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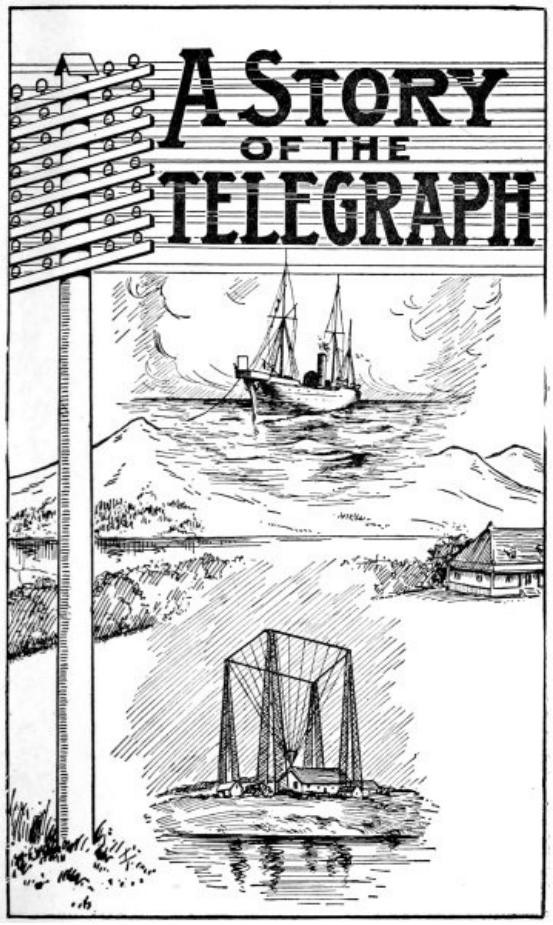

A STORY
OF THE
TELEGRAPH

A Story of the Telegraph

By JOHN MURRAY
Montreal

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PREFACE.

HE compiler of this little compendium of Telegraph History places it in the hands of the public in the hope that it may be received with favor.

The historical data is taken from leading standard authorities.

The biographical sketches of eminent scientists and inventors will enable the reader to form his own conclusions as to the merits of each.

The sketches of prominent pioneer telegraph men in Canada should be especially interesting to Canadians.

Many names worthy of mention have been reluctantly omitted, as it was thought desirable to confine this initial work into as narrow a compass as possible. A more extended edition may be forthcoming later should this venture prove successful.

The few reminiscent incidents in the Canadian section will lend a spice of variety to the narrative.

INTRODUCTION.

The Electric Telegraph is unquestionably one of our most valuable public utilities.

In commercial life the telegraph has revolutionized business methods. Transactions are now effected between New York, London and other financial centres in minutes, which formerly occupied weeks, and even months, to accomplish. In social life the advantages of telegraph communication are equally apparent; travel where we may, we are always within reach of friends or kindred at a distance by means of the telegraph wires.

The daily Press is now enabled to record the moving accidents on flood and field in all parts of the world, a few hours or even minutes after their occurrence.

The dreadful catastrophe at Martinique, with the loss of thousands of human lives; the fire in a Chicago theatre, and the loss of hundreds of women and children through culpable negligence; the shocking loss of life on the excursion steamer “General Slocum” through lack of life-saving appliances is gruesome reading, but the public demand it; the more pleasing event of King Edward’s visit to President Loubet, on his mission of Peace, and the return visit of the latter to London are a few examples of news carried over the wires, all within the purview of the humblest reader. There are few who cannot afford the price of a daily paper, and thus keep in touch with current events, but no very long time ago a daily newspaper was beyond the reach of all but the comparatively wealthy. The advent of the telegraph with its multifarious budget of news from every quarter of the Globe caused a large increase in circulation, and a decrease in price naturally followed.

During the Crimean war, when telegraph communication had been established with the army headquarters, the working men of a manufacturing concern near Glasgow, in which the writer was employed, clubbed together to defray the cost of a daily newspaper, the price then being four pence halfpenny, much beyond the means of a single individual. During the dinner hour he read to an interested and attentive audience the latest despatches from the seat of war, many of whom would forego dinner rather than miss the daily pabulum of war news. Now all this is changed, the poorest laboring man can afford the price of a daily paper, formerly only enjoyed by his more opulent countrymen.

Still earlier, Macaulay, in his History of England, tells us of the news letter, the predecessor of the modern newspaper, wherein he says: “The news letter within a week after its arrival had been thumbed over by twenty families, and furnished the neighboring squires with matter for talk over their October, and the Rector with topics for sharp sermons.”

The news letters were collated in London, for the benefit of provincial readers. The price was no doubt high, and the contents probably consisted of gossip or scandal in high life, details of a cocking main, an affair between my Lord Tomnoddy and a Captain of the Blues, or affairs of Church and State. Now the four quarters of the earth is ransacked daily and news collected at immense labor and enormous cost by the associated press, and retransmitted to all points of the compass.

Wireless telegraphy, the latest marvel in applied science, is surely and steadily forging ahead, and will cover areas of land and sea, where the land and cable wires do not operate.

The writer feels that no apology is necessary in publishing the following brief outline of telegraph history, a subject which he believes will interest both the old as well as younger readers.

The data of English telegraph history is largely derived from an early edition of the Encyclopaedia Brittanica, while that of the American is taken from a voluminous work published about a quarter of a century ago, by James D. Reid, a friend and associate of Professor Morse. The facts relating to Canadian history are taken from original records, while that of submarine and wireless telegraphy is from numerous sources of contemporary literature and personal knowledge.

While admitting there is nothing strikingly original in the work, the writer ventures to hope that the style will commend itself to those who prefer brevity to wearisome detail.

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Telegraph History

Telegraph, a machine for communicating intelligence to a distance, usually by means of preconcerted signals to which some convenient meaning is attached.

The name Semiphore was also applied to some of the machines used for effecting telegraphic communication, which in an extended sense may be considered to embrace every means of conveying intelligence by gestures and visible signs, as flags, lanterns, rockets, blue lights, beacon fires, etc., or by audible signals as the firing of guns, the blowing of trumpets, the beating of drums or gongs, as well as by the machine specially provided for the purpose.

Although telegraph communication as a means of conveying any required intelligence is an invention of recent date, the use of signals for the speedy transmission of messages as might be previously arranged between persons is a practice derived from the most remote antiquity. The use of beacon fires for example, as a means of giving warning of the approach of an enemy, is alluded to by the Prophet Jeremiah, who wrote about six centuries before the Christian era, and who warns the Benjamites to set up a sign of fire in Beth-Haccerem, for evil appeareth out of the north and great destruction (*Jeremiah* VI., 1). 10

The fine description given by Acchylus in his Agamemnon, of the application of a line of fire signals to communicate the intelligence of the fall of Troy is often referred to as an early instance of this kind of telegraphic dispatch.

This simple means of spreading an alarm, or communicating intelligence, is described by Scott in the “Lay of the Last Minstrel,” and in a note he refers to an act of the Scottish Parliament in 1455, c. 48, which directs that one bale or faggot shall be the warning of the approach of the English in any manner, two bales, that they are coming indeed, and four bales blazing beside each other that the enemy are in great force.

Such signals though best adapted to give information by night, were also available in day time, when they appeared as dense columns of smoke.

Torches held in the hand and moved in any particular manner, or alternately displayed and hidden behind a screen, were also used in ancient times as signals.

A night telegraph contrived by the Rev. James Bremner, of the Shetland Islands, and rewarded by the Society of Arts in 1816. 11

A single light constitutes the whole apparatus and the whole operation consists in its alternate exhibition and concealment. This plan had been found suitable for distances of twenty miles and upwards, and had been successfully put in operation between the light-house on Copeland Island and Port Patrick, on the opposite side of the Irish Channel.

Telegraph Electric

The attempts to render one or other of the phenomena of electricity subservient to the purposes of telegraphy have been numerous. From the earliest date, which we can assign to the existence of an electric telegraph, its essential parts have been the same. There are: 1st, the source of electrical power; 2nd, the conducting material by which this power is enabled to travel to the required locality; and, 3rd, the apparatus by which at the distant end of the line the existence of this power, its amount or the direction of its action is made known to the observer.

In the earlier stages of the invention, the investigations of its promoters were confined to the last of these three essentials, and, so long as the illustration of the idea was confined to the lecture table, this part claimed pre-eminence, but with the proposed application to purposes of general utility there arose the necessity for an equal degree of attention to the two former requisites. 12

The experiments of Dr. Watson, in England, in 1747, and of Franklin, in 1748, on the banks of the Schuylkill river may have suggested the conveyance of information by means of electricity.

The earliest authenticated instance of any attempt to reduce this to practice appears to have been that of Lesage, of Geneva, in 1774, and of Lomond, in France, in 1787, they employed as an indicator a pair of pith balls suspended from one end of an insulated wire, and at the other end of which was the operator provided with an electric machine, on charging the wire with electricity, the pith balls would exercise mutual repulsion and divergence from one another, but on removing the electrical charge from the wire by the contact of some conductor the balls would collapse.

It is evident that certain numbers of successive divergences might be made to denote particular preconcerted signals.

Subsequently to this the phenomena of the spark, as seen on the passage of electricity through an uninterrupted conductor, was used for the transmission of signals, were the various letters of the alphabet formed in this manner upon a table and connected with each one with a distinct and insulated wire and a particular letter might be rendered visible in a darkened room by passing an electric charge through the appropriate wire, this in fact constituted the telegraph of Reusser or Reiser invented in 1794. 13

Retancourt and Dr. Salva, in 1798, appear to have made experiments on the transmission of the charge through wires of great length.

A somewhat similar form of apparatus involving the same principle was constructed by arranging the several wires in succession with a single break in each. The various wires bore the names of the different letters or figures, and any required signal was indicated by passing the charge through the proper wire, when the spark visible at the interruption of the circuit would denote the letter to the observer at the farther end. This was the point to which invention had advanced at the commencement of the nineteenth century.

The discovery of Volta in 1800, of the Pile, which bears his name forms the commencement of a new era in electric telegraphs. Although there was no immediate application of the phenomena of the galvanic current to the purpose, indeed several important discoveries had to be made before an electric telegraph of any value was possible.

In 1807 Sommering, at Munich, proposed to construct an electric telegraph on the principle of the decomposition of water, by the Voltaic current discovered in 1800, by Nicholson and Carlisle. The form of apparatus was the following: 14

In a glass trough containing water, thirty-five gold pegs or pins were arranged vertically, this number of pegs corresponding to the letters of the alphabet together with the nine digits; each of those pins was connected by a wire which extended to the place whence the signal was to be transmitted; at this point they terminated in brass strips arranged in a frame side by side, but like the wires and pins insulated from each other, each brass strip bore the name of the letter or figure which belonged to the pin to which it was connected. The operator, when wishing to send any communication, connected the two poles of the battery with the brass strips bearing the names of the two first letters required—decomposition of the water in the trough at the distant end was instantly indicated by the evolution of bubbles of gas from the two gold pins which thus became the two electrodes or poles of the battery. The letters forming any communication were to be in this manner denoted in pairs, the inventor ingeniously availing himself of the different quantities of the two gases, evolved to point out the relative position of the letters in each pair, the hydrogen being employed to indicate the first letter. 15

Schweigger proposed to add to this system a plan for calling the attention of the correspondent at the distant station by the discharge by the current of a pistol charged with the mixed gases.

In 1816 Mr. Ronalds, of Hammersmith, invented an electric telegraph in which the use of frictional electricity was recurred to.

This telegraph, which was shown to several scientific men at the date above given, was fully described by the inventor by a work published by him in 1823.

Mr. Ronalds employed the divergence and collapse of a pair of pith balls as the telegraphic indication in which respect the principle was the same as that adopted by Mr. Lomond, but to this simple apparatus a distinct contrivance was appended in order to render the communication more rapid and easy.

A single wire, perfectly insulated by being suspended by silken strings, or buried in glass tubes, surrounded by pitch and protected by wooden troughs, was extended between the stations; from the end of this wire was suspended in front of the dial of a clock, a pair of pith balls so that whilst the wire was charged the balls would remain divergent, but would instantly collapse when the wire by contact with the earth, or with the hand of the operator was discharged. 16

A person at one end having, therefore, an electrical machine, by which he could maintain the wire in an

electrified state and the pith balls at the other extremity, consequently, in a state of divergence, had it, of course, in his power to give an instantaneous indication to the observer at that farther extremity by touching the wire with the hand, which, discharging the electricity, would allow the balls to collapse for an instant; but instead of merely employing the successive movements of the pith balls to denote the various signals, Mr. Ronalds added another apparatus for the purpose.

Two clocks, very accurately adjusted to the same rate of going, carried, instead of the ordinary seconds hands, light discs, on which the various letters of the alphabet, the figures and other required signals were engraved. These discs turned with a regular step-by-step movement behind a screen of metal in which was made a small opening, sufficient to allow one letter at a time being seen. As the discs turned round each letter in succession would be visible through this space, and it is evident that if the clocks started with the same signal visible, the movement of the discs would bring similar signals into view at the same time.

One of these instruments was situated at each end of the communicating wire.

17 The operator who was about to transmit any communication watched the dial of his clock until the letter he required was visible and at that instant discharged the wire; the momentary collapse of the balls at the distant end would then warn the observer to note the letter visible on his instrument which would form a part of the intelligence to be received, the successive letters or signals constituting any messages were denoted in this manner, as the clock dials continued to turn round.

In order to avoid the constant attention on the part of the observer an arrangement was adopted by which a pistol could be fired by the spark of the further end to summon the attendant to his instrument.

Various signals were also concerted before hand, by the use of which the time necessary for the transmission of any intelligence was lessened.

These experiments of Mr. Ronalds were made with the intervention of several miles of wire carried backward and forward across his grounds.

In 1819 Professor Oersted, of Copenhagen, made his great discovery of the action of the galvanic current upon a magnetic needle; he observed that when a current is passed along a wire placed parallel and near a magnetic needle free to turn on its centre, the needle is deflected to one side or the other according to the direction in which the current is transmitted.

18 He further noticed that the position of the wire, whether above or below the needle, had an equal influence with the direction of the current in determining the side to which the deflection took place. The power of a single wire in causing this deviation of a needle is but small, but this was remedied by the invention of the multiplier or galvanometer by Prof. Schweigger, in which the needle being surrounded with many successive coils of insulated wire, is acted upon by the joint force of all. Under a somewhat different form this discovery now forms the basis of the needle electric telegraph.

Very shortly after this important discovery had been made, Arago and Ampère, in France, and Seebeck, in Berlin, succeeded in rendering iron magnetic by the passage of a galvanic current through a wire coiled around the iron, and Sturgeon, in England, produced the first electro-magnet. It was found that provided the iron to be magnetized were perfectly soft and pure, the magnetic property remained only during the actual transmission of the electricity, and was lost immediately on the interruption of the electric current.

If the iron which was exposed to the influence of the galvanic current were combined with sulphur, carbon or phosphorus, the magnetic power became to a greater or less extent permanent in it.

19 The invention of the Voltaic battery, of the deflection of the needle, and of the magnetization of soft iron, formed the three great steps in the history of the electric telegraph.

M. Ampère suggested the employment of the discovery of Oersted as early as 1830, and this suggestion was acted upon by Prof. Ritchie, in a model telegraph exhibited by him at the Royal Institution.

Ampère’s plan, however, was far from possessing the simplicity so essential to an instrument designed for practical use; not less than thirty pairs of conducting wires were necessary according to his scheme for maintaining a telegraph communication.

Baron Schilling in 1832 and 1833, following the idea originated by Ampère, proposed a similar form of telegraph in which there were as many of these galvanometers, each with its appropriate circuit, as there were letters or signs to be used in the various communications, in fact, there were 30 needles and 72 wires.

In 1833 Gauss and Weber proposed to employ the separate movements of a suspended bar as signals, but its indication must have been feeble as they had to be observed through a telescope placed at some distance from the oscillating bar.

In 1837 M. Alexander exhibited a model of a proposed form of telegraph containing twenty-five needles to be acted upon as in Ampère’s arrangement.

20 In this instrument a distinct needle was employed for the indication of each letter, these needles bearing at one end light screens of paper which concealed from view a letter or figure until by the deflection of the needle the screen was removed, and the letter brought into sight.

M. Alexander, however, effected one great improvement in substituting a single wire to which one end of all the coils was joined for the several return wires existing in the previous invention of M. Schilling.

At a later period this gentleman undertook a series of experiments with a view to the establishment of a communication by means of a single wire, but some mechanical difficulties appear to have arrested his progress.

In both of these telegraphs, all that was required in addition to the indicating apparatus and conducting wires, was a contrivance by which the connection of the Voltaic batteries could be made with any pair of wires, in the former, and with any single wire and the return conductor in the latter of the two inventions. One pole of

the battery being connected to the return or common wire, the other pole of the battery was joined to a plate of metal, or to a trough of mercury, extending beneath all the keys. On depressing any key the wire belonging to it, which was continued to the end over the battery connection, was brought into contact with this bar or 21
trough. The current would then flow along the conducting wire, around the multiplier coil in the distant instrument, and return by the common wire to the Voltaic battery. The keys bore the same letters as the needles to which they were connected, so that the operator communicated any letter by pressing down the corresponding key.

In these two instruments, no use was made of the power which exists of determining the deflection of the needle to either side by merely reversing the connections of the battery.

We have thus traced the history of the telegraph up to the point at which it first assumed the practical form of Cooke and Wheatstone's inventions, but what had been accomplished remained either unknown, or was known only to a few leading men of science, until the unexpected development of the electric telegraph in the hands of these gentlemen led each one who was in possession of any title to the merit of having believed in and experimented upon the possibility to produce his title, or to have it eagerly put forward by his friends and fellow countrymen.

Although the principal facts necessary to the construction of an electric telegraph had been known ever since 1821, yet it was not until the general establishment of railways that telegraph wires could be safely 22
carried to any great distance.

Moreover, the importance of the invention was by no means understood.

In 1837 the experiments of Cooke and Wheatstone, which had been progressing for more than a twelvemonth, appeared so far successful as to induce them to apply for a patent for their inventions.

The instrument which was brought into use on the Great Western Railway shortly after the date of the patent, contained five needles, arranged with their axis in a horizontal line. The needles when at rest hung vertically, by reason of a slight preponderence given to the lower ends, each coil was connected with one of the long conducting wires at one end, and was united at the other, with a rod of metal, which joined together the similar ends of all the coils.

The current was transmitted from the opposite end of the wires where a set of five pair of finger keys for making the connections with the battery was placed through two of the wires at once, that is to say, of the wire of which one key was pressed down, served to convey the current from one pole of the battery to the distant instrument, while the key of a second wire being brought into contact with the other pole, the current returned by the rod of metal connecting the coils, and the second wire to the battery again.

Two needles were in this manner deflected at once, and it will be obvious, that the current would pass in 23
opposite directions around their coils, and, consequently, that the deflection must be in contrary directions. The needles would, therefore, converge either above or below their line of centre as one or other of the pair of keys belonging to each wire was depressed, fixed stops were so placed on each side of the needles, as to limit their motion and when resting against them the needles were parallel to two converging lines, at the point of intersection of movement of the needles.

In a similar manner as lines were drawn diverging from the centre of each axis mutually crossing one another, a number of points of intersection were formed at each of which was a letter or signal. Any of these letters could be indicated by the simultaneous movement of two needles, so that a communication could be carried on with certainty and tolerable rapidity, at the same time a plan was recognized by which the number of wires requisite for maintaining a communication might be reduced by using one of them at times as a return wire only, there being no needle in connection with this one.

One needle could, by the use of this wire, be deflected by itself, either to the right, or to the left, and thus, of course, each would furnish two signals in addition to those formed by its simultaneous deflection by any other. 24
The instruments at the two stations were always rendered reciprocating; that is, at each end of the line were placed at each instrument a set of finger keys and a Voltaic battery, so that either station could transmit, or receive a signal by an ingenious arrangement. The keys on being released after depression, were made to resume by themselves the position necessary to enable that which had been the signalling station to become the recipient; by this means messages and answers or words and their acknowledgment could follow one another without the necessity for any intervening adjustment of the instruments.

The bell or alarum which was to be rung, when the attention of the clerk at the distant end was required, was either direct or indirect in its action.

In the first case, the attraction exercised by a horseshoe-shaped piece of soft iron, rendered temporarily magnetic by the galvanic current, was made to draw an armature likewise of soft iron towards it, and by this action impel a small hammer against a bell.

In the second form of alarum the movement of the armature merely released a detent or catch from a train of clock work driven by a spring or weight. This clock work by the intervention of a scape wheel and pallets rang the bell as in a common alarum.

In April, 1838, Mr. Cooke obtained a patent for some further improvements in this apparatus. 25

The electric telegraph invented by Prof. Morse, of the United States, has led to a large amount of controversy, a claim having been put in for him as the first actual invention of a practical electric telegraph in 1832, while on board the packetship "Sully."

The Abbe Moigne states that a Mr. Jackson wrote to the Academie Française, affirming that he had in 1832 communicated the plan to Mr. Morse while returning together from Europe to America on board the "Sully."

Even admitting, however, the claim of either party, it would only show that they did not think sufficiently well of their scheme to enter upon it until nearly three months after the first English patent for an electric

telegraph had been sealed and the practicability of such an apparatus had been demonstrated in England.

The first really official letter on the subject from Prof. Morse is dated September 27, 1837.

Cooke and Wheatstone's first patent for an electric telegraph was sealed three months before this, namely, on June 12, 1837.

The difference between this telegraph and the preceding, in suggestions and contrivances, was very great. The experiments of these gentlemen had been proceeding for a long time previously, so that when in June, 1837, their patent was obtained, it was not for an arrangement of doubtful practicability, or of a form to be perfected only after repeated trial; on the contrary, it was within a few months after the date of the patent put up and brought into actual and daily use. 26

Some of its details have since been simplified, and the modes in which the electric needles are made to give the required indications have been greatly varied, but the great features and principles of their first invention remain unchanged, and not only so, but they form an essential part of nearly, if not quite all, the later telegraphs of other inventors.

The invention of an electric telegraph should have attracted the immediate attention of railway managers, one would naturally suppose; on the contrary, railway directors looked upon it as a new-fangled invention, and the public was not yet alive to its innumerable advantages. One fact, however, must be insisted on and is now a matter of history—that to England belongs the honor of this great invention; that in the year 1837, a needle telegraph had been invented so complete, and at the same time so simple in its operations, that it could be worked by any one who knew how to read; that in June of that year the patent for this telegraph had been sealed, and a month later the wires were laid down between Euston Square and Camdentown Stations of the North Western Railway, a distance of a mile and a quarter, and that on the 25th of July messages were actually sent between these two stations, Prof. Wheatstone being in the Euston Square Station, and Mr. Cooke being in that at Camdentown, the witnesses being the engineers, Messrs. Fox and Stephenson. 27

Now, it is quite true that Arago claimed before the French Academy of Sciences for Mr. Steinheil the precedence in this matter, inasmuch as he had his telegraph in operation on the 19th of July, 1837; but it must be remembered that Wheatstone's patent was taken out in June of that year, and was publicly shown on numerous previous experiments, all of which were successful, whereas Mr. Steinheil published no description of his instrument until August, 1838, and it is admitted that in the interval he had altered and amended his instrument and soon after abandoned it for a modification of one by Morse.

In September, 1837, he exhibited an imperfect instrument, although he afterwards succeeded in producing one of first rate excellence, which is still largely used in the United States.

Cooke and Wheatstone received notice to quit the London and Birmingham line, but Mr. Brunel gave them permission, in 1839, to lay it down on the Great Western Railway. This was first done as far as West Drayton, 13 miles, and afterwards extended to Slough, 18 miles, the wires in both of these preliminary trials being enclosed in iron tubes laid on the ground. 28

On proposing to extend this line to Bristol much opposition was offered by the directors, and the telegraph again had notice to quit, but on the proposal of Mr. Cooke to retain the wires at his own expense, he was permitted to do so on condition of transmitting the Railway signals free of charge, and of extending the line to Slough. In return for this favor, he was allowed to transmit messages for the public, which was accordingly done, one shilling being charged for a message, but the public did not avail themselves of the new instrument, and its value was scarcely appreciated until the 3rd of January, 1845, when it was used to convey a message to London police, directing them to arrest one Towell, on a charge of murder. The message flashed past the criminal while he was travelling express to escape the consequence of his crime.

By the end of 1845 upwards of 500 miles of line were in operation in England.

In 1846 the Electric Telegraph Company commenced its operations with a considerable capital, a large portion of which was expended in the purchase of Wheatstone and Cooke's patents, and the system which they had introduced became rapidly extended.

In due time other telegraph companies were competing with the original company, namely, the Electric & International Telegraph Company, and the London & Provincial Telegraph Co. The system spread over Europe and soon no railway was deemed complete without its telegraph wires. 29

On the 5th of February, 1870, the Monopoly conferred upon the postmaster general, by the telegraph act of the previous year, took effect when the Post-Office assumed control of telegraph communication within the United Kingdom, and it then became possible to send telegrams throughout the country at a uniform charge irrespective of locality or distance.

The purchase money paid to the telegraph companies, compensation to railway companies for their interest in the telegraph business and the expense of new lines amounted to upwards of ten millions sterling.

On the day of the transfer a thousand post-offices and nineteen hundred railway stations were opened as telegraph offices. The public at once showed their appreciation of the change.

In the year 1869 but seven millions of telegrams passed on the companies wires; in 1870 the postmaster general transmitted ten millions.

In 1885 the sixpenny telegrams were introduced. The charge for a written telegram, which came into force in 1870, was one shilling for the first twenty words, and threepence for every additional five words, the addresses of sender and receiver being sent free. 30

In 1885 the charge was reduced to a half-penny a word throughout including addresses (a system of abbreviated addresses, which could be registered on payment of a guinea a year, was introduced), with a minimum charge of sixpence; the effect of this reduction was to run the number of telegrams in two years from thirty-three to fifty millions.

During the first six months the number of telegrams increased by 48 per cent., while the gross telegraph revenue fell off to the extent of £40,233 though £18,124 had been received in respect to abbreviated addresses.

In April, 1886, the telegrams in excess of 1885 amounted to 40 per cent., but the revenue was £11,800 less. In May the increase in telegrams was 51 per cent. and the revenue £4,100 less than the previous May.

In June the increase was 61 per cent. and the revenue £2,800 less. The working expenses were thus increased, while the receipts were diminished. In London alone the receipts fell off by as much as 74 per cent. The principal reasons for the unfavorable financial results of the working of the telegraph are: the large price £10,130,000 expended as purchase money, an argument of little weight so long as working expenses are not 31
paid; the right accorded to railway companies at the time of the transfer of sending postal telegrams free of all charge. The number of these telegrams, at first insignificant, reached a total of 1,600,000 in 1891, with an average length of 25 words, representing a value of £80,000 a year. Arrangements were afterwards made under which the companies would surrender this privilege in return for permission to send a fixed number of free telegrams in the course of the year.

The loss on press telegrams, to quote the forty-first report of the postmaster general: “A still more serious burden is caused by the loss on press telegrams.”

The charge specified in the Telegraph Act of 1868 for press telegrams is one shilling for 75 words during the day, or one hundred words at night, but a proviso was added that for copies only 2*d* per 75 words in the day or 100 at night, and no condition was laid down as to the copy being for the same town as the original; the newspaper, accordingly, combined to receive from the news associations messages in identical terms, and by dividing the cost they are enabled to get the benefit of a rate which comes nearer 2*d* than a shilling, the average charge being in fact about four pence half-penny per 100 words.

Notwithstanding the economical arrangements which have been made for the transmission of press 32
telegrams, 5,400,000 in number containing 650,000,000 words, the loss incurred by the Post-Office in dealing with them is estimated to amount to £300,000 per annum.

The reductions in the tariff, especially in 1885 and 1897, and the competition of the telephone (upwards of 450,000,000 messages a year, transmitted by the National Telephone Company alone), though it must be remembered that the Royalties of the companies exceeded £100,000 per annum, which figure among the receipts of the Post-Office telegraph service. The increased wages paid to telegraphists in 1880 and 1881, the wages and salaries represented 44 per cent. of the total revenue; they now exceed 66 per cent. The real success of the state administration of the telegraph lies not in any contribution to the revenue, but in cheap telegrams and a large use of the service.

The average price of the ordinary inland telegram is sevenpence, three farthings, and there are more telegrams sent in the United Kingdom, both positively and relatively than in any other country, with the possible exception of the United States.

For every 100 persons there are sent in the United Kingdom 184 telegrams, while in France there are but 108 and in Germany 66.

In 1901 the gross revenue was £3,380,589. The pay of a telegraphist in London rises to £160 a year, with the 33
prospect of promotion to higher positions.

The number of telegrams transmitted in 1900–1 was 89,576,000.

In small towns and villages where the traffic is light, and a skilled telegraphist is unnecessary, the Wheatstone A. B. C. instrument is used; in this apparatus electric currents are generated by turning a handle (placed in front of the instrument) which is geared to a Siemens shuttle armature placed between the two arms of a powerful horseshoe magnet; when one of a series of keys (each corresponding to a letter), arranged around a pointer, is depressed, motion of the pointer which is geared to the shuttle armature is arrested on coming opposite that particular key and the transmission of the currents to line is stopped, though the armature itself can continue to rotate. The depression of a second key causes the first key to be raised, the currents actuate a ratchet wheel mechanism at the receiving station, whereby the hand on a small dial is moved on letter by letter.

At offices where the work is heavier than can be dealt with by the A.B.C. apparatus, the single needle instrument is very largely used.

It has the advantage of slight liability to derangement and of requiring very little adjustment. A fairly skilled 34
operator can signal with it at the rate of twenty words a minute.

The needle (in the modern pattern) is of soft iron and is kept magnetized inductively by the action of two permanent steel magnets. The coils are wound with copper wire (covered with silk) to a total resistance of 200 ohms. The actual current required to work the instrument is 3-3 milliampères equivalent approximately to the current given by one Daniel cell through 3,300 ohms, but in practice a current of 10 milliampères is allowed.

A single but important addition to enable the reading from the instrument to be effected by sound, in this arrangement the needle strikes against small tubes formed of tin plate and by this means the movement of the needle to the right or left is quite audible.

The Wheatstone automatic apparatus is largely used, especially for press matter; through it a speed of 600 letters per minute can be obtained.

In the Rowland multiple method, the transmitter consists of a mechanical key board, provided with a series of levers which effect certain combinations of positive and negative currents for each letter: these currents are furnished by an alternator, which transmits sine currents over the line, both machines running in synchronism.

At the receiving end of the circuit a shaft is coupled to the motor; this is provided with gearing which rotates 35
four combining commutators and four type wheels, which print the letters on the band of paper. There are four transmitters and four receivers, which are operated independently by means of an adaptation of the multiplex system of working, and each circuit is provided with a number of segments set apart for its own use. Each

transmitter is, therefore, able to transmit a separate series of positive and negative currents in different combinations; these are distributed by suitably arranged distributors and relays at the receiving end of the line into their respective receivers. The function of the “combiner” in each receiving instrument is to group the received combinations of positive and negative currents that they operate polarized relays in such a manner that the position of the tongues corresponds with the operation of the levers in the transmitter, since each letter is represented by a specific combination of positive and negative currents.

It is possible by means of the combinations to close a local circuit at any given interval and so cause the paper to be pressed against the periphery of the type wheel at the time when the letter required is opposite.

The paper is also caused to advance automatically for each letter, start a first line, and also to commence a fresh form at the completion of each message. 36

The Delaney Multiples System, which has been adopted to a limited extent in Great Britain, enables a large amount of work to be done on one wire.

Between London and Manchester four sets of the apparatus can be worked, but between London and Birmingham, a shorter distance, six sets (the maximum for which the system is adopted) may be used.

37

Sir William Fothergill Cooke,
1806–1879.

Son of William Cooke, M.D., Durham, was born at Ealing, Middlesex, and having received his education at Durham, was appointed in 1826 to the East Indian army, in which he held various staff appointments till 1831.

On his return home he devoted his time to the study of anatomy and physiology at Paris and Heidleberg and to modelling anatomical dissections for the illustration of his father’s lectures at Durham University.

In March, 1836, he began to direct his attention to the electric telegraph, with which he occupied himself exclusively for many years.

He entered into partnership with Prof. Wheatstone, and formed in conjunction with Mr. Ricardo, M.P., the first telegraph company of which he became a director.

The first telegraph line in England was constructed by Mr. Cooke, from Paddington to West Drayton, on the Great Western Railway in 1837.

In 1840 he established the telegraph on the Blackwall Railway, and in 1841 a short line from the Queen Street station, at Glasgow, through the tunnel to the engine house at Cowlairs on the railway to Edinburgh.

In 1842 the line from West Drayton was continued to Slough, and in 1843 two short lines were made in Ireland and in England, one of considerable length from London to Portsmouth for Government. 38

In 1867 he received the fourth Royal Albert medal, his name being preceded by Faraday’s, for the first introduction of a practical electric telegraph.

Her Majesty conferred on him the honor of Knighthood, November 11, 1869, as a recognition of his great and special services in connection with the electric telegraph, and on July 25, 1871, conferred on him a civil pension of £100.

