

# CW WIRELESS HERITAGE SIG EVENT

‘The Politics of Technology, Then & Now’

15 April 2026

# WELCOME AND INTRODUCTION

LINDSAY BLISS

MEMBERSHIP SUCCESS MANAGER

CAMBRIDGE WIRELESS

# EVENTS & CONFERENCES

CW International Conference (CWIC)

30 April 2026

Registration 9am

Reception Drinks 5:30pm

From networks and devices to resilience and global trends.

If you want the broadest possible view of where the industry is heading, CWIC is the place to be.

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# EVENTS & CONFERENCES

CW Technology & Engineering Conference  
(CWTEC)

8 July 2026

Supply-chain challenges, UK capabilities, energy efficiency, and how silicon intersects with telco, quantum and emerging technologies.

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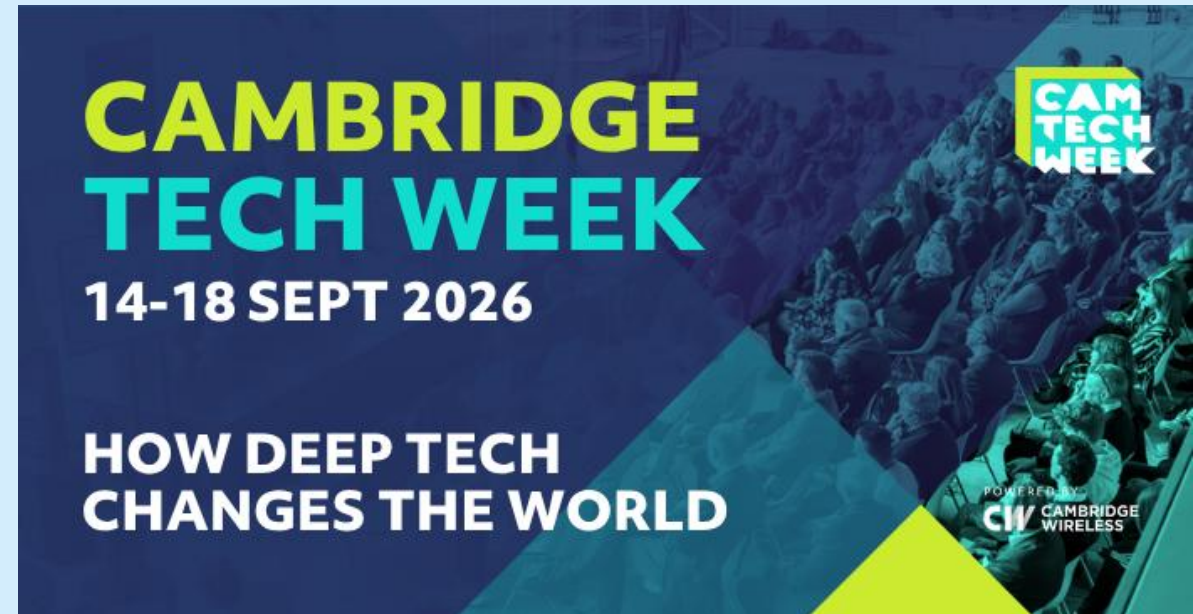


# EVENTS & CONFERENCES

Cambridge Tech Week (CamTechWeek)  
14 September 2026

Explore how deep tech shapes industry and society, from breakthrough research to real-world commercialisation

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# CW ACADEMY

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- **BRIDGE** any knowledge gaps
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**MWC 2027 March 1-4, 2027**

- **Use our stand as a central meeting point, with admission to the congress and on-stand branding;**
- **or take a space within our exhibition area, including a dedicated counter presence.**

**We'd love to hear if you're interested in collaborating with CW in this way.**

**If this sounds like a good fit, please email Emma Dexter before the end of April to express your interest.**

**[emma.dexter@cambridgewireless.co.uk](mailto:emma.dexter@cambridgewireless.co.uk)**

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# Member Exclusive

## International Trade Mission

Invite to travel to Serbia on the 5 June  
to meet the West Balkan ecosystem

please email Emma Dexter to express your  
interest.

[emma.dexter@cambridgewireless.co.uk](mailto:emma.dexter@cambridgewireless.co.uk)

# CW WIRELESS HERITAGE SIG EVENT

‘The Politics of Technology, Then & Now’

15 April 2026

# Chair for the event

**The Politics of  
Technology, Then &  
Now**

**15 April 2026**



Stirling Essex

Espansivo

CW SIG Champion

# **The Politics of Technology, Then & Now**

**15 April 2026**

- No planned fire drill – assemble in car park
- Please switch your phones onto silent whilst in session
- A PDF of the presentations will be available with permissions of the speaker



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# Wireless Heritage SIG

This SIG aims to develop existing contacts with museums & organisations with an interest in telecoms and wireless history. Their remit is to organise events that reference past experience in a contemporary context.

