

## THE STORY OF ELISHA GRAY

BOYD CRUMRINE PATTERSON

ONE evening, in the middle 1930's, after driving through the day across central New York State we stopped for the night at the Avon Inn at Avon, New York. Later that evening while waiting to complete a long-distance telephone call, I noticed on the telephone the legend "The Elisha Gray Telephone Company." The name at the time meant nothing to me and I assumed, as later proved to be correct, that this was one of many rural telephone companies scattered throughout the state.

Some few years later, having come into possession of a trunkful of old papers<sup>1</sup> relating to Washington County, I discovered a large manila envelope labeled "Elisha Gray." From the contents of this envelope — and from other sources — I learned the story of Elisha Gray. It is a story, now largely forgotten, of one of the most celebrated controversies of the last decade of the nineteenth century.

### I

Who was Elisha Gray? One can read about him in many of the existing biographical encyclopedias. Perhaps the most succinct as well as the most authoritative account is found in the *Dictionary of American Biography*, Vol. 7, p. 514. It relates that Elisha Gray (1835-1901), inventor, was born at Barnesville, Ohio, the son of David and Christiana (Edgerton) Gray. His father had emigrated from Pennsylvania and was poor. The family lived modestly on a farm. The children attended the public schools. Elisha's father died suddenly before he completed his schooling, and at a young age he was compelled to find work. His first employment was with a blacksmith but he soon found that he was not strong enough to carry on that trade. Then he took up carpentry and boat building and was working at these trades when, at the urging of friends, he matriculated at Oberlin College. Elisha

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<sup>1</sup> Now the "Boyd Crumrine Papers," Historical Collections, Washington and Jefferson College Library.

spent five years at Oberlin and his general interest lay in the physical sciences. By the time he left college his interest narrowed to electrical mechanisms. Ill health, brought on by overwork while in college, greatly restricted his activities for a period of about five years after graduation.

But, beginning in 1867 and continuing throughout the rest of his life, he embarked on a career of research. He invented an automatic self-adjusting telegraphic relay, a telegraph switch and annunciator for hotels, a private telegraph line printer and a telegraphic repeater. In 1872 he moved to Chicago where he maintained his residence throughout the rest of his life. About the time of this move he organized with E. M. Barton the firm of Gray and Barton which eventually evolved into the Western Electric Company. He continued actively in the firm for two years and then retired to devote his whole time to invention and research.

Gray's particular problem at this time was whether the number of messages sent simultaneously over a wire could be increased by first converting them to musical values (electro-harmonic telegraphy). He obtained patents for a successful device in 1875 and, as he progressed, the idea of transmitting vocal sounds occurred to him. Experimenting for some time he designed an instrument and filed a caveat (a confidential report of an invention which is not fully perfected) in the United States Patent Office on 14 February 1876. This caveat contained detailed plans for a speaking telephone.

That same day, a few hours earlier, Alexander Graham Bell filed a patent application for a speaking telephone. With the subsequent formation of the Bell Telephone Company and the introduction of the telephone as a competitor of the telegraph, the Western Union Telegraph Company acquired Gray's as well as Edison's telephone patents and a bitter infringement battle followed. Litigation continued over several decades through some six hundred lawsuits and involved malicious accusations of malpractice both within the Patent Office and outside. Finally, Bell's patent, granted in March 1876, was sustained by the courts, but the Gray-Bell controversy, in the minds of many people, has never been resolved. Gray himself continued for the balance of his life inventing electrical devices and amassed about seventy patents. For some of these the financial harvest was quite large.

His most important invention in later years was the telautograph, patented in 1888 and 1891. This electrical mechanism transmitted facsimile writing and drawing to distant points almost instantaneously. He had perfected the telautograph by 1893 and at the World's Fair in

Chicago that year he transmitted writing over wire a distance equivalent to 250 miles. The telautograph came into general use in banks and railway stations and adapted itself to a variety of industrial uses.

At the time of his sudden death near Boston, Massachusetts, in 1901, Gray was engaged by the problems of underwater communications with vessels at sea. Besides numerous articles in technical journals he published several books, and in 1893 he was the organizational chairman of the first International Electrical Congress held in Chicago. He was decorated with the Grand Cross of the Legion of Honor of the French government and was the recipient of honorary degrees from several colleges in the United States.