39

Sir Charles Wheatstone, F.R.S., D.C.L., LL.D.
1802–1875

Who, together with Sir W. F. Cooke, introduced and carried out practical electric telegraphy, was the son of Mr. Wheatstone, of Gloucester, at which place he was born.

He was educated at a private school and brought up to the business of making musical instruments, which turned his attention to acoustics.

He published his first work in 1823, “New Experiments in Sound,” and having studied Young’s theory of light, the results of his investigations were communicated to the Royal Society through Faraday, in 1833.

In the following year he was appointed Professor of Experimental Philosophy, at King’s College, London.

He was made F. R. S. in 1836, and two years later described the stereoscope, which he had invented, in a paper which he read before the Society.

Mr. Cooke (later Sir W. F. Cooke), was introduced to Professor Wheatstone, and they decided to unite their efforts to introduce the use of the telegraph on a large scale in England.

They took out their first patent for the electric telegraph laid on the Blackwall Railway in 1837.

Wheatstone received the Royal Medal in 1840, the Copley Medal in 1843, was one of the Jurors at the Paris Exhibition (1855), when he received the decoration of the Legion of Honor, and was knighted in 1868. 40

He was corresponding member of the principal academies of science in Europe.

It was by his skill in turning knowledge to practical account that Wheatstone gave the electric telegraph the character which it now possesses. Though his inventions in other branches of science are as numerous as they are various, yet it is in connection with the electric telegraph that the name of Wheatstone will live.

He was the inventor of the telegraph, indeed. No one else can lay claim to that title.

Stephen Gray, in 1827, suspended a wire, seven hundred feet long, on silk threads, and on applying an excited glass tube to one end, electrification was observed at the other, but he did not send messages. Advances were made from that time by many men of science, who saw more or less clearly the great possibilities before them.

Omitting the pioneer claims of Sommering, Lomond and others of the last century, the names connected with the early development of the practical telegraph are Froment in France, Gauss, Weber and Steinheil, in Germany, Sir Francis Ronalds and Edward Davy, in England, Morse and Vail, in America. But to Wheatstone 41
and his co-adjutor Sir William Fothergill Cooke is due the merit of having been the first to render it available for the public transmission of messages.

In 1834, shortly after being appointed Professor of Experimental Physics at King’s College, London, Wheatstone began experimenting on rate of transmission electricity along wires. For this purpose about half a mile of copper wire was insulated by suspension in the vaults under the college, and three interruptions of this circuit was made by three parts of brass knobs with a small interval between them, one of these interruptions was in the middle point of the conductor and the other two near the ends.

A leyden jar was discharged through the wire and the interval of time between the occurrence of the sparks at the ends and occurrence of the spark at the middle was measured by noting the displacement of the image of the middle spark in a mirror revolving at a known speed. It was calculated from results of this experiment that the velocity of an electric disturbance along a wire was about two hundred and fifty thousand miles per second, a result differing from the true speed of one hundred and eighty-six thousand miles per second; not very widely, considering the difficulties of observation in an experiment of this kind. From this research he passed on to the 42
transmission of messages by electricity, and in conjunction with Cooke he elaborated the five needle telegraph, the first that came into general use.

Wheatstone’s fertility of scientific resource led the partners on to many new developments.

The letter showing dial telegraph in 1841 and the magneto-electro dial telegraph, a subsequent extension of the same to type embossing, and lastly the automatic transmitting and receiving instruments by which messages are sent with such great rapidity.

He was the first to appreciate the importance of reducing to a minimum the amount of work to be done by the current at the receiving station by diminishing as far as practicable the mass and therefore the inertia of the moving parts.

This was beautifully exemplified in that marvel of ingenuity, the magneto-electro letter showing telegraph, which was particularly applicable for private telegraph uses.

From 1837 Wheatstone appears to have devoted a good deal of time to submarine telegraphy, and in 1844 experiments were made in Swansea bay with the assistance of Mr. J. D. Llewellyn.

Wheatstone also had a share in the perfecting of the magneto-electric machines which have culminated in the modern dynamo.

In 1837 he devised a method of combining several armatures on one shaft so as to generate currents which 43
were continuous instead of intermittent, and in 1867 he described to the Royal Society a method of making such machines self-exciting as to their magnetism by the use of a shunt circuit.

The use of a main circuit for the purpose had been described by Werner Siemens one month earlier, but the machine described by Wheatstone had been constructed for him by Mr. Stroh in the preceding summer.

Wheatstone was also the inventor of electro-magnetic clocks for indicating time at any number of different places united on a circuit.

It was he who called attention to Christy’s combination of wires, now commonly known as Wheatstone’s bridge—in which an electric balancing of the currents is obtained and worked out in its applications to electrical measurements.

He was one of the first in Great Britain to appreciate the importance of ohms simple law of the relation between electro-motive force resistance of conductors and resulting current—the law which is to-day the foundation of all electrical engineering.

Wheatstone contributed to numerous scientific journals and publications.

All his published papers were collected in 1879 by the Physical Society of London.

The Telegraph in America

Mr. Morse, the inventor of the telegraph system which bears his name, first conceived the idea on board the packet ship “Sully” on which he was a passenger. He sailed from Havre for New York on the first day of October, 1832. He was accompanied by a number of others, the whole company being unusually intelligent and agreeable. There was a long voyage before them, and each amiably undertook to relieve the tedium of the journey by the many pleasant devices indulged in by companionable travellers.

At an early period of the voyage, the conversation around the evening table turned upon the subject of electricity and magnetism which was then a popular topic of discussion and general interest.

One of the passengers (a Doctor Jackson) introduced the subject by reference to lectures to which he had recently attended while in Paris, in which interesting illustrations of the more recent discoveries in electro-magnetism had been given.

He also referred to the experiments of Ampère with the electro magnet; the subject excited very general interest into which Morse entered with great spirit. Hitherto he had felt no other concern in electrical matters than that of a lively and attentive curiosity.

Dr. Jackson had in his trunk an electro-magnet, which he described, and during the conversation alluded to 45
the length of the wire in the coils. This led one of the company to enquire “if the velocity of the current was retarded by the length of the wire?”

Dr. Jackson replied that electricity passed instantaneously over any known length of wire. This aroused the interest of Morse who was struck with the idea that electricity might be made the medium of conveying intelligence.

The conversation went on but he left them. As he paced the deck the idea rapidly took form in his mind that, either by electro-chemical or electro-magnetic effects of a current, marks might be made at distances so great and in such variety as to render possible the easy communication of and record of an intelligible language.

This was, so far as he knew at the time, a new thought. Gradually the conception took shape and system until at last it had assumed such a form that next morning, at the breakfast table, he communicated the plan by which he believed a recording telegraph could be serviceable.

Later on as the voyage was nearing its end, Mr. Morse, addressing the Captain, said “Well, Captain, should
you hear of the telegraph one of these days as the wonder of the world, remember the discovery was made on 46
board the good ship “Sully.”

He would now have devoted himself entirely to the elaboration of this new thought, but he had to betake himself to his work as an artist. He was poor and for three or four years following his return he had to travel much of the time to meet engagements in connection with his profession. Meanwhile, he devoted every spare moment to the perfecting of his apparatus.

In a letter to a friend Mr. Morse wrote: “Up to the autumn of 1837, my telegraphic apparatus existed in so crude a form that I felt reluctant to have it seen. My means were very limited—so limited as to preclude the possibility of constructing an apparatus of such mechanical finish as to warrant my success in venturing upon its public exhibition. I had no wish to expose to ridicule the representative of so many hours of laborious thought. Prior to the summer of 1837, at which time Mr. Alfred Vail’s attention became attracted to my telegraph, I depended upon my pencil for my subsistence. Indeed, so straightened were my circumstances, that in order to save time to carry out my invention, and to economize my scanty means, I had for months lodged and
eaten in my studio, procuring my food in small quantities from some grocery, and preparing it myself to conceal 47
from my friends the stinted manner in which I lived. I was in the habit of bringing my food to my room in the evenings, and this was my mode of life for many years.”

Under these distressing circumstances, Mr. Morse labored in perfecting his apparatus in which he finally succeeded. His caveat was filed in the patent office in Washington on October 6, 1837, but a patent was not obtained until 1840.

On the 8th of February, 1838, in response to an invitation from the Franklin Institute of Philadelphia, Prof. Morse exhibited the new telegraph before the Committee of Science and Arts of that institution, who reported their gratification and expressed their desire that government would give the means of testing it on an extensive scale.

Mr. Morse, shortly after this, exhibited his apparatus before the President and his cabinet, and which gave great satisfaction, in reference to which he wrote his friend and partner Mr. Alfred Vail, as follows: “Everything looks encouraging, but I need not say to you that in this world a continued course of prosperity is not a rational expectation. We shall doubtless find troubles and difficulties in store for us, and it is part of true wisdom to be
prepared for whatever may await us. If our hearts are right, we shall not be taken by surprise. I see nothing 48
now but an unclouded prospect, for which let us pay to Him who shows it to us, the homage of grateful and obedient hearts, with most earnest prayers for grace to use prosperity aright.”

Morse now determined to ask Congress for aid to make a thorough test of his apparatus on an actual line to show its capacity and practicability; in this he was encouraged by his friends. On December 6, 1842, he wrote an exhaustive letter to the Hon. C. G. Ferris, an influential member of the House Committee on Commerce, in which he gave a minute history of the invention, stated fully the basis of his claims as the inventor, and asked that through his committee an appeal might be made to Congress for the means to erect an experimental line to prove its value. In response to this the Hon. John P. Kennedy, February 23, 1843, offered a resolution “That the Bill appropriating thirty thousand dollars to be expended under the direction of the Secretary of the Treasury, in a series of experiments to test the expediency of the telegraph projected by Professor Morse should be passed.”

Mr. Morse sat in the gallery during the discussion which followed, a quiet but intensively anxious observer. For a time the project was made the subject of ridicule.

Irritated perhaps because the committee passed him in the control of the experiment, the Postmaster proposed to give half the sum appropriated by the bill to mesmeric experiments. 49

Another proposed that millerism have a share. The bill seemed doomed to failure by their ridicule. The debate became sharp and vigorous when, at length, the vote was taken with the result that the Bill passed by a majority of eight.

The bill, however, had yet to pass the Senate, and its temper respecting it was unknown. It had much unfinished business. Day after day passed, but the bill had not been reached. Finally the last hours of the session arrived.

Morse watched them as they passed with an anxious solicitude. It was getting late, ten o'clock had already struck, two hours only remained before the final adjournment. Just then the Hon. Fernando Wood, one of the Senators, came to Mr. Morse and advised him to go home. "The Senate is not in sympathy with your project. I advise you to give it up. Return home and think no more of it." Morse, feeling it useless to remain longer, with a heavy heart went to his hotel, paid his bill, procured a ticket for New York and retired to his room for the night. He there knelt down, opened his heart to God and committed his affairs to Him. He had done all that he could and could do more. 50

He counted his money and found after paying his bill and ticket he had thirty-seven and a half cents left.

In the morning, refreshed by rest yet grave and thoughtful, he came down to breakfast. While seated at the table a visitor was announced. The early visitant proved to be a young lady friend, Miss Ellsworth, the daughter of the Commissioner of Patents, who taking him warmly by the hand, exclaimed with a voice of unconcealed joy, "Professor, I have come on purpose to congratulate you." "Congratulate me! For what, my dear friend, can you offer me congratulations?" "Why," she said gaily (as she enjoyed the Professor's wondering surprise, and who was at the time not in the fittest mood for pleasantry), "on the passage of your bill. The Senate, last night, voted you your money, $30,000."

She then informed him that her father remained in the Senate until the close of the session, and that in the very closing moments the telegraph bill was passed without division or debate. On reaching home, Ellsworth had communicated the news to his family, all of whom were much attached to the Professor, and his daughter begged the favor of being allowed to go to the hotel to communicate the good news. 51

It was the desire of a good warm-hearted woman. So she had hastened on her pleasant errand, and now, having told her story, she asked, "Am I really the first to communicate this to you?"

The tidings were so unexpected that for some moments he could make no reply. At length he said, "Yes, Annie, you are the first to inform me. I was until now utterly unconscious of the fact, and now I am going to make you a promise. When the line is completed, the first despatch sent upon it from Washington to Baltimore shall be yours." "Well," she replied, "I will hold you to your promise."

All details having been arranged between the Government and Mr. Morse, the construction of the line was proceeded with. He was allowed a salary of $2,500 per annum during the test. Mr. Alfred Vail took charge of the machinery while Mr. Ezra Cornell was made Superintendent of construction.

It was most unfortunate for Mr. Morse that his mind from the very first seemed prepossessed in favor of underground lines which had been adopted in England. They gave to him the general impression of safety and permanence, and he selected the plan without experiment.

He had ordered to be made in New York forty miles of a five wire cable enclosed in lead, and Mr. Cornell invented a plow to make the trench for its reception. 52

This cable was laid from Baltimore to the Relay House, seven miles away, but on testing it the escape was found so great that the necessity of abandoning it became evident. More than half the appropriation had been expended. After much anxious thought, it was decided to place the wires on poles, and the line was finished in this way with two copper wires of size number 14, covered with cotton saturated with gum shellac.

The first insulation of the government line shows how crude and rudimentary was the conception held at that period. It was simply two plates of glass, between which the wire, after wrapping well with cloth saturated with gum shellac, was placed and over which a wooden cover to protect from rain and press the glass upon the wire and keep it in place was nailed.

These were afterwards removed and the Bureau Knob pattern substituted.

In about one year after the appropriation had been made, the line was completed.

The first telegraph office in Washington was in a small room on the east front of the Capitol, and afterwards in a room over the city post-office. The relays were of number 16 cotton covered copper wire saturated in gum shellac, each weighing about 510 pounds, and so coarsely constructed that Mr. Vail kept the ones in use in a back room where the operator had to run when it needed adjustment. 53

The battery consisted of 100 cells of Grove, which was renewed three times a week. The circuits were left open when the line was not in use, and the instruments were so connected that each operator started and stopped the instrument at the distant station by the dropping of a break upon the fly wheel when the manipulations of the keys were suspended.

The magnets were soon after greatly improved, reduced in size, and increased in power.

True to the promise he had made to his friend, Miss Ellsworth, Prof. Morse now sent for her and to which she at once responded.

She was invited to indicate a message for transmission. It was promptly done in language now historic and in consonance with the inventor's own often expressed thoughts respecting the origin of his invention, indeed,

he may have suggested the words “What hath God wrought.” This message was passed over the wires, and the strip of paper on which it was imprinted was given to Governor Seymour of Connecticut, as a souvenir in honor of the young woman who was a native of his State, and of the inventor who received therein his collegiate training. 54

An incident now brought the usefulness of the telegraph into public recognition.

The National Convention to nominate a President was in session at Baltimore. James K. Polk had been nominated President, and Silas Wright, then in the Senate, and in Washington at the time, as Vice-President. This was communicated over the wires. In a few minutes the convention was astonished to receive a message from Mr. Wright respectfully declining the nomination. The presiding officer read the despatch, but the convention could not or would not believe its authenticity, and adjourned to await the report of a committee sent to Washington to confer with that gentleman. The committee confirmed the telegraphic message. This fact soon became known when the fame of the telegraph at once took wing.

It is related that about this time that a prominent functionary asked an assistant “how large a bundle could be sent over the wires, and if the United States mails could not be sent in the same way!”

Some wag did straddle a pair of dirty boots over the wires and very seriously told an astonished citizen that they got dirty by coming so rapidly from Baltimore! 55

On the opening of the government line, Mr. O. E. Wood, at that time connected with the engineering department of the State of New York, was induced by his brother-in-law, Ezra Cornell, to give up his profession and join Mr. Morse at Washington. He then became Mr. Morse’s first pupil.

In November, 1844, he received over the wires from Baltimore the result of the Presidential elections in Northern and Eastern States, and with Mr. Vail spent the winter of 1844–45 in exhibiting the working of the telegraph to members of Congress, diplomatic representatives and to visitors attracted thither from all parts of the globe. He also transmitted to the Baltimore press a report of the proceedings of Congress for publication.

On April 1, 1845, the line, which had been worked as a curiosity, was thrown open for public business.

The operators appointed were Mr. Vail at Washington and Mr. Henry J. Rogers at Baltimore.

During the first four days the receipts amounted to one cent. This was obtained from an office seeker who said he had nothing less than a twenty dollar bill and one cent, and with the modesty of his class, wanted to witness the operations of the telegraph free, this was refused because against orders. He was told he could have a cent’s worth of telegraphy, to which he agreed, and he was gratified in the following manner: 56

Washington asked Baltimore “4” which meant in the list of signals “what time is it?” Baltimore replied “1,” which meant “one o’clock.” This was one character each way which would amount to half a cent. The man paid his one cent, magnanimously declined the change, and went his way satisfied.

This was the total revenue of four days.

On the 5th, twelve and a half cents; the sixth was the Sabbath; on the seventh the receipts ran up to sixty cents; on the eighth, to a dollar and thirty-two cents, and on the ninth, to a dollar and four cents. Not a very dazzling prospect certainly, yet watchful eyes saw its future value.

It is recorded that about this time a certain good dame, whose ideas of discipline were somewhat stern and fundamental, after surveying a pole recently planted near her door, placing her hands on her haunches, and looking critically at the pole, exclaimed, “Now I s’pose no one can spank their brats without bein’ known to the hull cree-a-tion!”

The telegraph was fairly under weigh. Prof. Morse offered to sell his rights to the Government for one hundred thousand dollars, but the Postmaster General was not satisfied. The operations of the telegraph between Washington and Baltimore had not shown him that, under any rate of postage that could be devised, its revenue could be made equal to its expenditure. The offer was therefore declined. This refusal was fortunate both for the inventor and the country. 57

The next move was to enlist private capital, and this was soon accomplished.

The first telegraph company in the United States, the “Magnetic Telegraph Company,” was formed, but this was not attained without difficulty.

Early in 1845 Mr. Kendall, formerly Postmaster General in President Jackson’s administration, was induced, after much deliberation and consultation, to take a leading part in organizing the Company.

It was thought expedient to make the first attempt to construct a line between New York and Philadelphia, and to limit the capital to the probable cost of that section, the traffic between these large cities being extensive, and likely to prove remunerative.

To aid in securing capital. Mr. Ezra Cornell and Mr. O. S. Wood went to New York to exhibit the telegraphic apparatus upon a short experimental line strung on the tops of buildings.

Offices were opened, one at 112 Broadway, and the other in a building near where the Metropolitan Hotel now stands. Permission to allow the connecting wires to be erected on the tops of houses was obtained with much trouble, and only after paying Prof. Silliman, Jr., a fee of fifty dollars for an expert opinion respecting its safety before the property owners would consent to the wires being erected. 58

The price of admission to witness the operation of the telegraph was twenty-five cents. This seemed a novel way to secure capital in a great city like New York.

With this embargo, notwithstanding the wonderful character of the invention, there was not visitors enough to pay expenses; everything indicated poverty. The exhibitors were so poor that one of them was glad to use a couple of common chairs for his nightly rest.

It was certainly a strange experience for the future princely founder of Cornell University, making his

breakfast out of the proceeds of a shilling picked up, as it were, from the sidewalks of Broadway, and which, he said, were the best meals he had ever enjoyed.

The estimated cost of a line from Fort Lee on the Hudson to Philadelphia was $15,000—a modest sum to ask of the great city of New York, but the men of capital looked over their immaculate collars at the ticking machinery, and into the faces of the hungry exhibitors, and up at the wire straggling among the chimney pots, and then down at the meagre furniture, and said “No;” each man feared to be the first fool. But what capitalists would not do, humbler men did.

One of the first men in New York to invest his money in the new device was the keeper of an eating-house on Nassau Street, and who afterward became one of the directors.

The money needed was finally raised, but chiefly outside of New York. It was provided in this original subscription that the payment of fifty dollars should entitle the subscribers to two shares of fifty dollars each.

A payment of fifteen thousand dollars, therefore, required an issue of $30,000 stock. To the patentees was issued an additional $30,000 stock, or half of the capital, as a consideration of the patent; the capital was, therefore, $60,000 for the first link.

Trustees were appointed to hold the patent rights and property until the organization was effected.

The incorporators were:—

S. F. B. Morse,
B. B. French,
Geo. C. Penniman,
Henry J. Rogers,
John S. McKim,
J. T. Trimble,
W. M. Swain,
John O. Sterns,
A. Sydney Doane.

“THE MAGNETIC TELEGRAPH COMPANY.”

Early in November, 1845, the line was first opened between Philadelphia and Norristown, Pa. distant 14 miles, so as to gratify public curiosity, while the building was going on beyond. This was completed to Fort Lee on January 20, 1846, and from Baltimore to Philadelphia, June 5, the same year.

No attempt was made for a long time to cross the Hudson.

In April, 1850, two gutta percha covered wires were submerged at Fort Lee, which for a time did good service. Shortly after the formation of the Magnetic Telegraph Company (the Pioneer Telegraph Company in America), numerous organizations followed. In 1859, the company amalgamated with the American Telegraph Company.

THE WESTERN UNION TELEGRAPH COMPANY AND ITS ORIGIN.

In April, 1854, a combination was agreed upon between the Erie and Michigan Telegraph Company and the New York and Mississippi Valley Printing Telegraph Company. The united capital being $500,000 under the name of the Western Union Telegraph Company, by an act of the legislature of Wisconsin, dated March 4, 1856, and of the State of New York, of April 4, 1856.

The following year the Michigan Southern Telegraph Company was added to this combination.

The headquarters of the Company were at Rochester, N.Y. Other companies joined the united companies and the Western Union found it necessary to transfer its headquarters to New York, but the most notable of these consolidations took place in 1866, when the United States Telegraph Company, as well as the American Telegraph Company, joined forces with the Western Union, thus virtually embracing the entire telegraph business of the country.

In this year the capital was readjusted and appointed to the various interests forming the Western Union combination.

Soon after the union of the many conflicting telegraph interests had been effected, and through fear of a burdensome monopoly, a move was made towards the nationalization of the telegraphs. As a matter of course, this was strenuously opposed by the telegraph company's representatives, and public sentiment was with the company. 62

Although politicians as a rule were favourably inclined to such a step, the majority of the people were against it, or indifferent, with the result that the movement dropped out of view, and has so far as known never been revived up to this period.

In telegraph operations little attention had been given to electricity as a science in America. Any improvements which had been made in connection with telegraphic appliances, except in repeating appliances, were of a comparatively trifling and unscientific character.

Marshall Lefferts had done much to show the value of statistics, and had laid down important ground work for systematized and scientific methods; he had even introduced some of the electric tests by which the telegraph wires afterward became so potential, but no clearly defined system had been in practice.

The battery man still multiplied his cells, emptied his carboys of nitric or sulphuric acid, and bathed his zincs in mercury, to raise the telegraphic steam; the patient operator turned and returned during the long hours of the weary nights the spring of his relay, to catch the erratic movements of the armature as it vibrated before the changing currents on the line. 63

Cromwell Varley, a well-known electrician whose accomplishments as a gentleman of education as well as a scientist had preceded him in the frequent appearance of his name in the records of scientific investigation, had arrived in New York. Mr. Orton, at this time the President of the Western Union Company, invited Mr. Varley to make a thorough investigation into the condition of the lines and apparatus owned by the Company.

The report made by Mr. Varley, minute and exhaustive, revealed a startling condition of things—half of the wires were found to be practically unavailable.

The best wires in the service showed a resistance far above the proper standard.

A popular relay was found to have a resistance equal to one hundred miles of number 8 wire, the use of which was choking the most important circuits.

The chief value of Mr. Varley's report, indeed was in giving a practical illustration of the immense value of a scientific electrical training.

The electrician now came to be an important factor in American telegraphic work.

To this report also may be fairly traced the beginning of a series of improvements and inventions which have made famous the American name.

By removing the obstructions to the electric current and reducing resistances in wires, magnets and batteries to a minimum, the great possibilities of the wires were discovered in accomplishments which were never dreamed of. 64

The duplex and quadruplex are great advances on the old condition, and would have been inoperative had they continued.

The visit of Mr. Varley had another result—the consolidation of so many important organizations under a single administration had unavoidably brought together more or less discordant elements; each company had its own peculiar methods, ideas of management, limitations of authority, rules of order, etc., as well as of tariffs and compensation. It was of the utmost importance that, in order to unity of management, distinct and clearly defined ideas of duty should be made to permeate the entire working force so as to make conflict impossible, and work quick, certain, harmonious.

It was scarcely less desirable also, now that the value of electric knowledge had been demonstrated, that by some means its attainment might be rendered easy and general, and a stimulus given to its acquisition. Under these circumstances Mr. Orton established the journal of the telegraph, and its usefulness soon became apparent; its clippings from the scientific journals of European and Home papers on electric art soon came to be the theme of almost universal interest.

A copy of this paper was mailed to every office of the Company as soon as issued. It became not only the vehicle for executive orders for the announcement of new offices and of changes in the tariff, but imperceptibly, yet markedly, the means of infusing an "esprit de corps" and sense of brotherhood throughout the telegraph service. 65

At the solicitation of Mr. Orton, Mr. James D. Reid accepted the management of the journal of the telegraph,

by whom it was admirably conducted for a number of years, with the praiseworthy results previously noted.

In view of the recent boundary arbitration between the United States and Great Britain, it may be interesting to recall the circumstances which led the American Government to become interested in Alaska as a connecting link in a telegraph project, to connect Europe and America by land wires.

When, in 1858, the Atlantic Cable proved a failure, and was looked upon as an utter impossibility, a Mr. Collins, the American commercial agent resident at St. Petersburg, proposed to construct a line of telegraph overland from the United States (via) Behring Strait and Asiatic Russia to Europe.

Perceiving the importance of the project, Mr. J. Cochrane, a member of Congress and of the Committee on Commerce, reported to that body on Feb. 18, 1861, a bill appropriating $50,000 for "The Survey of the Northern Waters, Coasts and Islands of the Pacific Ocean and Behring Strait, having reference to telegraphic 66
connection with Russia," and expressing full faith in its possibility.

In the United States Senate, Feb. 17, 1862, Mr. Latham also made an elaborate report, revealing the vast progress of telegraphs in Europe and the enthusiastic and enlightened action of the Russian Government in the proposed extension of her telegraph system to the Pacific.

A line had already been mapped out from Kazan, through Circassia.

From Omsk a line was traced out with the design of reaching India through the Northern Central gate of Asia. Still another was projected from the Amoor line to Pekin, Shanghai, Amoy and Hong Kong—thus, to reach the trade of China, these projects showed the value of the telegraph to commerce.

Mr. Latham asked an appropriation of $100,000 for a survey of the route from California to the Amoor.

Russia offered her aid and a rebate of forty per cent. on American messages when communication was established.

Russia had already assured the construction of the line 7,000 miles from Moscow to the Pacific.

Secretary Seward took a deep interest in the enterprise, in a report to the Senate, May 4, 1864.

On the proposition of Mr. Collins, he said: "I think it may be regarded as settled that the United States 67
cannot neglect to employ telegraphic communication with foreign countries, and yet expect to maintain a healthful commerce with them; that the United States cannot hope to inspire respect, confidence and good will abroad, and to secure peace with foreign States, without using the magnetic telegraph when it is possible. I do not know any one object lying within the scope of our foreign relations more directly important than the preservation of peace and friendship with Great Britain and Russia; nor can I conceive of any measure of nationality that would more effectually tend to secure that great object than the construction of this proposed international telegraph."

The sentiments thus officially expressed by Mr. Seward were responded to by all intelligent men, and the Russian line was the most popular of the enterprises of the period.

The proposition to construct the Russian American line was first formally submitted by Mr. Collins to the Western Union Telegraph Company, Sept. 28, 1863, and again at a meeting of the board of that company in Rochester, N.Y., March 16, 1864.

It was in the form of a letter from Mr. Collins, requesting the acceptance of his project to connect Europe and America by way of the Behring Strait, and offering, if accepted within twenty days, to transfer his rights and privileges under certain conditions.

The terms offered by him were accepted by the board of directors. 68

Soon after this construction commenced, beginning at New Westminster, B.C., the terminus of the California State Telegraph Company. The line in a few months was carried to the Skeena river. Meanwhile Mr. Serge Abasa, a Russian gentleman who had entered the service of the Western Union Company, was despatched to the Asiatic coast between the mouth of the Amoor and Behring Strait.

Mr. Abasa reported, January 18, 1866:—"Inform the directors, the entire extent between Anadyr and Okhotsk district has been surveyed, but the route of the line has been determined by me in person, and notwithstanding the scarcity of laborers in the country, I have commenced preparatory works in Anudirsk, Jijiginsk, Yamsk, Taousk and Okhotsk."

In the midst of all this enthusiasm, however, the Great Eastern, at the docks of an English harbor was having a cable coiled in her immense hold for another attempt to lay a submarine line between Europe and America.

When it was announced that at last victory had come, and that the continents were speaking to each other with easy garrulity, the overland line was abandoned.

It was a question of two thousand miles of cable against sixteen thousand miles of land line, half of which was along an uninhabited coast. The advantage of the cable was too palpable; orders were, therefore, issued 69
recalling the men.

Already some eight hundred and fifty miles of line had been built, and was in operation between New Westminster, B.C., and the Skeena River.

The United States Government were duly notified of the stoppage of the work by the Western Union Telegraph Company, to which the Secretary of State wrote the following reply:—

> I am not one of those who have been disappointed by the complete and magnificent success of the International Atlantic Telegraph.
>
> I regard it as tributary to an expansion of our national commerce, and ultimately to our political institutions, both of which are important forces in the progress of civilization.
>
> I would not have the Atlantic become dumb again if thereby I could immediately secure the success of

the Inter-Continental Pacific enterprise which was committed into your hands. Nevertheless, I confess to a profound disappointment in the suspension of the latter enterprise.

I admit that the reasons you have assigned for the suspension seem to be irresistible. On the other hand, I abate no jot of my former estimate of the importance of the Inter-Continental Pacific Telegraph.

I do not believe that the United States and Russia have given their faith to each other and to the world for the prosecution of that great enterprise in vain.

W. H. SEWARD.

The loss was very great to the enterprising company who had undertaken the responsibility, but everything was paid up without a murmur. The sum expended amounted to $3,170,292. 70

That the Western Union was enabled to defray this enormous expenditure without in any way impairing its stock value or credit proved the solidity of the Company even at that period of its history.

The friendly intercourse between the American and Russian authorities in connection with their telegraph project was, no doubt, the direct cause of the subsequent negotiations between the two Governments for the sale and purchase of Alaska, the advantages of which the astute Secretary of State, Mr. Seward, became cognizant, and finally consummated the transfer of that territory from Russia to the great Republic.

In the early days of telegraph enterprise the necessity soon became evident that, in order to provide the requisite facilities for public convenience and for the economical employment of capital, the consolidation of the many struggling companies was self-evident. This policy has been carried out effectually by the Western Union Telegraph Company, which gradually absorbed by lease or purchase upwards of fifty concerns from the date of its organization at Rochester, N.Y., to the removal of its offices to New York. In 1866 this Company had virtually absorbed all rival and opposing companies of any importance.

The commanding position reached by the Western Union in 1866, with its growing ramifications covered by 75,000 miles of wire, has steadily advanced until the present. It embraces in its great system over 1,000,000 miles of wire, over 23,500 separate offices, two atlantic cables, a cable to Cuba with connections throughout the West Indies, and close direct connections with all parts of South America. In Canada the Great Northwestern Telegraph Company, which leased the Montreal and Dominion Telegraph Companies, is controlled by the Western Union Telegraph Company. So also is the Nova Scotia and New Brunswick Telegraph Companies. 71

In 1872, six years after its reorganization, the Western Union owned in

	Pole mileage.	Wire mileage.
	62,033	137,190
In 1882	131,060	374,368
” 1892	189,576	739,105
” 1902	196,115	1,029,984

72

In 1872	it had	5,237	offices
” 1882	”	12,068	”
” 1892	”	20,700	”
” 1902	”	23,567	”
In 1872	it transmitted	12,444,497	messages
” 1882	” ”	38,842,247	”
” 1892	” ”	62,387,298	”
” 1902	” ”	69,373,095	”
In 1872	its receipts were	$ 8,457,095 77	
” 1882	” ”	17,114,165 92	
” 1892	” ”	23,706,404 72	
” 1902	” ”	28,073,095 10	

In 1902, 2,506 miles of poles and 57,218 miles of wires (of which 28,767 miles were copper) and 329 offices have been added to its system.

The increase in the number of messages transmitted in 1902 over 1901 was 3,717,834.

This increase does not include messages sent by brokers, press association and others over wires they lease from the Company, nor railway messages under contracts.

The receipts for the transmission of regular commercial messages increased in 1902 over the previous year $1,348,531.34 and from leased wires $451,749.64.

The maintenance and reconstruction of this enormous system cost the Company in 1902 $3,591,069.17, and $2,188,101.03 were expended in the construction of new lines during the same year.

Through the re-arrangement of the operating forces and substitution of direct working circuits for repeating or relay offices a reduction of $388,746 has been effected and the service besides greatly improved.

In 1903 contracts were made early in that year with various railway companies for the building of 16,800 miles of line.

