Samuel Morse is an enigma. For the first three decades of his life, Morse showed little sign that he would invent a world-changing technology.

Born and raised in Massachusetts in the early days of the country, Morse graduated from Yale in 1810 at the ripe age of 19. While at that institution, he studied religion, mathematics and equestrian science. Thought he did not study electricity, he did attend lectures by the famous scientists Benjamin Silliman and Jeremiah Day.

He supported himself by working as a contract painter. This was before the day of the camera, so if one wanted an image of something, a human had to draw or paint it.

Young Samuel showed great promise as a painter. In fact, in 1811, his work caught the eye of Washington Allston, perhaps the most famous artist in the country at that time. Allston persuaded Morse study in Europe. Under careful tutelage, Morse's technique improved and he soon joined the Royal Academy.

Morse arrived in Britain just before the War of 1812 started and he found himself isolated from the United States until it was over. He returned to the US in 1815 where he quickly became a successful and in-demand painter.

Tragedy struck in 1825. Morse traveled from his home in New Haven to Washington DC to paint a commissioned portrait of Lafayette. One day, he received a letter from his father indicating that his wife was convalescent – or recovering from a serious illness. This was the first Samuel had learned of her illness.

The next day, he received a second missive from his father informing Samuel of his wife's passing and subsequent burial.

Morse was heartbroken. And he was frustrated at the slow communications of the day which had not given him the opportunity to return to his dying bride's side in time.

Starting in 1830, Morse returned to Europe for two years—learning new painting techniques and visiting Italy, France and Switzerland. It was on the return voyage in 1832 that his life took a dramatic turn.

Another passenger, a polymath named Charles Jackson, showed Morse how an electromagnet operated.

Morse quickly realized that a simple key switch could energize an electromagnet at a distance such that an observer could know whether the key switch was open or closed. He invented a way for the receiver to record the signal by making indentations in a paper tape. The tape could then be run through the system again to retransmit the message. The sound of the receiver was the now familiar click and clack noise.

Bur Morse took the idea one step farther. He realized that it was possible to transmit information through this simple on/off process. He soon had developed a code based upon short and long signals known as dot and dash. One feature of Morse Code is that the most common symbols are the shortest with the letter E being a single dot while the much less common letter P required five dots.

The combination of a simple keying system and a way to encode information was all that was required for the telegraph. There were other inventors pursuing similar ideas, but most were either complex (using perhaps one wire per letter) or suffered from other limitations.

As we will discuss in the talk about Tesla, direct current signals such as Morse's telegraph lose strength over long distances. There is a limit to how far the transmitter and receiver can be separated. In that day, the limit was about two miles. But the fact that the receive could automatically record the incoming message and that that same recording could be replayed down the line made it possible to send a message by stages over very long distances.

Morse also recognized that it was unnecessary to record and then replay the message—with the ensuing cost and delay. Instead, he used Henry's relay that he called a repeater to regenerate the signal. Suddenly, the signal could be sent long distances.

These two ways to forward the message along with the fact that his system required only a single wire made it ideally suited for cheap deployment around the world.

In 1851, his system was adopted throughout Europe, though Britain abstained because of a competing system developed by Cooke and Wheatstone.

In 1856, the first trans-atlantic cable was laid.

Morse, though a well-educated man, was not a master of the finer details of electricity even as they were known in his time. Morse was dependent upon others for their technical expertise and assistance. In some cases, Morse's ignorance resulted in expensive problems.

The basic telegraph design of Morse was simple and easy to understand. While he patented it, many competing telegraph designs were proposed. After the Morse telegraph became the standard technology, competitors simply ignored his patents. Morse was forced to spend much of his remaining life in court enforcing his patent rights.

Morse died in 1872 a wealthy but embittered man. By the time of his passing, US newspaper readers were better informed of European news than most Europeans. Major newspapers created ways to share articles around the world which made for lower cost and faster reporting. Today we still have these wire services such as the Associated Press and Reuters.

Several decades later, early radio was invented. Morse's code and system were adopted for early wireless telegraphy. In fact, the use of Morse Code for radio continued up until recent times, at least for amateur radio enthusiasts or hams.

Eventually, manual keying of characters would be replaced with mechanical signaling which enabled teletypes. This was a distant ancestor to the modern internt.

Today, we remember Samuel Morse for two things: his large body of artwork, mostly portaits, and his contribution to high speed communications. The telegraph was a wonder in its day, but it also pointed future inventors in fruitful directions which continue to improve our lives today.