

## TELEPHONE PIONEERS OF AMERICA.

FIRST REUNION HELD AT BOSTON, MAES., LAST WEEK, AND A PERMANENT ORGANIZATION EFFECTED.

The Association of Telephone Pioneers of America was formed in Boston on Thursday of last week, at the Hotel Somerset. The idea of this Association originated with Henry W. Pope, Charles R. Truex and Thomas B. Doolittle, all three of these gentlemen having been identified with the early days of the great Bell invention. There were about 250 in the convention hall at the Hotel Somerset, when the assembly was called to order by Mr. Doolittle. Gen. Thomas Sherwin, chairman of the Board of Directors of the New England Telephone & Telegraph Company, was elected temporary chairman, and H. W. Pope temporary secretary. General Sherwin delivered an address of welcome, following which the following permanent officers were elected:

President:—Theodore N. Vail, Boston.

Vice-Presidents:—Frank H. Bethell, New York; W. T. Gentry, Atlanta, Ga.; B. E. Sunny, Chicago; E. B. Field, Denver.

Secretary and Treasurer:—Henry W. Pope, New York.

Executive Committee:—Thomas D. Lockwood, Boston; John J. Carty, New York; Francis A. Houston, Boston. Two additional members of the executive committee are to be appointed. Mr. Gentry presided during the sessions.

The dues of the Association are \$5 annually, and the first gentleman to get his receipt was W. L. Candee, who is a telephone pioneer of the year 1877.

The constitution and by-laws of the Pioneers' Association were adopted, and also plans for annual meetings. All persons who served for five years consecutively in telephone work prior to 1891 are entitled to Pioneer membership in the Association, and Junior Pioneers are made up of those who will have served twenty-one years subsequent to 1891.

During the day addresses were delivered by Alexander Graham Bell, Frederick P. Fish and Thomas D. Lockwood. Professor Bell's address will be found elsewhere in this issue.

On Thursday evening the ladies and gentlemen of the Association were en-

tertained at a theater party as the guests of the New England Telephone Company. On Friday forenoon they visited the main exchange of that company, and on Friday afternoon a very delightful automobile ride was enjoyed to Lexington and Concord. On Friday evening the visitors were tendered a highly enjoyable banquet by the American Telephone & Telegraph Company. Music and the singing of original songs with a telephone turn, written and rendered by Angus S. Hibbard, were participated in, and a magic lantern threw upon a screen many historical pictures relating to the telephone, and also the countenances of many of the men eminent in telephone work. These were received with much applause. Particularly was this the case when photographs of Theodore N. Vail, Edward J. Hall and John J. Carty were presented. Every attendant at the banquet received, with the compliments of the Western Electric Company, a model of Bell's first telephone, a very highly prized souvenir.

A number of letters of regret were read, among them letters from Theodore N. Vail, B. E. Sunny, Frank B. Knight, C. E. Yost and George C. Maynard.

On Friday afternoon a photograph of all those who could be assembled was taken in front of the Hotel Somerset, and is reproduced on pages 970-971.

Among those present at the convention and banquet were the following: C. H. Wilson, F. A. Pickernell, H. L. Storke, M. Eglesten, Thomas D. Lockwood, J. J. Carty, C. E. Scribner, N. C. Kingsbury, Chas. W. Price, W. R. Abbott, J. N. Keller, A. S. Hibbard, F. P. Fish, Thomas Sherwin, W. R. Driver, C. F. Sise, Alexander G. Bell, H. B. Thayer, F. O. Vaille, Leland Hume, H. W. Pope, Thomas B. Doolittle, W. T. Gentry, A. L. Salt, H. F. Stevens, E. B. Baker, F. A. Houston, E. T. Holmes, C. J. Glidden, W. L. Candee, S. G. McMeen, R. T. McComas, H. G. McCulley, D. M. Adee, F. E. Kinsman, F. W. Harrington, George T. Manson, L. A. Madden, John J. Ghegan, C. A. Nicholson, C. W. McDaniels, Moses G. Parker, James Menzies, J. N. Culbertson, C. B. Burleigh, J. F. Canfield, Martin Joyce, A. H. Embler, C. B. Doolittle, F. P. Lewis, J. T. Moran, Thomas B. Bailey, V. M. Berthold, C. J. H. Woodbury, N. W. Lillie, F. J. Boynton, W. J. Denver, A. N. Bullens, T. J. Killian, W. J. Keenan, R. W.