The capital stock of the Company is $100,000,000, on which a dividend of 5 per cent. per annum is paid, payable quarterly. 73

The Company has had the good fortune to have secured men of conspicuous ability to direct its affairs from its inception to the present time.

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THE POSTAL TELEGRAPH CABLE COMPANY.

This Company was organized in 1881. Its original promoters expected by the use of compound steel and copper wire of large size and the use of the Leggo-automatic and Gray-harmonic apparatus to transmit a large volume of business by the use of so few wires and at such a speed that a uniform and low rate would produce a revenue sufficient to justify a capitalization largely in excess of the cost of the plant.

The name postal was chosen upon the theory that the new plan of construction and method of transmission would bring the property into extensive use in competition with or perhaps as an auxiliary of the Post-Office department.

How far the purpose of the founders was speculative need not now be considered. Probably some of them were sincere in their beliefs, but they were ignorant of the telegraph business, and the fallacy of their plan was soon demonstrated.

In order to help a friend, who had become largely involved in the bonds of the Company, Mr. John W. Mackay found himself in control of the property in 1884. He had in the meantime been induced to interest himself in the organization of a new cable service between Great Britain, France and the United States, of 75
which, through the failure of some of those who were to join in the enterprise, he also came into control. Having "put his hand to the plow," so to speak, although the business was wholly new to him, he was not the man to turn back, and the more he examined the merit of the business itself, the better satisfied he became that, if it could be properly conducted in its details and the complicated and chaotic condition of the numerous comparatively small, but ruinously competing land line companies could be brought into right form and order, a successful and in every way creditable business worthy of the employment of his ample resources could be built up.

When the Western Union Company, early in 1881, under the leadership of Mr. Jay Gould, acquired control of the Atlantic & Pacific, the American Union and the combined Canadian telegraphs, and formed an alliance with the cable companies, it then seemed as if competition in the telegraph business had come to an end, and many of its ablest men were of that opinion, but by the end of 1884 more extensive and more injurious competition had been built up in the United States than had ever existed before, and the possibility of bringing order out of such chaos seemed remote, but Mr. Mackay was not discouraged.

Early in 1884 he secured the services of Mr. George G. Ward, who had been brought up in the business of the telegraph in England, and had been in the service of the cable companies almost from their inception, and 76
was Superintendent of the Direct United States Cable Company from 1875 to 1883. Under his direction the first of the Commercial Cable Company's cables was completed in December, 1884.

Early in that month Mr. Albert B. Chandler entered Mr. Mackay's personal service, having been assured of his purpose to permanently establish a telegraph system upon sound and just principles respecting which they were in full accord.

Mr. Chandler had served in almost every capacity known to the telegraph business, from operator in 1858 to President in 1879, and had won the confidence of proprietors of telegraph property, of their officials and employees, and the public as a practical, energetic and conservative manager. Under his guidance as receiver, the mortgage which had been placed upon the property of the Postal Telegraph Company under complete misapprehension of its earning power, was foreclosed.

The Postal Telegraph Cable Company, of which he became President and General Manager early in 1886, was organized. Extremely complicated and vexatious litigation, chiefly a legacy from the smaller companies, was gradually removed, and when, near the close of 1887, the various fragmentary companies had been acquired by either the Western Union or the Postal Companies, competition, based upon the cutting of rates, rebates and other wasteful practices which could only end in destruction, was promptly terminated by the 77
competing companies.

Since then the telegraph business has been carried on in the United States in a more business-like and progressive manner than ever before.

There is so little friction between the two companies apparent to the public, that it is sometimes charged, or at least suspected, they are in actual alliance, but such is not the case. Competition for patronage was never so sharp as now, but it is based upon excellence of facilities and service and treatment of patrons, and not upon any form of buying patronage with money, which has proven the ruin of so many companies whose chief purpose seemed to be to do the most harm in the shortest time, in order to sell or lease their property for more than it was fairly worth.

Probably no two men ever had more complete control of large interests not their own during their formative period than has been the case of Mr. Chandler and Mr. Ward in their respective positions, and to Mr. Mackay's implicit confidence in them may be attributed much of the success that has been attained by the Commercial Cable and Postal Telegraph Companies, which are now practically one property.

Most of the principal officers of these companies have been brought to their present positions by these 78
gentlemen, and the business is conducted with singular harmony and efficiency.

Mr. Mackay, who was from its inception President of the Commercial Cable Company, assumed also the Presidency of the Postal Company early in 1901 at the earnest request of Mr. Chandler, who desired to be relieved, partly by reason of somewhat impaired health, and partly because of his preference to spend much of his time in his Vermont home. Upon his retirement from active charge, he was made Chairman of the Board of Directors, and in this capacity renders a variety of services and exercises as a useful influence. He is still, as he has been for many years, a Vice-President of the Commercial Cable Company, of which Mr. Ward continues as first Vice-President and General Manager.

Mr. Clarence H. Mackay has succeeded his father as President of the Commercial Cable and Postal

Telegraph Companies, and entered with great pride and energy into the project of laying a cable to Hawaii and the Philippine Islands as projected by his father.

These very important links in the circuit round the globe adds further power and opportunity to the Postal Company, whose activity seems now to have fairly begun, and being laid upon sound foundations of finance, construction and methods of business is evidently destined to continue an increasing success.

The following figures show the pole and wire mileage, number of offices operated or reached, and number of messages handled in 1903 by the Postal Telegraph Cable Company, its subsidiary companies and direct connections in North America: 79

Pole mileage	48,801
Wire ”	276,244
Points reached	19,977[A]
Messages handled	21,600,577
Number of new offices added in 1903	3,729

[A] 1,782 of these are reached by no other company.

The properties in the United States owned and controlled by the Postal Company represent an investment in lines and equipment aggregating about $25,000,000.

In order to perpetuate the name of his father, the virtual founder of the Commercial Cable and Postal Telegraph Companies, Mr. Clarence H. Mackay, President of the United Companies, recently addressed a circular letter to the stockholders inviting the deposit of their stock for exchange for shares in a trusteeship created under the Massachusetts laws with the name of “The Mackay Companies.”

The capitalization of the Commercial Cable Company, which also owns the Postal Telegraph and Cable Company, is $15,000,000, upon which 8 per cent. dividends are paid.

“The Mackay Companies” has authorized for exchange for this stock $30,000,000 par value of its own 4 per cent. cumulative preferred shares and a like amount of common shares, so that each stockholder in the Cable Company will receive for his holdings 200 per cent. in the common shares of the new concern. 80

The Trustees are Clarence H. Mackay, John I. Waterbury, President of the Manhattan Trust Company of New York; T. Jefferson Coolidge, jun., President of the Old Colony Trust Company of Boston, both directors of the Commercial Cable Company, and Mr. W. Cook, Counsel to the Company.

The plan is practically consummated.

Mr. Mackay said in reply to an enquiry that this action on his part was the outcome of his desire to put on a permanent basis the properties created by his father, and to provide for all contingencies that might arise from death or changes in commercial conditions. He will continue to devote his entire time to the active management of the Company.

The Commercial Cable Company owns and operates four transatlantic cable lines and its connecting lines between Nova Scotia and New York, and Ireland and France, in all some fourteen thousand miles of cable, with also the cable from San Francisco to Honolulu and thence to the Philippines.

The Mackay system has an exclusive connection with the Canadian Pacific telegraphs and with the all red cable line to Australia and New Zealand.

81

THE ASSOCIATED PRESS OF AMERICA.

(*London Daily Express.*)

With the evolution of the United States into a world power there has grown up across the Atlantic the greatest news-gathering agency ever imagined or created, whose despatches are momentarily being read by nearly half a hundred million people, and upon which Europe itself is sometimes dependent for the first word or whisper of what has happened within her own gates. The name of the agency which supplies America with its news is the Associated Press.

Startling in its scope, romantic in its history, the Associated Press has now, probably, more influence upon daily international events than any other agent, except the will of the peoples, which it helps to form.

Sixty years ago, when America was in industrial and political childhood, its papers depended for news upon Associated Press post-boys, who, after meeting incoming schooners at New York, rode hot haste, or leisurely, according to the character of the rider and nature of the beast, to the various papers inland.

To-day the Associated Press sends over 31,000 miles of private telegraph lines, which form a network across the continent of America, thousands and thousands of columns, supplying about 3,000 American papers with 82
news of what is happening from minute to minute in America and abroad.

NETWORK OF WIRES.

In addition, the Associated Press keeps Europe and the rest of the world informed of the news of the great Republic, gathered and distributed by over 2,000 employees, who are supported on an annual revenue of over half a million sterling.

The Associated Press was started about 1840, when seven of the New York daily papers combined to reduce the expense of news by post-boys.

The organization at present consists of over 700 of the leading American daily papers. Each paper has a vote whereby fifteen directors are elected. These in turn elect officers. Through contract relations 2,300 other papers are granted the Associated Press News service, making a total of 3,000 out of the 3,200 daily papers published in America.

These 3,000 papers have a daily issue of 15,000,000, and each paper is estimated by an impartial statistician to pass through the hands of three persons; hence it is estimated that every despatch sent by the Associated Press reaches 45,000 pairs of eyes.

The Associated Press is not in itself a profit-making concern, being purely co-operative, and has nothing whatever to do with any advertising. Its papers, which include those of all languages, creeds and politics, are 83
assessed according to the expenditure involved in gathering and distributing the home and foreign news.

Over its own telegraph wires the Associated Press sends through its own telegraph operators, east, west, north and south, the news of the moment.

SOME QUICK WORK.

This is received in its branch offices in all the important towns throughout the United States, and transmitted to the papers. The result of last year’s Derby was in the New York office of the Associated Press, nearly 3,000 miles away, twenty-five seconds after “Rock Sand” had passed the winning post, and was published in San Francisco, about 7,000 miles from Epsom, two minutes afterwards.

Interesting as is this system whereby the news of America and the outside world is simultaneously distributed to the American papers—a system of mechanical ingenuity and organization that would require several columns to describe adequately—it must be almost of secondary importance to English readers compared with the influence wielded by this American news agency over matters British and European.

The Associated Press has treaty relations with the three great European news agencies, viz., Reuter’s, which supplies Great Britain, Greater Britain, all the British possessions, Egypt and the Far East, except Tonquin, with 84
their news. Havas, which covers the newsfield of France, and through its subsidiary agencies all the Latin countries, including South America; and Wolff’s, which from Berlin controls and distributes the news of Germany and all the Teutonic countries, and, through allies, the news of Russia, Austria-Hungary, the Slav countries, Scandinavia and Danish territory.

These three European agencies in turn rely upon tributary agencies such as the Telbureau, in St. Petersburg; the Stefani, in Rome; the Fabrin, in Madrid, and the Corresponz, in Vienna—all official voices of Government opinion.

NO SALES IN ENGLAND.

These European agencies and their tributaries constitute one great clearing-house of news. Havas gathers the news of France primarily into Paris; thence it radiates throughout the world: to Reuter for England, to the Associated Press for America, to Stefani for Italy, and so on. In this way a budget comprising the news of the world appears day by day.

Not content with receiving for its papers the news of Europe through the agencies already mentioned, the Associated Press has established in practically all the European capitals, bureaus of its own. In London the Associated Press keeps a large staff, though no attempt is made to sell a single item of news to English papers. 85
All their work is to gather news and send it to America.

In London the staff of the Associated Press, as it is familiarly called, is under the direct supervision of Mr.

Walter Neef, who is in charge of the entire European service.

The correspondents resident on the continent are in close touch with the Chancelleries, and are welcomed at their respective Foreign Offices with a kindness that speaks eloquently for the friendship these European nations are willing to offer to America.

The first news of the arbitration treaty that sealed the Anglo-French “entente” was cabled to New York by the Associated Press from Paris, and re-cabled to London, where it was promptly denied by no less an authority than the *Times*. The first news of the recent Anglo-Spanish treaty came to England from the Associated Press in New York, having been cabled from its London office.

When Martinique was devastated by a volcanic eruption, which included among its victims the correspondent of the Associated Press at St. Pierre, the Fort de France representative called on Mr. Melville E. Stone, the General Manager, then in New York, for assistance.

Mr. Stone promptly placed a steamer at his service, and the other correspondents of the Associated Press in 86
places of danger were rescued, and lived to tell to the world the story of that hideous visitation.

This cost the Associated Press about £5,000, and that is the sum it usually expends on the international yacht races for the America Cup, which are reported for England and America by correspondents and half a dozen special boats equipped with wireless telegraphic instruments.

When Pope Leo died, London, Paris, Berlin and other European capitals got the first intimation of his death from New York. The Associated Press correspondent in Rome had telegraphed the news on which all the world waited, and it had arrived in America exactly nine minutes after having been sent out from the Vatican, which is nearly two miles from the central telegraphic office in Rome.

This gave the Associated Press time to re-cable the news to Europe before it had arrived from another source. On that day the Associated Press published in its American papers over one page of closely printed description of the events centering round the Vatican, all of which was cabled from Rome after 4 o’clock on the preceding afternoon.

When Cardinal Sarto was elected Pope, the news again came to Europe in the same way—from the Associated Press office in New York. The decision of the Alaska Boundary Commission was cabled by the
Associated Press to New York and Canada on a Saturday, and re-cabled back to England for the Sunday papers, 87
though it was not officially announced in London until the following Tuesday.

To come to still more recent events, the news of the transmission of Russia’s final note to Japan was received in London from the St. Petersburg correspondent of the Associated Press via New York, while despatches from the same agency announced in America the rupture of diplomatic relations and the practical outbreak of war as early as Saturday afternoon on February 6.

A MANAGERIAL GENIUS.

Mr. Melville E. Stone, the General Manager and presiding genius of the Associated Press, whose indomitable “grit”—as they say in America—was the chief factor in the victory won when the Associated Press fought for five years for supremacy in America, has recently paid a flying visit to England, after being received by the Czar in St. Petersburg and by the Kaiser in Berlin.

Several other crowned heads have been pleased to consult with Mr. Stone, who naturally is one of the most prominent of Americans. He has been decorated by the King of Italy, the President of the French Republic, and the Kaiser.

As a result of Mr. Stone’s personal suggestion, the Czar has removed the censorship on all news that leaves Russia for abroad.

In a few hours the head of the American news agency was able to convince the Ruler of All the Russias that 88
the censorship was not only useless, but absolutely harmful to the Empire. The tradition of centuries has been swept away, and, on the word of the Czar, all the world will be free to have the individual opinions of correspondents who may care to come into Russian domain.

No country is likely to benefit more by this decision of the Czar than Russia itself; no public is likely to be more slow to realize the genuineness of the change than that of Europe. The extent of the revolution effected can scarcely be gauged except by those who know Russia well.

When asked the other day to what principles this American news agency owed its ascendancy in the world, Mr. Stone laconically replied: “Accuracy of statement and speed in transmission.”

Of such is the Associated Press of America.

89

S. F. B. MORSE.

PROF. S. F. B. MORSE.

Born April 27, 1791, at Charleston, Mass. His father, the Rev. Jedediah Morse, author of the well-known book entitled “American Geography” and compiler of the “Universal Gazette.” His mother was Elizabeth Ann Breese.

At seven years of age young Morse entered the preparatory school at Andover, Mass., and at 14 the Freshman Class at Yale, graduating in 1810.

The faculty which first developed in him was the artistic. He provided himself with brush and paint and commenced taking on ivory the portraits of his more opulent companions. He found in painting an inspiration, and selected it as his chosen profession.

He placed himself under the tutelage of Washington Allston, one of America’s famous artists, who encouraged him in the choice he had made. He accompanied Allston to Europe in 1811, bearing introductions to some of England’s most distinguished men.

Benjamin West was then in the zenith of his fame. It was a proud day for Morse when he met West and was welcomed to his studio. A mutual attachment sprang up between them, and West became thereafter his friend and counsellor.

Meanwhile West’s friendship and the introductory letters he had brought with him introduced him to men of 90
influence and reputation.

Some of their names are historic. It was something for a young man to meet such men as William Wilberforce and Henry Thornton, Zacharias MacCauley, father of the great historian, Lord Glenelg and many others, all of whom gave a warm and cordial welcome.

Mr. Morse’s instincts were refined and his companionships choice. He had for his room-mate in London the gifted Leslie, then, like himself, struggling for fame in a sublime art. For companions he had such men as Benjamin West, Copley, Allston, Coleridge, Rogers, Charles Lamb and others famous in art and literature.

He wrote thus to his mother in 1812:

“My passion for my art is firmly rooted, that I am confident; no human power could destroy it. The more I study the greater I think is its claim to the appellation of divine. I am going to begin a picture of the death of Hercules. The figure is to be large as life.”

The picture when finished was shown to West who warmly praised it, and in May, 1813, it was accepted for exhibition in the rooms of the Royal Academy, at Somerset House, then regarded as a very marked token of favor.

A new and unexpected triumph grew out of this painting. In executing it he pursued the plan of 91
conscientious artists who first model in clay the figure to be painted in order to ensure strict anatomical proportions and accuracy.

This cast, to which he attached no special value, was seen by West, and was induced through his kind criticism to send this model to the Society of Arts in competition for a prize in sculpture.

This venture proved successful, and was publicly presented with the annual prize and a gold medal by the Duke of Norfolk.

In the British Art Reports the “Dying Hercules” is placed among the nine best paintings in a gallery of nearly one thousand, and among them the works of Turner, Northcote, Lawrence and Wilkie.

When young Morse went to Europe he was dependent to some extent upon his father for his resources. He was to be away three years. It was now 1815, one year longer than his limit, but he was ambitious and felt he had the power within him. He determined to compete for the chief prize offered by the Royal Academy for a subject he had chosen, “The Judgment of Jupiter in the case of Apollo, Marpessa and Idas.” The prize was a gold medal and fifty guineas.

The picture was completed, and hoping he would be allowed to compete in his absence, he offered it for that purpose to West, who, struck with its merits, advised him to stay, but this he could not do, and the rules cut him 92
off. The premium had to be delivered to the successful artist in person.

A petition to make his case an exception was declined, and “Jupiter” went with its author to America.

He arrived in Boston, Oct. 18, and, without delay, rented a studio. He had his “Jupiter” on exhibition, and his own fame had preceded him. Many crowded the studio to see both the artist and the painting.

Society opened its doors, but this was all. No one offered to buy his picture or give him an order in the line of high art he had marked out for himself.

After various experiences Mr. Morse settled in New York, founding the National Academy of the Arts of Design, of which in 1827 he became President, and to which office he was annually elected until 1845. He delivered the first course of lectures on the fine arts ever delivered in America, and they were notable for suggestiveness and learning.

As an historical painter Morse stood next to Allston. Had the country demanded art of a very high order it is probable that Morse would have engaged his attention as an historical painter, but the nation was too young, knew little of art and cared less. Morse was honored, but his art kept him poor. He longed, however, too, for the opportunity to try his power on some national work.

He conceived the idea of painting the interior of Representatives Chamber in the Capital at Washington, and 93
devoted eighteen months to this. The picture measured eight feet by nine, and contained a great variety of figures. Its exhibition, however, caused him serious loss. The painting is in the possession of the President of the Arts of Design in New York.

He painted a picture of General Lafayette, who was at the time in the United States, and with whom he by this means formed a warm friendship.

In 1829 he again visited Europe, spending three years among artists and collectors of art in England, Italy and France.

In Paris he painted the interior of the Louvre, copying in miniature the chief pictures hanging on its walls. In the fall of 1832 he returned to America and resumed the Presidency of the Academy of Design, to which he was regularly elected annually during his absence.

When an artist was employed to fill with a picture one of the vacant panels in the rotunda of the Capitol, American artists, without exception, considered Morse best entitled to the honor, but great disappointment was felt when another was selected.

It was on his return from Europe on board the packet-ship "Sully" the idea of the electric telegraph engaged his attention, but it occupied many years of his time to bring it to practical shape. He would have accomplished 94
this much earlier had he not been hampered from lack of means.

When his invention was matured and its usefulness perceived and applied, he was fortunate enough at last to reap the reward of many years of struggle and anxiety he had undergone.

On June 5, 1856, with the telegraph established in America, he again left for Europe. In London he met with great joy his artist friends: West, Landsear, Leslie and many others distinguished in science and art, all of whom warmly congratulated him on the brilliant career which had been opened up to him. In their estimation he had honored in this new realm the old art which he loved and elevated.

Morse's development from an artist into an inventor was to them no marvel. He was still giving utterance to natural forces as when a few years before he combined his colors on canvass and produced his "Hercules."

After enjoying for a time this pleasant reunion with his old friends in London, he also met and consulted with the English electricians, Glass, Bright, Whitehouse and others in respect to the proposed Atlantic cable in which experiments were then being made as to its possibility.

He then left for the continent. On his arrival at Copenhagen, whither he first directed his course, he was introduced to Frederick VII. King of Denmark, who, with his Court, received him with every mark of honor. 95
There he visited the study chamber of Oersted, whose discovery of the reflection of a needle by a galvanic current was the dawning fact which eventually made his invention possible.

Continuing his journey to Russia, he found on arriving at the quay at Peterhoff the Imperial carriages with their usual retinue of footmen wearing the Royal livery in waiting. By these he and his party were driven to the Imperial Palace, where, with every demonstration of respect, he was received by the Emperor Alexander II., by whom he was most kindly congratulated as one of the world's benefactors.

He next proceeded to Berlin. Here he was received with great cordiality by Humboldt, who welcomed him to his house and treated him during his stay with every mark of respect.

At his departure the great author of Cosmos presented him with an Imperial photograph of himself, on the margin of which he wrote:

> "To Mr. S. F. B. Morse, whose philosophic and useful labors have rendered his name illustrious in two worlds. The homage of the high and affectionate esteem of
>
> ALEXANDER HUMBOLDT."

This memorial of one so great and gifted he greatly valued and carefully preserved.

Prussia, about the same time, presented to him the Prussian golden medal for scientific merit.

After passing through many places of interest in Europe, in all of which he was received with distinguished 96
honor, Professor Morse returned to London the latter part of September, 1856.

The public at that time were much interested in the subject of the proposed submarine telegraph connection with America.

A plateau extending across the bed of the ocean between the two continents had been discovered under a survey conducted by Lieutenant Maury for the United States Government, and which was regarded as extremely favorable for the projected enterprise.

Professor Morse, in concert with Mr. Whitehouse and Mr. Bright, the English electricians, conducted a series of experiments and sent signals through 2,000 miles of insulated wire.

These experiments removed any apprehension respecting the retardation of the electric current over this long length of wire.

It now became a question of capital and nautical engineering. The first was quickly pledged, the latter was not doubted.

While in London thus occupied, Professor Morse was tendered a banquet, which he promptly accepted.

The dinner was given Oct. 9, 1856. The Chairman was Mr. Fothergill Cooke, who, in presenting the guest of the evening, used the following language:—

"Gentlemen, I was consulted only a few months ago on the subject of a telegraph for a country in which no 97
telegraph at present exists.

"I recommended the system of Professor Morse. I believe that system to be one of the simplest in the world, and in that lies its permanence and certainty. (Cheers.) It is a great thing to say, and I do so after twenty years' experience, that Professor Morse's system is one of the simplest that has ever been, and I think ever will be, conceived. (Cheers.) He stands alone in America as the original and carrier-out of a grand conception.

“We know that America is an enormous country, but I think we have a right to quarrel with Mr. Morse for not being content with giving the benefit of it to his country, but that he extended it to Canada and Newfoundland, and even beyond there. His system has been adopted over all Europe.

“The nuisance is that we in England are obliged to communicate by means of his system, and he threatens to go further still, and promises, if we do not, he will carry out a communication between England and Newfoundland across the Atlantic.

“I almost envy Professor Morse for having forced from an unwilling rival a willing acknowledgment of his services.

“May he long live to enjoy the high reputation he has attained throughout the world.” (Long continued cheers.)

Other speeches equally complimentary followed. 98

It was on the day of this banquet Mr. Morse received from Paris the announcement that the Emperor Napoleon III. had made him a Chevalier of the Legion of Honor.

Martin Farquhar Tupper sent him a few days afterwards the following lines referring to the banquet:

“A good and generous spirit ruled the hour,
Old jealousies were drowned in brotherhood,
Philanthropy rejoiced that skill and power,
Servants to science, compass all men’s good.

“And over all religions banner stood
Upheld by thee, true patriarch of the plans
Which in two hemispheres was chimed, to shower
Mercies from God on universal man.

“Yes, the electric chain from East to West,
More than mere metal, more than mammon, can
Binds us together, kinsmen in the best
As most affectionate and frankest bond,
Brothers as one, and looking far beyond,
The world in an electric union blest.”

Although the Morse telegraph had been generally adopted in continental Europe, no compensation had hitherto been paid to the inventor.

Professor Morse, therefore, was much gratified in receiving the following letter while in Paris:

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“Ministry of Foreign Affairs.
“Paris, September 1, 1858.

“Sir,—It is with a lively satisfaction that I have the honor to announce to you that a sum of 400,000 francs will be remitted to you in four annuities in the name of France, of Austria, of Belgium, of the Netherlands, of Piedmont, of Russia, of the Holy See, of Sweden, of Tuscany and of Turkey, as an honorary gratuity, and as a reward altogether personal of your useful labors.

“Nothing can better mark, than this collective act of reward, the sentiment of public gratitude which your invention has justly excited.

“The Emperor has already given you a testimonial of his high esteem, when he conferred on you, more than a year ago, the decoration of a Chevalier of the Legion of Honor.

“You will find a new mark of it in the initiative, which His Majesty wished that his Government should take in conjunction, and the decision that I charge myself to bring to your knowledge, is a brilliant proof of the eager and sympathetic adhesion that his proposition has met with from the States I have just enumerated.

“I pray you to accept on this occasion, sir, my personal congratulations as well as the assurance of my sentiments of the most distinguished consideration.

S. Walewski.”

Professor Morse, in addition to this handsome gratuity, received tokens of honor from each of the contributing nationalities:— 100

From France, the Legion of Honor; Prussia, the Gold Medal of Scientific Merit; Austria, a gold medal; Spain, Knight Commander de Numero of the Order of Isabella the Catholic; Portugal, Knight of the Tower and Sword; Italy, Saints Lazaro and Mauritis; Denmark, Knight of the Danneborg; Turkey, decoration in diamonds of the “Nisham Iftichar,” or Order of Glory.

He was also the recipient of many other marks of honor of a more private character.

As early as 1835 Mr. Morse was elected a corresponding member of the Historical Institute of France.

In 1837 he was made a member of the Royal Academy of Fine Arts of Belgium.

July 15, 1839, the Silver Medal of the Academy of Industry was voted to him for the invention of the telegraph.

The National Institute for the promotion of science, established at Washington, made him a corresponding member in 1841, and in 1842 the Gold Medal of the American Institute was awarded him for successful experiments in subaqueous telegraphy.

In 1845 he was made a corresponding member of the Archeological Society in Belgium, and in 1848 he

became a member of the American Philosophical Society of Philadelphia. The following year he was elected a Fellow of the American Academy of Arts and Sciences, Boston. 101

Many other tokens of honor was accorded him from time to time.

While in Paris in 1867, the year of the International Exposition, Professor Morse served on the Committee of Telegraphic Appliances, and wrote an exhaustive report on the merits of telegraphic contrivances.

He also prepared with great minuteness a complete narrative of his own inventions.

Covered with honors, and having long overstepped the three score years and ten, Professor Morse returned to America and arrived at his rural home in Poughkeepsie, N.Y., where he was affectionately welcomed by friends and neighbors.

Shortly after his return a number of influential and representative gentlemen of New York felt that something should be done by his fellow countrymen to honor the distinguished inventor and welcome him home.

He was tendered a banquet, which was held at Delmonico's on Dec. 30, 1868.

The banqueting room was beautifully decorated the chair being occupied by the Hon. Salmon P. Chase. After the dinner the toasts to the Queen of Great Britain and the Army and Navy had been responded to by Mr. Thornton, the British Minister, and General McDowell, the Chairman, said:

"Gentlemen, you will now allow me to invite your attention to the next regular toast. God has given 102
understanding to man to be employed for His glory in promoting the happiness of His creatures and in nothing that belongs to earth can the human understanding be more worthily employed than in the researches of science and in the works of invention.

"Science and invention may be called, perhaps not unfitly, the creators and servants of civilization. Sometimes invention by a sort of intuition of principles has grasped results and seemed to anticipate science.

"More usually science by the patient investigation of truth and the discovery of principles has prepared the way for the triumph of invention. All invention is realized science, and this is especially true of the telegraph.

"I will not fatigue your attention with ancient and modern devices for communicating intelligence at a distance, but it seems proper to notice here how many men of science, and of what various nationalities have contributed to that wonderful art and instrument by which the world is now bound in electric chains.

"Many shining names will occur to any one familiar with the history of the telegraph. Among them I can pause to mention only those of Volta, the Italian, to whose discoveries the battery is due; Oersted, the Dane, who first discovered the magnetic properties of the electric current; Ampère and Arago, the Frenchmen who 103
prosecuted still further and most successfully similar researches.

"Then Sturgeon, the Englishman, who may be said to have made the first electric magnet, next, and not least, illustrious. Among these illustrious men, our countryman, Henry, who first showed the practicability of producing electro-magnetic effects by means of the galvanic current at distances indefinitely great, and finally Steinheil, the German, who, after the invention of the telegraph in all material parts was complete, taught, in 1837, the use of the ground as part of the circuit.

"These are some of those searchers for truth whose names will be long held in grateful memory, and not among the least of their titles to gratitude and remembrance will be the discoveries which contributed to the possibility of the modern telegraph. But these discoveries only made the telegraph possible, they offered the brilliant opportunity. There was needed a man to bring into being the new art and the new interest to which they pointed. And it is the providential distinction and splendid honor of the eminent American who is our guest to-night, that happily prepared by previous acquirements and pursuits. He was quick to seize the opportunity and give to the world the first recording telegraph; fortunate man, thus to link his name forever with the greatest wonder and the greatest benefit of the age.

"But his work was not done when in 1832 he conceived the idea and devised the plan of the first telegraph. 104

"Long years of patient labor and constant perseverance were needed to bring the telegraph into use. Its first message was not transmitted until 1844. Even then, and indeed before that year with something like prophetic inspiration, he grasped the future and predicted that telegraphic connection between Europe and America, which it was reserved for another distinguished American, kindred in spirit and kindred in renown and illustrious, to accomplish. Here I must pause, not, however, without uniting all your aspirations in the fervent wish that our honored guest may live long and happily to enjoy the applause, the gratitude and the reverence of mankind, which he has so honorably won.

"Gentlemen, I now give you 'Our Guest,' Prof. S. F. B. Morse, the man of science who explored the laws of nature, wrested electricity from her embrace and made it a missionary in the cause of human progress."

The venerable Professor then arose amid tumultuous applause. He was laboring under deep feeling, too strong to be concealed.

As he did so the whole company made cheer follow cheer in testimony of their admiration and respect. At last in a clear voice he addressed the company at considerable length, reciting the history of the telegraph, and concluding as follows:

"In casting my eyes around I am most agreeably greeted by faces that carry me back in memory to the days 105
of my art struggles in this city, the early days of the National Academy of Design.

"Brothers (for you are yet brothers if I have left your ranks), you well know it cost me many a pang. I did not leave you until I saw you well established and entering on that career of prosperity due to your own just appreciation of the important duties belonging to your profession.

"You have an institution which now holds, and (if true to yourselves) will continue to hold, a high position in the estimation of this appreciative community.

“If I have stepped aside from art to tread what seems another path, there is a good precedent for it in the lives of artists. Science and art are not opposed.

“Leonardo da Vinci could find congenial relaxation in scientific researches and invention, and our own Fulton was a painter, whose scientific studies resulted in steam navigation.

“It may not be generally known that the important invention of the percussion cap is due to the scientific recreations of the English painter, Shaw; but I must not further detain you from more instructive speech. One word only in closing.

“I have claimed for America the origination of the modern telegraph system of the world; impartial history, I think, will support that claim. 106

“‘Not unto us, not unto us,
But to God be the glory
What hath God wrought.’”

Mr. Morse’s address was listened to with deep attention, and greeted at the close with great and continued applause.

Among the last, but not the least, of the honors paid Professor Morse, was the erection of his statue in Central Park, New York, by the telegraph operators of the United States and the British provinces. The ceremony of unveiling the monument took place on June 10, 1871.

Many delegates were present from all parts of the country to witness the function.

In the evening a reception was held in the Academy of Music, at which the aged inventor was present, when he bade farewell to “his children of the telegraph.”

He did not long survive this event. He passed away full of years and honors on April 2, 1872.

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The Telegraph in Canada

Although the electric telegraph system of Cooke and Wheatstone had been established as early as 1837 in England, yet no move was made to adopt it in Canada.

After the Morse experimental line between Baltimore and Washington had proved a success and was thrown open for public business and wires were being carried to the leading business centres in the United States and a line of telegraph was projected connecting New York City with Buffalo, public interest was aroused in Canada, more especially in the Western section.

Mr. Morse had failed, or probably thought Canada at that time not important enough, to take out a patent for his invention, hence it was open to any or all who chose to use it.

In 1846 the first Canadian Telegraph Company was formed with a capital of $16,000; its object was to connect Toronto and Hamilton with the American lines at Buffalo. The corporate name of the Company was the "Toronto, Hamilton, Niagara & St. Catharines Electro-Magnetic Company."