# SIG Champions



**Stirling Essex**  
Director  
Espansivo



**Geoff Varrall**  
Director  
RTT Online



**Nigel Wall**

# Agenda

## The Politics of Technology, Then & Now

**15 April 2026**

**15:40 Stephen Unger, Former Chairman of the CW Board of Directors**

**'The Politics of Technology, Then & Now'**

**16:50** Q&A with the audience

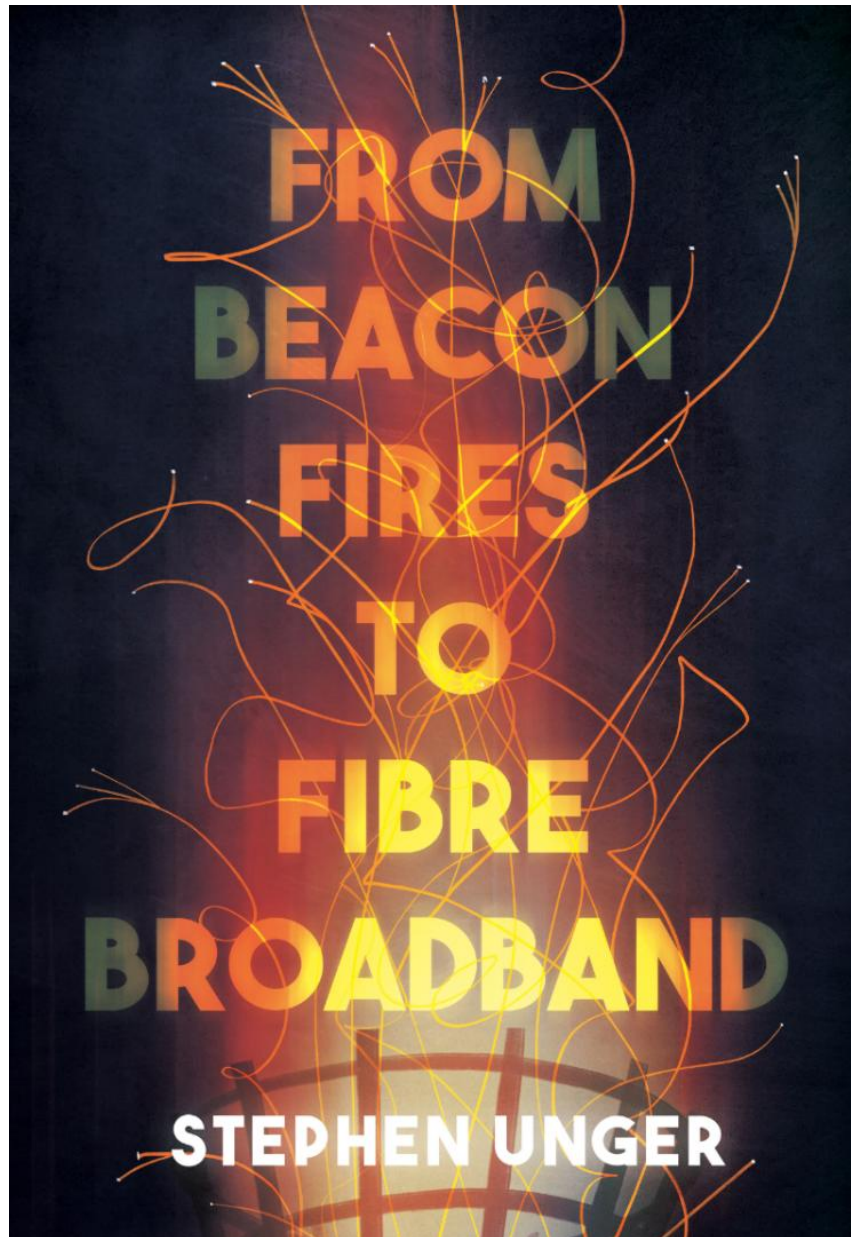
**17:10** Event ends

# The Politics of Technology, Then & Now



Stephen Unger,  
Former Chairman, CW Board of  
Directors

# The Politics of Technology, Then and Now



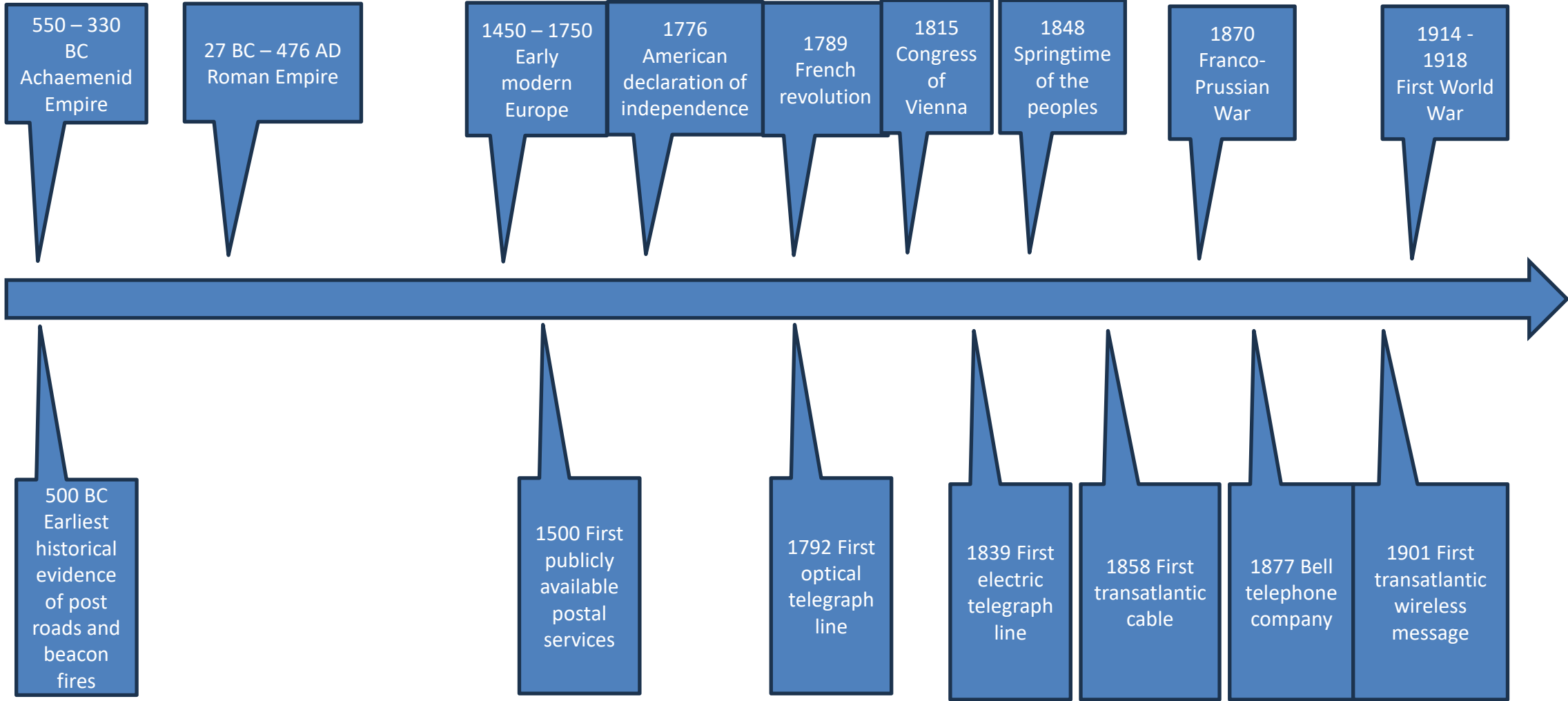
## FROM BEACON FIRES TO FIBRE BROADBAND

A history of innovation, enterprise and regulation

Those that fail to  
learn from history  
are doomed to  
repeat it

History doesn't  
repeat itself, but it  
often rhymes

# High-level timeline



# The Achaemenid Empire (550–330 BC)

## The Persian Royal Road

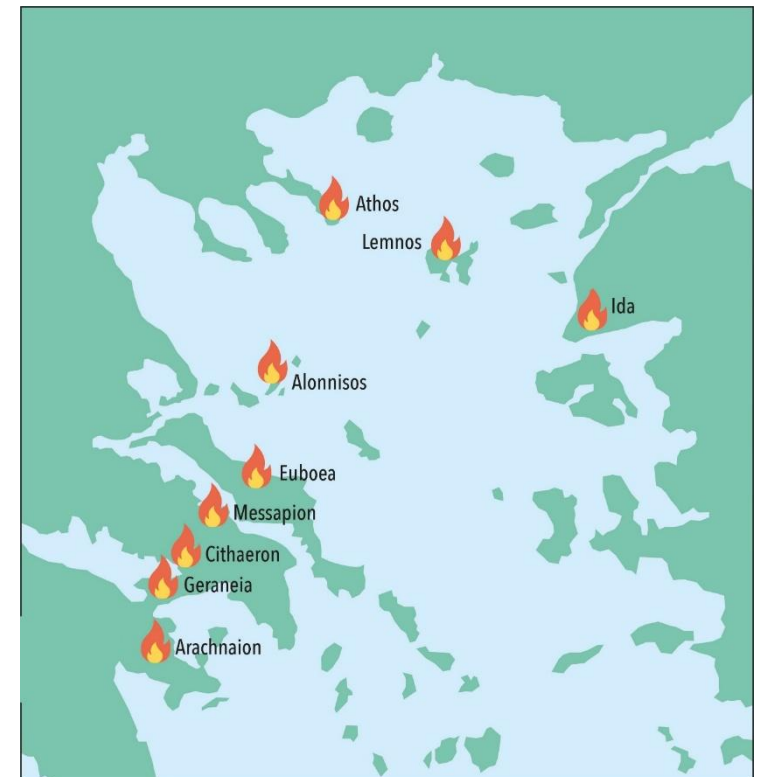
The Greek historian Herodotus described this ancient post road, which ran from Sardis to Susa. It was divided into 111 stages, with 'exceeding good hostelries' for use by messengers. Note that although Herodotus was particularly interested in this road, it probably formed part of a larger system of imperial roads.

