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TELEPHONIC ENTERTAINMENT,

At an early hour on Thursday evening Rheem's Hall was well filled by one of the finest audiences that Carlisle has contributed on such an occasion. Various pieces of apparatus were displayed upon the stage, and at one side Mr. Richards was easily recognizable presiding at a little sounder which had been connected with Philadelphia the day previous. An instrument resembling a guitar, without visible strings, placed in an upright position with a magnet in front of it, occupied a place on a table and wires led to it from the switch board near Mr. Richards.

Professor Himes was occupied in adjusting the instrument, and completing the connections, and, after an occasional preliminary sound, suddenly, and to the surprise of all, there issued from the old guitar, in clear, loud tones, that were even recognizable outside of the hall, the familiar air of "Home, Sweet Home." Whether it was simply imagination, coupled with the statement that the music originated in Philadelphia, or not, it seemed from far, far away, almost out of distant years and other scenes. The breathless silence in which it was received was followed by prolonged applause.

Finding the instrument in perfect order, Professor Himes stepped forward with a small instrument in his hand, which he said was but one of a large family, and which in its infantile condition at the centennial a few years ago was pronounced by Sir W. Thomson as the greatest, by far, of all the marvels of the electric telegraph. Since then it has been greatly improved, and the family has increased so rapidly that the evening could almost be consumed in enumerating the so-called telephones. Almost every practical electrician of eminence has contributed his one or more instruments to the number, and the names of Gray, Edison, Dolbear, Ball, and others have become quite familiar to the public.

The instrument, it was stated, is not adapted in all its varieties or in its fullest details to popular exposition in a short time or in a few words. It lays under contribution two branches of physical science that have been wonderfully developed in very recent years. The science of acoustics in the past twenty-five years has been crowded with facts of the most interesting character, many of them having more or less direct bearing upon the construction and operation of the telephone; and the same is true of the apparently widely separated branch of electricity, under which magnetism was also included.

The plan for the evening was stated to be simply to pick our way through the multitudinous facts revealed by these branches of science, in such a way as to bring prominently into view such as tend most directly to answer the questions. 1, What work has the telephone to do? 2, By what means does it accomplish its work? and then, through the assistance of our friends in Philadelphia, to illustrate how well it does its work. As the latter part of this programme could not but be of the highest interest and but rarely enjoyed, and as the friends at the other end of the line were awaiting the call for more music, fully equal to what we had had, the Professor stated that he would without hesitation curtail his remarks and his illustrations by selecting only such as could be most readily compressed into the time, and might have the most direct connection with the subject.

A telephone was defined as an instrument adapted to transmit sound to greater than ordinary distances, not an instrument to produce a sound loud enough to be heard at great distances, nor that can simply produce a sound at a great distance, but that in some way or other can pick up a sound and carry it from Philadelphia to Carlisle, and give it up again to us here in such a manner that we can recognize it in some or all of its essential features as sound. Any discussion of it involves a clear notion of what sound is, what the physical conditions are that give rise to the sensation

haunted, largely through the labors of Dr. Franklin, and the lightning rod was its only practical contribution. In 1800 a more docile electricity was discovered; atmospheric can't be harnessed, much as we may talk about it. In 1820 Oersted, in course of a lecture, detected a long sought for connection between magnetism and electricity. One of the most simple but fruitful discoveries ever made. Making of magnets by electrical currents soon followed. The wire from a small battery was passed around a piece of iron, and quantities of nails were held up by it; it could sustain several hundred pounds; as soon as the wire was severed its power was gone, the nails fell with a crash. Telegraphing essentially making and unmaking a magnet at a distance as rapidly as the finger can be tapped. That's what Mr. Richards is doing, communicating with Philadelphia. His noise is telegraphic noise, not telephonic; it bears no relation to the noise it makes in Philadelphia. If the sound worked the key they would have the same pitch in Philadelphia. Reiss' telephone was shown, consisting of a cone with paper stretched on the end with a small metallic plate on the centre connected with the battery and a pin in front very near to it, against which it struck when it vibrated. This was a key that sound would work; this is called a transmitter, but there must be something at the other end to convert these electrical pulses into sound again, something that can be made to vibrate just as rapidly, or a receiving instrument. This was fully explained. A thin iron plate vibrating in front of the magnet made and unmade by currents and their stoppage.

The Professor then connected such a receiver with the transmitter at points on the stage and hummed a tune, which was distinctly recognized as emitted by the receivers, though not exquisitely musical. A few years ago it might have been a wonder.

