Birth of the Telephone

The iron, steel and copper wire used by one great telephone company in the United States of America alone is of more than sufficient length to loop the earth to the moon. In fact, if it were posible to make the connections and to support the 772,989 miles of wire which the company reports as being used throughout its various circuits on January 1, 1899, three different wires could be stretched between our planet and her lunar satellite.

America is the birthplace of the telephone. Its discovery was made generally known in Philadelphia during June, 1876—100 years after the signing of the Declaration of Independence and at the Centennial exposition which commemorated that event. The story of the invention of the telephone is in many respects the most marvelous and interesting part of this one of the world's wonders.

Alexander Graham Bell, the genius who gave it scientific birth, was born in Edinburgh, Scotland, in 1847. His father, Alexander Melville Bell, was the inventor of what is known as "visible speech"—a system of teaching deaf mutes how to speak by indicating through visible characters the combination of the vocal chords necessary to produce articulate sounds. To the lifework of his father young Bell decided to devote himself. After a preparatory training he entered London university in 1867, but his health failed him and he left shortly afterward. In 1870, in company with his parents, he went to Canada.

Realizing that the United States offered a broader field for the work he had in view, Young Bell in 1872 came to the United States and settled in Boston, where he introduced his father's system of visible speech for the education of deaf mutes. He supported himself at first with private classes.

First Electrical Work.

Meanwhile, and even before he left England, young Bell had commenced experiments in that branch of physics and electricity which embraces sound. To the task of an inventor in this line he brought a life-long training of a teacher of vocal physiology—a profession involving a knowledge of how to produce and perceive articulate sounds. The groundwork of the system which he taught consisted in instructing deaf mutes to recognize by sight the motions of the organs which produce speech and from this to understand the meaning of spoken words. He became an expert in sound, which embraces among its other branches that of harmonics. Some time before he left England, Bell, following the natural bent of his genius, commenced experimenting in harmonics. The art of telegraphy then afforded an alluring field for research and, about the time he came to this country, he conceived the idea that a system of multiple telegraphy might be evolved from the principle that the various chords of a musical instrument are sensitive to sounds of different pitch. While in Canada he worked out a system of multiple telegraphy on this basis and on locating in Boston he

ORIGINAL INSTRUMENT THROUGH WHICH THE EMPEROR OF BRAZIL AND LORD KELVIN FIRST SPOKE AT THE PHILADELPHIA CENTENNIAL, 1876.

interested Gardiner Hubbard and Thomas Sanders, two gentlemen of wealth, in his experiments.

They had confidence in the young man and the three entered into a partnership, it being agreed that Messrs. Hubbard and Sanders should defray the expenses of the experiments necessary to complete Bell's system of telegraphy and for taking out the necessary patents on it.

Teaching was absolutely his only means of support. He spent all day in the class room and when night came devoted his time to study and experiment.

As the young scientist proceeded with his work he noted with ever increasing wonder the adaptability of the electric current to the transmission of sound. Some time in 1874 there occurred to him the idea that possibly the human voice itself might be transmitted and reproduced by means of the electric current.

There are many persons now who remember with what incredulity thew read the first press accounts of Bell's discovery of the telephone. Some people even refused to believe, after they had heard spoken words issue from the receiver of the telephone, preferring rather to think that their senses cheated them, or that they were the victims of some clever and ingenious hoax.

But the idea of the telephone had been born in the brain of young Bell, and come weal or woe, he was determined that it should be carried through to an exhaustive experimental conclusion. In the fall of 1874 he communicated his elementary idea for a speaking telephone to his friend, Dr. Clarence J. Blake, an eminent physician in Boston, and an authority on acoustics.

Bell received from him some encouragement for the further prosecution of this original idea. His partners, Messrs. Hubbard and Sanders, preferred, however, that the young man should devote himself to the completion of his system of multiple telegraphy, and rather discouraged his seemingly impracticable idea for the transmission of speech by the electric current.

"Get It," Prof. Henry's Advice.