Herodotus described these messengers using language so vivid that it became the informal motto of the USPS:

"Neither snow nor rain nor heat nor gloom of night stays these couriers from the swift completion of their appointed rounds"

## Beacon fires as military signals

Herodotus's histories covered many topics but paid particular attention to the Greco-Persian wars (499 to 449 BC). 480 BC was a low point for the Greeks, when Xerxes defeated them at the Battle of Thermopylae, and went on to sack Athens. Herodotus describes how, on his return to Sardis, Xerxes used a 'line of beacons across the islands' to communicate with his army.



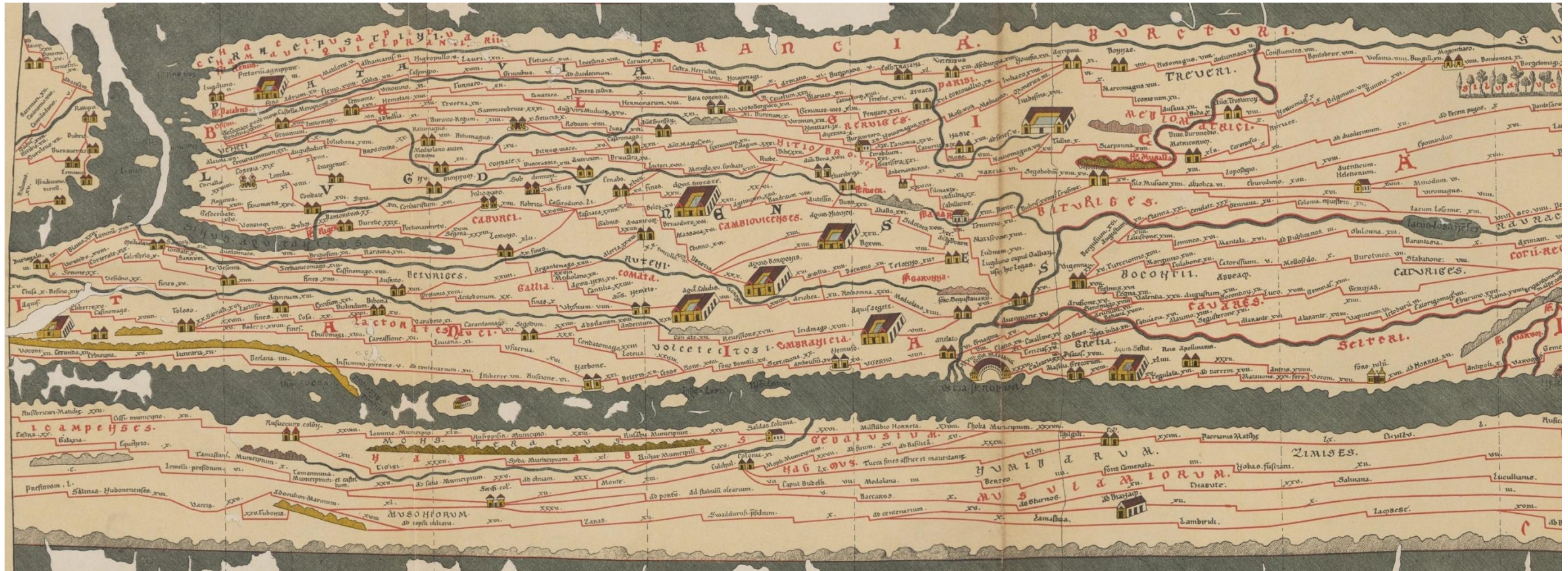
# The Roman Empire (27 BC – 476 AD)

## The Cursus Publicus

From around 300 BC onwards, the famous Roman road system facilitated troop movements and trade. Emperor Augustus (27 BC – 14 AD) added a network of roadside stations, where messengers on official business could rest and requisition transport. The result was an extensive system of post roads, which became known as the 'Cursus Publicus'.

“To enable what was going on in each of the provinces to be reported and known more speedily and promptly, he [Augustus] at first stationed young men at short intervals along the military roads, and afterwards vehicles. The latter has seemed the more convenient arrangement, since the same men who bring the dispatches from any place can, if occasion demands, be questioned as well.

Suetonius, The Lives of the Caesars, Augustus, Ch. 49.3



# Tudor England (1485– 1603)

## Post Roads

Henry VIII (1509 – 1547) appointed Sir Brian Tuke to be England’s first “Master of the Posts” around 1512. Tuke described the task he’d been given:

‘... the King’s pleasure is, that posts be better appointed, and laid in all places most expedient; with commandment to all townships in all places, on pain of life, to be in such readiness, and to make such provision of horses, at all times, as no tract or loss of time be had in that behalf’



During the first half of the 16<sup>th</sup> century, permanent posts were laid on two strategically important routes - the Dover Road and the Great North Road to the border with Scotland.

Elizabeth I (1558 – 1603) added three further post roads – to Plymouth, South Wales, and North Wales. The security of the realm was the primary consideration, and the network bypassed many important towns.

Most posts were in inns, with the innkeepers serving as postmasters.



