



RTT TECHNOLOGY TOPIC July 2018

From Smoke to Smart Phones

It might seem ambitious to telescope (seeing at a distance) the history of telecommunication (communicating at a distance) into a thousand words but here we go.

The starting point can be taken as some time fairly soon after man discovered how to create and manage fire and smoke. Recent archaeological research has suggested this could have been as long as one million years ago – digital communication has been around a while.

<https://www.history.com/news/human-ancestors-tamed-fire-earlier-than-thought>

The use of smoke for the long distance signalling of alarm and opportunity becomes well evidenced some 4000 years ago in Ancient Greece and China and then documented being used by indigenous Indian tribes all the way through to the use of beacons by the Romans and Anglo Saxons. The election of a new Pope is still marked by white smoke.

Smoke signals can be considered as the immediate precursor of the semaphores used to crucial effect in the Napoleonic era, First and Second World Wars through to the present day use of semaphore in maritime signalling.

If something surprising happens unexpectedly and you don't have time to light a bonfire then long distance voice is an option. Cicero (106-43 BC) was one of the earliest exponents of voice projection; a skill that he realised would allow him to talk to his potential power base, the common people, at the back of the forum.

Voice projection is however not particularly useful in battle. Military communication needed something louder. Trumpets were one of the options used by the Greeks from around 400 BC; (trumpet contests were introduced into the Olympic Games in 396 BC). Herodorus of Megara (328-292 BC) and Diogenes of Ephesus (69-85 AD) were considered to be the champion players of their time. The instrument, known as the salpinx, when played by someone like Herodorus, a huge man capable of playing two trumpets at once, could cause severe concussion to anyone either wittingly or unwittingly close, as Virgil (79 BC-19BC) described it, '*breathing brass to kindle fierce alarms*'.

Quite when trumpets were first invented is open to debate but it will have been sometime during the bronze age which could have been as early as 3000 BC in China or 2300 BC in Europe. The use of drums for communication almost certainly started earlier and remained important on the battlefield until the early 20th Century. The conch shell, the digeridoo, the Alpine horn and the megaphone can similarly be cited as long distance communication tools.

The megaphone in turn was the precursor of the gramophone, enabled by the invention of the valve and audio amplification. It was audio amplification that enabled Hitler to stage the Nuremberg rallies, a key factor in the consolidation of his power base. Simple metal megaphones are still useful today and have the advantage of not needing any power other than a large amount of air. Similarly, speaking tubes, a form of guided media for voice, can still be found in some large naval vessels and submarines and the occasional shop.

Telegraphy and telephony

The big leap forward however is generally considered to be the first wireline telegraph in Baltimore in 1844, Mr Morse's eponymous coding scheme and the laying of international submarine cables from 1866 onwards which in turn became the direct precursor of modern long distance transatlantic fibre. The role of Mr Marconi in developing long distance wireless telegraphy was documented in our April Technology Topic (Beam Radio) and our heritage article, 100 Years of Radio.

http://www.rttonline.com/documents/marconi_fisk_heritage_article.pdf

In parallel Mr Bell and Mr Strowger had laid the technical foundation for wireline telephony, with Mr Fessenden doing something similar for wireless telephony. Sixty years on (the 1970's), wireline telephony started going digital and wireless telephony followed (the 1990's). Then in 2007 came the iPhone and the beginning of the era of the mass market smart phone.

From Telegraphy to Telephony to Telepathy –Knowing Networks - the next million years

The next chapter in this million year story could be assumed to be the evolution of networks that know what we want and need before we do. Google, Apple, Facebook, Amazon, Ten Cent and Ali Baba are the early precursors of this new age.

Technology transitions always have risks associated with them and can produce unexpected and sometimes unwanted outcomes but in general new technology should deliver net social, economic and cultural gain. It is of course the role of regulation to minimize the risks and maximise the gains. Over the next decades, centuries and millennia it is to be hoped that technology will remain a constant companion for human progress

On the other hand.....

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