Devonshire, J. D. Ellsworth, George E. Betts, C. T. Keller, H. A. McCoy.

There were a number of historical exhibits shown at the Hotel Somerset, among them being the following, the exhibits being in charge of N. W. Lillie, who entered the telephone service October 8, 1877, and George K. Thompson, who entered the telephone service 30 years ago:

The original six-line switchboard used at the office of E. T. Holmes, 342 Washington Street, Boston, for connecting banks by telephone.

Magneto bells, battery bells, switches and types of apparatus used in the first days of the telephone business.

The first lists of subscribers issued in Boston, New York, Chicago, Newark, N. J., and other places.

Photographs of the building first used for a telephone exchange at 342 Washington Street, Boston, Mass., and of the building at 518 Broadway, New York.

Original circulars distributed in Boston and vicinity describing the uses for which the telephone was adapted.

Photographs of early telephone exchange interiors and many papers of interest.

Earliest New Haven, Conn., telephone directory.

Chinese exchange pictures, San Francisco. Parts of Bell's original telephone of 1875. Parts of Bell's Centennial iron-box telephone.

Single-pole membrane telephone.

Bell's figure-seven transmitters.

Bell's figure-seven receiver.

Bell's telephone receiver—early form.

First sample of hard-drawn copper wire.

Bell's receiver for educational purposes.

Fac-simile of Blake's original transmitter.

Blake's transmitter, first commercial form.

Blake's transmitter, final commercial form.

Cross-section model of standard bipolar receiver.

Cross-section model of solid-back transmitter.

Early form of telephone insulator bracket.

Telephone Despatch Company. List of subscribers, Boston and vicinity and many other lists of subscribers of early days.

### Russian Telephone Service.

The telephone service in Russia is maintained partly by the Government and partly by private companies. The zemstvos are also exploiting the telephone service in sixty-nine counties. Last year the Government maintained ninety-nine urban telephone lines and four long-distance lines. Besides this a telephone service was carried on between thirty cities by means of telegraph lines. The receipts from the Government's telephone system amounted to \$1,370,855, and the expenditures to \$774,393, yielding a profit of \$596,462. A telephone service was also maintained in fifty-five cities by private companies, and the Government's revenue, derived by means of a tax of three per cent levied upon the gross income of these companies, yielded \$77,466.



LEFT HALF OF GROUP, TELEPHONE PIONEERS OF AMERICA.



RIGHT HALF OF GROUP, TELEPHONE PIONEERS OF AMERICA.

## THE INVENTION OF THE TELEPHONE.

ADDRESS OF ALEXANDER GRAHAM BELL  
BEFORE THE TELEPHONE PIONEERS,  
GIVING EARLIEST FACTS NEVER BEFORE  
PUBLISHED—DELIVERED AT BOSTON,  
NOVEMBER 2, 1911.

Mr. Chairman and Gentlemen: This is a great day for me—the first meeting of the Telephone Pioneers of America and of the world. It gives me great pleasure to meet with you all today; and yet, there is a feeling of sadness about it. I am the first telephone pioneer, and my memory goes back to the very beginning; and I miss the faces I remember so well, the faces of the old pioneers, whom I wish were here today. The Association is fortunate that one of these old pioneers is at the head of matters today—Mr. Theodore N. Vail, that great organizing mind that presides over the destinies of the telephone system of America.