In the meantime the Professor had requested Mr. Richards to say to the Professor he would be ready to take some music in five or ten minutes. Many experiments were placed aside for want of further time, and Dr. Himes announced the pieces according to a programme just arranged over the wires with Philadelphia. Gray's Harmonic telephone first gave instrumental music. "Home Sweet Home" was beautifully rendered. The audience was delighted. The highest expectations of all were surpassed. Loud applause followed. "Yankee Doodle" was then well rendered, ending with capital effect with "Over the Fence is Out" so natural that it brought down the house. "Hold the Fort" and "Sweet Bye-and-bye" followed on the same instrument.

The Professor took advantage of the intervals to explain the receiver and transmitter employed, and stated that two hundred battery cells were being employed in the transmission of the music.

After a little tuning up a change to Edison's Singing transmitter was announced and soon the "Swanee River" came filtering through the old guitar from Philadelphia, with all the richness of its melody. It was followed by "The Heart Bowed Down with Care," so finely rendered that all could feel that the music that went in at Philadelphia could not have lost much on its way. It was very awkward applauding an old guitar but they couldn't help it, and this brought out "Robin Adair," and then "You'll Remember me." The vocal music seemed richer and fuller than the instrumental.

Professor Himes then announced that the audience would have the pleasure of hearing a recitation by Professor Barker; he expressed his regret that so fine a man and so capital a talker should be cramped down to so awkward a mode of communication, but he expressed a wish that he might some day be induced to appear before them, and they would realize what there was at the other end of the line, a statement that was greeted with prolonged applause.

The piece he announced in advance was

what sound is, what the physical conditions are that give rise to the sensation. The usual formula of words could readily be given that it consists of undulations of the air, and yet no clear conception be had of the nature of sound. By undulations is meant transmission of motion without transfer of matter. Standing upon the sea shore, the waves apparently roll in and in and in, and yet the water remains as it was, a vessel resting on it simply dances up and down; a pebble thrown into water creates little waves that circle outward until they strike the shore, but it's only the motion that's transferred from the stone, and when the wavelets die away the water is just where it was before. We speak of waving fields of grain, but the grain remains where it was. There are numberless cases presenting themselves in illustration. So the sound of my voice passes through the air to the distant wall, but no air passes; it is not a puff or a breeze, but it is simply a disturbance of the air commencing here, passing to that point and leaving the air as it dies away just where it was. The particles of air have moved back and forth and have fallen into their original positions. But sound waves are harder to illustrate, they are not like waves of water, &c., they are longitudinal; the particles of air move back and forth, not up and down, there are alternate condensations and rarefactions.

This subject was further beautifully illustrated by a-half dozen glass balls on a curve; one was allowed to fall upon the rest, all did not move; had they been lead they would have, but on account of their elasticity only the last one moved. All had changed shape a little and had transferred the motion to the next until the last moved off.

The fact was further beautifully illustrated by a sensitive gas flame. Although sensitiveness of gas flames to sound was discerned at a musical party in ordinary flames, the highest degree of sensitiveness requires considerable care in construction or selection. When a hissing or kissing sound was made the flame fluttered and dodged and roared and became quite unruly at the applause which followed, but the rattling of a bunch of keys by the Professor at the furthest point of the stage disturbed it most. There was no question here about a puff of air to the flame; the effect was instantaneous and too decided and peculiar. Neither was it a question of loudness. Taking a violin and sounding the bass string loudly, the flame remained perfectly indifferent, but as soon as the higher notes were sounded it showed symptoms of uneasiness. On placing a piece of gas tube over the flame it seemed extinguished, but when the keys were shaken it began to howl or sound like a steam whistle, and continued to add its sound to the applause that greeted it. The properties of sound of pitch, loudness and quality were fully explained, and in the latter case attention was called to the interesting investigations of Helmholtz.

The telephone to do a perfect work must transmit sound from Philadelphia to Carlisle with same pitch and relative loudness and quality. Not all accomplish this. An instrument employed by Wheatstone first demanded a passing notice, as it involved the principle of the lovers' telephone, the possibilities of which were rated higher than they usually are, and they could be made of more service. But it hardly belongs to the family of telephones. It depends on the superior facility with which solids transmit sound.

This was illustrated by drawing music from the basement by means of a long pine rod, which rested upon a music-box placed there. When a violin was placed on it the sounds were distinguishable all over the hall. Spiritualists had violins played by unseen hands in this way, but they were careful about the supports of their violins. But the range of this instrument is not only limited, but velocity of transmission would be slow if distance could be great. It differs from instruments of wider range in the fact that the sound goes in as sound is conveyed as sound, and is simply delivered at the other end in the instrument before us. In all true telephones the sound that is taken up at Philadelphia ceases to exist as sound; it becomes something far more mysterious, that passes along the wires with the rapidity of thought, and when it reaches here is reconverted into sound, or aerial vibrations of the same character as produced it in Philadelphia. That something is electricity.