On the occasion of his death, the *Scientific American*, Vol. 84, February 2, 1901, p. 72, featured an article eulogizing Elisha Gray:

"The career of Professor Elisha Gray, D.Sc., was a most pathetic one. He was a man of marvelous talent and ingenuity, and in the opinion of many who have calmly weighed all the evidence, it is likely that he will receive justice at the hands of future historians by being immortalized as the inventor of the speaking telephone. The litigation in the early history of the telephone, which was of the most complex nature, finally resulted in the decision that Prof. Bell was the inventor of the telephone, and as such was entitled to the credit and profits which would naturally accrue from such an important invention, but many persons hold that victory was a technical and corporate one, rather than one based on science . . .

"In pursuing his investigations he made a discovery to which the invention of the telephone was largely due. He relates it in his own words:

"My nephew was playing with a small induction coil, taking shocks, for the amusement of the younger children. He had connected one end of the secondary coil to the zinc lining of the bathtub, which was dry. Holding the other end of the coil in his left hand, he touched the lining of the tub with the right. In making contact, his hand would glide along the side for a short distance. At these times I noticed that a sound was proceeding from under his hand at the point of contact, having the same pitch and quality as the vibrating electrome [*sic*]. I immediately took the electrome [*sic*] in my hand and, repeating the operation, I found, to my astonishment, that by rubbing hard and rapidly I could make a much louder sound than the interrupter or the electrome [*sic*]. I then changed the pitch of the vibrator and found

that the pitch of the sound under my hand was also changed, agreeing with that of the vibrator.'

"On February 14, 1876, Prof. Gray filed a caveat in the Patent Office at Washington with the expectation of perfecting the 'art of transmitting vocal sounds telegraphically.' Prof. Alexander Graham Bell and Prof. Dolbear were workers in the same line, and it is said that Prof. Bell's patent was applied for a few hours earlier than Gray's, therefore the former received the patent. In the litigation which ensued, Gray alleged that his caveat had been on file before Bell's application, and he contended that there had been collusion with an official of the Patent Office. The courts decided, however, that this was not the case, and ruled against the Chicago inventor. Prof. Gray parted with his rights to a company whose name was The Harmonic Telegraph Company, by which transaction the Western Union was retired from the field."

Not all of Gray's critics were so kind, however, and a representatively hostile appraisal is found in Herbert N. Casson, *History of the Telephone*, published in 1910 (Chicago):

"The most plausible and persistent of all the various inventors who snatched at Bell's laurels, was Elisha Gray. He refused to abide by the adverse decision of the court. Several years after his defeat, he came forward with new weapons and new methods of attack. He became more hostile and irreconcilable; and until his death, in 1901, never renounced his claim to be the original inventor of the telephone.

"The reason for this persistence is very evident. Gray was a professional inventor, a highly competent man who had begun his career as a blacksmith's apprentice, and risen to be a professor of Oberlin. He made, during his lifetime, over five million dollars by his patents. In 1874, he and Bell were running a neck-and-neck race to see who could first invent a musical telegraph — when, presto Bell suddenly turned aside, because of his acoustical knowledge, and invented the telephone, while Gray kept straight ahead. Like all others who were in quest of a better telegraph instrument, Gray had glimmerings of the possibility of sending speech by wire, and by one of the strangest of coincidences he filed a caveat on the subject on the same day that Bell filed the application for a patent. Bell had arrived first. As the record book shows, the fifth entry on that day was 'A. G. Bell, \$15'; and the thirty-ninth entry was 'E. Gray, \$10.'

"There was a vast difference between Gray's caveat and Bell's

application. A caveat is a declaration that the writer has not invented a thing, but believes that he is about to do so; while an application is a declaration that the writer has already perfected the invention. But Gray could never forget that he had seemed to be, for a time, so close to the golden prize; and seven years after he had been set aside by the Western Union agreement, he reappeared with claims that had grown larger and more definite."