The year of 1875 dawned dark and gloomy enough on the struggling young inventor to have discouraged almost any one other than Bell. After he had completed his system of multiple telegraphy and applied for his patent, he was thrown into consternation by finding that his title to an original inventor was contested by the distinguished scientist, Elisha Gray of Philadelphia. He went to Washington to look after his interests, and while there called on the veteran physicist and electrician, Prof. Joseph Henry, the secretary of the Smithsonian Institute.

In the course of his interview with Prof. Henry he explained his ideas for the construction of the telephone. He then wrote to his father and mother in Canada, telling them of his talk with Prof. Henry, which it will be seen had a vital bearing on the future of Bell's ideas for the telephone.

"I felt," said he, "so much encouraged from his (Prof. Henry's) interest, that I determined to ask his advice about the apparatus I have designed for the transmission of the human voice by telegraph. I explained the idea, and said:

"What would you advise me to do, publish it and let others work it out, or attempt to solve the problem myself?

"He said he thought it was the germ of a great invention, and advised me to work it out myself instead of publishing.

"I said I recognized that there were mechanical difficulties in the way that rendered the plan impracticable at the present time. I added that I felt that I had not the electrical knowledge necessary to overcome the difficulties. His laconic answer was:

"'Get it.'

"I cannot tell you how much those two words encouraged me. I live too much in an atmosphere of discouragement for scientific pursuits. Such a chimerical idea as telegraphing vocal sounds would, indeed, to most minds seem scarcely feasible enough to spend time in working over. I believe, however, that it is feasible, and I have got the cue to the solution of the problem."

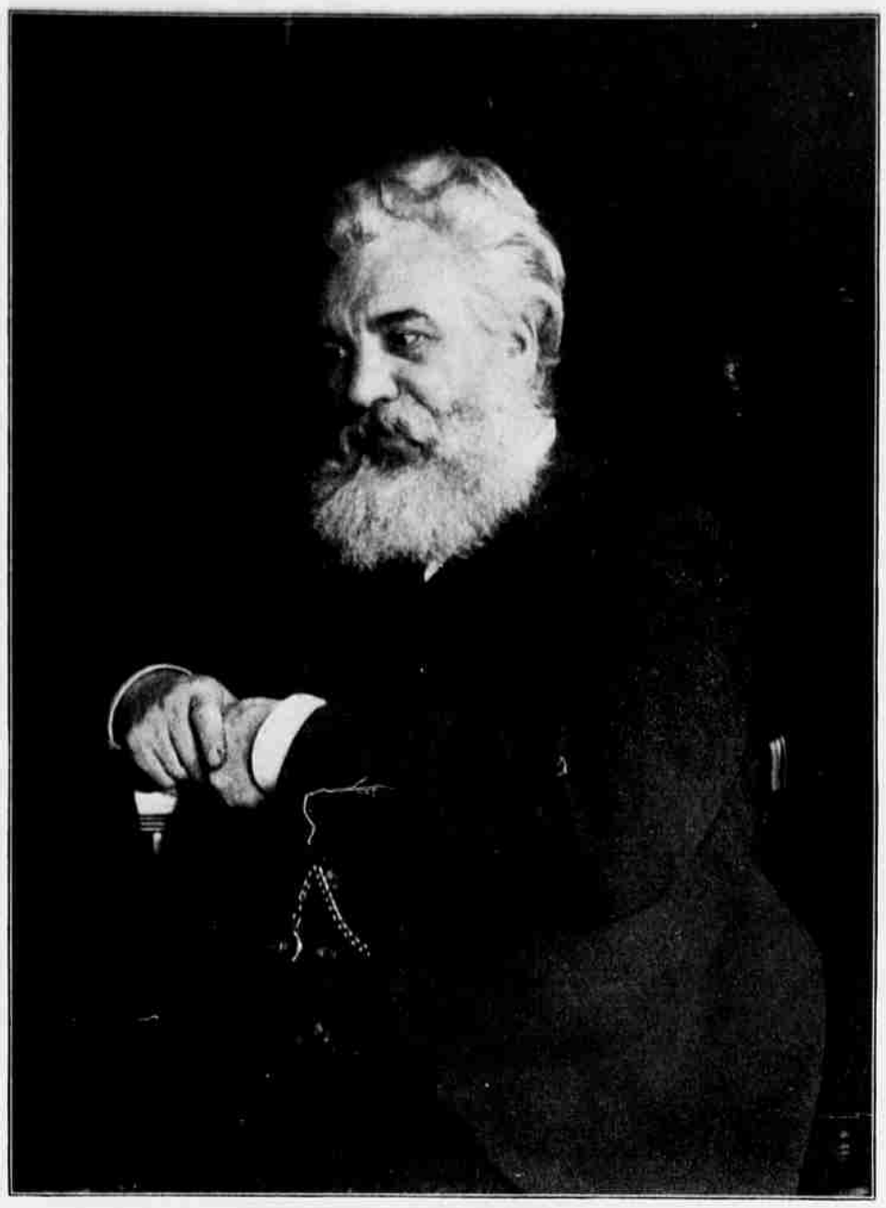
Spurred to Action.