The first observed fact in regard to it dates 600 years before the Christian era. After 2,000 years more facts were accumulated until the middle of the last century the subject seemed almost ex-

plause.

The piece he announced in advance was "Mary had a Little Lamb," which they'd doubtless all recognize, when a terrible struggle at articulation could be recognized, but for once the old guitar couldn't express itself; though some persisted that they did hear some words. But as the Professor announced that it was not an articulating instrument we must conclude they were mistaken. He remembered that some scientific men thought it was an advantage in using a telephone to have some idea of what it was going to say. Jack and Jill was then recited, and

There was a little girl, who had a little curl,
Right on the middle of her forehead,
And when she was good, she was very, very good,
And when she was bad she was horrid.

Everything the evolutionists contended had a beginning, and the lecturer remarked that this seemed like articulation in evolution. There was a perceptible falling off in the volume of the music when they went back to the Gray transmitter, and gave "Sweet Bye-and-bye" and "Then You'll remember me;" the tones were as clear and sweet and perfect as ever but it was evident something was wrong. The clatter of keys showed that Philadelphia and Carlisle were conferring, and the conclusion was that the music was being stolen.

The audience had received too much enjoyment to be indignant, especially as more had been transmitted than had been on the programme, and the Professor felt satisfied if some operator was getting a little of what we had left. In an interval whilst the communications with Philadelphia were going on, Professor Himes secured the attention of the audience and remarked,

"Just at this point I desire to acquaint you with the obligations we are all under to the friends through whose kindness and courtesy the largest source of entertainment has been opened up to us this evening. Upon mentioning to Professor G. F. Barker, of the University of Pennsylvania, some time ago, my intention to lecture upon the Telephone to a Carlisle audience, he offered at once the use of such apparatus as I might be in need of, and subsequently added that he might be able to furnish music for the occasion from Philadelphia. I hesitated somewhat to impose to such an extent upon the kindness of a friend. The matter was, however, mentioned to the authorities of the Western Union Telegraph Company, in Philadelphia, and the use of the wires of that company were very promptly and with great courtesy offered as far as necessary. For several evenings past they have been in use for several hours testing and adjusting the instrument and preparing the programme for the evening.

The gentlemen to whom we are most largely indebted for the success of the evening is Mr. H. C. Robinson, General Manager of the Western Union Telegraph Company, in Philadelphia, who has in every way facilitated our efforts, and who has cheerfully given us his time and assistance, not only this evening, but on all other previous occasions. I know that you will retain him in kindly remembrance in connection with this evening.

Besides these gentlemen, I desire to thank thus publicly our own gentlemanly operator at this place, well known by us all—Mr. J. Richards—loud applause—without his hearty and untiring co-operation, I may say, the measure of success we have had would have been impossible."

After some clicking of the instrument, and conferences between the Professor and Mr. Richards, announcement was made that the music seemed to be leaking out, and to be drawn out all along the line, and that already more had been received than was on the programme or than we had ventured to hope for, so that we would release our friends in Philadelphia, and close the exercises of the evening.

Messages of thanks and congratulations were passed back and forth after the lecture, and we have the privilege of copying several which will be of interest to our readers, as giving them the names of the individuals to whom they were indebted for the music that went into the receiver at Philadelphia, was metamorphosed into electricity, came over the wires to Carlisle and resumed its original character as music.

BARKER—My Dear Barker:—We have had a splendid time, a very good and highly appreciative house, and the music was excellent. You have the thanks not only of myself, but of the audience; and please also say to Mr. H. C. Robinson, Manager of the Western Union Telegraph Office, at Philadelphia, that Professor Barker's friends have been made equally his friends this evening, by his courtesy and kindness, which rendered possible the evening's entertainment, and I took pleasure in acquainting the audience with the obligations they were under to him.

HIMES—My Dear Professor:—We are all very glad the affair went off so well. Mr. Robinson unites with me in saying you are entirely welcome to what we have done for you, for we know it was done for a capital fellow. The music on the Gray instrument was played by Mr. Harden, of the Geological Survey, and the singing was done by Mr. William Farmer Jones, of the Western Union office here. They have all kindly volunteered their services.

Good night, BARKER.
MY DEAR BARKER—Glad to know who gave us our music. Thanks to them both, and your recitation which I labeled "articulation in course of evolution."
Good night, HIMES.

THE BUSINESS GROWS.—On Monday night about ten o'clock, officer Sanno arrested Al. Johnson, a horse dealer, charged with embezzling \$100 from George Lehley, of the First Ward. Johnson was left out on bail.