## II

Elisha Gray died in 1901. The following year, 1902, Boyd Crumrine began to write a biography of Elisha Gray. It was not completed because the author's interest led him into the intricacies of the litigation surrounding the telephone patents. The unpublished manuscript of this incomplete biography together with Gray's letter to which it alludes will be found in the Historical Collections of Washington and Jefferson College. What follows is made up largely of excerpts. So, we continue our story by moving back to the year 1854. The locale is Bridgeport,<sup>2</sup> Pennsylvania.

"In the winter of 1854-5, I was allowed for the first time to leave the old homestead in East Bethlehem Township,<sup>3</sup> Washington County, Pa., to attend the High School at Bridgeport, separated from Brownsville, Pa., by the bridge over what is so well known as the Neck. The High School was conducted by Prof. L. F. Parker and his estimable wife, both from Vermont, I believe, in the Public School building on the hill in Bridgeport, then called 'Hardscrabble.' Coming from the quiet of the country, where I had literally ploughed by starlight to hurry through the fall work in order to get away to school, how well do I remember the effect upon me when, on the frosty mornings of October, I walked to the school building and heard coming up to me from all directions below the sound of hammering on metal and wood, and the rapid puffing of steam from the engines and from the boiler and machine shops of Snowden & Mason across the Neck; of Herbertson & Co., near the east end of the Monongahela Bridge; from the planing mills of Carver, Wood & Co., on the river bank in Bridgeport, and the boat-yard of John S. Pringle over in West Brownsville, first put in operation by Jas. G. Blaine's father and mine, 1831. Brownsville, with its sister towns, then made a busy place, and the noise of its

<sup>2</sup> In 1908, Bridgeport was absorbed by South Brownsville. This, in turn, was consolidated into Brownsville proper (1933).

<sup>3</sup> This is now known as Deernston Borough.

industries was a startling wonder to the country youth.

"Two of my most intimate school-mates were Henry S. Bennett, and Elisha Gray. We three were about the same age, apparently between 16 and 17. Bennett was the son of Capt. Elisha W. Bennett, then owning, at least commanding, one of the steamboats plying between Brownsville and Pittsburgh. He had a dark-eyed sister Sallie, who with Ruth Anna Miller, Edith Griffith and certain other Quaker maidens, sat on the other side of the school-room from us, and took care of us in and out of school hours. I remember how, when coasting together with other Quaker youth and maidens down Hardscrabble hill on the winter's ice, and the country boy became a little too noisy or rude, Ruth Anna would say, 'Now Boyd, thee must not do that . . .'

"Bennett was an inmate of a pleasant home with his father, mother and sister Sallie, and perhaps a younger brother, but Gray was poor. Gray's father had died in Belmont County, Ohio, and subsequently his mother had become the wife of Cozens Smith, a Quaker farmer, of East Bethlehem township, Washington County, Pa.; and Gray himself had been apprenticed as a carpenter in the planing mill of Carver, Wood & Co., where he worked to learn his trade in the evenings and mornings, but was allowed to attend the High School with us during the day. In the evenings and on Saturdays, Bennett and I were almost always together, and Gray, when permitted to be absent from his work, was with us. We then often spent our early evenings in the grocery store of Seaburn Crawford near the bridge over the Neck, teasing Mr. Crawford in various ways. Bennett was lively, very bright, and always full of fun and gladness . . . Gray was more reserved, and more quiet, but he was also manly, studious and ambitious; and he then seemed to feel the difficulties of life to be over by him . . .

"In February 1856, we concluded we would all start for a college course at Oberlin College, Ohio. Bennett's parents were well able to give him a college education, and preferred Oberlin because of its anti-slavery record. Gray and I both felt that we must work our own way to an education, and preferred Oberlin College because of the opportunities that institution gave to students without means. But, in my case, parental prejudice in an opposite direction to that in Bennett's case intervened, and in the fall of 1856, I was sent to Jefferson College, at Canonsburg, Pa., while Bennett and Gray the same year went on to Oberlin. At the commencement season of old Jefferson in August 1859, both Bennett and Gray visited me at Canonsburg, when on their way home from Oberlin.