The letter was written after his return to Boston and he started in on his experimental work with renewed energy. He tried to accomplish with limited resources and under conditions the most trying, an amount of work which would have staggered the strongest of men. He taxed his resources, financial and physical, to the limit, and then he resolved on a bold step. On March 18 he wrote to his father and mother:

"I have put off my pupils and all my classes until the first of April. Flesh and blood could not stand much longer the strain I have had upon me. Professional work is all in confusion and the only way is to cut the Gordian knot and throw up everything until the end is achieved."

With this he struggled on. The date of the real discovery of the telephone might be said to be June 2, 1875. On that day Bell was standing by one of his harmonic instruments when his assistant accidentally tapped the connecting instrument with his hand. The slight noise proceeding from the nearby receiver would have escaped the attention of a less-skilled observer than Bell. To him it sounded as distinct as the crack of a pistol. Again and again the excited young scientist made his assistant repeat the tapping with his finger on the connected harmonic instrument, while he stood with his ear to the receiving instrument, listening delightedly to the sounds that issued from it. He repeated the experiments until he had satisfied himself that the sound which he heard from the one instrument was due to electric impulses generated by the sonorous vibrations of the other. Within the hour he gave orders for the construction of exactly such a telephone as in the preceding fall he had described to Dr. Blake. The electric speaking telephone was then a practical certainty.

In July and August, when his invention was ready to patent, Bell's assistant, Mr. Watson, became sick, and Bell himself broke down. He went to Canada to visit his parents, and in the fall of 1875 drew up specifications for his patent. These he gave



PROF. ALEXANDER GRAHAM BELL.

to Mr. Hubbard to take to Washington and file in the Patent office. But owing to delays with the English patent, it was not until February 14, 1876, that the application was filed with the commissioner of patents. One hour after it was filed, Elisha Gray of Philadelphia also filed in the Patent office a caveat warning inventors against any attempt to patent an instrument such as the telephone, as he was doing some work looking to the transmission of speech by the electric current. Had this been filed before Bell's application, there is a possibility that he would not have been granted a patent.

Patent number 174,465, perhaps the most important ever allowed by the United States Patent office, was issued on March 7, 1876, to Graham Bell for his original invention of an electric speaking telephone.

Meanwhile, Bell was at work harder than ever conducting his classes in Boston, and in trying to make such improvements in the telephone as suggested themselves. He sent the rude instruments which constituted his first telephone on to the Centennial exposition, which was being held that year in Philadelphia. They were placed in an obscure corner of the Massachusetts exhibit, and attracted little or no attention.