I feel it is a little presumptuous upon my part to try to speak of the telephone to telephone men. You have all gone so far beyond me! Why, the little telephone system that I look back upon—what is it compared to the mighty system that goes through the whole extent of our country today? It is to you that this great development is due, and I feel that it behooves me to speak very modestly of the little beginning that led to this great end. I can not tell you anything about the telephone. I can not speak to you about undulating current, intermittent current and pulsating current. I belong to the past, you belong to the present; and it occurs to me that perhaps the most useful feature of my address today might be to call to your minds some of the notable events of the past that preceded the commercial organization and development of the telephone. This is a matter upon which I can give information; that is the point on which many of you may be weak. You know all about many of the later developments; you may not be so familiar with the earlier ones.

The period that marks the incipency of the telephone was the years 1874 to 1877. It was in 1877 that the telephone really began its commercial career. I shall leave the time after that period to my friend Mr. Lockwood and shall deal chiefly with the points that preceded 1877. Of course, in dealing with this period of the history of the telephone I shall have to be somewhat personal, for it all centered upon me in those days.

From 1873 until the beginning of 1876 I was a resident of Salem, Massachusetts, and came into Boston every day for my professional work. Then I would spend my summer vacations in Canada, at Brantford, at the home of my parents. So these three places—Salem, Boston and Brantford—are concerned in the early days of the telephone. Boston is *par excellence* the home of the telephone, for it was here that all the apparatus was made and where the important experiments went on. Brantford, in Canada, was my thinking place, where I would go and spend my summer holidays and look over the line of experiments that had been made in Boston and plan for the future. I generally went to Brantford about the middle of July, stayed there during the summer and was back in Boston the first of October.

And so it happened that in the summer of 1874, during my visit to my father's house in Brantford, Ontario, considering myself and discussing with my father the numerous experiments I had made in Boston relative to the reproduction of musical sounds by electricity for the purposes of multiple telegraphy, the thought of the

membrane telephone was elaborated. So that the conception of the telephone originated in Brantford, Ontario, in the summer of 1874. You are all familiar with it. It was practically the same instrument that was shown in the patent that is marked upon our little memento here. It was a theoretical conception of a magneto telephone, a very daring conception, if I may be allowed to say so—that the vibrations of the voice might create electrical impulses like the aerial impulses, and produce an audible result at the other end. To tell you the truth, as a practical man I did not quite believe it; as a theoretical man, I saw a speaking telephone, that theoretically we had the means of transmitting and reproducing speech in distant places. But it really seemed too good to be true that you could possibly create electrical impulses that would amount to any practical purpose by the action of the voice itself.

And so, on my return to Boston in October, 1874, and all through that winter and through the spring of 1875, instead of making the apparatus and trying it I was trying to devise methods of increasing the strength of these electrical undulations. I was working at what is now known as the variable resistance method. That is shown very well in a letter that I wrote to Mr. Hubbard on the fourth of May, 1875, when I was experimenting on the passage of a voltaic current through a vibrating wire, with the idea that the variation of tension in that wire, by producing variations in the resistance of the circuit, would produce the electrical undulations that I desired.

From the summer of 1874 up until June 2, 1875, the development of the telephone was delayed by this thought, that the magneto-electric impulses would not be sufficient by themselves and would require a battery current.

Then came the discovery, with which you are all probably familiar, that a magneto-electric current would produce by itself sonorous effects at a receiving station, and you may remember the plucking of reeds that went on that celebrated June 2, 1875. In a moment all the difficulties in the way of the practical solution of the telephone disappeared, and orders were given at once to construct the membrane telephone that was conceived in Brantford in 1874. When it was first tried it was somewhere about the end of June or July 1, 1875. We have present records of experiment on July 1, 1875, and I well remember these experiments. We had only one membrane telephone, and the receiver was one of the old tuned reed receivers. It was held up to the ear. You crammed the armature against the ear to dampen its vibrations. I was listening at that armature while Thomas A. Watson, my assistant, was down in the basement of Charles Williams, Jr.'s, building, 109 Court Street, shouting at the end of the telephone, and then we changed places. I may say that I heard nothing. Then Mr. Watson went downstairs to listen, and I went upstairs to speak, and while I was speaking Mr. Watson came rushing up the stairs in a state of great excitement, saying, "Why, Mr. Bell, I heard your voice very distinctly, and could almost understand what you said." Well, that was gratifying, but it would have been still more gratifying if I could hear that, too. You see, Mr. Williams' workshop was a very noisy place. Mr. Watson was accustomed to that noise and could hear a good deal better than I. I was more accustomed to throwing out my voice than Mr. Watson, so that he had the advantage of me in hearing and I had the advantage of him in speaking. The results would be very unsatisfactory at the present time: yet, encouraged by the results, poor as they were, I went ahead immediately to prepare specifications for a patent. In September, 1875, I was at work upon the specifications of the now celebrated patent. In October, 1875,