A line was speedily erected and the desired connection made.

At the end of this year action was taken at Montreal to organize a telegraph company.

The Origin of the Montreal Telegraph Company

At a meeting of the Council of the Montreal Board of Trade, held on Dec. 26, 1846, a Committee was appointed to enquire into the best means of extending the use of the electric telegraph system into Canada. The Committee reported favorably of the project.

After giving the subject full and earnest consideration, on December 29, three days afterwards, a general meeting was convened for the purpose of forming a company to connect Montreal and Toronto by a line of electro-magnetic telegraph, the capital to be £12,500 in 1,250 shares of £10 each.

Among those present were L. H. Holton, D. L. Macpherson, Fred A. Wilson, John Glass, T. W. Middleton, Thos. Tait, Henry Starnes, John Young, Henry Joseph, I. Taylor, William Murray, Andrew Shaw, George Elder, jun., and Henry Chapman.

On motion of L. H. Holton, seconded by D. L. Macpherson, Mr. Young took the chair.

The Chairman stated the object of the meeting to be the organization of a company by parties in favor of connecting Montreal and Toronto by electro-magnetic telegraph, and who had proposed to take stock in the company to be formed for that purpose in accordance with the recommendation of the Board of Trade.

It was moved by Mr. Elder and seconded by Mr. Starnes, that the meeting do organize itself into a company 109
to be entitled the Montreal & Toronto Magnetic Telegraph Company. This was carried.

It was then moved by Mr. Chapman, seconded by Mr. Tait, that Messrs. Shaw, Glass, Elder and Young be a Provisional Committee to conduct the affairs of the Company.

Moved by Mr. Holton, seconded by Mr. Macpherson, that the Provisional Committee be empowered to enter into all necessary arrangements for the early construction of the proposed line of telegraph, the whole of the shares having been taken up.

At a meeting held on January 22, 1847, it was moved by Mr. Lindsay that Andrew Shaw, John Young, John Glass, George Elder, jun., and Henry Chapman be directors for the ensuing year—Carried.

On the 6th of March, 1847, Mr. O. S. Wood was appointed Superintendent of the Company, and immediately took charge of the Company's operations.

The charter was obtained on July 28, 1847, under the amended title of the Montreal Telegraph Company.

Andrew Shaw was elected its first President, Mr. James Dakers, Secretary.

In securing the services of Mr. Wood the new Company was exceedingly fortunate. He had been associated with Professor Morse, was his first pupil, and undoubtedly the most experienced telegraph man of that day in 110
America, a man of great ability and of the highest personal character.

Proceedings were immediately begun in construction work.

The construction of the line between Montreal and Toronto and Montreal and Quebec was awarded to Livingston & Wells, the well-known express forwarders, and by them pushed on with the utmost vigor under Mr. Wood's supervision and direction. When the work was completed it was found to be satisfactory in every particular, both in material and workmanship, and became a model for future work of the kind.

At the close of 1847, 540 miles of line had been erected, 9 offices opened and 33,000 messages transmitted.

In 1851 Sir Hugh Allan, who had early interested himself in the fortunes of the Montreal Telegraph Company, became its President. This office he held uninterruptedly until his death in 1882.

Immediately on assuming office, Sir Hugh Allan, in concert with Mr. Wood, projected important extensions of the lines of the Company, and in a short time the most remote towns and villages were placed in telegraphic connection with the chief business centres of the country.

The Montreal Telegraph Company became one of the leading institutions in Canada. Many companies were started to compete in the same line of business, but in no long time were doomed to failure, as they neither had 111
the skill, the men nor the money to enable them to succeed in opposing their more formidable rival. After placing the Company on a high pedestal of efficiency, and after 18 years of strenuous exertions on its behalf, Mr. O. S. Wood retired from the management in 1865, carrying with him the esteem and respect of the Company and the business community generally.

Mr. James Dakers was then placed in charge of the eastern, and Mr. Dwight of the western section of the Company's territory.

The advance and prosperity of the Company continued, as the foundation had been well and truly laid by a capable workman.

In 1875 it had in operation 20,000 miles of wire, 1,400 offices and 2,000 employees.

During the preceding year some 2,000,000 messages were transmitted in addition to millions of words in press despatches, and the capital increased to $2,000,000, at which figure it still remains.

In 1881 this splendid old Company was forced by circumstances which confronted them to lease their business to another company.

The names of Sir Hugh Allan, O. S. Wood and James Dakers will always be inseparably associated with the history of the Montreal Telegraph Company.

The first company to compete against the Montreal Telegraph Company was the Grand Trunk Telegraph 112
Company in 1852–3, lines were erected from Buffalo to Quebec, following the lines of the older Company.

After some years of an unprofitable business they sold out lock, stock and barrel to the Montreal Telegraph Company for $11,000.

The next venture was by the Provincial Telegraph Company, the Canadian ally of the United States Telegraph Company, which was then spreading its lines over the United States; but was in 1866 absorbed by the Western Union; this ended the career of the Provincial, and its plant was purchased and transferred to the Montreal Company for a nominal sum.

Some two years later the Dominion Telegraph Company took form with a capital of $700,000. This Company proved the most serious opponent of the Montreal Telegraph Company, but was never a financial success. In 1878 it was leased by the American Union Telegraph Company, an opponent of the Western Union. Both Companies were acquired by the latter Company, which was busily occupied in securing a monopoly of the telegraph business, and succeeded, in a great measure, in accomplishing its object.

The Dominion Telegraph Company was transferred to the Great North Western Telegraph Company of Canada, a subsidiary concern of the American Company in 1881.

In the lower provinces a move for telegraphic facilities were made almost concurrent with those of Western Canada. 113

During 1847–48 the Press Association ran a steamer between Digby, N.S., and Portland, Me., to carry news received by the steamships touching at Halifax, and from thence sent overland by express riders to Digby, 149 miles, and was sometimes accomplished in less than eight hours and a half, or at the rate of 17½ miles an hour, to be despatched from thence by steamer to Portland and telegraphed to New York from there in advance of the Cunard steamers at Boston.

This service was managed with great vigor. The express rider was the great event of the day as he flew past Annapolis, his horse white with foam and the whole population lining the road. A gun was fired to announce his arrival to the captain of the steamer immediately anchors were weighed. Steam raised, the pilot took his place at the wheel and the small boat manned by athletic seamen was sent ashore to receive the bag of the express rider, as at full speed he arrived at the dock.

This process, though full of éclat and splendidly performed, was expensive, and the Associated Express agents, offered to guarantee the payment of a liberal subsidy to any company who would construct a line of telegraph between Calais, Me., and Halifax, which could be available for press matter.

The Nova Scotia Government came to the rescue and erected a line of 125 miles in length from Halifax to Amherst to meet the American and New Brunswick lines. This line was completed on Nov. 9, 1849, and Halifax was for the first time connected telegraphically with New York. 114

On Oct. 4, 1847, a telegraph company was formed in New Brunswick with $40,000 capital. Lines connecting St. John and intervening points with Calais and Portland were completed Jan. 1, 1849, and connection with the Nova Scotian Government line at Amherst was made.

The lines in New Brunswick and Nova Scotia were acquired by the American Telegraph Company and later by the Western Union Telegraph Company, by whom they are now operated.

In 1847 the British North American Telegraph Company was organized for the purpose of connecting Quebec and the lower provinces by wire, but the wire got no further than River du Loup, where it terminated for a time.

A second company, bearing a similar name, erected a line between Montreal and Quebec; both properties were afterwards transferred to the Montreal Telegraph Company.

In 1849 the Montreal & Troy Company built a line from Montreal to the Canadian frontier, and thence to Whitehall, and Troy, after working independently for a couple years, were purchased by the Montreal Company.

In 1850 a line from Bytown (now Ottawa) by a company organized by Joseph Aumond; it also after a few years became the property of the Montreal Company. 115

In the West about the same period the Hon. Malcolm Cameron interested himself in a telegraph line to connect Hamilton and London, but, after some 18 months of unprofitable labor, was abandoned.

Coming down to a later date the People’s Telegraph Company was organized and a line erected between Montreal and Quebec, which proved a financial failure to the promoters, and served as a warning to others to avoid going into isolated telegraph ventures.

In 1881 the Canada Mutual and the Union Mutual Telegraph Companies worked in conjunction for a short period in the States and Canada; both were eventually absorbed by the Western Union.

116

The Great North-Western Telegraph Company

This Company was incorporated on May 7, 1880, for the purpose of establishing and working telegraph lines in the Northwest Territory in the district of Keewatin, Manitoba, and to connect with lines in the Province of Ontario.

The capital stock, $400,000 in shares of $100 each, with power to increase the capital from time to time as necessity required, by a resolution of the Directors, with authority to establish, construct, purchase, lease or work lines in the Dominion of Canada by land or water, etc. The head office at the City of Winnipeg.

At a meeting of the Company held on June 10, 1881, Mr. Erastus Wiman was elected President.

At this meeting Mr. Wiman as President was empowered to enter into negotiation with the Montreal, Dominion and Western Union Telegraph Companies as shall harmonize the interest of the several named companies subject to confirmation of the Directors.

Mr. Wiman thus empowered lost no time in effecting his object.

The resolution quoted is amusing. The Western Union owned the Dominion Telegraph Company, or at least 117
controlled it. There was no discord between the Western Union and the Montreal Telegraph Company.

A close and intimate business relationship had been maintained between these companies for years and nothing had arisen hitherto to disturb this good understanding. The Dominion Telegraph Company had been acquired as an asset of the American Union Telegraph Company which had been purchased by the Western Union and was a white elephant on its hands and of which they naturally enough were anxious to get rid of.

It was offered to the Montreal Company, but the offer was not entertained as the wires of the Dominion Company merely paralleled its own, and its own wires were sufficient for its own business at that time. Mr. Wiman, being familiar with the position of affairs, saw a chance for a deal and the future monopoly of the telegraph business of Canada.

He got the refusal of the lease of the Dominion Company and to some extent his plans were approved by the Western Union and of which they were more or less informed. He then made his purpose known to the Directorate of the Montreal Telegraph Company, that they should hand over their business to his company on a 99 years' lease and a compensation of 8 per cent. per annum on the paid-up capital stock of $2,000,000 would be paid, guaranteed by the Western Union Telegraph Company.

The Directors, as a matter of course, were aghast with astonishment at the audacity of the proposal. 118

A company with a nominal capital, recently formed, with no one of standing in its make up to suggest the idea, was too preposterous. However, Mr. Wiman coolly told them they had better think it over, that unless his terms were accepted his Company, the Dominion and the Western Union, behind them, would go into competition with them for Canadian business. A meeting of shareholders decided, after a stormy and exciting discussion, to accept the terms offered.

The transfer was made on July 1, 1881.

The big fish swallow the smaller usually, but in this case it was the extraordinary feat of a small fish swallowing a bigger one.

When the agreement took effect Mr. James Dakers resigned and was succeeded as Secretary by Mr. D. Ross Ross.

Mr. Dwight was appointed General Manager of the Great North-Western Company and most of the officials and employees of the Montreal Telegraph Company were retained by him. Owing to his able management the Company has been successful in every way; all its obligations have been met with punctuality and regularity.

Mr. Wiman resigned the Presidency some ten years ago and Mr. Dwight succeeded him.

In 1902 it had 17,838 miles of line, 35,721 miles of wire, over 2,000 offices and transmitted 2,795,278 119
messages, not including press despatches.

Recently Mr. Dwight resigned the management and was succeeded by Mr. I. McMichael.

120

Canadian Pacific Railway Telegraph

In the charter of the Canadian Pacific Railway Company it had power to carry on a commercial telegraph business throughout the Dominion of Canada.

The telegraph lines of this company were constructed concurrently with the railway which was begun in 1880 and completed in 1885.

The following year the company inaugurated the commercial telegraph business and Mr. C. R. Hosmer was appointed General Manager of this branch of the company's business; this selection was recognized as a fortunate one for the company; no better qualified man could have been found in Canada than he to properly fill this important position. It was no light task he had undertaken, to equip and man the numerous stations as they were opened up for business, covering such a vast extent of territory as well as to enter into competition with a long established telegraph system through the more populous sections in the East. About this time the Postal Telegraph Cable Company was reorganized in the United States, and the Commercial Cable established, and a working arrangement made between these companies and the Canadian Pacific Telegraph for interchange of traffic, which has proven mutually beneficial to each company concerned. 121

The lines of the Canadian Pacific System traverse from Halifax to Vancouver, including numerous branch lines.

The Postal Telegraph Cable Company cover nearly every state and territory in the United States. A direct connection is made with the Government Cable to Australia at Vancouver and with the Commercial Cable Company at Canso, N.S.

In 1902 the Canadian Pacific Telegraph System had in operation 9,736 miles of line and 41,354 miles of wire, 1,022 offices and transmitted during that year 2,053,000 messages, not including press matter or railway messages.

The Company has two number six copper wires extending from Montreal to Vancouver.

About four years ago Mr. Hosmer resigned; he was succeeded by Mr. James Kent, formerly Superintendent of the Eastern division. Under him there are five divisional Superintendents, namely:—

James Wilson,	Vancouver.
B. S. Jenkins,	Winnipeg.
A. W. Barber,	Toronto.
P. W. Snider,	St. John.
J. F. Richardson,	Montreal.

W. J. Camp is electrician and Joseph Townsley Construction Superintendent.

Recently the Company erected on the former site of its Head Offices in Montreal a handsome fire-proof structure of white brick with Ohio stone facings, seven stories in height, combining in its interior every comfort and convenience for the large staff of employees. 122

The operating room is spacious, well lighted from three sides, and furnished with the latest designs of office fittings and electrical appliances.

The telegraph service of the Company is admirably conducted and doubtless is not the least profitable of the many enterprises in which it has engaged in.

123

The Government Telegraphs.

It was through the continued and persistent urging of the late Capt. Fortin, member for Gaspé, that the Dominion Government was at length aroused to the necessity of providing efficient telegraph facilities in the Gulf and the lower St. Lawrence.

The splendid telegraph system, now in operation, forms a fitting monument to his memory and is alike creditable to the Government which created it and carried it out.

During the past twenty years since it was first initiated, there has been erected 5,481 miles of land wire lines, and 225 miles of submarine cables laid.

One line on the north shore from Murray Bay to Belle Isle is over 1,000 miles in length and there are over 200 miles on the Island of Anticosti connecting the various lighthouses. Extensions are constantly being made as necessity arises.

In the Northwest territory 607 miles of line connect Selkirk with Edmonton with intermediate stations and from Ashcroft to Dawson 1,826 miles, from Hazleton to Port Sampson, B.C., 200 miles.

At the end of 1902 there were 222 Government Telegraph Stations, 89,400 messages transmitted and a revenue of $114,266 derived. The expenditure was $208,968.

All signal and meteorological messages are sent without charge.

The Government Telegraph System is under the jurisdiction of the Department of Public Works.

Remarks.

The commercial telegraph business of the Dominion is carried on, and has been for many years, by the Great North-Western, the Canadian Pacific and the Western Union Telegraph Companies—the latter in New Brunswick and Nova Scotia.

The Anglo-American Telegraph Company has the monopoly in Prince Edward Island and Newfoundland.

The Canadian Government Telegraphs operate in territory where it would not be profitable for commercial telegraph companies to enter. The competing companies each get a fair share of patronage by exercising care and promptitude in handling the business placed in their hands. The Canadian public have every reason to feel satisfied with the telegraphic facilities provided by these companies and can take pride in the fact that no better exists anywhere, or in any country.

The rates are reasonable when the great distances covered are taken into account.

125 It is gratifying to know that they are doing a thriving business, every year showing better results, all sharing in the universal prosperity felt throughout the country now and for years gone by.

The following sketches of prominent and well-known telegraph men, some of whom are living, and others who have passed away, will be of interest to many Canadian readers.

Preceding these brief portraitures are a few reminiscent tales recalled at random, chiefly Canadian incidents of “days that are gone.”

126

The Fall of Sebastopol.

I was in the service of the Montreal Telegraph Company at the head office in Montreal. One day the Superintendent summoned me to his presence. He directed me to proceed at once to Sherbrooke as the operator in charge there was very sick and unable to discharge his duties.

I left by the first train and reached my destination the same evening. On arrival I noticed a great crowd of people awaiting the train. Something unusual must have happened surely.

I immediately reported myself to the station master, and was considerably astonished when he seized me by the shoulder, rushed me across the passage to the telegraph office, ordered me to call up Montreal and enquire if the rumored fall of Sebastopol was true. This I did and found the report confirmed. This was on the 20th day of September, 1855. A Cunard steamer arrived at Halifax that afternoon bringing the news which was flashed over the wires by the Associated Press.

Montreal sent a full report, which came in on the old style recording instrument. A newspaper man came in and volunteered to write it down as I read it off the paper reel. Each sheet when finished was read aloud to the 127 crowd outside. The despatch ended and the people dispersed.

Next evening the event was celebrated by illuminations, bonfires, *feu de joies*, etc. The local militia turned out *en masse*, headed by Captain Ibbotson, loyal and patriotic songs sung, and universal joy was manifested by all.

At that period the town was largely populated by English railway men and mechanics who had been brought here by the Grand Trunk Railway Company when the road opened up a short time before. There was also a considerable number of retired naval and military veterans in the town and neighborhood, some of whom had fought under Nelson and Wellington. All of these took a keen interest in the fate of the British army in the Crimea, and were naturally overjoyed at the defeat of the enemy and of the victory achieved.

Sebastopol fell on Sept. 8, 1855, and the war was virtually ended.

Montreal, Toronto and every town and village in Canada celebrated the event with the greatest delight, but it is safe to say that nowhere was there more hearty rejoicing than in the capital city of the Eastern Townships on the occasion referred to.

128

How a Duel was Prevented.

One day during the winter 1856 I received a telegram from Richmond, a station on the Grand Trunk Railway, about 25 miles distant, addressed to the High Constable at Sherbrooke to the effect that a party of gentlemen were on the southbound train with the object of fighting a duel when the American frontier was reached, the party consisting of the principals, seconds and surgeons, and to have the whole party arrested.

Seeing the importance of the message due measures were taken to have it delivered promptly. The minions of the law were duly on hand and secured their prey on the arrival of the train. The party were much surprised, as they had taken every precaution to keep the affair a profound secret and were ignorant as to how the matter had leaked out. All were placed under arrest and escorted to the Magog House. They had come from Quebec. The nature of the quarrel I am unable to say.

They were brought before a magistrate and admitted the object of their journey, when each and severally were released on their own recognances. All promised to abandon their evil intentions and return to the ancient capital forthwith.

Having nothing special to interest them for a time they adjourned to the bar-room of that famous hostlery, 129 then carried on by Mr. Cheney, the flowing bowl passed round with the result that a reconcilation was effected, and the rest of the evening spent in harmony and good feeling.

The only one who refused to come to terms of amity was one of the sawbones of the party! He would have none of it.

They departed from Sherbrooke the following day, if not sadder, at least, wiser men.

Reading by Sound.

In the early days of telegraphy I was employed at an important station on the Grand Trunk Railway as commercial and railway operator. One night, after a busy day's labor, I was preparing to leave when I overheard the office call sounded from the relay, the local battery having been disconnected, as was then the custom when leaving for the night, for economical reasons. I answered the call and ventured to receive the message from the sound of the relay, and in this found no difficulty whatever.

Whilst thus engaged the locomotive foreman stepped in. Singular enough, the communication was for him. He was rather astonished at my receiving a message in this fashion and expressed his surprise. He spoke to others about it, and the affair in time reached the ears of the Railway Telegraph Superintendent, who, thereupon, called me up on the wire and gave me a severe reprimand. A "23" or circular was sent immediately thereafter to the effect that it had come to his knowledge that certain operators were in the habit of reading by sound instead of from the register, with which all stations were provided, and warning all to desist from this dangerous practice.

The modern operator will be inclined to smile at this bit of ancient history.

In no very long time, after the custom became general in both railway and commercial telegraphy, the Recording instrument, upon the perfecting of which Professor Morse had spent so much time and labor, was abandoned, and the more convenient method of reading by sound substituted.

A Cheeky Operator.

My predecessor at a certain station on the Grand Trunk Railway vacated his position rather suddenly by reason of the following colloquy, and against whom many and frequent complaints had been made.

On one occasion the General Manager happened to step off the train to interview the station master. Amongst other subjects spoken of was the troublesome operator. He immediately stepped across the passage to have audience with the obnoxious telegrapher.

In a very impressive tone he said, "Young man, I hear a great many complaints against you. You had better be careful or I shall have you discharged."

The operator not knowing the General Manager from Adam, never having seen him before, looked at him in surprise, and said, "Who in the blank are you, anyway?"

"I am Mr. Bidder. Be careful, sir."

"I don't care a blank whether you are Mr. Bidder or Mr. Auctioneer," turned on his heel and walked away.

It may be explained that, although doing railway telegraph work, he was actually employed by the telegraph company, and believed the railway company had nothing to do with him, in this he was mistaken. This interview more than confirmed the numerous complaints, and the services of the youth were immediately dispensed with.

Mr. S. P. Bidder was the first General Manager of the Grand Trunk Railway of Canada.

All Fools' Day Incident.

In the year 1855, when the Government of Canada was located at Quebec, a Militia Bill was passed, dividing the militia into active and sedentary, the first to consist of volunteer troops of various grades and classes. Provision was made for dividing the country into military districts, regimental divisions and battalion divisions, with officers for each. This was the first step towards the organization of a regular volunteer force in Canada.

At Sherbrooke there was considerable political wire-pulling on behalf of those who were ambitious of being appointed as officers of the company to be raised at that place. One individual claimed that he was certain of getting command of the new company and ridiculed the idea of any one else having the slightest chance of getting the appointment. This rather nettled one or two who were equally ambitious for the honor, and a conspiracy was entered into to perpetrate a practical joke at his expense.

A certain gentleman called at the telegraph office and requested the favor of a telegraph blank and envelope, explaining the purpose for which they were intended. I hesitated over the matter, but was assured he would be responsible should any trouble arise. I reluctantly consented. The result was a message was concocted as coming from the Militia Department at Quebec to the effect that the Department were pleased to inform the recipient that he had been appointed to the command of the company at Sherbrooke and that his commission for same would be duly forwarded by mail.

The victim was elated over the psuedo despatch and took special pains to show it to those who doubted his success.

One person, to whom he confided the contents to and who was one of the conspirators, doubted its being genuine, remarking, the Militia Department was not likely to inform appointees by telegraph. He thought it a joke, and come to think of it, this was April Fool Day. This led the irate individual to me, when he desired to be informed, when the message was received, handing to me the bogus telegram. I, of course, felt in a very awkward position. I scanned it over for a minute and told him the message had not come through my office. He thereupon went off like a shot in a very dangerous mood.

He wrote the Superintendent enclosing the alleged telegram and threatened an immediate action against the Company for allowing its property to be the medium of such a trick as was the one complained of.

I was in a rather bad fix. I explained the whole matter as it occurred. The instigator of the hoax came to my

rescue and assumed all responsibility; the threatened action was not taken and the matter was soon forgotten, but a new rule was embodied in the Company's instruction book to agents and operators forbidding inside blanks to be allowed to go out of the office under any pretense whatever, except on the business of the Company. This rule is still in force.

The one actually appointed to command the Company was the originator of the joke herein related.

137

An Angry Frenchman.

One day the hired man of the village curé handed me a sealed letter and twenty-five cents, upon receiving which I tore open the envelope in order to count the words in the message before transmission.

I had no sooner done this when an angry cry proceeded from the throat of Jean Baptiste, who held up his hands, and, with a look of terror in his face, told me in broken English that it was not for me, but for the priest at St. Hyacinthe. Had there not been a high counter between us, it might have gone hard with me.

I took in the situation, however, politely begged pardon, I had made a mistake, and put the contents in a fresh envelope, readdressed it and thrust the missive into a box under the counter, the receptacle for the paper from the recording instrument on which messages were received, and then gave the key a few taps, all this being within the purview of the anxious messenger.

I now told him it was all right, the message had gone. He then departed with a smile of satisfaction on his face and a courteous *remerci monsieur*.

Shortly after I resurrected the message and sent it over the wire in the orthodox fashion.

138 The little trick practiced and the ignorance shown may seem like romancing, but at that date even many well-informed persons on other subjects were quite as ignorant as this simple servant man of the *modus operandi* of electric telegraphy at that period.

139

Pirating a Press Despatch.

A certain well-known colonel of militia in Montreal, now deceased, who had been in the telegraph service in his boyhood and an expert operator, told me the story I am about to relate illustrative of primitive telegraph days.

We were swapping old-time telegraph stories when he exchanged the following: He was in the employ of the old British American Telegraph Company. One day, the wires down, which happened too often, unfortunately, Bob having nothing to occupy his time, sauntered over to the vicinity of the Montreal Telegraph Company, on St. Sacrament Street. It was with a feeling of envy he heard the busy ticking of the instruments there when those of his Company were dead as a door nail. He lingered for a moment or two beneath the office window, which was only a few feet above; it was in summer and the windows were all open and he could plainly deciper everything passing over the wire. One item of some importance attracted his attention when the idea struck him he had better take it down. He took his pencil and note-book, copied the item, went back to his office, had it manifolded and distributed to the press. Later on the same was sent out by the other Company, but in a more leisurely fashion; this was refused, on the ground that it was already received over the wires of the British 140 American; this caused much mortification to the older Company to be beaten by their insignificant rival.

Reading by sound of the instrument was not a common occurrence then, and especially on the public highway.

The Montreal Company never became aware of the trick that was played upon them.

141

The Queen's Message.

When in August, 1858, the Atlantic cable had been successfully laid, uniting two continents telegraphically, there was universal rejoicing. The Queen sent a congratulatory message to "Her Good Friend," the President of the United States, to which a suitable reply was returned.

The brevity of the Queen's message was somewhat disappointing compared with the more lengthy reply of the President, and many unfavorable comments were made in the press and in conversation.

However, it was afterwards learned that only a portion of the communication had been received owing to a temporary interruption of the cable. When at last the completed message came there was no reason for disappointment, and general satisfaction was evinced.

Small pieces of the unused cable of about an inch to two or three inches in length mounted with brass or silver ferrules were sold on the street by speculators from 25 cents to a dollar each. The event was celebrated with great éclat on both sides of the Atlantic.

142 Banners were displayed with numerous devices and quotations from Scripture such as, "Their line is gone out through all the earth and their words to the end of the world," and from Shakespeare, "I will put a girdle round the earth in forty minutes."

There were torchlight processions, displays of fireworks, illuminations, etc., etc., together with addresses by distinguished men in honor of the event. I refer more particularly to Ogdensburg, N.Y., where I was then situated as operator and received the Queen's message over the wire.

The rejoicing unfortunately was somewhat premature.

After working more or less imperfectly for three weeks, the cable gave out completely on the 1st of September after the transmission of 730 messages had been effected.

The cable operator at Heart's Content, Newfoundland, named De Sauty, sent daily bulletins to the press

holding out strong hopes for the restoration of the interrupted communication, but these hopes were not realized. The bulletins ceased and he disappeared and was never heard of again, at least by the public.

It is in allusion to this mysterious individual that Dr. Oliver Wendell Holmes wrote the following humorous lines, and in fine satirical vein thought that with a Latin tutor and a professor of chemistry the educated classes would understand it.

DE SAUTY.

An Electro-Chemical Eclogue.

Professor. *Blue Nose.*

PROFESSOR.

“Tell me, O Provincial! speak ceruleo Nasal,
Lives there one De Sauty, extant now among you
Whispering Boanerges, son of silent thunder
Holding talk with nations.

“Is there a De Sauty, ambulant on Tellus
Bifed cleft-like mortals dormient in nightcap
Having sight, smell, hearing, food receiving feature
Three times daily patent.

“Breathes there such a being, O ceruleo Nasal
Or is he a mythus, ancient name for humbug
Such as Livy told about the wolf that wet-nursed
Romulus and Remus.

“Was he born of woman, this alleged De Sauty,
Or a living product of galvanic action
Like the *Acarus* bred in Crosse’s flint solution
Speak thou Cyano Rhynal.”

BLUE NOSE.

“Many things thou askest, Jacknife-bearing stranger,
Much conjecturing mortal, pork and treacle waster
Pretermit thy whitling wheel thine earflap towards me
Thou shalt hear them answered.

“When the charge galvanic tingled through the cable 144
At the polar focus of the wire electric,
Suddenly appeared, a white faced man among us,
Called himself De Sauty.

“As the small opossum held in pouch maternal
Grasps the nutrient organ whence the term mammalia,
So the unknown stranger held the wire electric
Sucking in the current.

“When the current strengthened, bloomed the pale-faced stranger,
Took no food or victual, yet grew fat and rosy,
And, from time to time in sharp articulation
Said, ‘*All right*,’ De Sauty.

“From the lonely station passed the utterance spreading
Through the pines and hemlocks to the grove of steeples,
Till the land was filled with loud reverberations
Of ‘*All right*,’ De Sauty.

“When the current slackened drooped the mystic stranger,
Faded, Faded, Faded as the stream grew weaker
Wasted to a shadow with a hartshorn odor
Of disintegration.

“Drops of deliquescence glistened from his forehead
Whitened round his feet the dust of efflorescence,
Till one Monday morning when the flow suspended
There was no De Sauty.

“Nothing but a cloud of elements organic
C. O. H. N. Ferrum, Chor, Flu. Sil. Potassa
calc. Sod. Phosh mag. Sulphur Mang.? Alumin caprum
Such as man is made of.

“Born of stream galvanic with it he had perished
There is no De Sauty. Now there is no current
Give us a new cable, then again we’ll hear his cry,
‘*All right*,’ De Sauty.”

After a lapse of eight years another cable was laid in 1866 and communication across the Atlantic permanently established, but the mysterious De Sauty never appeared.

146

Testing the Cable.

In the fall of 1856 the Montreal Telegraph Company laid a subaqueous cable across the St. Lawrence connecting Ogdensburg, N.Y., with its Canadian lines. Everything went well till the breaking up of the ice in the spring, when the American end of the cable was carried away from its moorings.

A man was sent from Montreal to effect the necessary repairs. When he arrived, I, then being in charge of the office there, decided to accompany him and render any assistance I could. A boat was hired to row over to the lighthouse where the cable terminated. The craft engaged was rather frail and shaky, with quite a heavy sea running. The Montreal man got safely seated, clutching the side of the boat with one hand and the testing instrument in the other. It was a cold day in March, a stiff north-wester was blowing. When all was ready the painter was untied, when I jumped, and in doing so lost my balance and went in headforemost. As I bobbed up the heels of my friend were just visible above the water. We succeeded in getting ashore safely, but the testing instrument had gone to the bottom, which we tried to recover, but failed, and the trip for the time was given up.

My companion in this adventure was the late Mr. Bowman, for many years the respected storekeeper for the 147
Montreal Telegraph Company.

In meeting we often reverted to this episode in our telegraph experience and of our involuntary bath in the icy St. Lawrence.

148

Cutting Down the Liberty Pole.

In 1857 the following amusing incident occurred and will be remembered by some of the older inhabitants of the pretty American city on the south bank of the St. Lawrence where I was then the agent of the Montreal Telegraph Company.

The villagers (it was a village at that period) had made every preparation for the due celebration of Independence Day with more than ordinary care, and all were looking forward to the event with eagerness, especially the more youthful element of the population. The first ceremony observed at sunrise was to raise old glory to the apex of the liberty pole, which stood at the corner of Ford and Water Streets, but, to the amazement of the party to whom this duty was assigned, there was no pole to be seen. On a close examination they found nothing remaining but the stump of the flag-staff. The question was: Who were the ruffians that dared to perpetuate the outrage? None other surely that some scoundrels from the opposite side of the river. In this surmise they were not far from the truth. After indulging in language more forcible than elegant, like practical Americans, they set to work, erected a temporary flag-staff and the ceremonies of the day were carried out without further incident. It was discovered to be a case of *lex talionis* on the part of some young men from 149
Prescott who rowed across the river during the night and performed this piece of vandalism in revenge for a foray made by some young fellows from Ogdensburg on the previous 24th of May (the Queen’s Birthday), when they removed the British flag flying on the old Windmill at Prescott, and substituted the Stars and Stripes. When this fact became known the Ogdensburg people had to acknowledge it was a case of tit for tat and served them right.

Fortunately these youthful pranks were condemned by all right thinking people on both sides of the border and were not repeated.

150

The Burns Centenary.

On the 25th day of January, 1859, the birthday centenary of Robert Burns, the Scottish poet, was enthusiastically commemorated by his admirers on both sides of the Atlantic, and, in fact, everywhere throughout the Globe where Scotchmen were to the fore.

It was generally observed in the form of a banquet at which eminent literary and public men were the speakers who paid glowing tributes to the merits and genius of the peasant poet. Many of these addresses are still preserved.