Mr. Gardiner Hubbard was attending the exposition during the latter part of June. He learned that on Sunday, June 28, the board of judges of the exposition, including Prof. Henry and Sir William Thomson, since Lord Kelvin, would, in company with the emperor of Brazil, inspect some of the inventions in harmonics of the distinguished scientist, Elisha Gray. As a special favor Mr. Hubbard obtained from them a promise to allow young Bell to show his telephone contrivance to the party. He then telegraphed Bell to come to Philadelphia.

The young man was undecided as to whether he should go. Perhaps the coldness with which the invention had so far been received and the hardships which had attended its inception, had disheartened him and shaken his confidence in himself. Anyhow, class work was pressing, and he determined not to neglect his scholars again for the chance of advertising his already too expensive and unremunerative invention.

He had about made up his mind to let the night train for New York and Philadelphia leave without him when someone knocked at his door and announced that Miss Hubbard was awaiting him outside in her carriage and desired to see him immediately. He seized his hat and went down to meet her.

"Why, aren't you ready to go to Philadelphia?" was the question which greeted him.

The young man began to explain about his classes and other duties which would deter him from taking the trip.

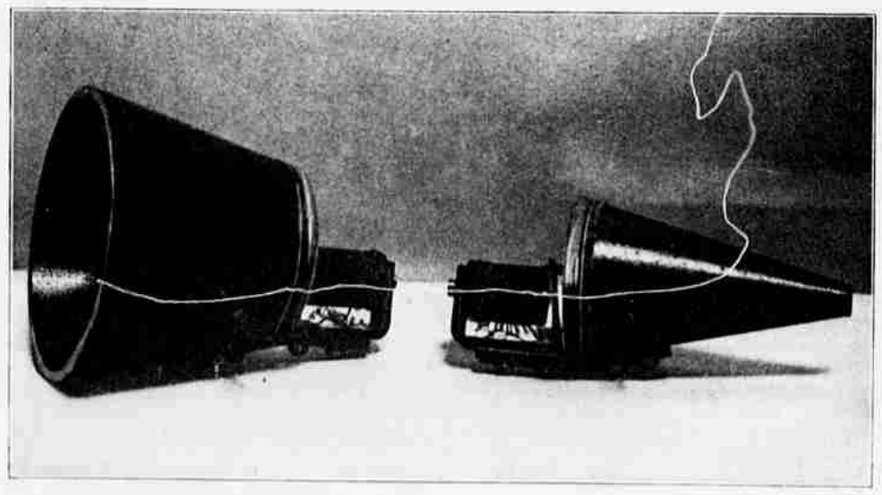
"Well, come take a drive with me," said his fiancee. This was an invitation which he could not refuse. He got in the carriage immediately and was driven to the station. There Miss Hubbard descended. Mr. Bell did likewise.

The New York train was already waiting on the track, with steam up, ready to pull out.

Bell's Triumph.

"Mr. Bell, you are going to Philadelphia to exhibit your invention," was the decided order that the young man received. And go to Philadelphia he did, although there was little time remaining to waste in making his decision and none in which to make other preparations for the trip than to buy a ticket. Miss Hubbard saw him safely on the train and returned triumphantly home. The next morning Bell arrived in Philadelphia and prepared to exhibit his telephone. The 25th of June proved a very warm day, and the distinguished party of judges and notables, including the two world-famed scientists and inventors, Sir William Thomson and Prof. Henry, and the emperor of Brazil had taken a long time in examining the really remarkable invention of Elisha Gray. They must have felt considerably bored when young Bell finally gained their attention and commenced to explain his apparatus.

But he had not proceeded far before Sir



FIRST TELEPHONE MODEL NOW IN PATENT OFFICE.

William Thomson and Prof. Henry became intensely interested. After explaining the theory of the telephone Bell placed Sir William Thomson at one of his instruments and, stationing another member of the party at the other, he told them to go ahead and talk to one another.

"To be, or not to be, that is the question," began Sir William. "Do you hear me?" The answer came back: "Yes, quite plainly." The members of the party were simply astounded. The emperor of Brazil was then stationed at one of the instruments and he carried on an animated conversation with Elisha Gray, who stated his wonder at the marvellous invention of Bell's.