the patent was completed. But it was not filed in October, 1875. A long delay ensued, because I was so imbued with the idea of the value of this great invention that I was not satisfied to take out patents for America alone—I must take them out for every country on earth. But that, you know, required money, and I did not have the money. Mr. Saunders and Mr. Hubbard, who were associated with me and carried on my experiments, paid the cost of my experiments and of the American patent. They were too wise to touch foreign patents. So I had to go ahead and see what I could do to get this great patent taken up abroad, and that caused great delay. I went up to Canada to interview friends in Canada, and at last made an agreement with the Hon. George Brown, who was at one time Premier in Canada, that he and his brother, Gordon Brown, would take out patents in England and perhaps other countries, on one condition—that I should not file my application for an American patent until I had word from them that it would not interfere with the applications abroad. And so it was that the American patent dragged on for months, until at last Mr. Hubbard just said a quiet word to my solicitors in Boston: "It is no use waiting longer for Mr. Brown; just you put in the patent." And the patent was filed without my knowledge or consent. It is very fortunate that he did so. It saved a great deal of trouble and interference in the patent office, and so forth, and that is the patent on which the whole telephone system of the United States has been based.

I think it might be well to speak of a few of the more important points. The patent was filed February 14, 1876; it was allowed March 3, 1876. I was in Washington at the time when it was allowed. I knew it was allowed on March 3, 1876, because that happened to be my birthday, and it came to me as a sort of birthday present.

After the granting of the patent came a period of publication, and I want to speak now of a very curious thing. In the case of new inventions we are generally led to believe that the public is ready to swallow anything, but that grave scientific men are the most skeptical of all. I found just exactly the opposite to be true in the case of the telephone. The public generally and the business men of the country were very slow to perceive any value in the telephone. The scientific world, on the other hand, took it up at once. My first paper upon the subject was delivered here in Boston before the American Society of Arts and Sciences on May 10, 1876. Then I was invited to lecture before the Society of Arts at the Institute of Technology, on May 25, 1876. Then came a very notable event, which I shall speak of very slightly, although it really forms the basis for the knowledge by the world of the telephone. It was the Centennial Exhibition, in 1876. Mr. Hubbard and Mr. Saunders, who were financially interested in the telephone, wanted this instrument to be exhibited at the Centennial Exhibition. In those days—and even up to the present time I am afraid it is true—I was not very much alive to commercial matters, not being a business man myself. I had a school for vocal physiology in Boston. I was right in the midst of examinations. My pupils, those studying under me, were studying to become teachers of the deaf, teaching speech to the deaf, and I could not be bothered at that time by having to go to Philadelphia and attend the exhibition. However, we found, in connection with the exhibition, that all the apparatus involving a necessity for quiet was to be examined on Sunday, June 25; and so it was urged that Sunday would interfere less with my professional pursuits than another day. I agreed, therefore, to go down and spend Sunday, and no longer.

I could not possibly stay any longer than that while in the midst of my examinations. So I went down to Philadelphia, growling all the time at this interruption to my professional work, and I appeared in Philadelphia on Sunday, the 25th. I was an unknown man and looked around upon the celebrities who were judges there, and trotted around after the judges at the exhibition while they examined this exhibit and that exhibit. My exhibit came last. Before they got to that it was announced that the judges were too tired to make any further examination that day and that the exhibit would be examined another day. That meant that the telephone would not be seen, for I was not going to come back another day. I was going right back to Boston.