# Tudor England (1485– 1603)

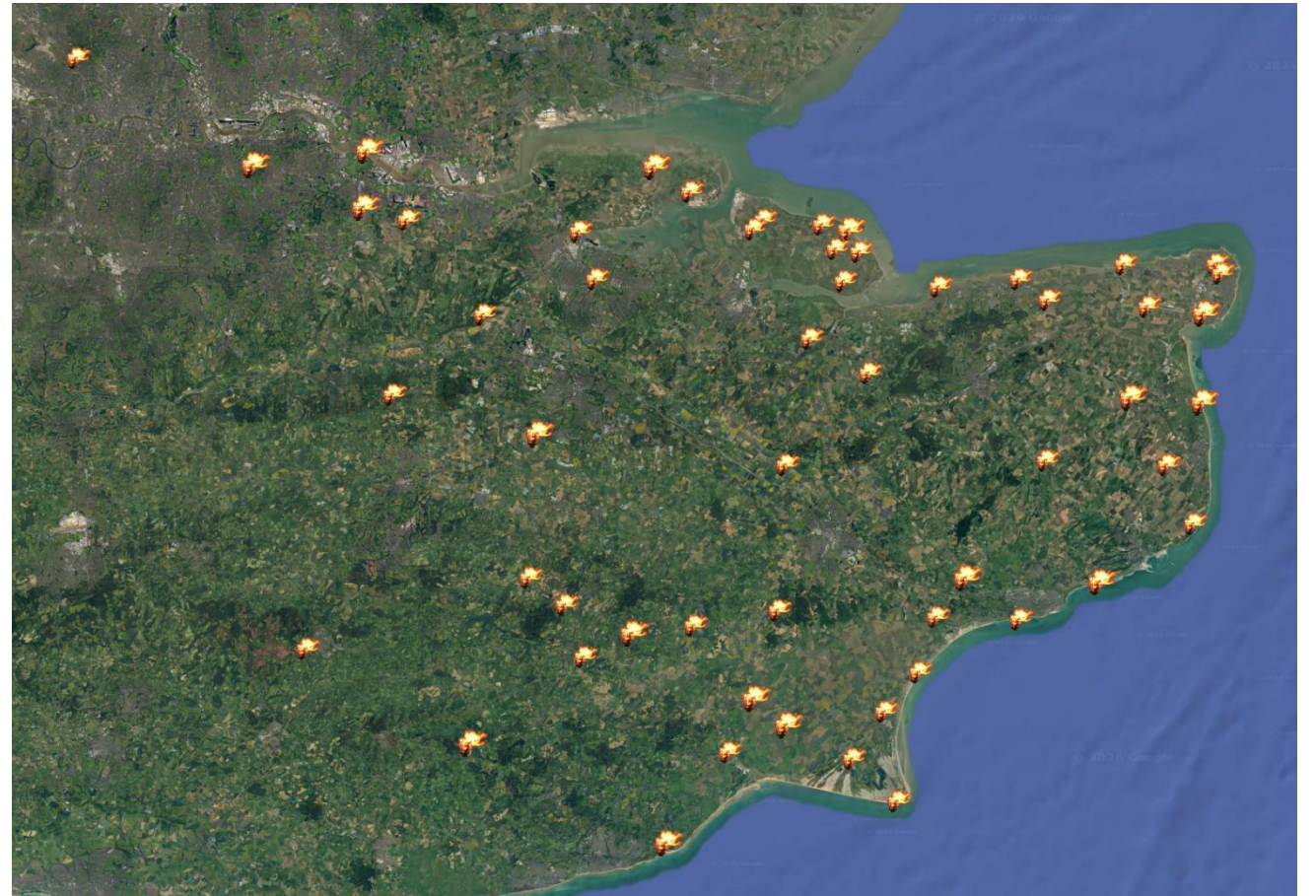
## Beacon Fires

From the early 14th century until the middle of the 17th century a network of beacon fires was used to muster defenders in response to attacks from the sea.

The beacons were tall oak posts topped by an iron brazier, which contained a flammable material such as pitch. Many such beacons are still scattered around the English countryside, and they are occasionally lit to mark major national events.



In 1596, William Lambarde published *Perambulation of Kent*, the first guidebook for an English county. He included a map showing the network of fire beacons that stretched from the Kentish coast to London, as well as the sightlines between different pairs of beacons. Defenders were expected to muster at the lit beacon closest to them and then travel from beacon to beacon along the sightlines until they reached the source of danger.



In 1588, the Spanish Armada sailed up the English Channel in preparation for an invasion of England. The poet and historian Thomas Babington Macaulay described the beacons that were lit along the English coastline to sound the alarm:

“For swift to east and swift to west the ghastly war-flame spread.  
High on St. Michael’s Mount it shone; it shone on Beachy Head  
Far on the deep the Spaniard saw, along each southern shire,  
Cape beyond cape, in endless range, those twinkling points of fire.”

# Communications as a service

The communications networks in 16<sup>th</sup> century Europe used the same basic technologies – post roads and fire beacons – as had been used by the Achaemenid empire 2,000 years earlier. What was new was a gradual increase in the volume of private correspondence carried by the state posts, culminating in the creation of the first publicly available communications services. This was driven by two considerations – the additional revenue generated by private correspondence, and the intelligence that could be gained by intercepting it.

## The House of Thurn und Taxis

The most significant postal service in early modern Europe was that provided by the House of Thurn and Taxis to the Hapsburg monarchs. The service emerged from about 1490 onwards and covered much of continental Europe.

The demand for the service arose from the extensive but fragmented nature of the Habsburg's holdings. The dominions of Charles V, for example, included parts of Austria, Spain, Italy, and the Netherlands. The Taxis family was well placed to meet this demand, as they had already been responsible for a courier service between Italian city states.

A series of treaties between the Habsburg monarchs and the Taxis family gave them the power to create a postal network across much of Europe, gave them a monopoly over postal services, and even specified how long it should take to carry a letter between various cities. Moreover, the Taxis family was rewarded with a grant of nobility, becoming the House of Thurn und Taxis.

## Tudor and Stuart England

The volume of private correspondence carried by the state post gradually increased during the 16<sup>th</sup> century. In 1583, a royal proclamation formalized this service by setting a price for it:

“The post shall receive the sum of three halfpence per mile when riding on her majesty's service, and twopence per mile when otherwise engaged”

The 1586 Babington Plot illustrated the value of state access to private correspondence. The conspirators planned to assassinate Queen Elizabeth and place Mary Queen of Scots on the throne. An intercepted and decrypted letter proved Mary's complicity and led to her execution.

In 1591, Elizabeth issued a royal proclamation creating a state monopoly over international letters:

“We do hereby straightly prohibit and forbid all persons whatsoever, directly or indirectly, to gather up, receive, bring in, or carry out of this realm any letters or packets without the allowance or ordinary address and dispatch of the said masters and comptrollers of the posts...”

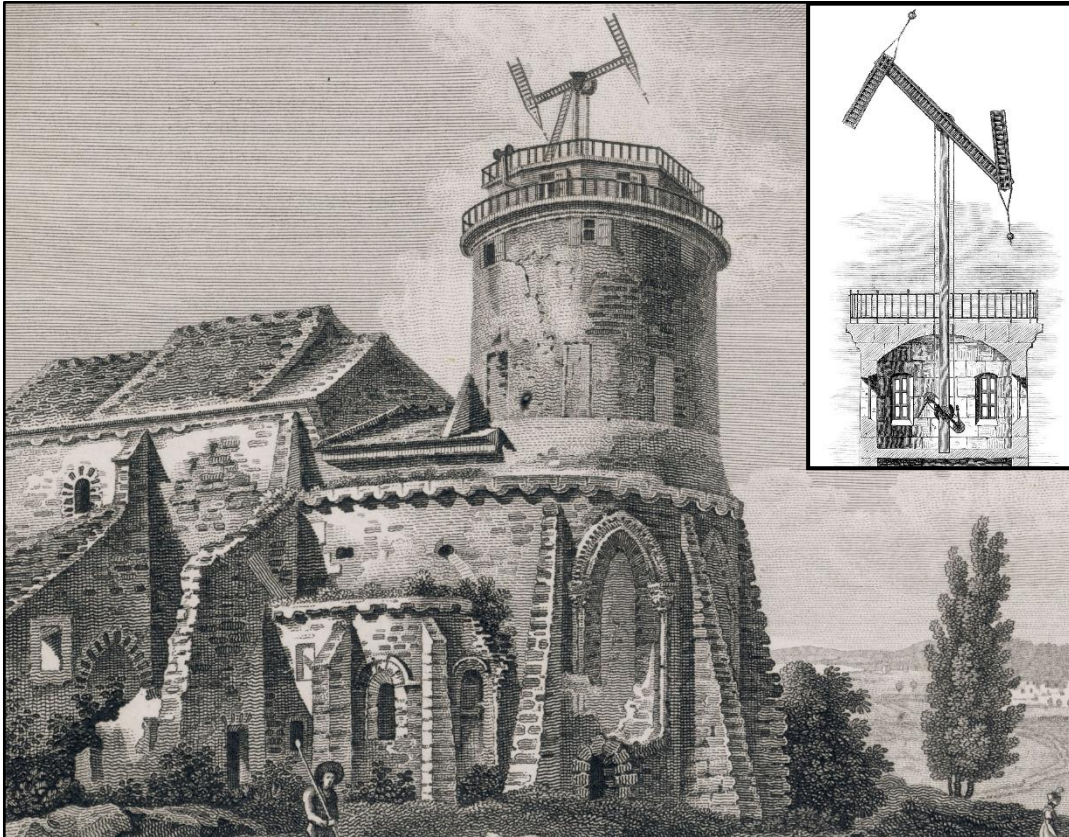
In 1635, Charles issued a royal proclamation which authorized ‘the Settling of the Letter Office of England and Scotland’. This is often regarded as the founding date of the Royal Mail.