Before Bell left Philadelphia that evening a note of congratulation was delivered to him from Sir William Thomson. For a week Sir William, Prof. Henry and others experimented with and examined the telephone instruments. When they had satisfied themselves as to the great scientific and practical value of the invention no words of praise from them for Bell and his telephone could prove too strong.

But the telephone which Bell exhibited at the Centennial exposition would scarcely be recognized as the parent of the wonderfully complete instruments used today by the great company which bears his name. It is true, however, that the basic principles of the instruments which now transmit messages amounting into the billions annually are identically the same as those first applied by Bell. The remainder has been a matter of evolution and of adaptation. Of late the principle movements have been effected along the line of long distance telephony until conversations can now be carried on between stations 2,000 miles apart.

Monograms on Gloves

The two latest fancies of our fair English cousins, writes a smart American woman in London, is the embroidering of monograms on gloves and writing in white ink. Gloves made to order with monograms are devoid of stitching on the back, and the monogram is embroidered in the center. Those which are purchased from stock and then embroidered have the monogram set between the thumb seam and first row of stitching, and others have it placed on the wrist below the stitching. It is almost too soon to tell whether this new fancy is to be popular. It is certainly very striking, and is open to the serious objection that it has a tendency to make the hand look larger than the ordinary glove. A glove of suede in the new bluet shade, with a white monogram in the middle of the back is really to the conservative taste more striking than pretty.

The use of a delicate white ink to correspond with a white crest or monogram is an exceedingly refined innovation. It may be used with very delicate tints, but is, of course, most telling on paper of some deep shade. Deep Russian blue or Sultan red shows to great advantage under white ink. The very prettiest, however, are the wedgewood effects in a variety of shades of blue, the blue-gray being the most effective. The monograms and crests used with wedgewood blue papers are of the tiniest, to carry out the wedgewood effect in its entirety. Of course nothing but pure white wax must be used with this combination.

His Own Coffin

A strange case of man's premonition of death has startled the inhabitants of the backwood village of Stark, Me., reports the Boston Globe.

Jefferson Blaisdell lived alone on his farm, a few miles from the village, and his preparations for death made him the laughing stock of the community until he was found dead in his bed.

One pleasant day in the early fall Blaisdell appeared in the village and drove directly to the undertaking establishment of Edward Hilton.

"Hullo, Ed," he shouted, entering the store, "I want a coffin."

"All right," replied the undertaker; "who's dead?"

"Nobody's dead," replied Blaisdell. "I want it for myself and I want just a plain box, with no polish and no new-fangled schemes."

After a little parley the contract for a coffin was drawn up and Blaisdell left the shop. He next went to the village sexton.

"How much do you charge for digging a grave?" he inquired of the aged official.

"Five dollars in winter, $3 in summer," replied the latter. "But who's dead?"

"Nobody's dead; I want it for myself." Blaisdell paid the sexton $5, took a receipted bill and went home, apparently in a happy frame of mind.

Late in November Mr. Hilton began to think that Blaisdell had given up his preparations for death and was about to consider his bill for storage for the coffin, when the man with the premonition came to the store on his wood sled. He inspected the burial box, pronounced it satisfactory and got Mr. Hilton to help him put it onto the sled, which also contained some provisions.

Then he seated himself on the top of the coffin and drove homeward in a cheerful mood.

Blaisdell placed his coffin in a convenient but not conspicuous place in his home. He lived alone and the presence of the casket did not seem to worry him.

Early in January Blaisdell failed to appear and his neighbors, who had joked in a lively manner over his burial preparations, began to have a creeping fear steal over them. The house was entered and Blaisdell was found dead in his bed—not a suicide, but the victim of that strange sense of certainty of death which sometimes compels men to give up the struggle for life.

An attack of heart failure of a few days' duration caused his demise. His pre-arranged funeral plan was perfect, except that he failed to provide for a minister and mourners.