And that was the way the matter stood—when suddenly there was one man among the judges who happened to remember me by sight. That was no less a person than His Majesty, Dom Pedro, the Emperor of Brazil. I had shown him what we had been doing in teaching speech to the deaf in Boston, had taken him around to the school for the deaf and showed him the means of teaching speech, and when he saw me there he remembered me and came over and shook hands and said: "Mr. Bell, how are the deaf mutes of Boston?" I said they were very well and told him that the next exhibit on the programme was my exhibit. "Come along," he said, and he took my arm and walked off with me—and, of course, where an Emperor led the way the other judges followed. And the telephone exhibit was saved!

Well, I can not tell very much about that exhibit, although it was the pivotal point on which the whole telephone turned in those days. If I had not had that exhibition there, it is very doubtful what the condition of the telephone would be today. But the Emperor of Brazil was the first one to bring that situation about, at that time. I went off to my transmitting instrument in another part of the building, and a little iron box receiver—you probably all know what it was from diagram—was placed at the ear of the Emperor. I told him to hold it to his ear, and then I heard afterwards what happened. I was not present at that end of the line. I went to the other end and was reciting "To be or not to be, that is the question," and so on, keeping up a continuous talk. I heard afterwards from my friend, William Hubbard, that the Emperor held it up in a very indifferent way to his ear, and then suddenly started and said: "My God! it speaks!" And he put it down; and then Sir William Thomson took it up, and one after another in the crowd took it up and listened. I was in another part of the building shouting away to the membrane telephone that was the transmitter. Suddenly I heard a noise of people stamping along very heavily, approaching, and there was Dom Pedro, rushing along at a very un-Emperorlike gait, followed by Sir William Thomson and a number of others, to see what I was doing at the other end. They were very much interested. But I had to go back to Boston and couldn't wait any longer. I went that very night.

Now, it so happened there, that although the judges had heard speech emitted by the steel disk armature of this receiving instrument, they were not quite convinced that it was electrically produced. Someone had whispered a suspicion that it was simply the case of the thread telegraph, the lovers' telegraph, as it was known in those days, and that the sound had been mechanically transmitted along the line from one instrument to the other. Of course, I did not know about it at that time; but when the judges asked permission to remove the apparatus from that location I said: "Certainly, do anything you like with it." But I could not remain to look after it; they had to look after it themselves. My friend, Mr.

Hubbard, who had kindly come up from Boston to help me on this celebrated Sunday, the 25th of June, said he would do his best to help them out, although he was not an electrician. He knew nothing whatever about the apparatus, beyond being in my laboratory occasionally, knowing me well. But he undertook to remove this apparatus and set up the wire under the direction of the judges themselves. So they had an opportunity finally of satisfying themselves that speech had really been electrically reproduced. Sir William Thomson's announcement was made to the world in England, before the British Association, and the world believed, and from that time dates the popular interest in the telephone.

That was the 25th of June. Of course, the judges and others were anxious to know whether this thing would operate on a long line. Experiments had been made from one room to another in a building; but that was not quite as satisfactory as having one telephone in one place and another in another a hundred miles off. So I was asked whether I would venture to try the instrument between Boston and Philadelphia. Well, I, in my ignorance of the conditions, said: "Of course, yes." So when I went to Boston I began to consider: "Now, what are we going to do? These instruments are only prepared for short circuits." So we began to make experiments in Boston to fit the instrument for use on a longer line. I knew that we must have many turns of quite fine wire in the instrument; so I had such instruments constructed, and then the Atlantic & Pacific Telegraph Company in Boston kindly lent me the use of their wires for experiment. On July 7, July 9 and July 12, 1876, attempts were made to use the telephone upon various circuits from Boston to New York, from Boston to Rye Beach, and other places, but, unfortunately, with poor success. We did not get any vocal sounds on these circuits, although with two instruments, one in one room and another in another room of the Equitable Building and a circuit to Rye Beach, we did get some audible effect. But still the results were unsatisfactory where the undulating current was employed. We tried the intermittent current. I had a parlor organ, and made contact with New York and asked the operator to listen and see if he could hear anything. I played tunes on the parlor organ, and he was asked if he could hear anything, and he said, "Yes." "What is it?" "Yankee Doodle." He could hear tunes, but that was really the only result of importance obtained in those trials of July 7, 9 and 12, 1876.