# The birth of telecommunications

The invention of the telescope made it possible to view complex visual signals over long distances. By the latter part of the 17<sup>th</sup> century, handheld telescopes with good image quality were widely available. Various designs of optical telegraph soon followed, divided into two broad categories - semaphores and shutters. Telegraph lines were made up of a series of telegraph stations, arranged so that signals could pass from one station to the next until they reached their destination.

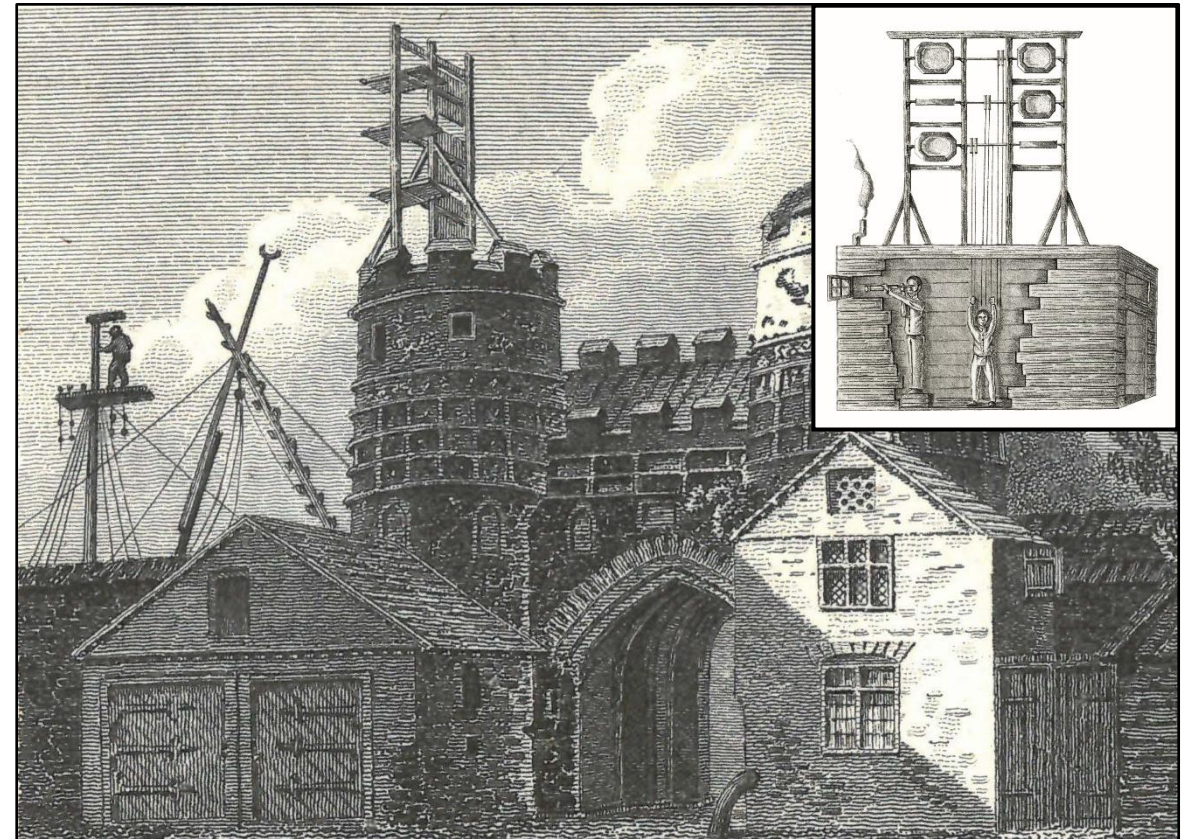
## 1792: Claude Chappe creates the first telegraph network

Chappe's telegraph had three semaphore arms, one primary arm attached to a mast, and two secondary arms. Different configurations of the arms represented different numeric codes, so code books could be used to translate a sequence of signals into a message.



## 1796: The English Admiralty responds with a shutter telegraph

The Admiralty telegraph used an array of six shutters to transmit what was effectively a simple binary code. Each code was associated with a different letter of the alphabet, so a message could be sent by spelling it out. The system was simpler than that used in France, but less efficient, and less secure.



# A truly disruptive innovation

Before the optical telegraph, it was possible to send extremely simple messages using beacon fires, but any more complex message had to be carried by messengers - and could take weeks or even months to reach their destination. The optical telegraph transformed the way we communicate. For the first time, complex messages could travel hundreds of miles in just a few minutes, a death of distance that pervaded contemporary reports of the new technology.

France's first telegraph message was sent over the Paris–Lille line in August 1794, carrying the news that French troops had recaptured the town of Le Quosnoy from the Austrians. The news reached Paris within the hour. Bertrand Barère, a prominent member of the Committee of Public Safety, explained how this feat had been achieved:

“An ingenious means has been invented to transmit thought by a special language which, repeating step by step, between machines separated by 4 to 5 leagues and which arrived in a few minutes, over great distances, does honour to this age of enlightenment”

Britain's first telegraph line, from London to Deal, was commissioned in January 1796. One of the first messages sent over the line informed the Admiralty that the Dutch fleet was coming out to sea. Newspaper reports noted the speed with which this message was sent:

“The celerity of the communication was quick beyond example; the news of the sailing of the enemy was known in Deal about 32 hours after, and it was only four minutes and a half in reaching the Admiralty”

