to follow the British mind in view of its trust in Arthur's story. It was quoted as simple truth in a petition to Henry the Eighth against the exactions of Friars, Pardoners, and Somners. "The noble King Arthur," it says, "had never been able to carry his army to the foot of the mountains to resist the coming down of Lucius the Emperor, if such yearly exactions had been taken of his people." In a later reign Bacon, after the manner of Malmesbury, said of the British king:—"There is truth enough to make him famous, besides that which is fabulous;" but Bacon lacked leisure or care to set forth the "truth enough," and future searchers will find that truth all the harder to be got at. The folk-lore for the whole story is to be seen in this, namely, that a Hebrew MS. of the Romance of the Round Table, translated from the Spanish, exists in the Vatican.

In the latter half of the twelfth century—writers disagree as to the year—in digging a grave for an obscure monk in the Abbey of Glastonbury, the diggers came upon that of a stalwart man, in whose grave a yellow-haired woman lay sleeping her last sleep. Some words on the coffin of the male showed that it contained all that could die of King Arthur. Ten marks of wounds on his body were as good warrant of his identity as the words. The mute companion was taken to be Queen Guinevere. Malmesbury, before the remains were discovered, speaks of the King's burial at Glastonbury, and later writers allude to the discovery as a well-known fact. Some think this "find" may have been but a pious fraud for the greater glory of the monastery. Others hold that this "find" must have been a true find; that the monks could not have forged a story that could be so easily put to the proof at the very time. But this is not the boundary of dispute. The question is, whether there was ever an Arthur at all, such as he stands before us in poetry and prose.