Sir William Thomson was present at later trials, and I presented to him a telephone that we used on that occasion, and it was taken to England and bothered me exceedingly in telephone litigation at a subsequent time. The owners of my English patent had to disclaim everything that was shown in those instruments. But it fortunately happened that the receiving instrument was one of those old Centennial box receivers with a metallic lid, which in this case was one of ferro-type iron, and when I gave this instrument to Sir William Thomson I was afraid he would lose the armature; and so I had Mr. Watson catch the armature down at one point to the magnet, to hold it in place. Sir William just threw the whole thing in his trunk without taking it off, and when it arrived in England the armature, instead of being flat, was cocked up like that. Well, that saved the English patent. Everybody got the idea that the vibration was from this cocked-up thing. The English patent showed the cocking up of the armature. When it finally came before the Supreme Court of England, when they were deciding the case, the thing looked rather slim, according to the English law. The shreds of the patent were there—nothing was left but the metallic diaphragm. But they made a very singular construction. They said, according to a very benevolent construction of the law,

as they construed it that did not interfere with the patent for metallic armature, and the patent was saved.

That brings me up to July 12, 1876. Then came my summer vacation of 1876. I went up to Brantford, Ontario. I prepared a whole lot of apparatus, telephones with coils of different kinds, high-resistance coils and low-resistance coils, long coils and short coils, and I carried them up with me to Brantford, Ontario, and continued attempts to get in touch with long-distance lines. The Dominion Telegraph Company of Canada kindly lent me the use of its wires, and I took upon one experiment there as of very great importance. It was an experiment made in August, 1876. The transmitting instrument was in Paris, Ontario; the receiving instrument, the Centennial iron-box receiver, was in Brantford, at a distance of eight miles from Paris; and the battery on the circuit was in Toronto, about sixty miles away. So we had a circuit of somewhere from sixty to seventy miles. The transmission went one way only, but speeches were transmitted, and that was the first time speeches were transmitted between persons at a distance of several miles. But it was only one way; the person at the other end could not reply, but had to telegraph back by another wire. But by August, 1876, quite a number of experiments that attracted attention were made on the wires of the Dominion Telegraph Company. There was one experiment between Brantford and Mt. Pleasant, a distance of about five miles, and then I gave an exhibition from my father's house at a country place, four or five miles from Brantford, known as Tutelo Heights. It was about a quarter of a mile from the house to the nearest telegraph line. We got a lot of stovepipe wire, cleaned the town out of stovepipe wire, and took the wire off the fence from my father's house to the corner of the Mt. Pleasant road, and then attached it to the telegraph wire leading into Brantford. Then I had some friends in Brantford who spoke, sung and recited into the membrane telephone, while a large number of guests at my father's house at Tutelo Heights listened to the transmission; and on that occasion also three voices were transmitted simultaneously. I had three mouthpieces made for the membrane telephone and three persons sang to the same telephone.

So those experiments at Brantford were the first experiments that were really successful in transmitting speech from one place to another at a distance, but they were all one-sided, not reciprocal.