In the town of Brockville, where I was located, a musical and literary entertainment was held in the Metropolitan Hall, the chairman being the Hon. James Morris. It was well attended by the leading people of the town. During the progress of the entertainment telegraphic congratulatory messages were interchanged between the chairmen of the different meetings then being held in Canada, and the United States, generally couched in lines and phrases from the poet’s works. The chairman gave an eloquent address; other speakers also contributed and the musical programme was excellent, but one gentleman had prepared with much care a paper on the Life and Character of Burns, which was admitted to be the gem of the evening by all who heard it, 151
but unfortunately very few did.

The person referred to was a well-known M.D. who was afflicted with deafness; he spoke in a very low tone of voice, like many who suffer from a similar infirmity. The paper was long, the night was getting late; before he was through, the audience showed signs of weariness, which the chairman noticed, when he rose and begged the Doctor to kindly curtail his paper as the night was advancing and he had several other items on the programme but the chairman’s request was unheard and unconsciously ignored. The audience had to patiently endure the martyrdom to the end, a few meanwhile retiring in disgust.

When the end did come the people were so delighted at being relieved of the infliction that he was generously applauded, when with an amiable smile, and bowing right and left in acknowledgment, resumed his seat in happy ignorance that he had been a very tiresome bore indeed.

152

The Prince of Wales at Brockville.

When in August, 1860, H. R. H. The Prince of Wales (now King Edward) and party had arranged to visit Brockville, the event was looked forward to with every manifestation of delight, and arrangements made to give them a hearty reception.

The route of the Royal party was from Ottawa, where a visit had been made, and recently named the capital city of Canada by Queen Victoria; there they embarked, sailing up the Ottawa River to Arnprior and thence by carriages to Almonte, and there entrained for Brockville. All the villages and hamlets passed were prettily

decorated for the occasion, here and there evergreen arches were erected where the loyal denizens assembled and heartily cheered his Royal Highness in passing.

Brockville was reached about nine p.m. The Royal party was received by the Mayor, Warden of Leeds and Grenville and other officials. Addresses were presented and replied to by H.R.H. Carriages were in waiting to convey them to the steamer at the dock, by which they were to leave at daybreak for Kingston.

The Royal party were escorted from the railway station to the steamboat wharf by a guard of honour, followed by a procession of firemen and citizens carrying torches. All the buildings on the way were brightly 153
illuminated, the church bells merrily ringing with a fine display of fireworks and the loud ovation of the people made it a memorable scene.

Instead of departing at daybreak, as had been arranged, it was about three in the afternoon before the steamer left. The detention was caused by difficulties which had arisen at Kingston. The Orange body there had erected an arch decorated with emblems of the order and which the Royal party would necessarily have to pass under. An address by the Orangemen was to be presented, to which the Duke of Newcastle was unable to assent. While the settlement of this was being arranged by telegraph wire, the Mayor, accompanied by many prominent citizens, waited on the Duke and invited the Royal party to a drive through the town, which was graciously accepted, thus giving the people an opportunity of seeing H. R. H. to better advantage. In appearance he was of medium height, pale complexion, modest in demeanor and dignified in manner.

He wore a tall white hat, a dark morning coat, light tweed trousers, patent leather boots and light tan coloured gloves. He bowed in acknowledgment to the cheers which greeted him and seemed to enjoy the drive.

It was said the Duke remarked he was not sorry at the detention as it had given the party the pleasure of seeing the pretty town by daylight.

There was a large entourage of pressmen reporting the Royal progress; one American correspondent when 154
writing up his report asked me among other questions how many people were in the torchlight procession. I told him 500, that being the number of torches purchased by the town council. Oh! he said, I'll make it 5,000, and sure enough he did and I sent this over the wire.

The whole population, men, women and children, at that period was a trifle over 4,000. This man afterwards became a famous correspondent during the American Civil War.

The fearful and wonderful reports received from the seat of war as to the extraordinary numbers of killed, wounded and captured, especially during the early stages of the trouble were something incredible; the experience narrated showed the need of a large discount being made.

The carriage the Prince of Wales drove through Brockville, and owned by a private gentlemen until his death, is now, or was until lately, doing duty as a public conveyance.

Should this meet the eye of some wealthy American, it might be a good thing for the cabby.

155

The Trent Affair.

It was on November 8, 1861, that Admiral Wilkes, in command of the United States frigate *San Jacinto* intercepted the British R. M. Steamer *Trent* on her way from the West Indies to England and forcibly removed therefrom the two confederate States Commissioners Mason and Slidell. When the outrage became known there was a universal burst of indignation felt at the affront in Great Britain and all the British possessions. Every one believed that unless the men were given up and the act disavowed war between the two countries was inevitable. A large military contingent was despatched from England on the Steamship *Persia* which arrived at Rimouski on Christmas day, Dec. 25, 1861. A Queen's messenger was sent to Washington bearing an ultimatum from the British Government demanding that the men be at once released.

The American Government were in a dilemma. Several members of the Cabinet were in favor of resisting this demand, but President Lincoln, with his characteristic common sense said "One war at a time, gentlemen, one war at a time," and the commissioners were surrendered and transferred to a British man-of-war at New York on January 1st, 1862, and *amende honorable* made.

While the negotiations between the American and British Governments were in progress, the government 156
and people of Canada were watching the trend of events with the keenest interest, and preparations were made for possible eventualities, flank companies at the respective military districts were ordered to prepare for active service.

When this order came by telegraph to the colonel of Brockville District, I delivered it personally and took occasion to inform him that if he would give me a commission in the company going on active service I was prepared to join at a moment's notice. This request pleased the veteran (he was out in the rebellion) giving me a hearty grip. "You're the right sort. I accept your services and shall have a commission for you within a week."

A few days after I was much gratified when I received a large envelope containing my promised commission, the same being initialled by the Hon. James Morris, the speaker of the Legislative Council and resident of Brockville; a short time thereafter while visiting his home he entered the telegraph office to send a message. I took this opportunity of thanking him for the commission he sent me. He glared at me for a second or two and said, "The commission is not for you; it is for John Murray the butcher." "Oh! indeed, I beg pardon. I was under the impression it was for J. M.—— gentleman." I did not get this off in a resentful mood; it was merely repeating 157
the language of the document. Of course I handed it over to my namesake, the rightful owner, a very respectable man of the town, when my military ambitions came to an end.

The services of the flank companies were not required after the *causes belle* had been removed and Canada once more resumed her usual peace footing.

158

The Old Soldier and the Parson.

About forty odd years ago when I was acting in the capacity of telegraph, express and steamship agent at Brockville, the following incident happened, which may be worth recalling: One day an old gentleman entered the office and desired me to furnish a steamship ticket to Liverpool. He informed me he was on his way to revisit his native land which he had not seen for many years. He was in the army previous to settling in one of the back townships. Although well on in years he looked hale and hearty, straight as an arrow and a remarkably handsome old fellow.

After completing his purchase and about to depart, he observed a pair of Fairbanks scales and requested me to weigh him, as he would like to see whether he lost or gained on the voyage. Whilst occupied in this, another old gentleman walked in attentively watching the operation; he also requested me to do a similar favor for him. He proved very much lighter and somewhat disappointed, and remarked: "Well, you are heavier than I, but I think I can beat you in length of years." "How old are you?" brusquely querried the old soldier. "I am 84," looking triumphantly at his questioner. "My young friend I am 85. I am heavier than you, older than you and 159
(whispering in his ear) can look at the girls yet!"

Singular enough, the name of the latter was Mr. Young, the former the Rev. Wm. Smart, a well-known and respected clergyman, whose chief weakness was a certain vanity in his length of years, coupled with activity and good health on which he greatly prided himself. He was therefore, considerably humiliated at being thus so badly taken down and his dignity ruffled by the above remark.

160

The Fenian Scare.

When in the summer of 1866 the Fenians invaded Canada and encountered the Canadian militia at Ridgeway, considerable alarm was felt all along the frontier. Cornwall, Prescott, Brockville and Kingston were strengthened with bodies of militia as being probable points of invasion.

For a time the Government took possession of the telegraph lines until all danger had passed.

Telegraph offices were kept open day and night by orders from Ottawa; this continued in force for several weeks. I was then at Brockville and found the long hours very irksome. No one believed in the likelihood of an attack here, but one night this belief was rather disturbed when a communication was received by the officer in command warning him to be on the alert as a body of Fenians had seized a steamer at Clayton, on the American side of the river, with the probability of attacking Brockville or Prescott.

Very soon the sound of the bugle was heard and the men formed in readiness to meet the enemy. They had been drilling for several weeks and were in splendid fighting trim, and under the command of an experienced officer, Lieutenant-Colonel Atcherley, D.A.G., who had seen service in the Crimea and India, in whom officers 161
and men had the utmost confidence. A home guard was hastily organized to watch the river front and give timely notice should any suspicious craft appear. During the prevailing excitement some one rang the town alarm bell, when the citizens were aroused from their beds, and the streets were soon crowded with men, women and children eager to learn what was the cause of the alarm. Many amusing scenes were witnessed. A few timid souls procured teams, loaded them with household effects, and with their families started for safer quarters in the back country. Many old veterans of the Canadian rebellion were seen carrying weapons of defense, but appeared more likely to be offensive only to themselves.

One aged gentleman carried a sword with a rope in lieu of belt and minus the scabbard; he refused to waste time looking for such appendages at such a time; the naked sword was good enough for him. The night was dark and ominous; every one awaited coming events with anxiety and more or less nervousness, and dawn began to appear, but no signs of the enemy. Meanwhile some of the home guard got tired waiting for the Fenians, who declined to come, and they one by one segregated to enjoy the comforts of their own firesides or seek repose on their downy beds at home. In this action the officer commanding the home guard preceded his men and was the first to retire, but one of their number a sturdy Scot, having been placed on an eminence favorable to scan the 162
movements of the craft on the river, he held on to his post, however. His family hunted him up and had much difficulty on prevailing upon him to come home.

The only fatality that occurred was the death of an old lady, who, nearing the end, collapsed suddenly when hearing the alarm bell and told the reason for its being rung.

Shortly after the Fenian fiasco became a thing of the past.

163

Professor Morse's Valedictory Message.

In 1870, when Mr. Morse had entered his eightieth year, it was felt by many telegraph men that some fitting recognition should be paid to the illustrious inventor before the close of his valuable life, which was now nearing the end.

In accordance with this general feeling action was taken and a committee formed, when after much thought had been given to the subject, it was at last decided the most appropriate memorial in its opinion would be to erect a statue and place it in Central Park, New York. This suggestion had the general approval of the telegraph fraternity. To carry this out subscriptions were invited; one of the first to contribute to the fund was Mr. John Horn, of Montreal, then in New York, and to complete the sum required Sir Hugh Allan was appealed to and promptly sent the desired amount.

The ceremony of unveiling the statue took place on June 10, 1871. Representative telegraph men from every State and territory, as well as the Dominion of Canada, were present, including many civic and State officials, and addresses were delivered by Governor Hoffman, Mayor Hall, the venerable poet, William Cullen Bryant and others.

In the evening a public reception of the delegates was held at the Academy of Music, which was filled to 164
overflowing, the Hon. William Orton, President of the Western Union, presiding, by whom the delegates were cordially welcomed. On the platform was a table and a set of telegraph instruments connected with the main

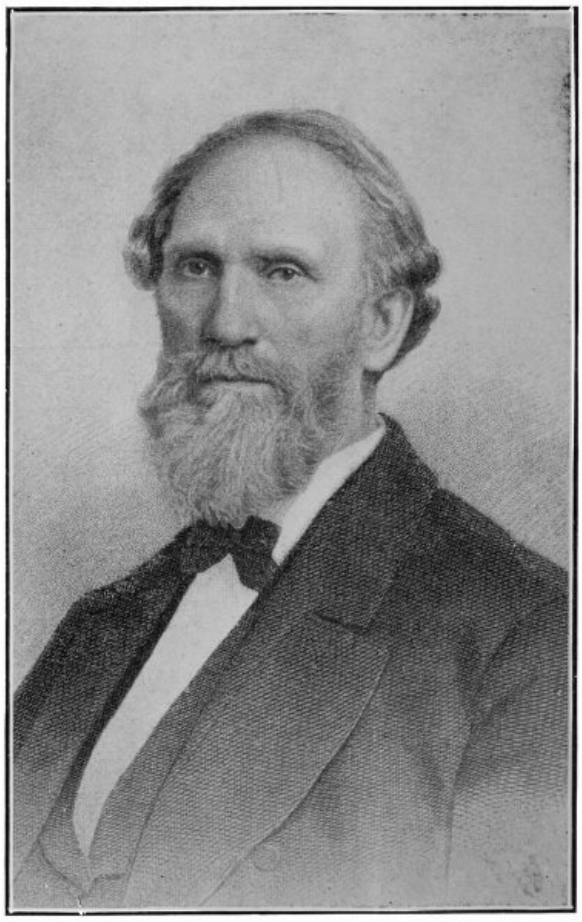
office of the Western Union Company. Punctually at 9 p.m., as previously arranged, Professor Morse, who was present, indited the following valedictory:

> "Greeting and thanks to the telegraph fraternity throughout the world. Glory to God in the highest, on earth peace and good-will to men."
>
> S. F. B. MORSE.

The message was sent over the wires by a young lady operator and Mr. Morse transmitted the signature.

The writer was at Brockville, Ont., at the time and received this now historic message simultaneously with hundreds, perhaps thousands of others.

Mr. Morse did not long survive this dramatic event. It was his last public appearance but one previous to his death.



O. S. WOOD.

O. S. Wood, Esq.

One of the most notable telegraph men in America, the first pupil of Professor Morse and the first to inaugurate an electric telegraph system in Canada on an extensive scale.

Born in 1817, near Ithaca, N.Y., after a grammar school and collegiate course, he studied and became a civil engineer, and was for some time employed in that capacity by the New York State Government.

When Mr. Morse was exhibiting his telegraph at Washington, in 1844, Mr. Wood was induced to join the inventor, and became his associate in constructing and working the experimental line between Washington and Baltimore, and the first to operate the line when opened for public business and afterwards engaged in constructing telegraph lines in other directions.

Early in 1847, when the Montreal Telegraph Company was formed, his services were sought, and he was appointed its first General Manager. By the end of this year a telegraph line was in operation between Montreal and Toronto, and to Quebec the following year, and in time extended throughout the whole country.

Owing to Mr. Wood's able administration the Company became one of the most important institutions in Canada.

After a long and successful career Mr. Wood retired in 1865, carrying with him the good will of the public and the respect and esteem of the directors and employees of the Company.

He subsequently engaged in other telegraphic enterprises in the United States, in all of which he was equally fortunate.

After amassing a considerable fortune he retired from active business pursuits many years ago, and is now spending the evening of his days at a quiet suburb of New York.

He is a man of commanding presence, tall, dignified and face bearing a very striking resemblance to Washington.

He possesses a highly cultured mind, a humane and benevolent disposition, coupled with an agreeable and attractive manner.

He is, and was always, a patriotic American citizen. During his sojourn in Canada he never relinquished his birthright.

The name of Orrin S. Wood will be long remembered by telegraph men as the first telegraphist on the continent of America, a distinction worthy of record in the annals of telegraphy, and is the oldest telegraph man living at the present time in America.

Long may he be spared is the fervent hope of the telegraph fraternity.

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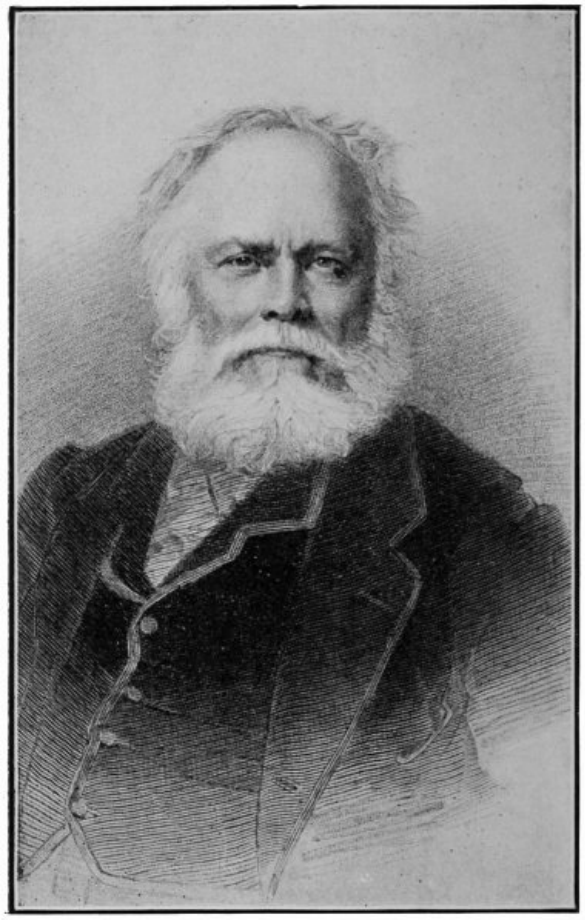

SIR HUGH ALLAN.

Sir Hugh Allan.

The name of this gentleman will be remembered in connection with the Montreal Telegraph Company. He was its President from 1851 until the day of his death.

It was largely through his efforts in conjunction with Mr. Wood that the telegraph system was extended to the most remote points in Canada.

It may not be generally known that, although a very busy man, he acquired a knowledge of telegraphy and became an expert telegraphist.

He had a private wire erected from his palatial residence, Ravenscrag, and connected with the general telegraph office, and by this means kept in constant touch with the inward and outward movements of his large steamship fleet.

He was for many years a director of the Western Union Telegraph Company, and one of the early contributors to the first Atlantic cable, and for a time one of its directors, but Sir Hugh Allan will be better known as the originator of the Montreal Ocean Steamship Company (now known as the Allan Line.)

There was no limit to his superabundant energy; no important enterprise was thought of unless his name and influence was sought. He was president or director in nearly every financial or industrial company in Montreal. No one before or since has occupied such a commanding position in business life in Canada. 168

He received the honor of knighthood from the late Queen personally in recognition of his great public services; this honor was never more worthily bestowed.

Sir Hugh Allan was a native of Scotland, born at Saltcoats, Ayrshire, Sept. 29, 1810. His death took place in Edinburgh while there on a visit Dec. 9, 1882.

The wonder is that some enduring mark of public appreciation has not been formulated to perpetuate the

name of one who has done so much for the land of his adoption.

A statue on Dominion Square would be a fitting momento.

"Lives of great men all remind us
We can make our lives sublime,
And departing leave behind us
Footprints on the sands of time."

169

JAMES DAKERS.

James Dakers, Esq.

Born in Forfar, Scotland, in 1811, on completing his studies at the parochial school, he served his apprenticeship in an attorney's office in his native town, and came to Canada in 1840.

He entered the service of the Montreal Telegraph Company shortly after its organization as Secretary. When Mr. Wood separated from the Company in 1865, Mr. Dakers was appointed Manager of the Eastern division, acting as Secretary in addition. Owing to his faithful and energetic services the success of the company was greatly enhanced.

"Whatever thy hand findeth to do, do it with all thy might," seemed to be his guiding principle. Like the restless sea, always moving, if not engaged at his own special work, he would repair to the operating department and give a helping hand, here and there, where most needed, then to the receiving counter attending to customers.

In the early telegraph days during a pressure of business, he not infrequently would take a handful of messages and deliver on his way to meals, and kept a vigilant eye on every department of the company's operations.

When the Montreal Telegraph Company leased its business to the Great North Western Company, in 1881, 170
he was not in accord with the directors in this move, and resigned, retaining, however, the good will of the shareholders, many of whom shared his views, and the respect of the business community by whom he was long and favourably known.

The following tribute to his worth by the late Rev. Dr. Ormiston in a letter to a friend is deserving a place here:

"James Dakers is in many respects a remarkable man. Notwithstanding many disadvantages, he has fairly earned the high position of influence, independence and usefulness which he now occupies. He is characterized by indomitable energy, great force of character, unyielding tenacity of purpose, his intellect is of a high order, and eminently practical, inflexibly upright in all his dealings, conscientiously faithful to all his obligations, punctual and thorough in the performance of all his duties, incapable of meanness, his word as good as his bond, he is a man universally trusted; his sympathies with the suffering and the struggling are wide and tender.

"Many bless him for his wise counsels and efficient aid; the extent and genuineness of his Christian charity is as manifest as the steadfastness of his religious life; as a true friend, he is one among a thousand.

"Were I asked by a young man for a model of a man, earnest and indefatigable, pure and firm in principle, exemplary and consistent in character, desirable and valuable in friendship, I would not hesitate to point him to James Dakers, of Montreal." 171

This was a very high testimonial of the character of Mr. Dakers by one who knew him intimately for many years.

After giving up his connection with telegraph interests, with which he had been so long associated, he lived in retirement until his death, which occurred on April 15, 1887.

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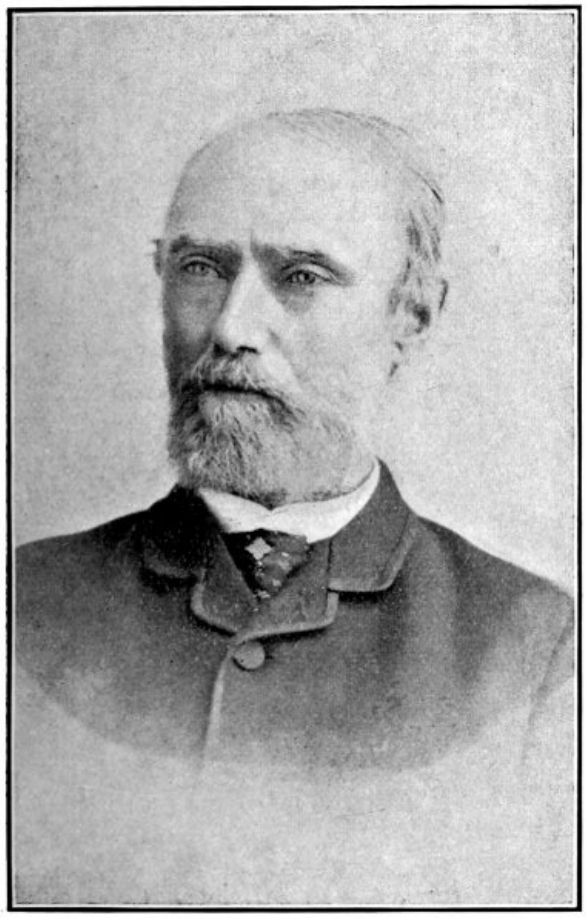


H. P. DWIGHT.

H. P. Dwight, Esq.

For the long period of fifty-six years Mr. Dwight has been continuously engaged in the telegraph service, and only quite recently retired from the more active duties of his calling.

Born on December 23, 1828, at Belleville, Jefferson County, N.Y., he entered the service of the Montreal Telegraph Company in 1847, the year of its organization, and placed in charge of the Belleville, Ontario, Office, where he remained for a time, and afterwards employed at the Head Office, Montreal. When the wires connected Toronto he was appointed agent there and soon made superintendent of the Western Section. In 1881, when the Montreal Telegraph Company leased its business to the Great North Western Telegraph Company he was appointed general manager of the latter.

When Mr. Wiman resigned the presidency of that company, Mr. Dwight succeeded him and filled the dual positions until a few months ago, when he resigned the general managership, the duties being too onerous and exacting for one at his time of life.

Mr. Dwight is associated with many other enterprises. He is president of the Canadian General Electric Company and a director of the Toronto and London Electric Company, president of Birkbeck Investment Company and chairman of the Governors of the Royal Humane Society. He is a man of fine physique, has lived a regular and careful life, which accounts for the vigorous and evergreen appearance at his time of life. 173

He is a keen sportsman and a devoted disciple of Isaac Walton. Every year he finds time to spend a few weeks in the happy summer-time, in the wilds of Northern Ontario, in quest of the speckled beauties of that region, or in the lower St. Lawrence, seeking the haunts of the lordly salmon in the Restigouche or other famous streams. In closing we wish him long life and many years to indulge in this his favorite recreation.

174

WILLIAM CASSILS.

William Cassils, Esq.

Born in the village of Renton, Dunbartonshire, on June 25, 1832, after acquiring a rudimentary training in the parochial school, and equipped for a business career, he engaged in a commercial house for a time, but his prospects were not equal to his youthful ambition, and his attention was directed to Canada wherein he had relatives and was encouraged to join them. He arrived at Montreal in 1852. Shortly after his arrival he entered the service of the Montreal Telegraph Company; his abilities were soon recognized—within a short time he was appointed manager of the Quebec Office, the second in importance to Montreal, and later was made superintendent of the Eastern Division; while in this position he had the wires extended to Father Point, the extreme eastern limit of the Company's system at that time.

In 1865 he left the telegraph service to engage in a wholesale business in Montreal, but his heart was never quite divorced from his first calling.

In 1876 he organized the Canadian District Telegraph Company and became its president.

When the telephone first made its appearance he foresaw its great possibilities, when he, in association with others, established in 1878 the first telephone exchange in Canada, which was afterwards merged with the Bell Telephone System. 175

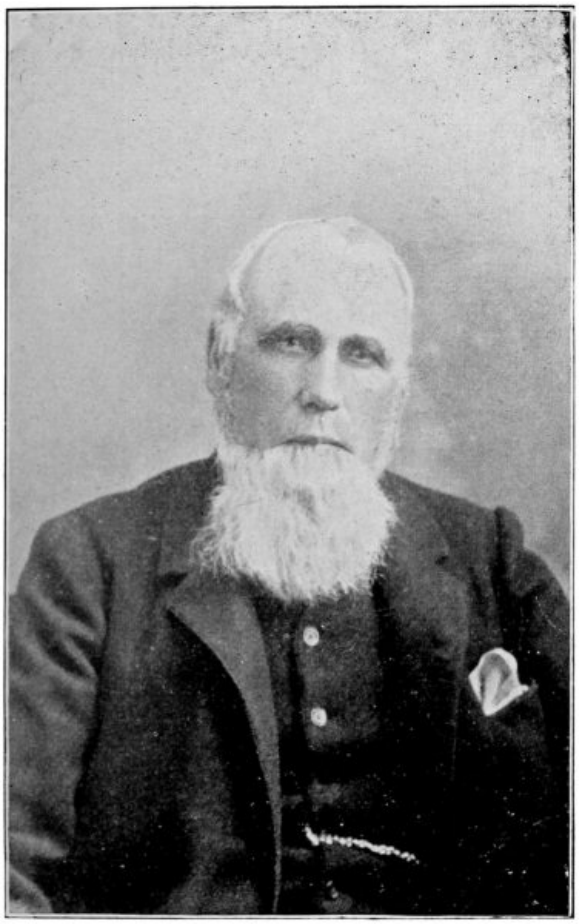
He was a Director of the Montreal Telephone Company, President of the Canada Central Railway and administrator of the St. Lawrence and Ottawa Railway, both of which are now linked to the Canadian Pacific Railway; he was also President of the Dominion Transport Company, but his interest and sympathies were always keenly directed to the progress and development of telegraphy. He himself was an expert telegraphist and always took a lively interest in the welfare and success of the telegraph fraternity. He was amiable in manner, kind in disposition and generous to a fault; his purse was ever open to the needy or unfortunate.

He possessed a fine tenor voice in his young days. When at social gatherings he rendered the songs of his native land with a sweetness and pathos few could equal. He took a great interest in young men, and many were indebted to him for advice and assistance in beginning the battle of life.

He passed away at a comparatively early age (in his fifty-ninth year) on December 25, 1891.

"Howe'er it be, it seems to me
'Tis only noble to be good
Kind hearts are more than coronets,
And simple faith than Norman blood."

176



JAMES POUSTIE.

James Poustie, Esq.

Born at Montrose, Scotland, in 1830. While yet an infant, his parents came to Canada in the historic brig "Favorite," owned and commanded by the father of the late Sir Hugh Allan.

Mr. Poustie is the pioneer telegraph line builder of Canada. He was engaged by the Montreal Telegraph Company shortly after its organization.

After the contractors had finished the line between Montreal and Toronto, all line extensions thereafter were under his personal supervision.

He would start early in the spring with gangs of linemen, equipped with tools and provisions, live under canvas during the building season and return in the fall to prepare for the next year's operations. This continued on from one year to another until the whole country was covered with a network of wires.

In purchasing material Mr. Poustie was a shrewd and careful buyer, getting the very best to be had at the lowest figure. In hiring labor, while paying liberal wages, he took good care to receive in return a fair day's work for a fair day's wage from his men. Though stern and exacting, he was not unkind. His gangs of men were chiefly French Canadians; he knew their language and could apply it forcibly, if not elegantly, when circumstances required it. 177

His men were devoted to him and worked like beavers. It is no exaggeration to say that owing to inherent shrewdness in handling his men and purchasing supplies the lines were constructed at half the cost of similar work in the United States; this fact the Company soon became cognizant of.

Finally the system became so extensive as to demand a division of labor and responsibility when foremen were placed in charge of important sections of the line, and Mr. Poustie directed operations from headquarters at Montreal and became General Superintendent of Construction.

This position he held for many years. At length he resigned to rest for a while. He is at present associated with R. G. Reid & Co., of Newfoundland, in their Montreal office.

Mr. Poustie is a man liberally endowed with good common sense, dislikes humbug or insincerity, a keen observer of men and possesses a retentive memory and a happy vein of dry caustic humor with a merry twinkle in his clear penetrating greyish blue eyes. He can relate many interesting tales generally, from a humorous point of view, in reference to his own varied experience, all of which are well worth listening to. He is still vigorous and hearty, and we hope has many years before him. Like Yorick, "A man of infinite jest, of most excellent fancy."

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CHAS. R. HOSMER.

Charles R. Hosmer, Esq.

“Some are born great. Some achieve greatness. Some have greatness thrust upon them.” It is no difficult task to determine to which class Mr. Hosmer belongs.

Born some fifty years ago in the little French Canadian village, Coteau Landing. On receiving an elementary training at the village school he turned his attention to telegraphy, and, instructed in its mysteries by the operator and agent at the railway station there, qualifying as an operator he secured a position with the Montreal Telegraph Company and was in its employ for some years.

When the Dominion Telegraph Company came into being he entered the service and rose step by step to the highest position attainable. When that Company merged with the Great North Western, Mr. Hosmer was offered and accepted the offices of President and General Manager of the Canada Mutual Telegraph Company, then recently organized. A few years later when the Canadian Pacific Railway Company were about to establish a commercial telegraph business, he was made General Manager, and held this for some thirteen or fourteen years, during which period he was very successful in organizing and carrying on this branch of the Company’s business. He was also a leading factor in exploiting the Commercial Cable and the Postal Telegraph Cable 179
Companies; he is a Vice-President of the former and a director of the Canadian Pacific Railway, director of the Merchants’ Bank and many other financial concerns; President of the Ogilvie Milling Company, said to be the largest of the kind existing; a member of St. James’ Club and at one time President; he is also a member of Mount Royal (yclept the millionaires’ club).

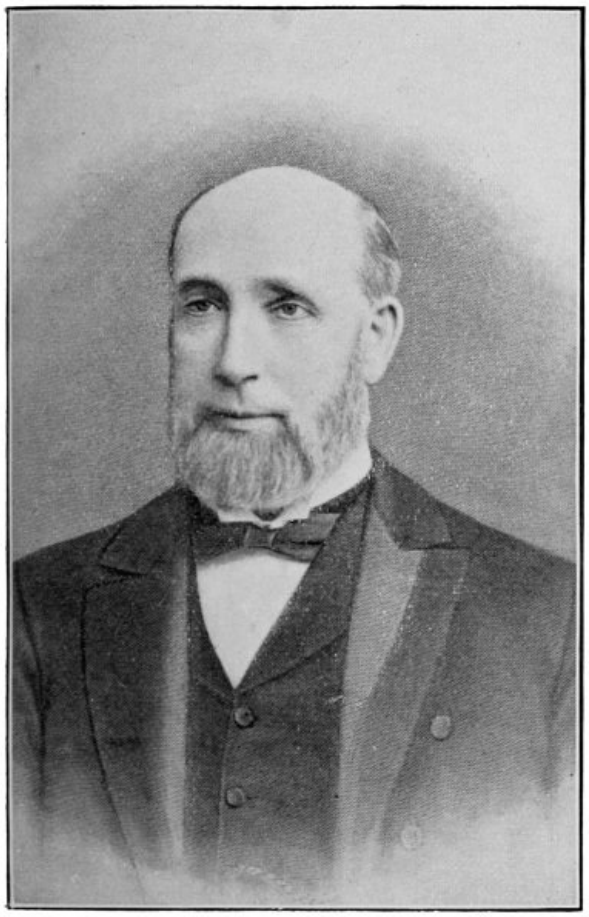
Mr. Hosmer is a recognized leader in financial circles in Montreal; he is possessed of a cheery, bright and winning personality, affects no airs, gracious in manner with a pleasant word for all.

Although not actively connected with the Canadian Pacific Telegraph System, his guiding hand is always reached.

He is yet a young man, full of life and energy, there is no saying the number and kind of activities may further engage his busy and restless mind.

His motto seems to be:

“Still achieving, still pursuing,
And a heart for any fate.”



HON. GEO. A. COX.

Hon. George Albertus Cox.

Born at Colborne, Ont., May 7, 1840, he commenced business life there as an operator in the service of the Montreal Telegraph Company.

After two years spent in the office of his native town he was in May, 1858, placed in charge of the Peterboro office of the Company and in addition a few years later was made agent of the Canadian Express Company.