"In 1860, we all graduated, they at Oberlin and I at Jefferson. From that time Gray was lost to me for many years. But Bennett studied theology and became a Congregational minister, and I studied the law. The War of the Rebellion diverted the attention of everybody during its continuance, but in the subsequent changes brought to the South, Fisk University was organized at Nashville, Tenn., for the education of the colored race, and Bennett became Vice President of that institution, serving as such during his whole life thereafter. I settled in the practice of my profession at Washington, Pa., where I remained with an occasional letter from Mr. Bennett, but without meeting him or even hearing from or about Gray until 1884.

"In the summer of 1884, Bennett, then on a visit to his friends at Brownsville, paid a visit to me at Washington, for a week or so. During that visit he preached one Sabbath in the First Presbyterian Church, when his naturalness, sprightliness, sincerity and eloquence, the same as in his youth when I knew him, a quarter of a century before, made me proud of him.

"In his manner I observed, however, a vein of sadness, slight it is true, but all the same observable, which I had not noted when we were boys together. Was it merely the result of the soberness of maturer years, or was it caused by his so long continued contact with an hitherto oppressed people who were endeavoring to reach a higher plane? One evening after he had been entertaining a number of young ladies in my presence by singing the plantation melodies of the noted 'Jubilee Singers,' first organized under his personal direction and at his instigation at Nashville, thence travelling with their splendid singing throughout this country and in Europe, I asked him—

" 'Mr. Bennett, what became of young Gray, our comrade of the Hardscrabble High School?'

" 'Don't you know who Gray is?' said he, with apparent astonishment.

" 'No,' said I, 'I cannot remember that I have ever heard a word about Gray since you and he graduated at Oberlin.'

" 'Is it possible,' he replied, 'that you don't know who Gray is?' 'Do you remember,' he continued, 'the time when we three were together in Seaburn Crawford's grocery one evening after school hours, and Mr. Crawford put down our names in the back of his large ledger, saying that he would put us there together, and see if any of us would ever amount to anything?'

"I said to him I had an indistinct recollection of the matter, when

he repeated the incident bringing it more fully to my mind, and continued:

“‘And don’t you know who Gray is? Don’t you know that Elisha Gray is the real inventor of the Bell Telephone, and lives at Highland Park, a suburb of Chicago, worth perhaps his millions, and is one of perhaps but two men in the United States who have received the Grand Cross of the Legion of Honor of France?’

“‘What!’ said I, ‘I have been reading about that Elisha Gray in the newspapers and magazines for many years, and until this moment I never knew that he was the Elisha Gray who had to work at the carpenter’s bench with Carver, Wood & Co., at Bridgeport, to enable him to attend the High School with you and me’; and I reached for a volume of my Appleton’s *American Cyclopedia*, and under the name of Elisha Gray could read the sketch of his public life with far more delight by knowing that it was the public life of my school-mate, lost to me as it were for twenty-five years. And then, too, I was proud of Gray, and proud, also, for the institutions of my country, in that they gave such opportunities to the American boy . . .

“In the later part of the winter of 1887, I was disabled from hard work in my office at night, and amused myself writing weekly screeds for the Washington Reporter, over the signature of Uncle Enoch; and in one of my contributions I related the story of the three school-boys and how two of them had succeeded in life, and sent a copy of the article to Mr. Bennett at Nashville, Tenn. In March 1888, I received a fat letter from Highland Park, made up of two parts, the first dated on March 28, 1887, but breaking off without a signature at the beginning of a joke, the second dated on January 28, 1888 [*sic*] and the whole in its two parts of ten pages completed by the signature of Elisha Gray at the end. By the time the second part was written, the remainder of the joke had been forgotten, I was told, but the two parts together were full of interesting facts relating to the life of the writer, who was then engaged in perfecting his invention of the Telautograph . . .”

[The letter reads in part as follows:]

“You will be surprised at getting a letter from me. Indeed, I am surprised myself to find myself writing any but business letters. I believe this is the tenth letter since I sat down this evening about 9 P.M. Now 11:30.

“Yesterday I met a man who had been visiting in old Brownsville



and he brought back to me a flood of old memories. Curiously enough in the evening when I returned from the city (Chicago) I found your letter to Bennett enclosed in one from him. Also the clipping 'Uncle Enoch's Notes.' Well this brought another flood and I wished that I could stop in and have a chat with you and 'Ebenezer.'