The first reciprocal communication occurred after my return to Boston in October, 1876. On October 9 occurred the first conversation by telephone between persons separated by miles of space. This was on the Walworth Manufacturing Company's line, connecting its factory in Cambridgeport with the office in Boston. It was not a very long distance, probably two and one-half miles, but free communication was carried on, and I think that was an historical occasion. Mr. Watson was at one end of the line and I was at the other, and we kept a record of what passed. I noted what I said and I noted what I thought I heard him say, and the parallel columns were reported in the newspapers, especially in the Boston Advertiser, October 19. I think that was the first time that conversation had actually been carried on between two persons separated by miles of space. The space, however, was not great, only about two and one-half miles.

And so we went on during 1876 with experiments, trying to increase the distance at which results could be obtained. For that purpose the Cambridge Observatory offered its services. They had a private line from Cambridge to Boston for transmitting time signals from the Cambridge

Observatory, and through Professor Rogers I had the use of that line at night, when it was not needed for time purposes. I had it connected with my laboratory, and by night made experiments between the Cambridge Observatory and Boston, trying to ascertain the conditions fit for telephone service on long lines.

Then came a really noteworthy series of experiments on the lines belonging to the Eastern Railroad Company. An experiment was made on November 26, 1876, in which conversation was carried on between myself, in Boston, at the Eastern Railroad depot, and Thomas A. Watson, in Salem. We had increased the distance to eighteen miles. Then we experimented on a line that led to North Conway, 143 miles away, so that Salem was a way station to North Conway. That was a very notable extension. It was determined that we should send a man to North Conway, and Mr. Watson went up to North Conway with a stack of apparatus, with all sorts of modifications. Now that we had a chance of trying it out on a 143-mile circuit we were determined to take advantage of it, if we had to spend all day and night on it. All sorts of apparatus was carried. I was in Boston and he in North Conway. I think that was really the most important experiment that had been made in connection with the free commercial stage. This experiment was on December 3, 1875, when we had a free communication between Boston and North Conway.

Then we tried varying the coils, trying small wire, thick wire, long coils, short coils, tried it with and without a battery; and as a result of the experiments we gave up the battery and took to the magneto telephone alone, in the laboratory.

That takes us up to the end of 1876. There is hardly anything more I can tell you about it before it came into commercial use. On January 13, 1877, I gave a lecture on the subject at the Philosophical Society in Washington. On January 31, 1877, there was an experiment here in Boston that attracted a good deal of attention at the time, although it did not compare with the other experiments in importance. It was a communication between the rubber shoe factory and the residence of Mr. Converse in Malden, but it attracted a great deal of public attention to the telephone. On January 21 there was a public exhibition on the line of the Eastern Railroad, in which no battery was used. Conversation occurred between Boston and Salem; and by and by, at about that time, in the early part of 1877 or the end of the year 1876 a rather interesting circumstance took place. I had among my students at Boston University a young Japanese student named Tsawa. He came to me for the purpose of studying the pronunciation of English. Of course, when he heard about the telephone he became very much interested. He said: "Mr. Bell, will this thing talk Japanese?" I said: "Certainly, any language." He seemed very much astonished at that, and said he would like to try it. I said that he could try it, and he went to one end of the circuit and I stood at the other. He talked Japanese, and I reported the result to him. He asked if it talked Japanese. I said: "It talked Japanese, but I couldn't quite understand it." He was not quite satisfied with that, and asked permission to bring some Japanese friends of his from Harvard College. I said: "Certainly." He brought two young men there, and they talked through the telephone and listened; so that Japanese was the first foreign language that was spoken over the telephone. And these two Japanese gentlemen were exceptional men. I did not know who they were at the time, but years afterwards it was revealed to me. I was in Japan, in Yokohama, when the American residents in Japan were giving a banquet to the new Japanese minister who was going to Wash-

ington, Mr. Kamura, now at the head of affairs in Japan. I was asked to attend the banquet, and instead of being introduced to Mr. Kamura, he came up to me and said: "I don't require an introduction to Mr. Bell. I knew him years ago." And he turned out to be one of those Japanese students. Then I found out about the other one in a rather curious way. The Japanese government sent to this country at the time of the Russian-Japan War Baron Kaneko. He came to Washington and gave a lecture before the National Geographical Society. I happened to be president of that society at the time. And so, when the dinner was over and the time for the speaking came, Baron Kaneko said: "I knew Dr. Bell years ago," and he told his story about the use of the telephone. So those two men, the foremost men in Japan today—Baron Kaneko and Mr. Kamura—were the two men who heard the telephone in the winter of 1876-1877.