He took an active part in the municipal, educational and commercial interests of the town and was for seven years its mayor.

In 1888 he left Peterboro, and from that time has resided in Toronto where there is a wider scope for his energies.

He was appointed to the Senate in 1896 by Lord Aberdeen.

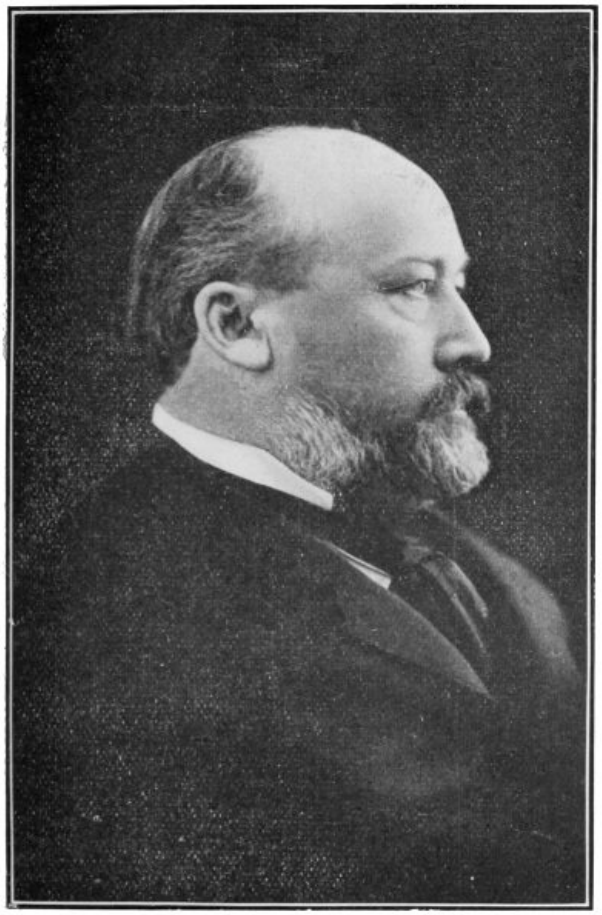
Mr. Cox is a strong temperance man and a warm supporter of the Methodist Church, of which he is a member; is Bursar of Victoria University and President of the Ladies' College, Whitby; President of the Bank of Commerce, the Canada Life Insurance Company, the Western Fire Insurance and on the directorate of many other companies; is one of the leading financiers in the Dominion.

His name has been publicly mentioned as one likely to receive honors at the hands of the King at no distant 181
date. As "coming events cast their shadows before," this is not at all improbable.

Senator Cox was one of a syndicate to build the Canadian Pacific Railway in opposition to the syndicate formed at Montreal. His name is now prominently connected with the Grand Trunk Pacific project.

His success in life has been phenomenal when his humble beginning is considered, and is a tolerably fair model for young Canadians to imitate in the battle of life.

182



SIR WILLIAM VAN HORNE.

Sir William Cornelius Van Horne.

Born near Joliette, Ill., February 3, 1843. On quitting school he began life as an office boy at the Railway Station there, and later became telegraph operator on the Illinois Central Railway. He was afterwards despatcher then superintendent of telegraph, and in a short time was made divisional superintendent of the Chicago and Alton Railway, and in 1872 general superintendent of the St. Louis and Kansas City and Northern Railway; from there he went, in 1874, to the Southern Minnesota Railway as its general manager.

In 1878 he returned to the Chicago and Alton Railway as general superintendent, but two years later he was called to the position of general superintendent of the Chicago, Milwaukee and St. Paul Railway, and in 1881 he was asked to take control of the Canadian Pacific Railway, then in process of construction. Under his vigorous and energetic direction the line was built in one-half of the time required by the contract between the government and the Company.

He has been successively Vice-President and President of the Company and is now Chairman of the Board of Directors.

The construction and successful management for years of this great enterprise has not impaired his 183
wonderful energies. He has built a railway in the Island of Cuba some four hundred miles in length in the usual expeditious manner. This work being completed, he is now, it is said, turning his attention to the distant Philippines in order to provide Railway facilities for the people of that country.

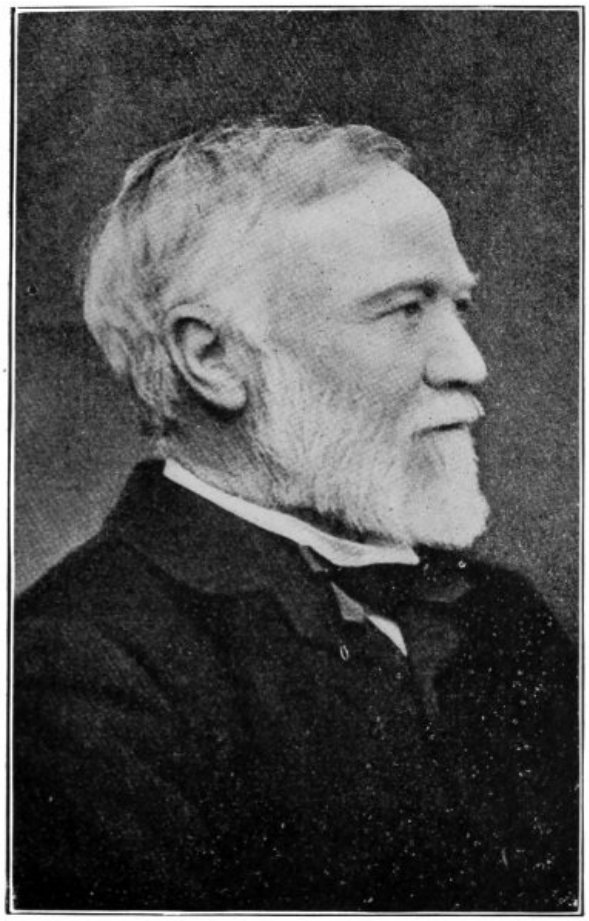
He is a director of many companies, including the Postal Telegraph and Commercial Cable Company, and a member of St. James and Mount Royal Clubs.

Sir William Van Horne is not only a famous railway man, but possesses artistic talents of a high order. Had he followed art as a profession he would have taken high rank. He is looked upon as one of the best art connoisseurs in Canada.

He was created a K. C. M. G. by the late Queen in acknowledgment of his public services in connection with the Great Transcontinental Railway and Imperial Highway.

Sir William is a man of fine presence, wears his honors with ease and dignity, affable and courteous in manner, and approachable to all.

“Honour and shame, from no condition rise,
Act well your part, there all the honor lies.”



ANDREW CARNEGIE.

Andrew Carnegie.

Born in the ancient Royal Burgh Dumfermline, Fifeshire, in 1837. His father and mother emigrated to the United States in 1848, settling in Alleghany, Pa.

The senior Carnegie was a master weaver and a man of exceptional intelligence, who was obliged to relinquish his business owing to the development of steam mills with which the handicraftsmen could not hope to compete.

At the age of fourteen young Carnegie began work as a messenger in the office of the Ohio telegraph company; in a short time he became an operator.

When the Pennsylvania Railway was carried to Pittsburgh he received an appointment as train despatcher and rose to be superintendent of the Pittsburgh division of the system.

At the outbreak of the American civil war Carnegie was made Superintendent of military roads.

After the war he went into numerous ventures, in all of which he was eminently successful.

His first big manufacturing venture was the organization of the Keystone Bridge Company. Iron bridges were coming into fashion, and he got the lead everywhere. He soon acquired other manufacturing plants in the iron line.

By 1888 he had control of the Homestead Steel Works and many other plants which were capitalized at about one hundred million dollars. 185

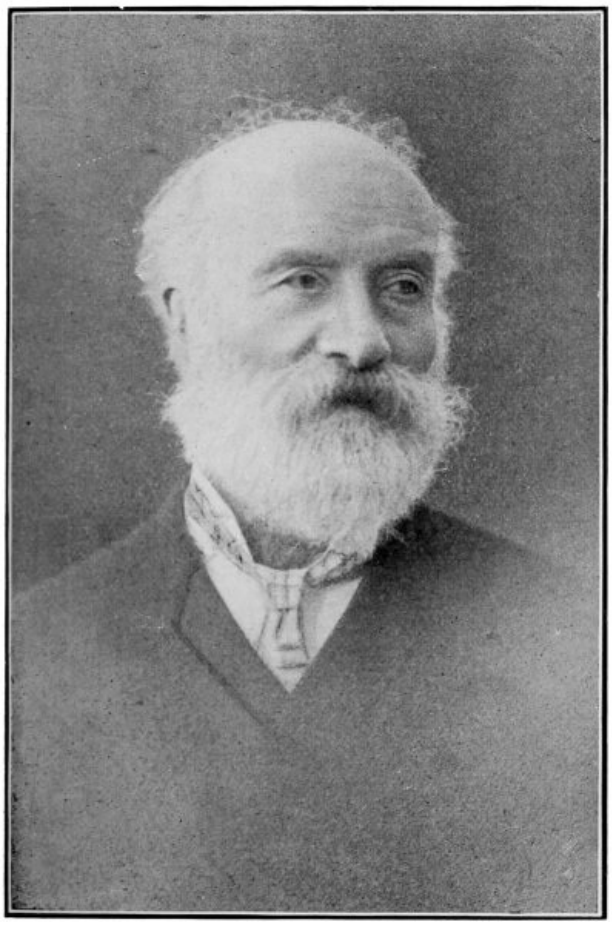
Some ten or fifteen years ago Mr. Carnegie began to feel the oppression of wealth and its responsibilities and made arrangements by which his employees became sharers in his profits. After getting free of the greater part of the personal care of the properties in which he was the chief owner, Mr. Carnegie has devoted himself largely to philanthropic objects, his gifts being chiefly in the line of building public libraries.

He takes a warm interest in everything relating to telegraphy and telegraph men, and is rather pleased to be remembered as an old-time telegraphist.

His chief place of residence is Skibo Castle, Scotland, but he pays frequent visits to the United States.

“Ring in the valiant man and free
The larger heart, the kindlier hand.
Ring out the darkness of the land,
Ring in the Christ that is to be.”

186



SIR SANDFORD FLEMING.

Sir Sandford Fleming, C.E., LL.D.

Was born at Kircaldy, Fifeshire, Scotland, on the 7th day of January, 1827. He left school at the age of 14, and was immediately articled as a student of surveying and engineering. At the age of 18 he came to Canada.

In 1852 he was appointed one of the engineering staff of the Northern Railway then known as the Ontario and Lake Huron road.

In 1863 he went to England as a representative of the Red River settlement to invoke the aid of the Imperial Government toward the construction of a railway to connect with the Canadian railways, but the scheme was not carried out.

When the Intercolonial Railway was projected he was made Chief of Surveys and Construction. When nearing its completion he was called upon by the Government to undertake the survey of the proposed route to the Pacific.

After exhaustive surveys had been made and the construction of the Canadian Pacific had been well advanced and some six or eight hundred miles of the heaviest sections built, political exigencies arose, and in 1880 he resigned. In that year he was elected Chancellor of Queen's University, and in 1882, while on a visit to Scotland, was presented with the freedom of Kircaldy Burghs, and in 1884 received the honorary degree of LL.D., from St. Andrew's University. 187

In 1881 he went as a delegate from the Canadian Institute and the American Meteorological Society to the International Geographical Congress at Venice, and in 1884 he was appointed a delegate of Great Britain to represent the Dominion of Canada at the International Prime Meridian Conference at Washington, where he had the pleasure of finding his views which he had been pressing on the public for years with regard to Cosmic time and a prime meridian for all nations, accepted by the representatives of the civilized world.

As early as 1879 Sir Sandford submitted to the Canadian Government a scheme for spanning the Pacific Ocean by electric cables which would, in connection with existing land and cable wires, complete the electric girdle of the globe, and bring Great Britain, Canada, Australia and New Zealand in unbroken electric touch with each other without passing over foreign territory. The proposition was given due consideration and the subject was laid before successive parliaments, but, while much interest had been awakened, nothing practical was accomplished, owing to the many obstacles in the way, and the matter was, for a time, held in abeyance. Meanwhile its energetic projector did not despair. Year after year he took every favorable opportunity to bring 188 it before the public men of Great Britain and the Colonies, travelling thousands of miles to attend Conferences at London, Brisbane, Ottawa and elsewhere, wherever the subject was under review. At length the reasons and arguments adduced on all these occasions in support of this scheme were found to be convincing, and its feasibility so apparent that it was finally accepted and practically applied.

On the 31st day of December, 1900, the Imperial and five Colonial governments joined in an interstate partnership to carry out the work so long and ably advocated by its originator and promoter. Exactly twenty-two months after the agreement, 8,272 miles of cable had been manufactured and safely embedded in the vast

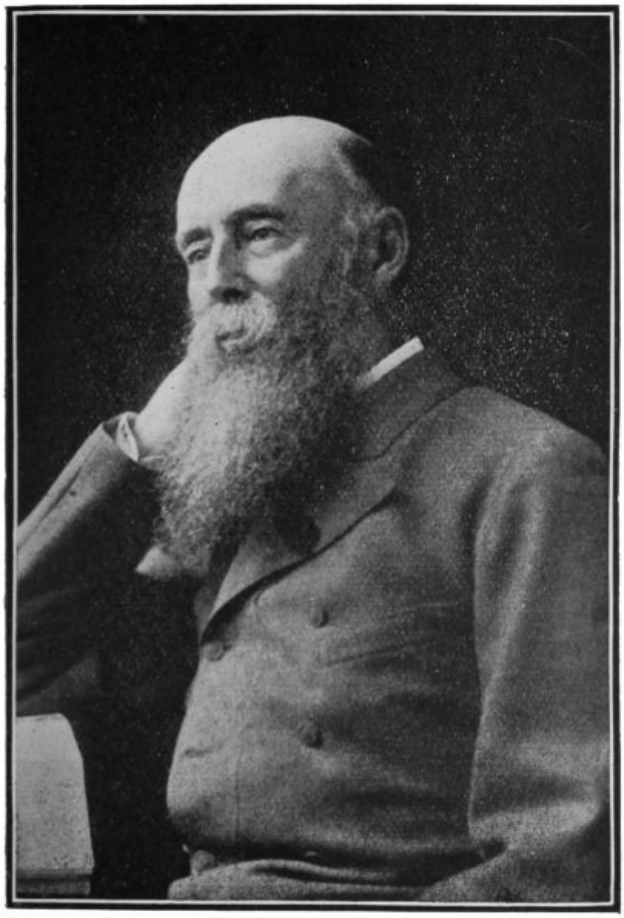
depths of the Pacific, nearly a third of the earth's circumference, on the 31st day of October, 1902, electric communication was successfully established between Canada, New Zealand, Fiji and Australia, and has been uninterruptedly maintained ever since. The success of this great telegraph enterprise, the most stupendous ever taken, was a fitting prelude to the dawn of the new century and a splendid triumph to the genius and foresight of Sir Sandford Fleming.

During nearly a quarter of a century he had given his time and talents, as well as his private means, to accomplish the end he had in view, and it must have been peculiarly gratifying to him that his labors all these 189
years had not been in vain. His patriotic and self-sacrificing efforts should receive some suitable public acknowledgment in some substantial form.

In 1877 he was made a Companion of St. Michael and St. George, and in 1897 he was promoted to be a commander of the same distinguished order on the occasion of the sixtieth year of Her Majesty's reign.

"Peace hath her victories,
No less renowned than war."

190



FRED. N. GISBORNE.

Frederick N. Gisborne

Was born at Broughton, Lancashire, England, March 8, 1824, and came to Canada in 1845.

When the Montreal Company was organized he was employed as one of its first operators, opening the first office of the Company at Quebec.

He was afterwards engaged in various telegraph enterprises in the Maritime Provinces.

In 1851 he laid the cable connecting New Brunswick and Prince Edward Island, the first submarine cable in America.

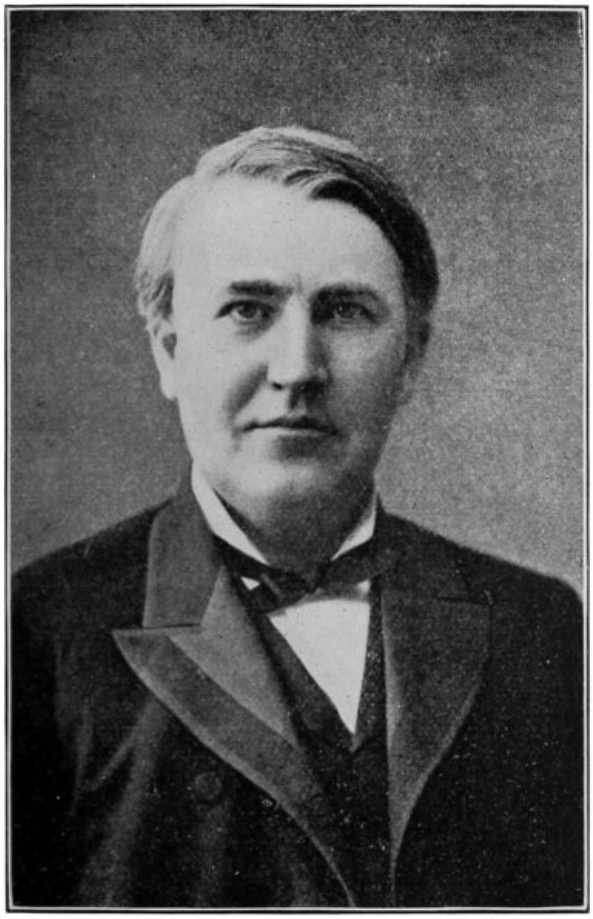
In 1856 he laid the cable connecting Cape Breton and Newfoundland (85 miles in length), this being an important link in the Atlantic cable system.

Previous to this he had secured a charter from the Newfoundland Government to construct a telegraph line across the Island, which, with the projected cable crossing the Gulf of St. Lawrence connecting with the land telegraphs, would provide the quickest news on the arrival of steamers from Europe. In this project he was associated with several American capitalists, but financial difficulties arose, and in the winter of 1853–4 Mr. Gisborne visited New York to secure further capital, and there met Mr. Cyrus W. Field, with the result that Mr. Field returned with him to Newfoundland. The Legislature, at Mr. Gisborne's request, cancelled the original 191
thirty years' charter granted to himself and associates, for a new charter for a term of fifty years to the New York, Newfoundland and London Company. The object of this Company was to complete the land lines begun by Gisborne, lay the cable in the Gulf of St. Lawrence and to lay a cable across the Atlantic. The latter attempt, however, proved a failure, and the franchise of this Company was subsequently acquired by the Anglo-American

Telegraph and Cable Company.

Meanwhile Mr. Gisborne dropped out of the enterprise, probably losing all the interest in it he possessed. Some years later he was appointed Superintendent of the Canadian Government Telegraph and Signal Service, which he filled until his death, which occurred on Aug. 30, 1892.

192



THOS. A. EDISON.

Thomas A. Edison.

Born in Milan, Erie county, Ohio, February 11, 1847, he attended school for a few months only, being educated at home by his mother, a woman of superior ability and attainments.

The boy was an apt scholar, showing preference for historical and scientific subjects.

In 1854 his father removed to Port Huron, Mich., where, at the age of twelve, he was engaged as a newsboy on the Grand Trunk Railway. While thus employed he took every occasion to watch the operations of the telegraph at the various stations on the line. He erected a wire between his father's house and that of a neighbour, himself making the instruments to save the cost of battery material; he experimented with a tom-cat, using the fore and hind feet as electrodes. The connections having been duly made he tried to start an induced current by rubbing the back of the feline. This amusing experiment was not a success, however, and was abandoned; later on he was rewarded for bravery in rescuing the child of the station master from the front of a moving train by receiving lessons in telegraphy, which he soon mastered, and was employed as telegraph operator on the Grand Trunk Railway for a time, leaving thereafter for the United States, where he worked in 193
various cities, meanwhile devoting himself to the study of electrical science then little understood in America.

While working as operator in New Orleans, La., he invented the automatic repeater. In 1864 he conceived the idea, which he afterwards perfected, of duplex telegraphy, but it was not put into practical operation until 1872. His next important inventions were the quadruplex and the printing telegraph for stock quotations.

In time his inventions were numerous and varied. On the lists of inventions at the patent office, Washington, in 1895, no less than 600 were credited to his name. The most notable amongst these are the quadruplex, the phonograph and the incandescent light.

Although Edison had acquired considerable wealth, yet in 1896 he publicly declared that he would have been at least $600,000 better off if he had never taken out a patent or defended one, and that all the money he ever made was made by manufacturing his inventions or in their practical use.

In 1896 he established the village of Edison, N. J., in the very centre of an iron ore deposit, a plant for the magnetic separation of iron from the rock in which it is embedded in the mine, the process being purely automatic. He first invented a crusher capable of reducing ten tons of rock to dust every minute; he then invented apparatus whereby the iron ore was separated from the dust by means of a magnet, the extracted ore 194
being made into briquettes and easily handled for transport to the blast furnace.

Mr. Edison is one of the simplest and unostentatious of men, careless in his costume, abstemious and simple in his habits, unselfish and generous in dispositions.

He married in 1874, and has four sons and one daughter.

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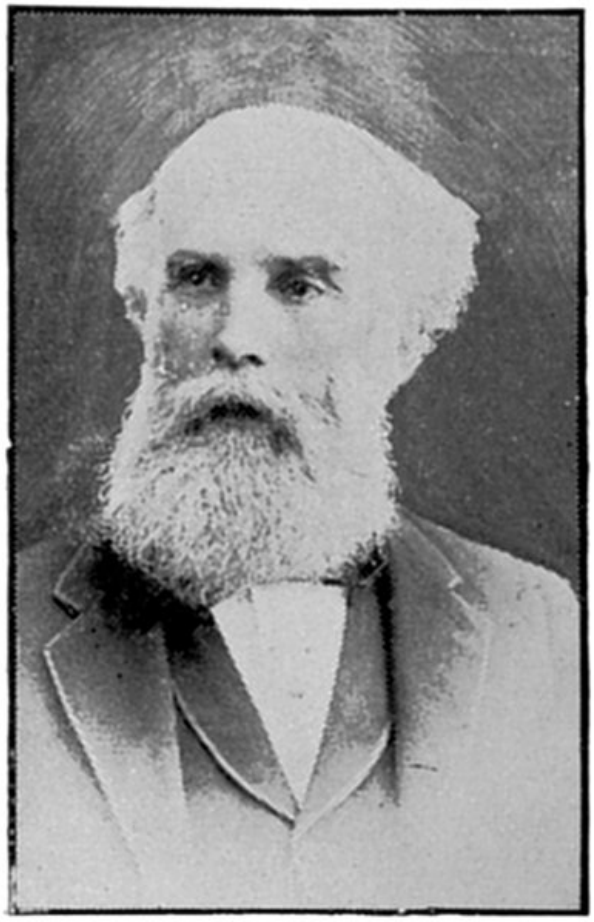

ISAAC D. PURKIS.

Isaac D. Purkis, Esq.

Was born in Laprairie, Que., in 1827. He was son of the Rev. Isaac Purkis, who came from England in 1821, and was a lineal descendant of the Purkis who carried the body of King William Rufus from the New Forest to Winchester in Hampshire, when shot by Sir Walter Tyrell, while hunting in the New Forest.

Mr. Purkis learned telegraphy under Mr. O. S. Wood and was located at Prescott, Ont., from 1849 to 1851, in the employ of the Montreal Telegraph Company. In 1851, on the very flattering recommendation of Mr. Wood, he entered the service of the British North American Telegraph Association and was appointed Superintendent (equivalent to General Manager at the present date). This company had a line from Quebec city east, to Rivière du Loup, thence southerly to St. John, N.B., etc. In 1853, on the recommendation of Mr. Purkis, the line was extended to Montreal, along the north shore of the river, and thus entered into competition with the Montreal Telegraph Company, whose line was from Point Levi, along the south shore to Montreal and thence westward. Connection was first made between Quebec and Point Levi by a long span of wire on masts, in the spring when the ice was breaking up. None of the linemen would attempt to cross on the floating, broken 196
ice. Mr. Purkis then got a ladder, and placing himself in the centre with the coil of wire over his shoulder succeeded in making the passage, at the same time paying out the wire over the edges of the ice. His exertions were so great that he was completely exhausted when he finally got across.

This company established at Rivière du Loup, Que., a signal office under the Lloyd code, whereby all vessels passing were signalled and information at once telegraphed to the owner or agent and to the press. In addition to this a boat manned with capable oarsmen, swivel gun on bow to signal the approaching steamer, more particularly at night, was used to intercept and receive from the inward steamer the despatches and latest newspapers from Europe. The method was to throw a tin cylinder in which were enclosed the despatches and newspapers with a small flag attached to the end; this was attached to a lanyard, and when secured by the Telegraph boat, the steamer was given a signal and she proceeded on her way, the despatches being promptly brought ashore and delivered to the telegraph and signal officer in charge.

In December 29, 1854, the British North American Telegraph Association and the Canada Grand Trunk Telegraph Company (whose lines extended from Montreal westward) entered into an agreement for the mutual 197
interchange of business, and Mr. Purkis was appointed Superintendent of both companies. This position he held until both companies were amalgamated with the Montreal Telegraph Company in the latter part of 1856. When he left the telegraph business in August of that year his subordinates presented him with a signet ring, which he wore to the day of his death.

He engaged in the forwarding and ferry business at Prescott until 1870, when he was appointed General

Manager of the Dominion Telegraph Company, with headquarters at Toronto. He resigned from this position in 1874 and again returned to Prescott taking up his former business. Besides himself he had three brothers engaged in the telegraph service, George, Arthur and William, all of whom predeceased him many years since.

Mr. Purkis was a citizen of the highest type, always eager for the welfare of the town and its inhabitants.

Personally, he was of a most genial and kindly disposition, a true and sincere friend to all who shared his confidence.

He passed away recently at his home at Prescott after a brief illness, in his 78th year.

Submarine Telegraphy.

When the electric telegraph had been successfully established in Great Britain, the public soon became alive to the necessity of extending its operations beyond the confines of the United Kingdom.

As early as 1840 Professor Charles Wheatstone, of England, suggested the practicability of connecting Dover and Calais, in France, by an electric wire, but it was ten years later before a submarine line was laid. This first attempt proved a failure, owing to the wires being imperfectly insulated.

In 1851 a second cable, containing four copper wires insulated with gutta percha and surrounded by tarred hemp and protected by ten galvanized iron wires wound round spirally, was laid connecting England and France. This proved successful. All submarine cables thereafter were made on this pattern.

It was now evident that the sea offered no barrier to international telegraphic communication.

In the same year (1851) a submarine cable ten miles in length was laid connecting Prince Edward Island and New Brunswick.

In 1852 six submarine lines were laid connecting England with Ireland, Scotland and the continent, the longest of which was one about one hundred nautical miles, and in 1854 five additional cables were laid in 199
European waters.

In 1856 Newfoundland and Cape Breton was connected by submarine wire, the distances being some eighty-five miles. The successful laying of this cable led to the more gigantic undertaking, viz., to connecting the old and the new worlds electrically. There are three names prominently connected with the origination of the idea, Bishop Mulock, of Newfoundland, Frederick Gisborne and Cyrus W. Field.

The following interesting remarks of Mr. Mackay, of Newfoundland, is worth producing.

In a speech he made at a banquet given by the old-time Telegraphers' Association, held at the Windsor Hotel in the summer of 1901, he said; "If you please, I shall now refer to a matter that I think may be far more interesting to you all than anything I have said thus far. I mean to refer to the matter of the Atlantic telegraph, as it is a subject that must always occupy a large share of the attention of the telegraph world, because at the present time telegraphing by cable is one of the most important factors in the whole service that makes the telegraphy of the world as valuable as it is. The subject that I wanted to mention to you is the question as to who was the person that initiated or gave birth to the idea of an Atlantic telegraph, which, of course, gave birth to all deep-sea and long-distance telegraphy.

"As a matter of fact, in Newfoundland, where this subject has been given considerable attention, it is stated 200
that the Right Rev. Dr. Mulock, Roman Catholic Bishop of Newfoundland, was one of the parties. Others contend that the late F. N. Gisborne is the person, others that Cyrus W. Field is the person.

"I would like to refer to those gentlemen, beginning first with Dr. Mulock.

"I trust you will pardon me for saying that I consider my opinion on the matter is worth something, inasmuch as I think I am the only man of those that were connected with the Atlantic telegraph at the time of its inception, in an executive capacity, all the others having gone before, as far as I know.

"Now with regard to Dr. Mulock, I think there is not the least doubt he got his information from Mr. Gisborne in regard to the Atlantic telegraph, and that his only connection with it was the expression of his belief in the possibility of its establishment, just as a man might say, for instance, we will in the next generation fly in the air; but he contributed nothing towards the direct accomplishment of the object. There is not the least doubt in my mind, therefore, that it lies between Mr. F. N. Gisborne and Cyrus W. Field.

"Mr. Gisborne's friends contend now that he was unjustly treated by Field, and that he really had advised Mr. Field of the possibility of accomplishing this great work. Mr. Gisborne did not make this contention in his 201
lifetime.

"I had the privilege of seeing him some years before he died, long subsequent to the establishment of the Atlantic telegraph, and he said that on his meeting Cyrus W. Field, in the month of January, 1854, whilst foreshadowing the possibility and the desirability of establishing Atlantic communication between Newfoundland and the Continent of America, he did not refer to the possibility of a cable to England, but only relied on the success of that enterprise by contributing to its coffers messages obtained from steamers arriving in Newfoundland and transmitted from thence by carrier pigeons, and ultimately by telegraphic cable.

"Mr. Gisborne made that statement, and he admitted that he did not, in his first interview with Cyrus W. Field, foreshadow the possibility of the Atlantic telegraph.

"Now Mr. Field on being questioned in regard to that interview which took place in Mr. Field's house in January, 1854, said exactly the same thing.

"He only contended for the pigeons in the first place and the possibility of a cable to Cape Breton in the second place, and the clever far-seeing commercial man, as he was considered, said that there was no possibility of such a scheme ever paying, and, therefore, he would not have anything to do with it; but on seeing Gisborne, he turned over the Globe, and, in turning it over, seeing that Cape Breton was only an inch or two on 202
the Globe from Newfoundland, and that Ireland was only six inches, with his shrewdness and cleverness he said at once, 'If a cable can be laid to Cape Breton, why can't it be laid to Ireland?' and the next morning he wrote a letter to Professor Morse and asked him if a cable could be laid to Ireland and whether it could be worked. He also wrote a letter to Lieutenant Maury, of the United States Navy, and asked him whether it would be possible to lay a cable to Ireland. Satisfactory answers being obtained to these two questions, he at once embarked in the enterprise and threw his whole influence (rich man that he was at that time) into the work of laying the Atlantic cable. You will see, therefore, that Mr. Gisborne did not communicate the idea of the Atlantic cable, but he communicated *the idea of a cable* that was quite enough for a man of Cyrus W. Field's foresight and ingenuity to suggest the possibility of an Atlantic cable, so that there is really no difference as to credit due

these two gentlemen for the initiation of the project, and I can assure you it is most satisfactory to me because I have always been a warm friend of both gentlemen (applause). I think I am the only living witness to these facts I have related, and I am glad to have this opportunity to state it publicly. I know it is a matter of interest to all telegraph men. Now the question comes to my mind, Who then was the author of the first idea of the Atlantic cable.

"In this connection I will go back to the year 1850. In 1854 the New York, Newfoundland and London 203
Telegraph Company obtained a charter which gave them exclusive rights to land a cable in Newfoundland for fifty years. This charter terminates in 1904, and I hope to live to see that charter expire. I am confident it will never be renewed, because the British Government would never consent, now that deep-sea telegraphy is an assured fact, to exclusive rights, of that nature being conferred on anybody or corporation. (Applause.)

"We will now go back to, Who was the first man that started the idea of the Atlantic cable? and I find no difficulty in naming the man, as far as my opinion goes.

"In 1850, whilst studying telegraphy with Mr. Gisborne in Halifax, he was very communicative in all his methods and actions, and he showed me letters at that time from Mr. Brett. There were two Bretts. I think the first was John and the second Jacob, but it was the elder Brett who was in communication with him then by letter, and he had given birth to the idea of a cable. He not only gave birth to it in 1850, but in 1852 he laid the cable from Dover in England to France, and that cable was working until within a few years of the present time. He, therefore, not only gave birth to the idea, but he gave actual presence to the cable, and I think it is not unlikely, and I find it easy for me to say, that there never was an inventor who was wont to appreciate his own 204
invention. I think it is not unlikely that Brett, when he had the idea of a cable at all, although only twenty-one miles in length, that he had within his vision thousands of miles, covering all bays, all waters and all seas (applause); that is my idea that John Brett was the originator and inventor of the submarine cable."

Mr. Mackay, whose testimony we have given, was the superintendent of telegraphs for the Anglo-American Telegraph and Cable Company for the Island of Newfoundland and held this position for many years.

The circumstances which brought Gisborne and Field together was as follows: The former had planned a line of telegraph from St. John's, Nfld., through four hundred miles of dense wilderness and forest to Cape Ray, there to connect by steamers or by carrier pigeons or by cable.