"By the way — if you will come out here I will give you points enough to keep Uncle Enoch busy for the next five years making notes of them. And if he aspires to story writing I will give him enough of '*truth that is stranger than fiction*' to fill a novel full of thrilling interest. The story of the telephone is full of dramatic situations and a novel could be founded on it that would prove the truth of the adage above quoted but it would take months of study to get the material together.

"Well my dear old friend: there has been a deal of history made since you and I met and it is still making, 'the mills of the gods grind slowly but they grind exceeding fine.'

"What are you doing? you ask. Well a little of everything. For a long time I have been trying to 'save the pieces' — for I found that the fabric I had been years in building had been rudely stepped on, not to use a harsher term. But I cannot go into this now. I am at my old tricks again and I like it, devoting my whole time to science and invention. Just now I am bringing out an invention for writing at a distance by telegraph. So you can sit in your own room and give your own signature 100 miles away. I call it the 'telautograph.'

"I have just completed a course of lectures at Oberlin College to the sophs — juniors — seniors and theologues — on electricity. I have the chair in 'Dynamic Electricity' in two colleges, Oberlin and Ripon. I go for a short course once a year. I get a receipted bill for the damage I have done at the end of the course in the shape of a note of thanks from the faculty. I also gave while there what is called the Thursday lecture, which happens once a week before the whole school — students and faculty. My subject was '*What and How Shall We Study at College.*' I told several stories one of which I will repeat here as it is connected with old days in Pennsylvania."

[Here the letter breaks off, to be resumed nearly a year later.]

"Jan. 24, 1888. Nearly a year has elapsed since I commenced to tell you a story. I was called away and then 'the world, the flesh, etc.' came between me and my letter to you. One of the above trio has stolen

my manuscript which contained the story. I cannot reproduce it as I had it there . . .

"I have spent the last year on the invention I spoke of in the first installment of this letter . . . The instrument is designed to supercede, in a measure, the telephone and do what it will not do: give a record of any order at both ends of the line simultaneously.

"All you have to do is to take up a pen, pencil or style and write, as I am now, and another pen at the end of the line follows it, making the same record in substantially the same hand, at precisely the same speed. Business men say that for most purposes they will prefer it to the telephone.

"I have also made a number of other inventions of less magnitude during the year. I shall go to New York and Washington City to spend a month (filing new cases) in about three or four weeks. Then I have two courses in lectures to deliver, one at Oberlin and another at Lake Forest University. A number of colleges want me, but I cannot [*sic*] do only *so* much of this kind of work. A little of it each year helps me, but too much interferes with my original work . . ."

[Crumrine's biography continues:]

"This letter, and my reply to it, brought about a visit to me by Elisha Gray, himself, in the summer of 1888, of a week or ten days duration. In an extended drive through the valleys and over the hills about the town of Washington one Sunday afternoon, the heart of the silent student was opened to the memories of our boyhood days together . . .

"He had brought with him for my pleasure two articles of the greatest interest to my family and others to whom they were exhibited. One of them was the medal he had received from the Paris Exposition of 1878 for his electrical inventions shown then together to the world of sightseers in attendance . . . The other was the Grand Cross of the Legion of Honor presented to him on the same considerations by Marshall McMahan, President of the French Republic, by order of the French Parliament . . .

"The days of these two reunions were red-letter days."

In 1898, Elisha Gray went to Boston to do experimental work in submarine signaling. In December 1900, after two years of hard discouraging work, he succeeded in signaling twelve miles under water without wires. He died less than one month later at Newtonville, Massachusetts, in January 1901.

In a feature article in the *Pittsburgh Gazette Times*, Sunday, 9 April 1916, the story of Elisha Gray is recounted in some detail. What prompted the article was the spiral of improvements in telephonic technology after 1900. "We perhaps have forgotten the long progression of discoveries beginning with those of Gray, Bell and others in the 1870's to the wireless telephone of the present day. On 25 January 1915 Dr. Bell talked over a wire from New York to San Francisco, California, a distance of 3400 miles. On 30 September 1915, a wireless conversation was held from Arlington to the Hawaiian Islands, a distance of 4600 miles. On 21 October 1915, Arlington talked with Paris by wireless telephone and the operator at Honolulu, 8700 miles from Paris, heard and recorded the message from Arlington. On 5 November 1915, Secretary Daniels, talking to Admiral Usher by telephone and wireless, gave orders to his chief of service. These and other breakthroughs in bridging space are today considered but a part of twentieth century living!"