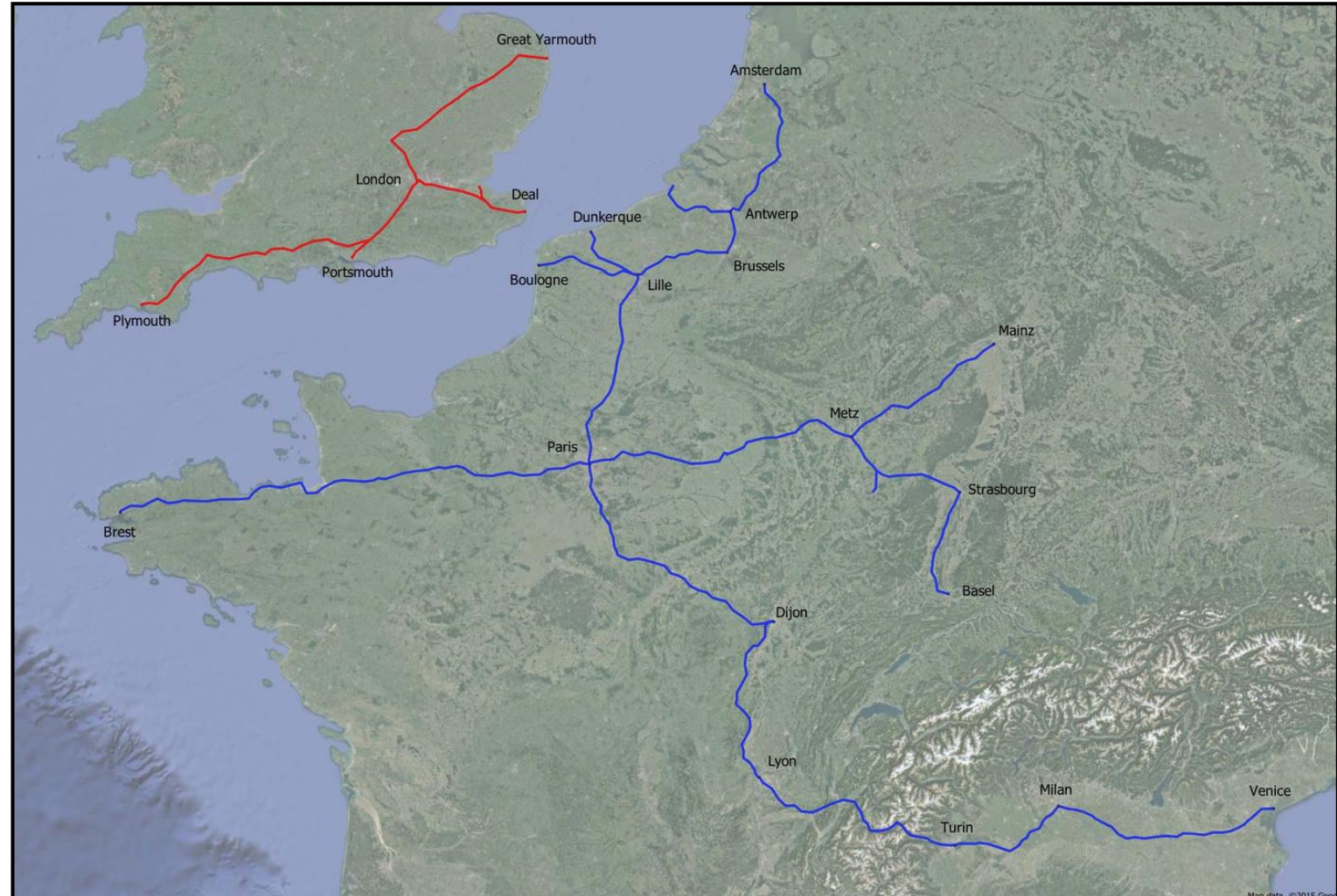
As for the bandwidth supported by optical telegraph networks, we know that the semaphore system used in France could send about three signals every minute. Each signal carried a significant amount of information, so, when used with an efficient set of codes, the system had an effective bandwidth of 10 to 20 bits per minute. This was much less than the bandwidth supported by later generations of technology, but more than sufficient for optical telegraphs to be justly described as the first true telecommunications networks.

# The Revolutionary and Napoleonic Wars

The invention of the optical telegraph coincided with the outbreak of war across Europe. The Revolutionary and Napoleonic Wars lasted from 1792 to 1815, during which time a series of different coalitions fought against France. The major European powers who participated in these coalitions were Great Britain, Russia, Austria, and Prussia – though only Great Britain participated in all the coalitions against France. The military priorities of the warring states drove the creation of the first telegraph networks.

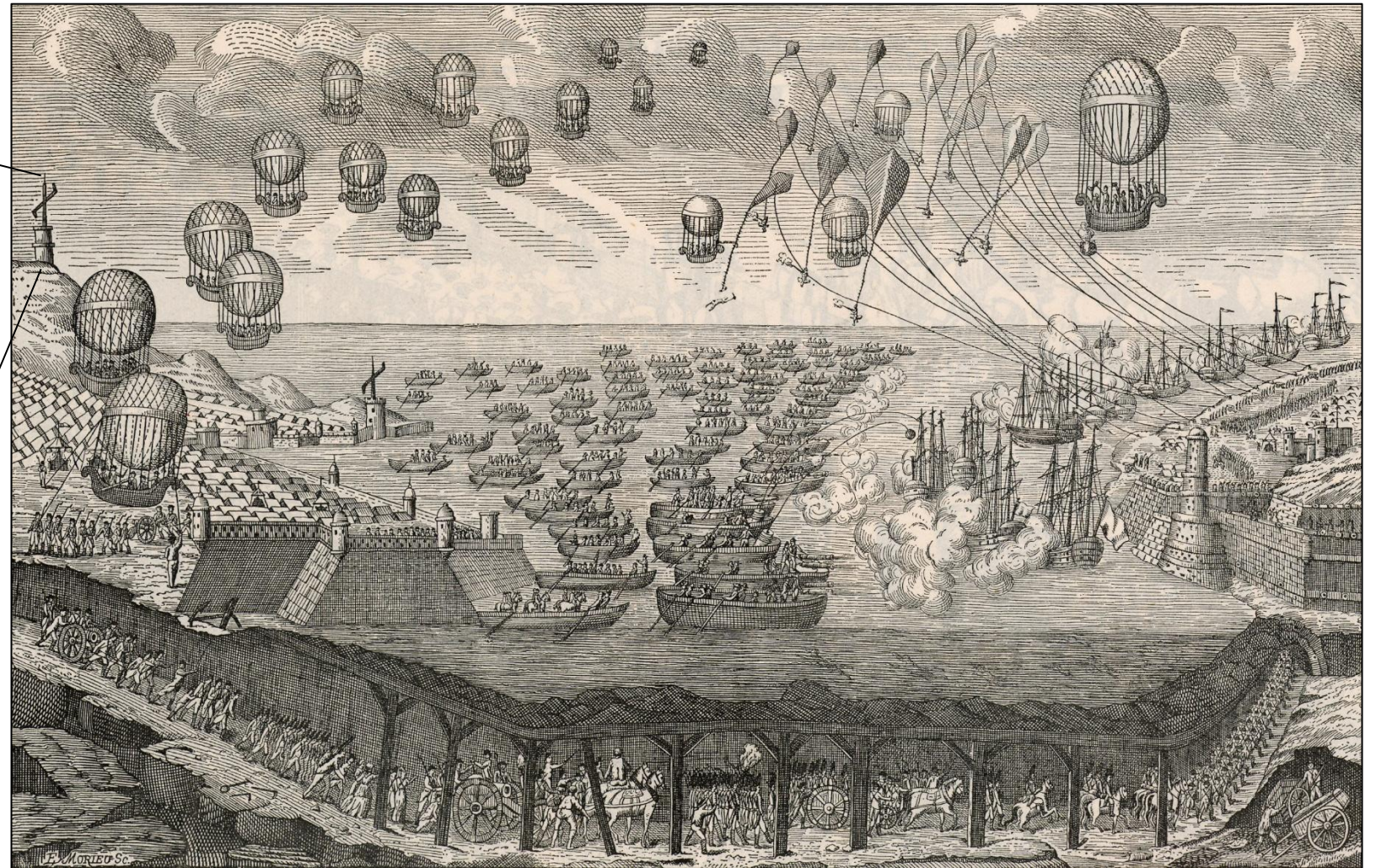
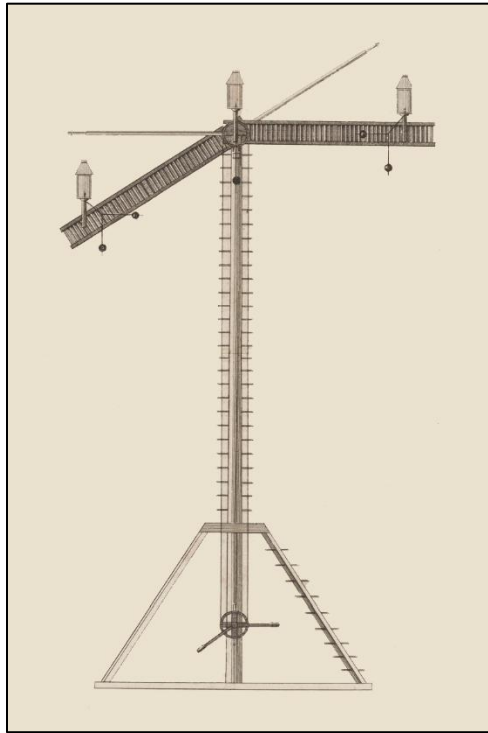
Napoleon used the optical telegraph to bind together his expanding empire. At its peak, the telegraph network connected Paris to Amsterdam, Brussels, Milan and Venice

The English Admiralty used the optical telegraph to coordinate action by the Royal Navy. Its telegraph network connected London to the naval bases at Deal, Portsmouth, Plymouth, and Great Yarmouth.