To enable him to carry out this project the Legislature of Newfoundland granted £500 for a survey of the route.

An Act was also passed incorporating the Newfoundland Telegraph Company with an exclusive right of way for thirty years, including amongst other privileges valuable concessions of public lands. Having thus laid the groundwork of his scheme Gisborne immediately left for New York to raise capital; in this he was successful. Horace B. Tebbets and D. H. Holbrook were among the more prominent to join him, and a company was 205
organized under the charter which had been granted. Soon after the formation of the Company Mr. Gisborne left for England, to purchase a submarine cable to connect Cape Ray and Cape Breton.

In 1852 thirty miles of the land line had been completed, and Mr. Gisborne had skilfully and successfully laid the first submarine cable of any considerable length in America between Cape Ray and Cape Breton and Cape Tormentine and Cape Traverse in Northumberland Straits.

In 1853, however, the cable gave out, about the same time the New York stockholders withheld their support; this caused the work to be suspended and the Company became bankrupt. Mr. Gisborne, finding himself unable to proceed, gave up all he possessed to pay the accrued debts, and for a time abandoned the enterprise.

Under such circumstances and with renewed courage Mr. Gisborne in 1854 returned to New York, to try, if possible, to resuscitate interest in his work. Among others to whom he now found access was Mr. Matthew D. Field, a New York Engineer, to whom he communicated his position and plans. Mr. Field, however, declined to interest himself, but politely offered to introduce him to his brother, Cyrus W. Field, at that time retired from active business. This led to several interviews, which had the effect of exciting a general interest in telegraph 206
affairs in Mr. Field's mind. Standing one evening over a large globe after one of these interviews with Mr. Gisborne, and tracing the lines overland to St. John's, Nfld., an idea dawned on his mind which gradually strengthened its hold upon his imagination and soon absorbed his whole heart and life.

While following with his finger the track of the inland lines to the ocean, it was natural to traverse also the course of the steamships across the Northern Atlantic. It was but a step further to plant his finger on London and to feel that to reach the centre of English commercial life by telegraph, were this practicable, would be an achievement worth striving for.

Mr. Field, thus aroused to a comprehension of a possible opportunity to embark in a grand enterprise worthy of the age, began to make enquiry respecting the project of laying a cable on the bed of the Atlantic. He found that a recent survey of the Northern Atlantic, under the direction of Lieutenant Maury, had been made, and a plateau extending from Newfoundland to Ireland had been discovered, forming a safe and easy pathway for a submarine wire.

Professor Morse also assured Mr. Field that the project was entirely feasible, and warmly encouraged him in it, and asserted the certainty of its ultimate accomplishment.

Being now thoroughly convinced Mr. Field communicated with some of his intimate friends, amongst whom 207
were Peter Cooper, Moses Taylor, Marshall O. Roberts and Chandler White, names familiar in the history of American enterprise. The scheme met with earnest attention and ready response. Mutual consultations resulted soon after in the organization of a company with a capital of one million and a half dollars to carry out the project and the immediate purchase of the Gisborne charter, it resulted also in the generous enlargement of the franchises granted by the colony of Newfoundland, the exclusive right to land ocean cables during fifty years, £50,000 to aid the work and fifty square miles of land when the cable was successfully laid was granted.

The Government of Prince Edward Island also made liberal grants of money and land. With these important arrangements completed on May 6, 1854, a company was formally organized under the corporate name of the New York, Newfoundland and London Electric Telegraph Company.

Peter Cooper was elected President.

Chandler White, Vice-President.

Moses Taylor, Treasurer.

Professor Morse, Electrician.

Matthew D. Field, Engineer.

The latter immediately proceeded to Newfoundland to begin operations, first honorably paying the debts due to workmen under Mr. Gisborne.

Mr. Field, with six hundred men, pushed the work of construction through the vast forests of Newfoundland 208
until the wires were erected between St. John's and Cape Ray. Meanwhile, Cyrus W. Field made his first voyage to England to contract for a new cable to connect Newfoundland with Nova Scotia, and to continue his enquiries into the scientific obstacles to the laying and operating a cable between the shores of the Old World and the New.

In England Mr. Field met Mr. John W. Brett, the originator and inventor of submarine cables, who gave every encouragement to Mr. Field in the Atlantic cable project, and to show his faith in its success Mr. Brett purchased a considerable number of shares in the concern.

In 1855 the cable for Cape Ray was shipped from England. It weighed 400 tons, and was manufactured by W. Kupert & Co., London. The steamer, "James Adger," was chartered by Mr. Field, to convey a large party to Newfoundland to witness the submergence.

Among these were Peter Cooper, Robert W. Lowber, Professor Morse, Rev. H. M. Field, Rev. Gardiner Spring, Rev. J. M. Sherwood, Dr. James A. Sayre, Bayard Taylor, Fitzjames O'Brien and John Mullarky.

The cable had arrived in an English brig, which had to be towed by the steamer from shore to shore. 209
Everything seemed favorable. A hawser was thrown from the steamer to the brig and the cable began to find its way to its appointed bed. Unfortunately, while yet in mid-channel, a furious gale set in when the overloaded brig became unmanageable, and, fearing destruction, the cable was cut and the work for the time abandoned.

In 1856 a steamer amply provided for the purpose was chartered, by which after lading the cable it was easily and successfully submerged without a hitch.

The line was now finished. Although it had to wait during many years for the completion of the great work for which it was a link, it ultimately showed the wisdom of its construction and became of much value to its projectors; it had cost so far $1,000,000.

On the formation of the Atlantic Telegraph Company, the charter of the New York, Newfoundland and London Telegraph Company, conferring the exclusive right for fifty years to land cables on the Island of Newfoundland, was made over to the new Company.

In 1855 Chandler White died; on his death, Wilson G. Hunt, a name well-known among merchant princes of New York, took his place as director, and gave the company during its existence the benefit of his able counsel and active and intelligent support. Mr. Cyrus W. Field was at the same time elected vice-president and Robt. W. 210
Lowder, secretary.

In 1857 the first attempt was made to lay a cable across the Atlantic, the length of which was 2,500 miles. After paying out 255 miles the cable broke, and the work was given up for that year.

In 1858 another attempt was made, the British naval ship "Agamemnon" and the United States frigate "Niagara," each carrying one-half of the cable, proceeded to mid-ocean, spliced the ends, and going in opposite directions reached Newfoundland and Ireland the same day, August 5, after each having successfully accomplished the submergence. There was great rejoicing on both sides of the Atlantic over the event, but disappointment soon followed. On the 1st of September, the cable ceased working and the project for a time was abandoned. Seven years after another attempt was made, a new cable had been prepared and stowed in the hold of the "Great Eastern." The big ship, lightly carrying her great burden, steamed out to sea paying out the cable as she proceeded. Half the Atlantic was passed over in safety when the cable broke and the "Great Eastern" returned to her moorings. Such, however, had been the indications of success in laying the cable in 1865, that in 1866 the Anglo-American Telegraph Company was organized with a new capital, and the "Great Eastern" once more started across the deep, when the great work was at last accomplished. Universal joy 211
followed the announcement that the cable was successfully laid, not only so, but the lost cable of the previous year was, to the general wonder, found, picked up and spliced and continued to the American shore.

The cable was thrown open for public traffic August 26, 1866. A large and remunerative business followed, which has continued unbroken ever since.

There are now fourteen cables spanning the bed of the Atlantic between Europe and America, the total length of these being 40,000 miles.

In the present year (1902) the total length of submarine cables in the world is about 200,000 miles, all but 20,000 of which are owned by commercial concerns and the remainder by different Governments.

The amount of capital invested in cables is estimated at about $210,000,000.

The cost of the cable before laying depends upon the dimensions of the cars, or conducting wire, which is copper; gutta percha, which still forms the only trustworthy insulating material, constituting the principal item of expense.

For an Atlantic cable of the most recent construction, the cost may be taken at £250 to £300 per nautical

mile.

The system of submarine cables originating in Great Britain has continued to develop in her hands, until the world has been covered with a veritable network of cables, which has hitherto done much to prevent the decline 212
of her commercial supremacy. During the last few years, however, other maritime nations in Europe have begun to realize the importance of submarine cable enterprise in this respect, and France and Germany have made some progress towards freeing themselves from British monopoly; both are now connected with America by cables which are owned in their respective countries, though their manufacture and submergence was effected by an English Company.

This spread of the cable system has naturally followed trade routes, and thus, with the exception of the cables to America, their trend has been eastwards as far as Australia and Japan. During the year 1902 the Dominion of Canada was connected by cable with New Zealand and Australia, the total length of cable, 8,272 miles, and cost £1,795,000.

An agreement was entered into between the Imperial Government and the Governments of Canada, Victoria, New South Wales, New Zealand and Queensland, and it was through the persistent efforts and advocacy of Sir Sandford Fleming that this great work was accomplished.

Owing to the experience gained with many thousand miles in all depths and under varying conditions of weather and climate, the risks, and, consequently, the cost of laying, has been greatly reduced, but the cost of effecting a repair still remains a very uncertain quantity, success being dependent on quiet conditions of sea 213
and weather.

The *modus operandi* is briefly as follows: The position of the fracture is determined by electrical tests from both ends with more or less accuracy depending on the nature of the fault, but it can be located within a few miles. The repair steamer, on reaching the given position, lowers one or perhaps two mark buoys, mooring them by mushroom anchors, chain and rope, using these buoys to guide the direction of tow. Grapnel, a species of five pronged anchors attached to a strong compound rope formed of strands of steel and manilla, is lowered to the bottom and dragged at a slow speed, as it were ploughing a furrow in the sea-bottom in a line at right angles to the cable route until the behavior of the dynamometer shows that the cable is hooked. The ship is then stopped and the cable gradually hove up towards the surface; but in deep water, unless it has been caught near a loose end, the cable will break on the grapnel before it reaches the surface, as the catenary strain on the bight will be greater than it will stand. Another buoy is put down marking this position, fixing at the same time the actual line of the cable. Grappling will then be recommenced so as to hook the cable near enough to the end to allow of its being hove to the surface. When this has been done an electrical test is applied, and, if the original fracture is between the ship and shore, the heaving in of the cable will continue until the end comes on board. 214
Another buoy is then lowered to mark the spot, and the cable on the other side of the fracture grappled for brought to the surface, and, if communication is found perfect with the shore, buoyed with sufficient chain and rope attached to allow of the cable itself reaching the bottom. The ship now returns to the position of original attack and by similar operations brings on board the end which secures communication with the shore. The gap between the two ends has now been closed by splicing on new cable and paying out until the buoyed end is reached, which is then hove up and brought on board. After the “final splice,” as it is termed, between these ends has been made, the bight made fast to a rope is lowered overboard, the slip rope cut and the cable allowed to sink by its own weight to its resting place on the sea-bed. The repairs being thus completed the various mark buoys are picked up and the ship returns to her usual station.

The grappling of the cable and raising it to the surface from a depth of 2,000 fathoms seldom occupies less than twenty-four hours, and, since any extra strain due to the pitching of the vessel must be avoided, it is clear that the state of the sea and weather is the predominating factor in the time necessary for effecting the long series of operations which, under the most favorable circumstances, are required for a repair. In addition the 215
intervention of heavy weather may mar all the work already accomplished and require the whole series of operations to be undertaken *de novo*.

As to cost, one transatlantic cable repair cost £75,000.

The repair of the Aden Bombay cable, broken in a depth of 1,900 fathoms, was effected with the expenditure of 176 miles of new cable, and, after a lapse of 251 days, 103 being spent in actual work, which for the remainder of the time was interrupted by the monsoon. A repair of the Lisbon Porthcarrow cable broken in the Bay of Biscay in 2,700 fathoms, eleven years after the cable was laid, took 215 days with an expenditure of three hundred miles of cable.

All interruptions are not so costly, for in shallow waters, with favorable conditions of weather, a repair may be only a matter of a few hours, and it is in such waters that the majority of breaks occur, but still a large reserve fund must be laid aside for the purpose.

As an ordinary instance it has been stated that the cost of repairing the direct United States cable up to 1900 from its submergence in 1874 averages £8,000 per annum.

Nearly all the cable companies possess their own steamers of sufficient dimensions, and specially equipped for making ordinary repairs, but for exceptional cases where a considerable quantity of new cable may have to 216
be inserted, it may be necessary to charter the service of one of the larger vessels owned by a cable manufacturing company at a certain sum per day, which may well reach £200 to £300.

This fleet of cable ships now number forty, ranging in size from vessels of 300 tons to 10,000 tons’ carrying capacity.

The life of a cable is usually considered to continue until it is no longer capable of being lifted for repair, but, in some cases the duration and frequency of interruptions as affecting public convenience with the loss of revenue and cost of repairs, must together decide the question of either making very extensive renewals or even abandoning the whole cable. It is a well ascertained fact that the insulator—gutta percha—is, when kept under water, practically imperishable, so that it is only the original strength of the sheathing wires and the

deterioration allowable in them that have to be considered.

Cables have frequently been picked up, showing after many years of submergences, no appreciable deterioration in this respect, while in other cases ends have been picked up which in the course of twelve years had been corroded to needle points, the result, no doubt, of metalliferous deposits in the locality.

The experience gained in the earlier days of ocean telegraphy from the failure and abandonment of nearly 50 per cent. of the deep-sea cables within the first twelve years, placed the probable life of a cable as low as fifteen years, but the weeding out of unserviceable types of construction and the general improvement in materials, have, by degrees, extended that first estimate until now the limit may be safely placed at not less than forty years. 217

In depths beyond the reach of wave motion and apart from the suspension across a submarine gully which will sooner or later result in a rupture of the cable, the most frequent cause of interruption is seismic or other shifting of the ocean bed, while in shallower waters and near the shore the dragging of anchors or fishing trawls have been mostly responsible.

Since by international agreement the wilful damage of a cable has been constituted a criminal offence and the cables have avoided crossing the fishing banks or have adopted the wise policy of refunding the value of anchors lost on their cables, the number of such fractures have been greatly diminished.

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Cable Instruments.

The apparatus in use on land lines are not adapted for cables except for comparatively short distances not exceeding four or five hundred miles.

When the Atlantic cable was laid a special instrument had to be devised to transmit signals to the distant end. The man to accomplish this was Professor Thomson (now Lord Kelvin), who invented the mirror system. A beam of light was thrown on a minute mirror an eighth of an inch in diameter and the light reflected on to a scale by means of which the signal was interpreted into letters. This necessitated one person constantly scanning the spot of light as it moved to the right and to the left of the scale and calling out the individual letters, which were taken down by another person. This tedious and trying method of receiving signals was superceded by another device of Lord Kelvin, the siphon recorder.

The siphon, by which the cable signals are automatically recorded, is a thin glass tube, about the thickness of a strong linen thread, and quite flexible. It is suspended in a frame and attached by a single silk fibre to one side of a rectangular coil of fine insulated wire, moving about a soft iron bar fixed in the magnetic field of two large permanent magnets. The coil is held down at the lower end by a silk thread, fastened to an adjustable 219
spring, to regulate or confine the lateral motion of the siphon, the magnets are placed vertically and are two inches apart, one end of the siphon is twice bent at right angles, and dips into an ink well filled with filtered aniline ink. The other end has a minute thread or short piece of soft iron cemented longitudinally to it, and sways in close proximity to a narrow fillet of paper five-eighths of an inch wide, which is drawn along by a small motor. The small motors by which the paper is drawn along receive their current generally from lead-lined trays, 18 by 20 inches, at the bottom of which is placed a copper sheet, the zinc is wrapped in stout manilla paper which serves the purpose of a porous cup for the sulphate of copper. The cable current passes through the small rectangular coil, which is about two inches long, as both positive and negative currents are sent into the condensers, and thereby disturb the static electricity of the cable. The coil is deflected to the right and left respectively, tending to place itself at right angles to the lines of magnetic force between the fixed bar magnets and which lines of force are concentrated by the small bar above mentioned of the best soft iron within the coil. The siphon has, therefore, a corresponding motion to the coil. As the mechanical force of the suspended coil is very small in deflecting, it is necessary that the siphon be not in continuous contact with the fillet of paper 220
otherwise its motion would cease. The difficulty of obtaining a record is overcome in an ingenious manner. The siphon is made to vibrate by means of a local battery on the principle of the push button electric bell by the breaking of the circuit—the vibration is communicated to the siphon by the interposition of another electro-magnet in the local circuit and placed underneath the fillet of paper, the small thread of iron on the tip of the siphon acts as the armature to the latter electro-magnet. The number of vibrations made in a second depends on the siphon, different siphons having different periods or inherent notes, but 55 is about the number of vibrations a second, every pulsation of the siphon deposits a drop of ink on the paper, and, as the paper is moving at the rate of over half an inch a second, an apparently continuous line is drawn.

From the description of the working of the siphon—of its lateral movements—it will be evident that the cablegram, as shown on the fillet of paper, will look like the contour line across the Rocky Mountains. The undulations made by the siphon correspond to the clicking we hear in the ordinary telegraph instruments. A cable office is very quiet compared to the bewildering clatter in a large telegraph office.

It was found that on the Atlantic (and shorter cables) a greater speed of signals was possible than could be sent through by hand with the double key. This called forth the invention of the so-called automatic transmitter. 221

For this purpose the messages are in the first place punched into a strip of oiled and prepared paper, the characters on the strip are represented by holes at varying distances on each side of a central line. This strip of continuous paper is then fed into the transmitter, in which metallic points slide along the under side of the strip. Wherever a hole is encountered electric contact is made and a signal sent. The speed of running the strip through the transmitter can be regulated as desired.

The “auto” can easily keep two men busy punching.

Within recent years an improvement has been effected for transmitting signals or messages automatically from one cable to another. Formerly it was necessary after receiving the signals from one cable to transmit them by hand to the connecting cable at the station. Now, however, this can be done automatically by means of Taylor, Brown and Dearlove’s Translator. The siphon in it instead of carrying ink contains a metallic thread which rests, instead of on the fillet of paper, on a rapidly, revolving, perfectly, smooth, small wheel, in which the surface of the circumference is divided into three parts, the central one known as “no man’s land” being a non-conductor such as glass, while the outer ones are of silver. As the siphon sways to one side or the other it makes 222
metallic contact, which is communicated by means of “brushes” which press against each side of the wheel to the outgoing cable.

This translator simplifies the work and reduces the office staff which would be otherwise necessary.

At the present time nearly all cables use the duplex system, that is, messages can be sent and received at the same time on one wire.

The speed of a cable is given in words per minute, the conventional number of five letters per word being understood, though in actual practice, owing to the extensive use of special codes, the number of letters per word is really between eight and nine, and this forms a considerable factor in the earning capacity of the cable, but the speed depends upon the length of the cable and the experience of the operator. Tests made over the Vancouver and Fanning Island section of the Pacific cable give 85 letters per minute with hand working and 100 letters a minute with automatic curb working, and approximately 168 letters a minute (84 letters each way) with duplex and curbed automatic working. This section of the cable is 3,455 nautical miles in length, the longest cable that has ever been laid, and about twice the length of the Atlantic cables. On shorter cables a greater speed can be attained.

223

CYRUS W. FIELD.

Cyrus W. Field.

Born in 1819, at Stockbridge, Mass., at the age of fifteen, he left home and became a clerk in a leading house in New York. At twenty-one he married and settled down in life as a wholesale paper merchant. Having been very successful he wished to retire, but yielded to the wishes of his junior partner and allowed his name to remain as the head of the firm. He withdrew, however, so far as to make a six months' tour to South America, returning in 1853.

He was led to turn his attention to ocean telegraphy through an interview with Mr. Gisborne, who was then engaged in constructing a telegraph line across the Island of Newfoundland, and laying a submarine cable from there to Nova Scotia, in connection with a projected line of steamships to Ireland. It struck him that if a cable of such length could be laid there was nothing to hinder a still longer being carried from one side of the Atlantic to the other. Turning over this thought in his mind he consulted with Professor Morse and Lieutenant Maury, and receiving encouragement from them he devoted his energies in the enterprise in conjunction with his brother Dudley.

Other friends joined him, and the first Atlantic Telegraph Company was organized with a favorable charter, 224
granting them the sole right for fifty years of landing a telegraph cable on Newfoundland and with a subsidy as soon as the line was completed.

The first thing was to connect the Continent with Newfoundland. This part of the scheme was successfully accomplished in 1856.

The next step was the formation of the Atlantic Telegraph Company and the sounding the way for the cable which was undertaken by both the British and American Governments separately. The British Government gave every encouragement to the projectors by promising £14,000 a year for the transmission of its messages and the use of the ships of its navy to lay the cable.

£350,000 was asked for and in a short time subscribed, Mr. Field taking 80 shares of £1,000 each.

In 1857 the first attempt to lay the cable proved a failure, but in the following year (1858) a second attempt was made, but a terrific storm met the vessels in the middle of the Atlantic, the cable broke again and the expedition returned to England once more. A third effort met with better success, and on the 5th of August, 1858, the two ends were safely landed, one in Valentia Bay, Ireland, the other in Trinity Bay, Newfoundland.

The first message sent from the Old World to the New was worthy the occasion.

"Glory to God in the highest, on earth peace and good-will to men." 225

A few weeks later the cable ceased to act, but a new cable was prepared and the "Great Eastern" was sent out with it, only, however, to lose it also when 1,200 miles from Ireland.

It seemed a hopeless dream to bind the two worlds by electric wire, but Mr. Field did not despair. A better cable was once more made; another company was formed with a capital of £600,000.

In 1866 the "Great Eastern" again sailed, and this time carried the thin thread triumphantly from shore to shore, not only so, but fished up the broken cable from the abysses of the ocean, united it and joined England and America by two telegraphic wires.

The moving spirit throughout was Mr. Field, who spent some thirteen years of his life and made forty trips across the Atlantic, imperilling his health and means in pursuit of this great enterprise before his efforts were crowned with success.

He died on the 12th day of July, 1892.

226

MICHAEL FARADAY.

Michael Farady.

The pupil of Sir Humphrey Davy, and himself the greatest philosophical chemist of his time, was born on the 22nd of September, 1791. The son of a smith, who was unable to give him any better education than that afforded by a common day-school in the neighborhood, reading, writing and arithmetic embraced all his training for life, so far as schools were concerned; but he had that within him which from these poor beginnings made a magnificent end. A fondness for reading filled his mind with miscellaneous knowledge and paved the way for all that followed.

At thirteen he was apprenticed to a bookseller and binder, but his heart was even thus early in science rather than trade, and he paid more attention to rude experiments than to his immediate calling. A gentleman having taken him to hear some of Sir Humphrey Davy's last lectures at the Royal Institution, Faraday wrote out the notes he had taken in a quarto volume, and sent them to Sir Humphrey Davy, with a letter asking that, if he could, would he give him a chance of escaping from trade to philosophy. The result was his employment as an assistant in the laboratory of the Royal Institution in 1813, at the age of 22, after he had been a bookseller for nine years. 227

From this time Faraday's progress was rapid. In 1820 his name was first made prominent for chemical discoveries, and from that date every year recorded some new research and new triumph, till in 1832 his eminence was so thoroughly felt that the University of Oxford made him a D. C. L., and in 1835 Lord Melbourne's Government gave him a pension of £300 a year. Honours meanwhile were showered upon him; he became one of eight foreign associates of the Imperial Academy of Science at Paris, a commander of the Legion of Honour, a knight of the Prussian Order of Merit and member of numerous scientific bodies in Europe and America.

The secret of his success, apart from his genius, lay in his wonderful industry and calm and careful attention to every detail of what he essayed.

In electricity and magnetism his researches made him one of the foremost; his language in lecturing was always simple; his experiments convincing, and his enthusiasms so catching, that every one felt engrossed by subjects which so absorbed the lecturer.

He was a true philosopher, taking nothing for granted, and thinking nothing too insignificant to follow out to the utmost. Many books have been written on his discoveries, and several on his life and character, but it is felt that no one who did not know him could realize the man as he was.

With a European fame his was modest as a child. The greatest authority in his day on natural science, he was a humble Christian. 228

Faraday never married. When he died in 1867 his pension was continued to his maiden sister, who survived him.

In Faraday, as in others, genius seemed largely to be what Carlyle calls it, only a faculty of infinite labor.

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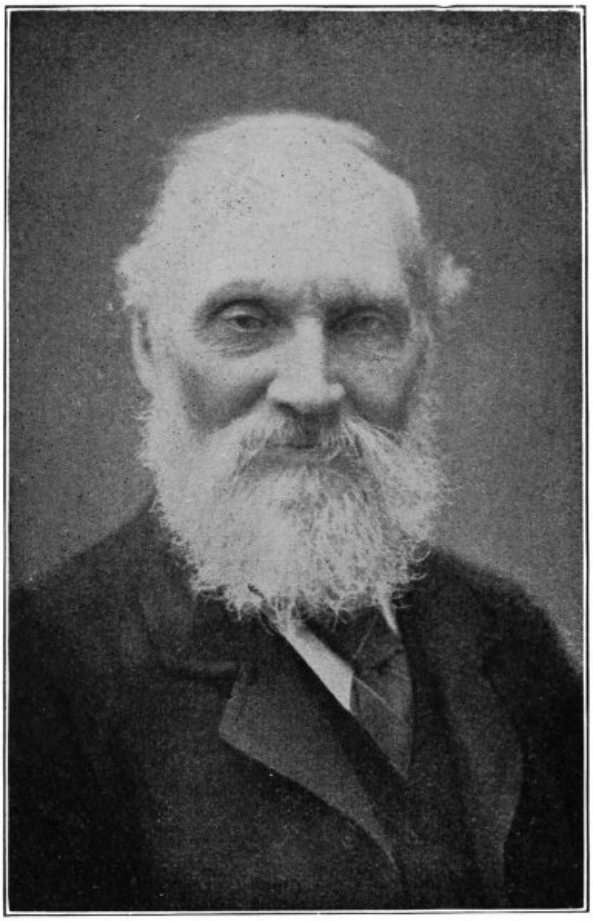


LORD KELVIN.

Lord Kelvin.

Born at Belfast, Ireland, 26th June, 1824, his father being then teacher of mathematics in the Royal Academical Institution. In 1832 James Thomson accepted the chair of mathematics at Glasgow and migrated there with his two sons, James and William, who in 1834 matriculated in that University, William being little more than ten years of age, and having acquired all his education through his father's instruction.

In 1841 William Thomson entered Cambridge; in 1845 took his degrees, second wrangler, to which honour he added that of the first Smith's prize.

At that time there was few facilities for the study of experimental science in Great Britain. At the Royal Institution Faraday held a unique position, and was feeling his way almost alone.

In Cambridge science had progressed little since the days of Newton. Thomson, therefore had recourse to Paris and for a year worked in the laboratory of Regnault, who was engaged in his classical researches on the thermal properties of steam; but his stay in Paris was comparatively short, for in 1846, when only twenty-two years of age, he accepted the chair of Natural Philosophy in the University of Glasgow, which he filled for fifty-three years, attaining universal recognition as one of the greatest physicists of his time. 230

The Glasgow chair was a source of inspiration to scientific men for half a century, and many of the most advanced researches grew out of the suggestions which Thomson scattered as sparks from the anvil.

Although his contributions to thermo-dynamics may properly be regarded as his most scientific work, it is in the field of electricity, especially in its application to submarine telegraphy, that Lord Kelvin is best known.

From 1854 he is most prominent among telegraphists. The stranded form of the conductor was due to his suggestion, but it was in the letters which he addressed in November and December of that year to Prof. Stokes, and which were published in the proceedings of the Royal Society for 1855 that he discussed the mathematical theory of signalling through submarine cables, and enunciated the conclusion that in long cables retardation due to capacity must render the speed of signalling inversely proportional to the square of the cable's length.

Some held that if this were true ocean telegraphy would be impossible, and sought in consequence to disprove Thomson's conclusions. Thomson on the other hand set to work to overcome the difficulty by improvement in the manufacture of the cables, and first of all the production of copper of high conductivity, and 231 the construction of apparatus which would readily respond to the slightest variation of the current in the cable.

The mirror galvanometer and the siphon recorder, which was patented in 1867, were the outcome of these researches, but the scientific value of the mirror galvanometer is independent of its use in telegraphy, and the siphon recorder is the direct precursor of one form of galvanometer (d'arsnovals), now commonly used in electric laboratories.

Thomson's work in connection with telegraphy led to the production in rapid succession of instruments adapted to the requirements of the time, for measurements of every electrical quantity, and when electric lighting came to the front, a new set of instruments was produced to meet the needs of the electrical engineer.

His industry is universal, and he seems to take rest by turning from one difficulty to another, difficulties that would appal most men, and be taken as an enjoyment by no one else.

This life of unwearied industry and of universal honour has left Lord Kelvin with a lovable nature, and charms all with whom he comes in contact.

In 1866 he received the honour of knighthood in acknowledgment of his services to transatlantic telegraphy, and in 1892 he was raised to the peerage, with the title of Baron Kelvin of Largs.

232

John Watkins Brett.

Telegraph engineer, was the son of a cabinet-maker, William Brett, of Bristol, England, and was born in that city in 1805.

Brett has been styled, and with apparent justice, the founder of submarine telegraphy.

The idea of sending electricity through submerged cables originated with him and his brother; after some years in perfecting his plans, he sought and obtained permission from Louis Phillipe in 1847 to establish telegraphic communication with France and England, but the project did not receive public attention, being regarded as too hazardous for general support.

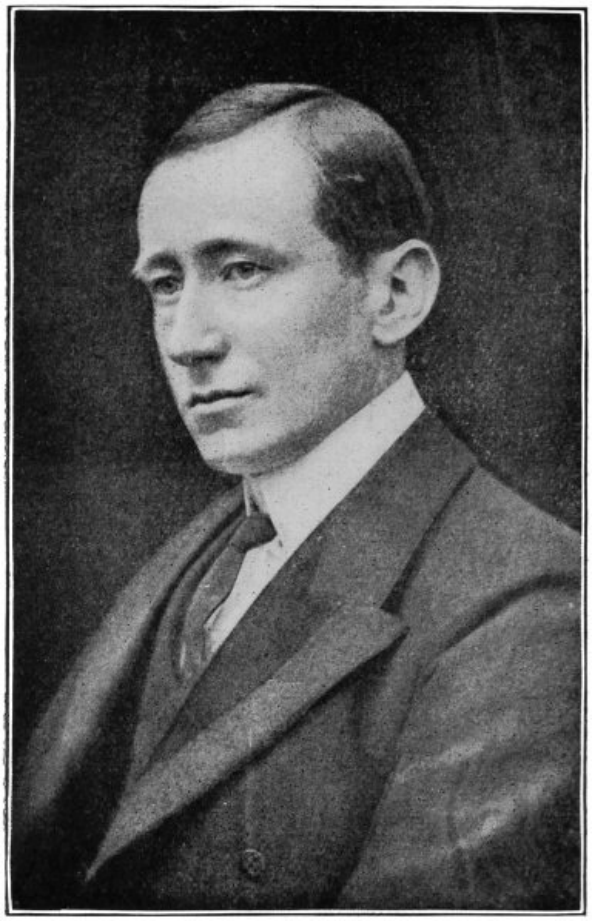
The attempt was, however, made in 1850, and met with success, and the construction of numerous other submarine lines followed.

Brett always expressed confidence in the ultimate union of England and America by means of electricity, but did not live to see its final success.

He died on 3rd December, 1863, at the age of 58.

Brett published a book of 104 pages on the origin and progress of oceanic telegraphy. He also contributed several papers on the same subject to the Institute of Civil Engineers, of which he was a member.

A list of these contributions will be found in the index of the Proceedings of the Society.



GUIGLIELMO MARCONI.

Signor Guiglielmo Marconi.

Born at Marzabotta, near Bologna, Italy, in April, 1875. His father was a native of Italy and a man of substance, his mother was a Miss Jamieson, born in Ireland, but of Scottish lineage.

Young Marconi early turned his attention to the wonders of electricity and began his experiments in wireless telegraphy in 1891. While yet a mere lad he came to England in 1896, and in co-operation with Sir William Preece, then the head of the telegraph department in England, began further experiments.

On March 27, 1899, he succeeded in sending messages across the British channel from Boulogne to the south foreland.

The next and greatest achievement of all, on December 12, 1901, he received a signal at St. John's, Nfld., from Poldhu, Cornwall, nearly 2,000 miles distant.

On February 26, 1902, he received messages aboardship on the Atlantic ocean from Poldhu, 2,099 miles away.

He is now engaged in further experiments and hopes to establish permanent communication between England and America within a very short time, and later extend the system over the entire globe. 234

At the present time all the leading steamship lines crossing the Atlantic, and many ships of the British navy, are equipped with wireless telegraph apparatus, by means of which vessels at sea are in constant touch with Europe and America; thus each ship has become a floating telegraph office.

The inventor is somewhat above medium height and of a highly strung temperament. He is quiet and deliberate in his movements; he talks little; is straightforward, unassuming, and has accepted his success with calmness, almost with unconcern.

He is undoubtedly the most prominent man of the day and the wonder of the age.

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Genesis of Wireless Telegraphy.