### III

One final item, a footnote, if you will, to the story of Elisha Gray. The principal of the Bridgeport, Pennsylvania, High School in the years 1854-56 was L. F. Parker. Mr. Parker left Bridgeport to go to Grinnell College, Iowa. Indeed, the remainder of his teaching career was spent as professor of history at, first, Grinnell College and, later, the State University of Iowa. At one time he was State Superintendent of Public Instruction of Iowa. At the age of seventy-seven, in 1902, he was Professor Emeritus of History and lived at Grinnell. The following is a small part of a five-page typewritten letter<sup>4</sup> to Mr. Parker on 29 September 1902 by Boyd Crumrine, his pupil at Bridgeport High School in 1854:

"... I was delighted to receive the three little books you sent me, especially the one in memory of Mrs. Parker . . . . In that little two-story frame house upon Scrabbletown hill and in the three-story brick school building on the same level with it on the same hill, I got my start, and received the impulse towards the sturdy life I have tried to lead . . .

"My dear Sir, I could talk to you through this shorthand writer before me for hours, and then would not have told the half I would like to tell; how I came to go to Jefferson College and Bennett and

<sup>4</sup> This letter may also be found in the "Boyd Crumrine Papers," Historical Collections, Washington and Jefferson College Library.

Gray, my chums, to Oberlin; how we graduated the same year, I think, 1860; and how we saw each other the last in those days in 1859 when they visited me at Canonsburg on their way to Brownsville, neither of us ever saw an other until 1884 when Bennett and I had corresponded, not regularly, but of Gray I knew nothing of him in his life after our graduation . . .

"In 1886 I was laid up for nearly a year with inflammatory rheumatism and its resultants; in 1887 I became the Reporter of the decisions of the Supreme Court of Pennsylvania, and in a very funny way, which I haven't the time nor the space to relate, I succeeded in having Gray stop off with me on his return from Washington City in the summer of 1888. He was then in his prime, and what a time we had for the week or so he was with me. Of course he told me everything about his telephone invention and controversy, and was then obtaining patents for his Telautograph, and believed himself to be very, very wealthy . . . and the next thing I heard of Gray was that he had died poor, but I never could learn the particulars. Then I began to write a sketch of him, it was about 1894 perhaps, and wrote a letter to his widow, or some member of his family at Highland Park, Chicago, for information, when Gray wrote me in his own handwriting that he was still alive. I went on with my sketch of him, intending it for a magazine article or something of that kind, and got up to the history of the telephone and its litigation, when I found that I did not at that time have the opportunity to study the subject as I wanted to, and laid it aside. The next thing I heard of him was his sudden death two or three years ago.

"Bennett passed away before either of us, then Gray, and of the trio in the back of Seaburn Crawford's ledger, wherever that may be, I am the sole survivor.

"I wish you could have time and would feel able for it when that time comes, to write me what you know of Gray after say 1888. I would like very much, though I cannot assure anyone that I will ever have the time to do it, to write the biography, or at least a biographical sketch of Mr. Gray. Well, my friend, I must not dictate any longer, else my stenographer may be unable to translate her notes, and this being Saturday evening she should go home. She says to me that she thinks she will not have time enough today, and therefore I direct her to translate her letter for you on Monday morning next, and I will add a few more sentences . . .

"I must close now, after having — I will not say inflicted — written a long letter for you, but I assure you that I have not written

the one-tenth of what I would like to say to you. Do you know of what I have been thinking? How nice it would be if that daughter of yours that married the Colorado judge would bring you sometime to Brownsville, Pa., or Washington, Pa., or to some place where I could get hold of you and take you both to my house and make you listen to my tale by the word of mouth and turn you loose among my books and papers."