A few more words, and I shall have done. On February 12, 1877, I gave a lecture before the Essex Institute in Salem, Massachusetts, and the lines were connected with Boston. The speech was transmitted between Boston and Salem, and the audience generally could hear the sound of the speaker's voice, while those who came close to the telephone were able to converse with Mr. Watson in Boston. At the invitation of the Essex Institute this lecture was repeated on February 23, 1877, and admission was charged; and on this occasion the proceeds were presented to me for my lecture on the telephone. I immediately went into Boston and we had a little silver telephone made, and it is interesting now to look back upon the fact that that was made from the first money made from the telephone.

On that occasion a very interesting incident took place. A Boston *Globe* reporter had the brilliant idea that he would send a dispatch to his paper in Boston by telephone, and on that occasion the first newspaper dispatch ever sent by telephone was sent to Boston by the Boston *Globe*. That, I think more than anything else, woke up the press of the world to the advantage of the telephone. That article in the Boston *Globe* was copied all over the world and had a great influence in modifying public opinion.

On April 3, 1877, we talked perfectly freely between Boston and New York. On April 5, 1877, there was a lecture in Providence, Rhode Island, which was attended by a great many people, and speech was transmitted to Boston from Providence, and a bugler in Boston, who was well known in Providence, played, the sound being heard all over the large hall in Providence, Rhode Island.

On April 4, 1877, was opened the first telephone line specially built for telephonic purposes. It simply connected the office of Charles Williams, Jr., in Boston, with his house. It was a short line, but it was the first of the hundreds of thousands of miles of telephone wire that has since been laid.

#### Aspects of Public Ownership.

Can any line be drawn between those enterprises that should be in public hands and those that should not? Is there any principle that can be laid down for guidance, or any formula at once explicit and comprehensive enough to serve as a touchstone in all emergencies?

The answer is that no such simple solution of the difficulty has been, or probably ever will be, arrived at. But

there are certain considerations which when taken together may serve as something more than makeshift direction-posts. The most earnest advocates of public ownership, for instance, admit that a municipality is not justified in attempting to meet any demand which is not sufficiently extensive and constant to keep the necessary plant fully employed. The most ardent opponents of public ownership, on the other hand, admit that in the case of many utilities the balance of advantages points to their municipalization. Thus no one objects to seeing sewerage systems, markets, water works, baths, cemeteries, and slaughter houses in public hands, while a very strong case, as a rule, can be made out for turning over harbors and docks to the management of the local authorities. In all these cases where municipalization is generally held to be necessary, it appears that there are three conditions usually fulfilled. (1) The enterprise is one which would be a complete monopoly were it in private hands. (2) The services rendered are of great importance to the community at large. (3) The fair price to be paid for the work performed is not readily estimated in advance. When an undertaking fulfils these three conditions the argument for bringing it under public ownership, with or without public operation, is so strong as to be practically overwhelming. Every absolute and irreplaceable monopoly supplying a community with some essential utility on terms that cannot be regulated beforehand is *ipso facto* a fit subject for municipalization.

It is rather, however, over those enterprises that tend to become monopolies and that present no insuperable difficulties of public supervision and control—such as gas works, electric lighting, street cars and telephones—that the battle for and against municipalization has chiefly raged. And here the example and experiences of Great Britain are of the first value and importance. No country in the world has plunged so heavily into the policy of municipal trading and none shows its good effects and its bad effects more plainly. The local debt of the United Kingdom amounts to over \$3,000,000,000; capital sunk in reproductive undertakings exceeds \$1,500,000,000; the average per capita debt of the eighteen leading British cities is some \$114.—Sidney Brooks, in *The North American Review*.