# Napoleon's plans to invade England

Between 1803 and 1805, Britain was at war with France, and the other major European powers remained neutral. Napoleon assembled an army at Boulogne and prepared to invade Britain. To coordinate the invasion, he commissioned the construction of an optical telegraph with semaphore arms large enough to be visible across the English Channel. The invasion never happened, as by mid-1805 Napoleon was at war with a new coalition of European powers. An imaginative contemporary cartoon depicts what might have been...



# The Concert of Europe

After the fall of Napoleon, the Congress of Vienna redrew the map of Europe. It established a period of relative stability between the major powers of Europe (Austria, France, Prussia, Russia, United Kingdom), sometime described as the 'Concert of Europe'. The optical telegraph networks operated by these states adapted to this new reality.

France gave up the territory it had conquered and shut down those telegraph lines that extended beyond its new borders. Those telegraph lines that remained took on a new role, facilitating public administration. The government constructed several new lines, especially in the south of the country.

Britain shut down its shutter telegraph network, which had only ever been seen as a temporary system. It was now emerging as the principal global power of the 19<sup>th</sup> century, based on the strength of its navy. So, the Admiralty created a new a more permanent telegraph line between London and Portsmouth, then and now the principal base of the Royal Navy.

The Congress of Vienna gave Prussia extensive new territories in the Rhineland, on the northeastern border of France. This was in the hope that it would be able to contain any future threat from France. The new territories were far to the west of Berlin, the administrative capital of Prussia. So, the government created a telegraph line between them.



# The first state monopoly

The development of the French state telegraph network was frequently held back by a lack of money. Claude Chappe made several proposals to generate commercial revenues, but the only one that the government accepted was to distribute the national lottery results.

Several entrepreneurs tried to exploit the gap in the market that this created. Notably, Alexandre Ferrier proposed to extend the state-owned line from Paris to Calais, to create a direct connection between Paris and London. His initial venture was a commercial telegraph line between Paris and Rouen, which started operating in July 1833.

The government opposed all commercial telegraphs, arguing that they would 'infringe the privilege which the government possesses today to be the first to hear all important news'. It announced that it would use all legal means to block Ferrier, and that it would introduce new legislation to outlaw commercial telegraphs. The campaign was successful, and Ferrier's service was forced out of business.

The failure of Ferrier's business meant that there was no immediate need for legislation, but it soon resurfaced. This time, the trigger was the first ever case of wire fraud.

Between 1834 and 1836, François and Louis Blanc made money on the Bordeaux Stock Exchange by gaining early access to prices on the Paris Exchange. They did so by bribing operators of the state telegraph to introduce a specific pattern of errors into the transmissions. They were arrested but successfully argued that they had broken no law.

In response, the French government drafted a law that would create a statutory monopoly over telegraphy. But the minister who introduced this legislation to parliament went well beyond its original justification. He had been responsible for suppressing the 1834 'Canut revolts' and argued that the power of the telegraph was too great to be available to dissenting citizens:

"No-one can ignore the immense service that at all times, but above all in times of unrest and riots, the telegraph provides to the Government... it is fair to say that victory would have been more dearly bought if our enemies had in their power the weapons that we want to remove from them forever"

The proposal was agreed by large majorities in both houses of the French Parliament and became law in May 1837. The law stated:

"Anyone performing unauthorised transmissions of signals from one place to another, with the aid of telegraphic machines or by any other means, will be punished with an imprisonment of one month to one year, and a fine of 1,000 to 10,000 Francs"

Thus, it created a state monopoly that was to last for most of the next 150 years. There was a brief period during the 1880s when the French state allowed private telephone companies to operate. Otherwise, it was not until the end of the 20th century that the state monopoly over telecommunications was dismantled

# The first commercial networks

While France responded to the optical telegraph by creating a state monopoly, both Britain and America allowed the development of commercial networks.

## 1801: Jonathan Grout becomes the world's first telecoms entrepreneur

The first commercial telegraph service anywhere in the world was launched in 1801 in Boston. A local lawyer, Jonathan Grout, posted a lookout for ships passing the island of Martha's Vineyard. He then used a telegraph line to send news of their arrival to anyone in Boston who was willing to pay for this intelligence. He advertised his service in the local press:

“All persons who may wish to obtain by the Telegraphe, or by the Telegraphe and by the Mail, first intelligence of arrivals at the Vineyard or of arrivals at foreign ports – or who may wish to pass orders directing a vessel at the Vineyard to sail from thence to any particular port – or to wait there for further orders – or who may wish to learn the contents of a cargo – or whether a friend is on board of a particular vessel, &c &c. may be accommodated”

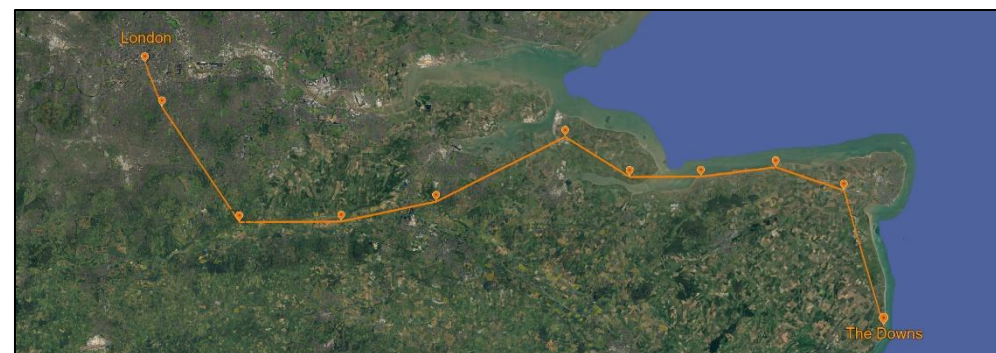
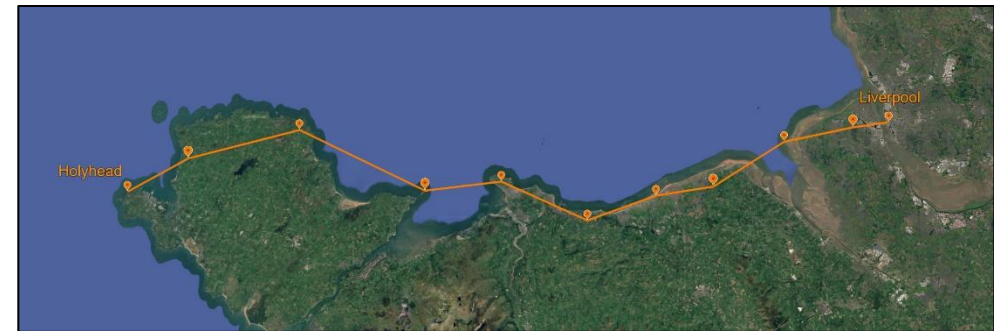
Grout obtained a patent for his design of telegraph in October 1800. However, while the record of the patent has survived, the patent itself was destroyed in a fire, so no information remains as to the design of Grout's system. All that does remain is a series of hills along the route of the telegraph line, seven of which are called 'Telegraph Hill'

Grout's venture was not commercially successful, and it ceased operating in April 1807. But other more successful ventures followed. Notably, John Lowe Parker created a telegraph which, between 1824 and 1834, announced the arrival of 13,725 ships to the citizens of Boston.

