Elisha Gray (1835-1901)

"The Edison of Oberlin College"
Showcase Display, Science Center, April 2018
Curated by Roderic Knight, emeritus professor of ethnomusicology,
to mark the 140th anniversary of Gray's Oberlin honorary degree, 1878.

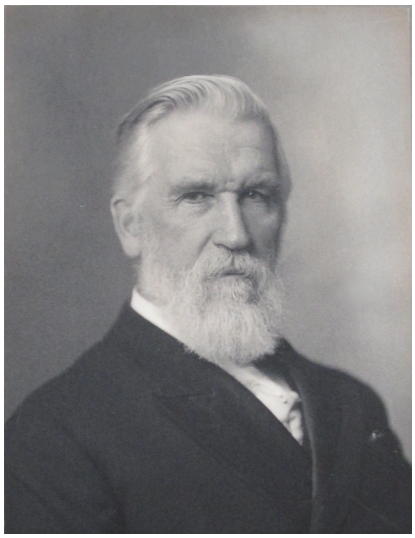

Photo courtesy of the Oberlin College Archives

Elisha Gray (pronounced "Ee-LYE-sha") was born in Barnesville, Ohio to a Quaker dairy-farming family. He enrolled in the Oberlin prep school, and then in the college, and would have been class of 1864, but he was anxious to begin his career as an inventor instead. He and his college sweetheart, Delia Shepard, a pianist, were married at First Church in Oberlin at the stroke of the new year, January 1, 1862. Within five years Gray had the first of his 70 lifetime patents and two years later formed a company, Gray & Barton, in Cleveland, which was soon bought out to form Western Electric, a giant in the industry.

Gray was well known in his lifetime, but has been largely forgotten since then. If people have heard of him, it is usually for the role he played in developing the telephone. Gray and Alexander G. Bell were contemporaries and independently filed patents for a "speaking telephone" on Feb. 14, 1876. The ensuing court battles went on for years, with Bell winning every case against him, but most experts today agree that Gray should have been awarded priority for the invention. (The best synopsis of this story is "The Theft of the Century" by Seth Shulman, *Ohio Hist. Soc.,* 2009.)

Through the efforts of his college mentor Professor Charles H. Churchill, Gray was appointed Honorary Professor of Dynamic Electricity at Oberlin in 1880. For twenty years he visited every spring from his home in Highland Park, IL to give a series of mini-courses. During this time he also authored a three-volume book on the natural sciences and electricity for the general reader titled *Nature's Miracles*. It was published in 1899, and is available today online.

The showcase is divided into five panels to provide a capsule history of Gray's achievements. Panel 1 shows his early experiments, inspired by the discovery that an electric hum, such as that emitted by a quack medical device called an electrotome, could be amplified. Panel 2 shows an early method: by placing himself in the battery-powered circuit, Gray turned a violin into a loudspeaker by electro-friction, rubbing his fingers on a silver plate he had mounted on the instrument in place of the strings. Another method was to touch a rotating drum. He soon abandoned these devices, however, because a certain amount of pain was involved in their use!

Panels 3, 4, and 5 feature the "take-away message" of the showcase, Gray's world firsts: in 1874 he premiered the world's first electric musical instrument, the Musical Telegraph; in 1876 he proposed his design for the speaking telephone; and in 1893, he introduced his Telautograph, the world's first fax machine, capable of replicating anything written or drawn in real time at a remote location. This was his most successful invention, used by banks, hotels, railroads and other businesses well into the 20th century.