Professor McBride, M.A., D.Sc., of McGill University, in his inaugural address as President of the Natural History Society of Montreal in October, 1901, referred to wireless telegraphy as follows:—

"Take a discovery that is exciting the greatest interest at the present time, and promises results of the most far-reaching importance, namely, wireless telegraphy. Let us trace the apostolical succession, to borrow a term from theology, of the idea which underlies the discovery.

"Thirty or forty years ago the great Cambridge physicist, Clerk Maxwell, one of the greatest and most penetrative of the geniuses who have filled the chairs of that ancient university, was engaged in determining the value of the electric unit. As many of my hearers are aware, there are two ways of doing this: we can estimate either the push that an electric charge exerts on another similar charge, or else the pull that an electric current effects on a magnetic needle. In this way two different values for the unit are arrived at, and the relation between them, or to put it more simply, the number obtained by dividing the one by the other, gives the velocity of light in centimeters per second. This remarkable result suggested to Clerk Maxwell that, that mysterious thing called electricity had something to do with the ether which fills all space and transmits the vibrations which we call light, and he thereupon constructed this famous electro-magnetic theory of light which 236
conceives light to consist of vibrations not on a comparatively gross material like ordinary matter, but of electricity itself. This theory received at first little support from the German physicists, who are inclined to scoff at every idea that is not of German origin.

"Amongst a crowd of scoffers, however, one open-minded enquirer was found who said to himself 'If Clerk Maxwell is right, I ought to find that if I start artificial electric vibrations they will propagate themselves like light waves.' This man's name was Hertz, and he promptly set about producing electric waves purely with a view of testing Clerk Maxwell's theory.

"He had many difficulties to overcome before he succeeded in producing them in sufficiently rapid succession, but this was at last accomplished and Maxwell's theory triumphantly vindicated.

"The electric vibrations comported themselves like light. It is true that a stone wall was as transparent for them as a sheet of glass is for ordinary light, but they were reflected by a metal plate and could be brought to a focus, etc., etc. Now this invisible light, as we may call it, is what Marconi and others have employed in their so-called wireless telegraphy, but, without Maxwell or Hertz, it would have remained undiscovered to this day."

237

Historical.

Wireless telegraphy, or the transmission of signals through space by means of electric waves, is of a comparatively recent origin, although the idea of the existence of electric waves dates back some forty years ago.

In 1868 Clerk Maxwell, then Professor of Physics in Cambridge University, first published a theory showing that an intimate relation between electricity and light existed. This theory, which has received most conclusive substantiation since then by eminent physicists, is known as the electro-magnetic theory. It tells us that electric waves and light waves are similar; that they represent a transfer of energy by means of the all-pervading universal ether; that they differ radically in their effects on the physical senses in wave length and period of vibration, and that both possess the same velocity, 186,000 miles per second.

Many of the exponents of the electro-magnetic theory discussed the properties of electric waves long before they were experimentally demonstrated.

Our experimental knowledge of the existence of electric waves dates from about 1880.

Hertz, a German physicist, while working under the illustrious Helmholtz, discovered that small sparks could 238
be made to pass between the two conductors when held near a circuit in which electric oscillations were set up. He soon discovered that this was due to the action of electric waves, and, realizing how fundamental in importance this was to the thorough knowledge of the electro-magnetic theory, he commenced a series of experimental researches which were of such a brilliant and productive nature as to mark them as amongst the most important investigations in the whole domain of science.

A number of experimenters then followed, amongst them Signor Marconi, who has since become closely identified with its practical application.

In 1890 the coherer was discovered by Branly, and simultaneously by Oliver Lodge.

Lodge’s coherer was a very delicate instrument, and by its means the electric waves could be detected at a much greater distance than was possible with the conductors used by Hertz.

In 1895, in Cambridge, Mr. Rutherford (now Professor of Physics in McGill University), first showed that the waves could be observed by a magnetic detector.

He discovered that a weakly magnetized steel wire becomes instantaneously demagnetized under the influence of electrical oscillations, such as electric waves. With his detector he succeeded in establishing communication at half a mile.

In 1896 Marconi came from Italy to England, and, with the help of a Government grant, obtained through 239
the instigation of Sir William Preece, head of the British telegraph department, commenced a series of experiments in wireless telegraphy. Very rapid strides were made, and the distance to which signals could be sent was very much increased.

An important development soon followed in regard to the use of a vertical wire for transmitting the waves, instead of a horizontal one, which increased the distance still more.

Although Marconi has come to be chiefly associated with the development of wireless telegraphy, other systems have been established in various countries which involve slight modifications in the apparatus employed.

In Germany the Arco Slaby system is used with success, and in the United States the De Forest is being installed in many places.

Then there is the Armstrong, Orling and the Muirhead Lodge system. In England a wireless telegraph company was organized in 1902.

This company, having secured the Marconi patents, aimed to monopolize that business in Great Britain, but, as the Government there controls the telegraphs, this was not permitted.

The company complained as to the attitude of the British Government in retarding instead of encouraging
the enterprise. When the subject was brought up in the House of Commons on June 8, 1903, Mr. Chamberlain, 240
the then Postmaster-General, explained that he had no desire to hamper a new invention, but the Post-Office did not intend to throw away its right to the monopoly in public communication as it had done in the early days of the telephone.

He had not been dealing with Mr. Marconi, but with the company owning Marconi’s invention. The company asked for a permanent exclusive right to use wireless telegraphy in Great Britain.

This was refused, on the ground that it was not business. When the company was prepared to talk business, he was prepared to deal with it. When the company asked for a private wire to Poldhu he (Mr. Chamberlain) had granted the request immediately.

At the time President Roosevelt sent his wireless message to King Edward, and the latter replied by cable, the Post-Office had arranged to convey the message from the nearest office to Poldhu at any hour, although there was no difference whatever in telegraphing from London to Poldhu.

The company next asked the Post-Office to act as its agent in collecting messages in Great Britain for transatlantic marconigraphing, but he had submitted certain conditions with the view of preventing interference with the admiralty and for strategic reasons, adding that when the conditions were accepted and
the company satisfied the Post-Office experts of its ability to send messages across the Atlantic, the Post-Office 241
would appoint the company as its agent, as it already had done in the case of the cable companies.

That letter had been sent to the company on March 31, but no reply had been received.

Mr. Chamberlain contended that the Post-Office was in no way to be blamed for the delay, but it refused to

take the public money for messages until the company was willing to allow the Post-Office experts to go to Poldhu and satisfy themselves that the wireless system is workable. All this shows the company was not at that time in a position to transact public business, otherwise the Post-Office experts would have had access to its station at Poldhu. The subsequent failure showed the contention of the Post-Office was correct.

In the early part of 1903 a transatlantic communication was established for a short time and then collapsed; the system not having been fully perfected, the company should hesitate to again make the attempt until its plans are fully matured. As to the future of the system there is not the shadow of a doubt of its ultimate success. Meanwhile the Marconi Company has arranged with the British Government Telegraph System and also with the leading Telegraph companies in the United States and Canada to interchange traffic. Now nearly all passenger steamers crossing the Atlantic are equipped with the Marconi apparatus and are in a position while 242
at sea to send and receive messages to and from all parts of the world, and the company are doing a profitable business even now with its limited area of operations; what must it be when they shall have established communication over every sea and continent in the world. This will be accomplished in no very long lapse of time. The medium of communication provided by nature is ready and waiting like a willing steed to be harnessed for the uses of man.

The man singled out by providence to perform this superhuman task is Signor Guiglielmo Marconi.

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Wireless Telegraphy Apparatus.

Electric waves have long been harnessed by the use of wires for sending communications to a distance, but the ether exists outside of the wire as well as within; therefore, having the ether everywhere, it must be possible to produce waves in it which will pass anywhere on the earth's surface, and if these waves can be controlled, messages can be transmitted as easily and certainly as the ether within the guiding wire. The problem lay in producing suitable instruments to effect this result. Marconi adopted a device invented by an Italian named Calzecchi, and improved by a Frenchman, Mr. Branley, called the coherer, which he greatly improved. This instrument is merely a small tube of glass about as big around as a lead pencil and two inches in length; this is plugged at each end with silver. The plugs almost touching within the tube, the narrow space between is filled with finely powdered particles of nickel and silver, which possess the property of being alternately good and very bad conductors of an electric current or waves. The waves that come from the transmitter, perhaps a thousand or two thousand miles away, are received, but are so weak that they could not of themselves actuate any ordinary telegraph instrument; they do, however, possess strength enough to draw 244
the little fragments of silver and nickel in the coherer together in a continuous path; in other words, they make these metal filings cohere, and the moment they cohere they become a good conductor for electricity, and a current from a local battery operates the Morse instruments. Then a little tapper actuated by the same current strikes against the coherer, the particles of metal are separated or decohered, becoming instantly a poor conductor and thus stopping the current from the home battery; another wave comes through space into the coherer there drawing the particles again together and another dot or dash is printed. All these processes are continued rapidly until a complete message is received.

The sending instrument, or transmitter, is called the oscillator, a device somewhat similar to the familiar Morse telegraph key.

Marconi is now employed in perfecting an instrument by which the station only with which communication is desired can hear the signal, and receive the message. Thus the required secrecy will be preserved.

Marconi has patented over a hundred devices in connection with wireless telegraphy, but the nature and application of these has not been given to the public as yet.

245

Thomas A. Edison's Opinion of Wireless Telegraphy.

"There is absolutely no reason why Marconi may not develop a speed of 500 words a minute in the transmission of translantic messages," said Thomas A. Edison in course of an interview; "on the other hand," continued the inventor, "there are technical, scientific and mechanical obstacles which make it absolutely impossible to increase the speed of transmission of ocean cables.

"There is not the least doubt but that the Marconi system is successful. All this talk about lack of secrecy and interception of messages is nonsense. At least ten men know the contents of every cable message, and none of them receive very high salary. Personally I have no doubt whatever that the Marconi system is both a commercial and scientific success."

A Cable Manager's Views of Wireless Telegraphy.

At the annual meeting of the Commercial Cable Company on March 3, 1903, Mr. Ward, the Vice-President and General Manager, referring to wireless telegraphy, said: "At the last annual meeting some remarks were made by me in regard to wireless telegraphy and its effects upon submarine cables. We see no reason to change the opinion expressed at that time.

"Admitting the recent transmission of a message across the Atlantic without wires, radical improvements would have to be made in its development before wireless telegraphy could possibly hope to meet the demands of trade and commerce, and engage in successful competition with submarine cables.

"A good deal has been said and advertised about the wireless systems for the past three years. As yet there is nothing to show that messages can be transmitted without wires even across short distances with anything of the regularity, reliability, correctness and secrecy at any time and all time during the day or night demanded of the present telegraph systems, and necessary for the protection, interests and the development of the telegraph business.

"Furthermore, the transmission of messages between European and American coasts of the Atlantic is far 247
from constituting a transatlantic service as it exists to-day.

"The essential adjunct of an extensive inland system for the distribution and collection of messages on the North American Continent must not be lost sight of. A large part of the traffic passing by the Atlantic cables is destined for places remote from the seaboard. Messages to and from Chicago, St Louis, San Francisco, Montreal, Toronto, Winnipeg, Ottawa, Vancouver, etc., require and receive transmission which are measured by minutes. This important traffic would be practically extinguished if the sender could not rely on extremely rapid and accurate service.

"For the benefit of those who do not share my confidence I may say that the etheric waves will be as obedient to us as to anybody, if it should ever be found practicable to dispense with cables and wires.

"On the other hand, we have not been standing still in the matter of improvements.

"The Commercial Cable Company will maintain its pre-eminence, and has nothing to dread from the competition of wire or wireless telegraphy. At the same time we are satisfied it has its limits."

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An Interview with Signor Marconi.

The following interesting interview had with Signor Marconi by a representative of the *Montreal Star*, Sept. 10, 1903, is worth reproducing:—

"Seated in the rotunda of the Windsor Hotel to-day was a slightly built man with a keen expressive face and grey eyes that flashed incessantly. Probably not one of the guests that thronged the spacious lobby was aware that the little man sitting there so quietly was Signor Guiglielmo Marconi, the 'Wizard of the Wireless.'

"Signor Marconi reached the city early to-day from New York, where he has been for the past ten days. He is now on his way to Ottawa, where he is to have an interview with the Government in regard to his future plans. When approached by a *Star* reporter Signor Marconi chatted pleasantly of those plans and gave some interesting information of what had been done in the past and the prospects of the future.

"He speaks English fluently with a slight accent, and appears to be more eager to interview than be interviewed.

"'I am glad to be in Canada once more,' said the distinguished inventor. 'Canadians have always been 249
extremely interested in my work and I am beginning to feel quite at home when I get here.'

"'Do you know,' he said with a smile, 'that this is my fourth visit to Canada?'

"'What is the object of your present visit to Canada?'

"'I am here partly on a holiday trip and partly on business. I am leaving for Ottawa to-night, and while there I shall go into a matter I have long been considering, but which as yet I have not been able to accomplish, namely, the establishment of Canadian stations for the transmission of overland messages. These stations will reach from the Atlantic to the Pacific, and I hope that in a short time the wireless system of telegraphing communications will be thoroughly tested and perfected overland.

"'In case I obtain the permission I desire, I shall begin operations as soon as possible, and Canada will offer exceptional advantages for the testing of the system by reason of its tremendous distances.'

"'It is merely a matter of time, then, before these stations are built and experiments begun?'

"'Yes, merely a matter of time. There is one point in regard to wireless telegraphy that the general public do not seem to grasp quite, and that point is the length of time that must be taken up by the incessant private experiments in order that the system may be perfected. One cannot go at matters of this sort too quickly; each 250
step has to be thought out carefully, and often weeks are spent in perfecting some little detail; the progress of the work is, therefore, slow.'

"'Can you tell me anything of the negotiations you are conducting with the British Admiralty?'

"'All I can say is that a contract between myself and the British Admiralty has already been signed and sealed for the adoption of the Marconi system on all the ships of the navy. Sixty-three of the battleships are already fitted up with the apparatus and the whole of the navy is to be equipped.'

"'The terms of the contract will allow me to use the different stations of the navy for the erection of my receiving station and my masts; negotiations have been going on for some time, and now everything is arranged and the British navy will be equipped with the Marconi wireless apparatus.'

"The distinguished inventor then gave a very lucid description of the effectiveness of the wireless agency over marine areas; the unbroken surface of the ocean enabled great distances to be obtained.

"In regard to the overland service, if the land was low lying, the same conditions prevailed as at sea. Over tracts, where the usual diversified topographical features were found, the potency of the vibrations might be reduced. The vibrations seemed to reach farther in fogs than in a clear atmosphere, but, as a rule, atmospheric conditions did not appear to affect the transmission of messages. In regard to the location of stations Signor Marconi said that proximity to the sea was desirable for a station, as some geological formations were perverse 251
and others responsive.

"Before his return to England he would visit Cape Breton and his Receiving Station at Glace Bay.

"He expected to be in Canada for some weeks.

"Signor Marconi spoke of the voyage he made on the 'Campania' a few days ago. On that trip the 'Campania' was in constant touch with Poldhu until nearing the Coast of America, when she picked up the Narraganset Station.

"Throughout the voyage a daily bulletin was issued of the world's leading events, and the result of the yacht races were known on board a few minutes after the conclusion of the various races.

"A few minutes' chat with the 'wizard' is convincing proof that the distinguished inventor has implicit faith in the future of his system.

"The great tone of assurance in which he speaks is only equalled by the modest way in which he refers to the marvellous results that have been obtained already."

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The Trip of the SS. "Minneapolis."

"Signor Marconi has scored another triumph with his wireless telegraphy.

"The passengers on the Atlantic Transport Company's steamship 'Minneapolis,' which reached London on Tuesday, enjoyed the distinction of being the first transatlantic travellers to keep in touch with the rest of the world throughout their voyage from the New to the Old World.

"The 'Minneapolis' left New York on January 31, and for five days kept in touch with the Cape Cod Station; after that the wireless plant began to respond to the messages at Cornwall.

"The varying phases of the Venezuelan question, the domestic troubles of European potentates, the definition of true philanthropy by John E. Rockfeller, jun., King Edward's illness, the contest for the Fair millions, the hurricane that destroyed 1,000 inhabitants of the Society Islands, Sir Thomas' latest plans, Count Montesquious' New York debut, the latest gossip from Washington and St. James', these were among the tit-bits of news that varied the monotony to ocean travel.

"When the English pilot picked up the 'Minneapolis' his two-day old newspapers were accepted with disdain, and he was informed of the latest news that had been flashed to the liner."

Valuable Use of Marconi System made by Disabled Steamer.

Queenstown, Dec. 10, 1903.

The saloon passengers of the steamer “Kroonland” are enthusiastic over the utility of the Marconi wireless telegraph system, by means of which news of the accident to that ship was received here yesterday.

The breakdown of the steering apparatus occurred at noon Tuesday, when the “Kroonland” was 130 miles west of Fastnet. Captain Daxrud immediately sent to Crookhaven a wireless message to the agents of the line at Antwerp describing the damage and informing them that the steamer must abandon her voyage. A reply was received within an hour and a half. Whereupon Captain Daxrud complied with the instructions sent to him to return to Queenstown. Meanwhile, three-fourths of the saloon passengers and a number of those in the second cabin sent wireless messages to friends in various parts of Great Britain and Europe, and many of them received replies before Fastnet was sighted from the steamer.

Some of the wireless messages were cabled to the United States. In some cases the senders asked friends for money, and the replies authorizing the purser to advance funds to them, which was done before land was sighted. 254

The “Kroonland’s” twin screws steered the ship easily, the only difference being steam was reduced.

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Another Use of Wireless Telegraphy.

New York, Oct. 17, 1903.

Wireless telegraphy was successfully used in tracing lost baggage on the last outward trip of the Red Star Liner “Finland,” on Oct 10.

A passenger, who discovered some time after the steamer’s departure, that he left some baggage behind on the dock, communicated with the officials at the Pier through the Marconi Station at Babylon, L.I., and in twenty minutes received a reply that the baggage had been found and would be forwarded by the next steamer.

A Newspaper's Opinion of Wireless Telegraphy.

The Montreal *Witness*, in its issue Nov. 18, 1903, says: "Whatever may be the actual achievement of the Marconi wireless system, so far as telegraphing across the Atlantic is concerned, that system is now an assured success in communicating from ship to ship and from ships to lighthouses on the coasts. In this respect the system has passed the stage of scientific curiosity and has become a necessity. The Cunard and Allan Lines now, for instance, are able to communicate with stations established on the south and northwest coasts of Ireland, so that their owners as 'Syren and Shipping' puts it, are no longer in a quandary during bad or thick weather as to whether their boats are calling at Queenstown or at Moville, as the case may be. The Marconi system was first installed upon the 'Lucania,' and so satisfied were the Cunard people with results that it is now in regular operation on the 'Campania,' 'Etruria,' 'Umbria,' 'Ivernia,' 'Saxonia,' 'Aurania' and 'Carpothia.'

"Other shipping lines have similarly found the Marconi system indispensable, so that now it is quite an ordinary occurrence for a ship on the North Atlantic to be in electrical communication with passing steamers or 257
the shore during nearly the whole of the voyage.

"Such remarkable success as already attained is sufficient warrant for the general belief that this system of aerial telegraphy is but in its initial stages, and that its commercial success over wider spaces is only a question of time. Presently the system will be used on the Canadian Coast line, and then it is hoped that shipwreck caused by want of knowledge of locality will be largely a thing of the past."

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Wireless Telegraphy.

There has been no announcement in connection with science of recent date which has such an important meaning as the very modest statement recently made by Signor Marconi to the members of the Royal Institute of London. His discoveries in connection with wireless telegraphy have exceeded the expectations of many of the greatest scientists of the day who gave him all credit for the work which he had done, but could not bring themselves to believe that he could perfect his system within so brief a time.

One of the principal handicaps which Mr. Marconi has endeavored to overcome has been that of rapid and reliable transmission of messages. For a time he found it very difficult to mechanically record messages which were transmitted with high speed. It necessitated the use of a telephone receiver which meant that the operator might take down the message, but there was no mechanical record which would cause a mistake in receiving it to be instantly detected.

Mr. Marconi says: “I have perfected a receiver which will permit the transmission and receiving of messages at the rate of 100 words per minute on an ordinary Wheatstone recorder. This obviates the difficulty of relying 259
upon the operator to take the message by sound and permits of a double record of every message received.”

The ability to transmit and correctly receive wireless messages at this rate means that this latest invention of science is now in a position whereby it can compete on even terms with the great telegraph and cable services of the world. Mr. Marconi further stated that his new invention further combined accuracy with absolute reliability, and it means that the future development of wireless telegraphy has received an impetus which will carry it into a broader field than has heretofore been conservatively looked for, and that this unlimited possibility can and will be made an actuality in the immediate future.

No more important announcement could be made at this time when Mr. Marconi is about to install the new, high-powered apparatus which will allow uninterrupted communication between Glace Bay, Nova Scotia and Poldhu, England.

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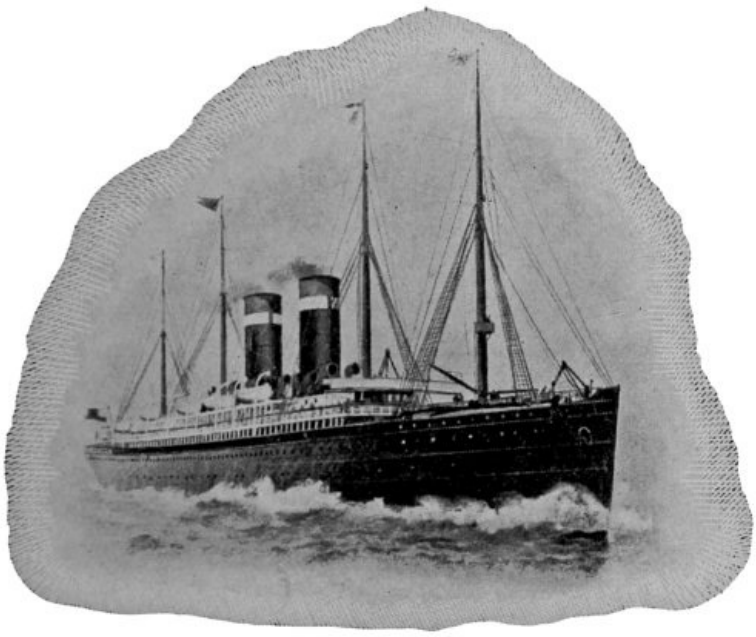

SS. PARISIAN.

Wireless Telegraphy on the SS. "Parisian."

Through the courtesy of Major Fishback, Canadian Manager for the Marconi Telegraph Company, the writer had permission to visit the Marconi Cabin on the SS. "Parisian" in order to learn the *modus operandi* of wireless telegraph at sea.

On boarding the ship the first object noticeable is a wire leading from the cabin to the peak of the main mast ending in a triangular form, connecting the apparatus with the ether and another wire to the ship's hold going to earth.

Mr. McGee, the young man in charge, politely pointed out and explained the uses of the various appliances comprising the Marconi outfit.

First was a large Rumford coil, a glass cylinder through which the electric spark was discharged and a key or transmitter constituting the sending apparatus.

Second, on the left was a large oblong box containing the coherer, the chief instrument in wireless telegraphy, and in the centre an automatic self-inking Morse register with an alarm bell attachment, these being the receiving instruments, and underneath the accumulators or storage batteries and six cells of a home battery to work the Morse instrument. When the key was depressed for an instant a bright electric spark 261
emitted from the contact points in the glass cylinder, giving a hard hissing sound; this imprinted a dot on the register, and a longer impression marked a line, the two forming the letter "a" of the Morse alphabet.

The characters or code used by the wireless system is what is known as the European or Continental Code, that is the spaced letters are eliminated and dots and lines substituted the same as the cable system.

All the vessels equipped with Marconi apparatus on the St. Lawrence route have a capacity of eighty miles' transmission, but a possible one hundred and twenty, this distance being deemed great enough for all practical purposes.

On the New York and Liverpool route the steamships have a much more extensive equipment, which enables them to keep in touch with the one side of the Atlantic or the other during the entire voyage.

The cost of the Marconi equipment of the former averages £200—or $1,000.

Five Marconi stations have been erected on the Lower St. Lawrence during the present summer and a fair, profitable traffic carried on so far. These stations will be closed during the winter, but a station is being erected at Cape Race, Nfld., which will be open throughout the year.

The rates charged is two dollars for ten words and twelve cents for each additional word plus cable or land 262
line rates.

Mr. McGee informed me the "Parisian" was enveloped in a dense fog when in the vicinity of Belle Isle on her inward trip. The captain was surprised at not hearing the fog syren and the Marconi station was communicated with to learn the reason. A response immediately came that the fog horn had been and was then blowing since the fog had fallen, thus showing the ship was out of range and in safety.

Many passengers took occasion to Marconigram friends of their whereabouts and their probable arrival at Montreal.

Passengers by the St. Lawrence route are now enabled to communicate with friends three days after departure and before arrival at Montreal by means of the Marconi telegraph system. All the Marconi stations are connected with the Canadian telegraphs.

Mr. McGee also stated this was his first trip as operator with the Marconi Company.

He had attended the company's Instructive School in London for a period of three months, at the end of which time he was considered duly qualified and was appointed to the "Parisian." This shows the wonderful and mysterious wireless telegraphy is acquired more rapidly than the Morse system, which takes from six months to one year to become fairly proficient.

The operations of the one is very similar to the other; each ship or station has an individual call or signal, 263
and should the current affect any instruments within range, no attention is given unless its own particular signal is heard.

Many objections have been raised against wireless telegraphy, for the reason that any one with a wireless outfit could intercept a message.

The very same thing can be done on land by any competent operator if he feels inclined to gratify his curiosity and incur the penalty for so doing.

Taken altogether, the wireless system on shipboard will prove an immense convenience to ocean travellers and shipping interests, and will ensure greater safety to both life and property.

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The Future of Wireless Telegraphy.

When, at the close of 1901, Marconi first announced to the world his marvellous achievement that he had received a signal from Poldhu at St. John's, Nfld., many were incredulous and doubted its possibility, even many scientific men were sceptical and suggested many reasons why there might be an error in the experiment made. Amongst these were Edison, Graham, Bell, Sir Wm. Preece and others but, when the facts became known, all had to admit the success of the experiment and the accuracy of Marconi's statement.

Mr. Edison became a warm believer in wireless telegraphy, and is now identified with its development. Soon after this triumph of the young Italian, the voice of the company promoter was heard in the land.

A wireless telegraph company was organized in England. This company had the audacity to claim an exclusive monopoly to operate the Marconi system, but this the British authorities refused to grant. Following this a company was formed for the same purpose in the United States and one in Canada, these being all more or less co-related.

The principal object being to establish wireless communication between Europe and America, a wireless 265
station was erected at Glace Bay, Cape Breton and one at Cape Cod, Mass., early in 1903. When these were completed communication was for a short time carried on.

A congratulatory message from President Roosevelt to King Edward was transmitted and a reply returned by the King, but the system broke down and it has so remained.

Mr. Marconi has been (ever since the mishap) devoting his inventive genius to the perfecting of his devices, and, it is believed, transatlantic communication will be once more re-established within a very short period. Meanwhile, these companies are not standing still, but are very busily engaged in equipping passenger steamships with Marconi wireless instruments, enabling vessels to communicate with each other or with the stations on land on either side of the Atlantic. The wireless telegraph business is constantly increasing and becoming very lucrative. Traffic is now interchanged between the British Government telegraph lines, the American and Canadian telegraph companies and the wireless companies, so that a message can now be sent from any telegraph station to a person aboard ship, or *vice versa*, by payment of the tolls required for each company's service. This seems to be naturally the proper sphere for wireless telegraphy.

In time every ship that floats, whether naval or mercantile, will eventually be installed with Marconi 266
apparatus. This should be made one of the conditions of insurance, if not compulsory. As far as being successful competitors with existing land or cable telegraph systems, it is more than doubtful, except in places where no other telegraph system can be maintained. Wireless telegraphy for a long time to come will merely be auxiliary or supplementary to the land and cable systems, and mutually beneficial to each instead of being antagonistic.

The wireless system of telegraphy will be of immense benefit to Canadian shipping interests owing to the long stretch of river navigation from Montreal to the Gulf.

Several minor stations have been erected recently on the Lower St. Lawrence and are now working satisfactorily.

The Canadian Government recognized the importance of wireless telegraphy in its inception and granted Marconi a substantial sum to enable him to build his wireless station at Glace Bay. The public hardly yet realize its great possibilities.

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Dominion Wireless Telegraph Company, Limited.

PRINCIPAL OFFICE: 160 ST. JAMES STREET, MONTREAL. CAPITAL STOCK, $1,200,000. PAR VALUE, $5.

This company proposes to build and operate stations at all important points in the Dominion of Canada and do a general telegraphic business between stations in the United States or elsewhere, owned or controlled by the American DeForest Wireless Telegraph Company or any of their subsidiary companies. It will also build and operate stations on both the Atlantic and Pacific Coasts for transmission of messages abroad, and will work in harmony with like stations built by foreign DeForest companies, will erect and operate stations along all of the important rivers, gulfs and lakes, as well as on the sea coast, and will equip vessels with Wireless Telegraph instruments, keeping them in touch with their home office until their destination has been reached.

This company proposes to erect and operate stations as follows:

ONTARIO.

Barrie
Belleville
Berlin
Brantford
Brockville
Chatham
Cobourg
Collingwood
Cornwall
Fort William
Galt
Guelph
Hamilton
Ingersoll
Kingston
Lindsay
London
Niagara Falls
Orillia
Ottawa
Owen Sound
Peterboro
Port Arthur
Port Hope
Rat Portage
Sault Ste. Marie
Smith’s Falls
St. Catharines
St. Thomas
Stratford
Toronto
Windsor
Woodstock

QUEBEC.

Farnham
Fraserville
Granby
Hull
Lachine
Levis
Montreal
Perce
Quebec
Richmond
Rimouski
Sherbrooke
Sorel
St. Hyacinthe
St. Jerome
St. Johns
St. Pi’re Montmagny
Three Rivers
Valleyfield

NEW BRUNSWICK.

Chatham
Fredericton
Moncton
St. John

NOVA SCOTIA.

Amherst
Halifax

Dartmouth
Lunenburg
New Glasgow
Truro
Sydney
Yarmouth

PRINCE EDWARD ISLAND.

Charlottetown
Summerside

MANITOBA.

Brandon
Portage La Prairie
West Selkirk
Winnipeg

NORTHWEST TERRITORIES.

Calgary
Regina
Edmonton
Moose Jaw
Medicine Hat

BRITISH COLUMBIA.

Grand Forks
Rossland
Kamloops
Vancouver
Nelson
Victoria
New Westminster
Fernie

YUKON

Dawson

Thus bringing not only every important point in the Dominion of Canada in touch by wireless telegraphy, but also Europe, through the station to be erected at Halifax, and Asia from stations on Vancouver Island.

All doubts of the practicability of wireless telegraphy may now be abandoned.

These new competitors must be somewhat disconcerting to managers and shareholders of the older systems of telegraphy, but they will no doubt prove equal to the problems confronting them and maintain their ascendency as heretofore.

ERRATA

Page 3 for employed *read* enjoyed

" 10 for lost *read* last

" 52 second line from foot *read*:
The first telegraph office in Washington was in a

" 54 for young man *read* young woman

Transcriber's Note

Punctuation, hyphenation, and spelling were made consistent when a predominant preference was found in this book; otherwise they were not changed.

Simple typographical errors were corrected; occasional unpaired quotation marks were retained. On several lines, the first or last letter was not printed. Those have been remedied here.

Original text uses both "Sandford Fleming" and "Sanford Fleming". The former is correct and is used throughout this eBook.

Original text uses both "Branley" and "Branly"; both retained here.

Original text contains what appear to be numerous spelling errors of words and names that only occur once. Since they could reflect accepted practices at the time the book was written, or the author's way of spelling them, most of them have been retained in this eBook.

Ambiguous hyphens at the ends of lines were retained.

Some of the topics in the Table of Contents do not have corresponding headings in the main text. The early headings in the main text are not italicized, while the later headings are italicized. These anamolies have been retained in this eBook.

Page 16: "if the clocks started" was printed as "blocks".

Page 37: "Heidleberg" was printed that way.

Page 50: "He had done all that he could and could do more" probably should be "do no more".

Page 64: "unity of management" was printed that way.

Page 118: "Mr. D. Ross Ross" was printed that way; in other sources, the last name is hyphenated as "Ross-Ross".

Page 129: "reconcilation" was printed that way.

Page 139: "deciper" was printed that way.

Page 156: The intent of "J. M.—— gentleman" is unclear, so what appears to be the printed spacing has been retained here.

Pages 208 and 210: Text refers to both "Robert W. Lowber" and "Robt. W. Lowder"; both spellings retained here.

Page 224: The word shown here as "projectors" was printed with a letter missing after "pro". The Transcriber completed the word as "projectors" because "projector" and "projectors" occur elsewhere in the original text.

Page 224: "the sounding the way" was printed that way.

Page 242: "big around" originally was printed as "big round" with extra space between the words. Transcriber added what appears to be the unprinted letter "a".

Page 252: "John E. Rockfeller" was printed that way.

The Errata at the end of the book have been applied to the text of this eBook.

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