For Oberlin, whose TIMARA department (Technology in Music and Related Arts) was the first undergraduate degree program in electronic music, Gray's Musical Telegraph is his most important achievement. This was a small keyboard with polyphonic capability that produced sounds by setting tuned steel reeds in motion by electromagnets. The sound was then sent via telegraph to any remote location, to be reproduced by another of Gray's inventions, the loudspeaker. After an 1874 premiere, Gray organized a series of concerts, beginning at Steinway Hall in New York City on April 2, 1877, and continuing in Washington. For these events, Gray used his most elaborate loudspeaker – sixteen wooden pipes, each with a tuned electromagnetic reed inside. Through these, the audience of 2000 heard a program of popular tunes played by the keyboardist sitting in Philadelphia. The following year this was repeated at First Church in Oberlin. Even though the sound was limited to a "soft organ tone" (New York Times review), this was the world's first synthesizer, and a sign of things to come. (See over for a synopsis of Gray's achievements.)

Timeline as seen in the display:

IN THE BEGINNING
there was
ELISHA GRAY
from Barnesville, Ohio
WHO:

Applied his tinkering ability at age 11 to build his own working model of Samuel F. B. Morse's new phenomenon, the **telegraph**.

Managed his family dairy farm when his father died, from age 12 – 22.

Learned carpentry and boat-building on the Ohio River, ca. 1855.

Enrolled in the Oberlin preparatory school in 1857, benefitting from the college's "Learning and Labor" program to pay his tuition.

Originated the offbeat wedding by marrying his college sweetheart, music student Delia Shepard, at First Church, with Reverend Wright presiding, at the stroke of the New Year, January 1, 1862.

Filed his first patent, for a telegraphic device, a fail-safe relay, in 1867.

Founded a company, Gray and Barton, in 1869, that was soon bought out to become **Western Electric**, the giant in the industry.

Presented the world's first electro-mechanical/ electro-acoustic musical instrument, a small keyboard we now call the **Musical Telegraph**, at concerts in Highland Park, IL in 1874, and in New York and Washington in 1877. Electromagnets set metal reeds in motion, then telegraphed the polyphonic sound to any remote location.

Invented the **Telephone** in 1876 (even though, after years of litigation, it is Alexander G. Bell whose name we know rather than his).

Received an honorary MA degree from Oberlin in 1878, along with similar honors from other institutions, including the French Legion of Honor.

Taught electricity, telegraphy and their musical applications at Oberlin from 1880 to 1900. His title was **Honorary Professor of Dynamic Electricity**. (One could say he was Oberlin's first TIMARA professor.) Thaddeus Cahill OC '88, inventor of the behemoth 1897 electro-mechanical synthesizer called the Telharmonium, learned from him.

Developed and perfected in 1893 the world's first real-time FAX machine, the **Telautograph**, used in banks and hotels well into the 20th century.

Thanks to the efforts of a Barnesville admirer named Jack English, Gray was inducted into the National Inventors Hall of Fame for this in 2007.

Conceived of a method to transmit images by wire (a kind of proto-television), using Selenium cells. He called it the "telephote."

Gave generously of his earned wealth to Oberlin College.

Wrote three "pocket volumes" (like paperbacks) for the general reader on all aspects of the natural and physical sciences, titled ***Nature's Miracles.*** These volumes are available today online.

Perfected "submarine signaling," to transmit underwater the sound of a large bell activated by electromagnets for a distance of 12 miles to warn ships approaching the New England shore more effectively than a lighthouse or foghorn. His partner Arthur Mundy formed a company and implemented this system in several locations after Gray's death in 1901.

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Elisha Gray and Delia Shepard Gray first lived in Oberlin, then moved to Highland Park, Illinois. They had five children. One died in infancy; three attended Oberlin, as did several other descendants. The couple are buried together in Rosehill Cemetery, Chicago.

Gray's legacy lives on at the Smithsonian Institution in Washington, D.C. where most of his inventions and experimental devices, such as those pictured here, are held, along with a large paper collection.

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Exhibit curated and prepared, Spring 2018, by Roderic Knight, Oberlin College emeritus professor of ethnomusicology, with generous assistance from Harold Wallace, curator of the Electricity Collections, National Museum of American History.

To see the panels of the display, visit:
www2.oberlin.edu/faculty/rknight/Gray/Gray.html