## 1827: Barnard Lindsay Watson becomes Britains first telecoms entrepreneur

Watson was born in 1797 and joined the Oxfordshire Militia, becoming a lieutenant in 1820. By September 1825, he was promoting the construction of a telegraph line from London to Manchester, on behalf of the grandly named Imperial Telegraphic Company.

- In 1827 he built Britain's first commercial telegraph line, from Holyhead to Liverpool, to provide early news of incoming ships.
- In 1841 he created Watson's General Telegraph Association, to build a telegraph line from London to the coast of Kent.



# The birth of electronic communications

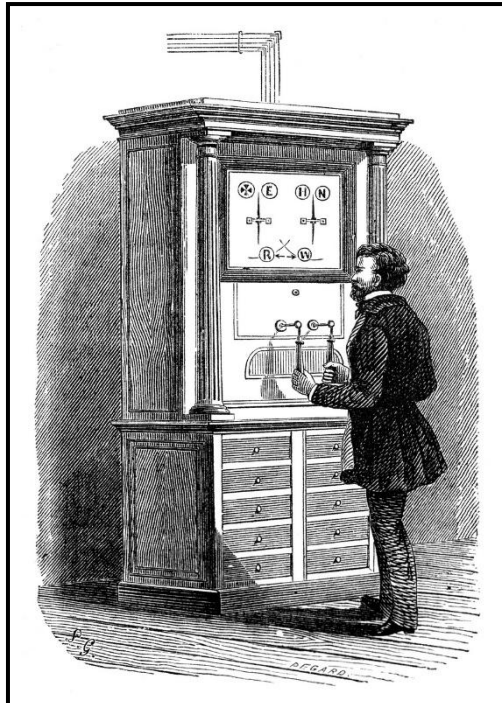
The invention of the galvanometer made it possible to view variations in an electric current, leading Ampère to suggest that the deflection of a galvanometer needle could be used to transmit information. Various designs of ‘needle telegraph’ followed, the most successful being that developed by William Fothergill Cooke and Charles Wheatstone. Meanwhile, Samuel Morse developed an alternative approach, which turned pulses of electric current into marks on paper tape.

## 1839: The world’s first telegraph line

Cooke and Wheatstone patented their design of ‘needle telegraph’ in December 1837. Their invention coincided with a once-in-a-lifetime commercial opportunity, the creation of a national railway network, and the associated need for signalling systems. They exploited this opportunity through partnerships with two of the greatest railway engineers of the age, Robert Stephenson and Isambard Kingdom Brunel. The world’s first electric telegraph line ran alongside Brunel’s Great Western Railway.

The electric telegraph fascinated Charles Dickens, who wrote:

“The mystery, then – the secret of the electric telegraph – is simply this. Two handles serve to break and to re-unite the current of the Electric Spirit; each breakage causes a needle, swinging above the handles, to move. Another similar needle, miles away, moves at the same instant, in the same way. Different amounts of motion of this needle are understood to indicate certain letters; and thus the telegraph people talk to one another, by spelling what they have to say, letter by letter.”



## 1865: The first global standard for network interconnection

Samuel Morse patented his design of telegraph instrument in June 1840. Unfortunately, the ‘Railroad Boom’ in the United States peaked several years later than ‘Railway Mania’ in the United Kingdom, so Morse was unable to exploit the commercial opportunity offered by railway signalling.

In any case, Morse believed that his invention should be controlled by the state, rather than by private companies, and he persuaded Congress to fund a demonstration line. Lawmakers were won over by the apparent superiority of Morse’s system to that which was being deployed in England:

“If a system more complicated and less efficient than the American telegraph is operated for great distances in England, with such eminent success and advantage, there can be no reasonable doubt that, if the means be furnished for putting in operation the system of Professor Samuel F. B. Morse, of New York, the original inventor of the electro-magnetic telegraph, the same, if not greater success, will be the result”

The demonstration line ran from Washington to Baltimore, and it started operating in May 1844. Subsequent lines were funded commercially, and Morse’s system proved to be a great success. In 1865, when delegates to the first meeting of the International Telegraph Union signed the first International Telegraph Convention, they adopted a version of Morse code as the first international standard for network interconnection.

# The springtime of the peoples

In 1848, shortly after the invention of the electric telegraph, a wave of revolutions spread across Europe. Details varied, but common goals included a reduction in the power wielded by European monarchies, and a corresponding increase in the rights held by ordinary citizens. Few of the revolutions succeeded, but they did shape the political environment from which the first telegraph networks emerged.

## France

In February 1848, a popular uprising forced the abdication of King Louis-Philippe, who was to be the last King of France. The Second French Republic was created shortly thereafter but lasted only a few brief years. In December 1851, Louis-Napoléon Bonaparte staged a coup, proclaiming himself Napoleon III, ruler of the Second French Empire. A telegraph line had been laid in 1847, between Paris and Lille, but no new telegraph lines were created during the period of political turmoil.

After 1852, Napoleon III was keen to modernise the French economy. Achievements ranged from the rebuilding of Paris, to the creation of a national railway network, plus of course a national telegraph network. The minister responsible for this programme emphasised its urgency:

“It was when the optical telegraph became inadequate that the electric telegraph was invented. This admirable discovery, which places unprecedented speed at the service of human thought, and which is the essential companion of the railways, had a very slow start in France.”

## Prussia

In March 1848, fighting on the barricades in Berlin forced King Frederick William IV to commit to a process of German unification. Elections were held for an all-German assembly, to be based in Frankfurt.

The government in Berlin wanted to stay in touch with the political negotiations in Frankfurt, even though the king subsequently refused to accept the recommendations that emerged from them. Thus, the first state telegraph line connected Frankfurt to Berlin, becoming operational in 1849.

The construction of this line provided an engineer called Werner Siemens with the opportunity to show what he could do. He had just founded the company which still bears his name today, and his first major contract was the line to Frankfurt.

The Prussian telegraph network went on to play a major role in the Franco-Prussian war of 1870. France initiated this war, but the effective use by Prussia of its railway and telegraph networks allowed it to mobilise its troops more rapidly and win a series of victories.

## Great Britain

In April 1848, the Chartist movement held a major demonstration in London, and petitioned Parliament for voting rights to be extended beyond property owners.

The Electric Telegraph Company had just been created, in June 1846, to exploit the patents held by Cooke and Wheatstone. The comparative permissiveness of the British state contrasted sharply with developments elsewhere in Europe – it was not until 1850 that private citizens in France and Prussia were even permitted to make use of the state telegraph network, let alone construct their own network.

That said, the British government was worried about the threat that telegraph networks might create to public order. So, the legislation that created the Electric Telegraph Company did give the government the power to take over its operations, stating:

“Emergencies may arise in which it may be expedient for the public service that the entire control over the operations of the company and the conveyance of signals shall be vested in Her Majesty’s Government”

Thus, the government was able to respond to the Chartists by taking control of the Electric Telegraph Company, and denying its services to the general public

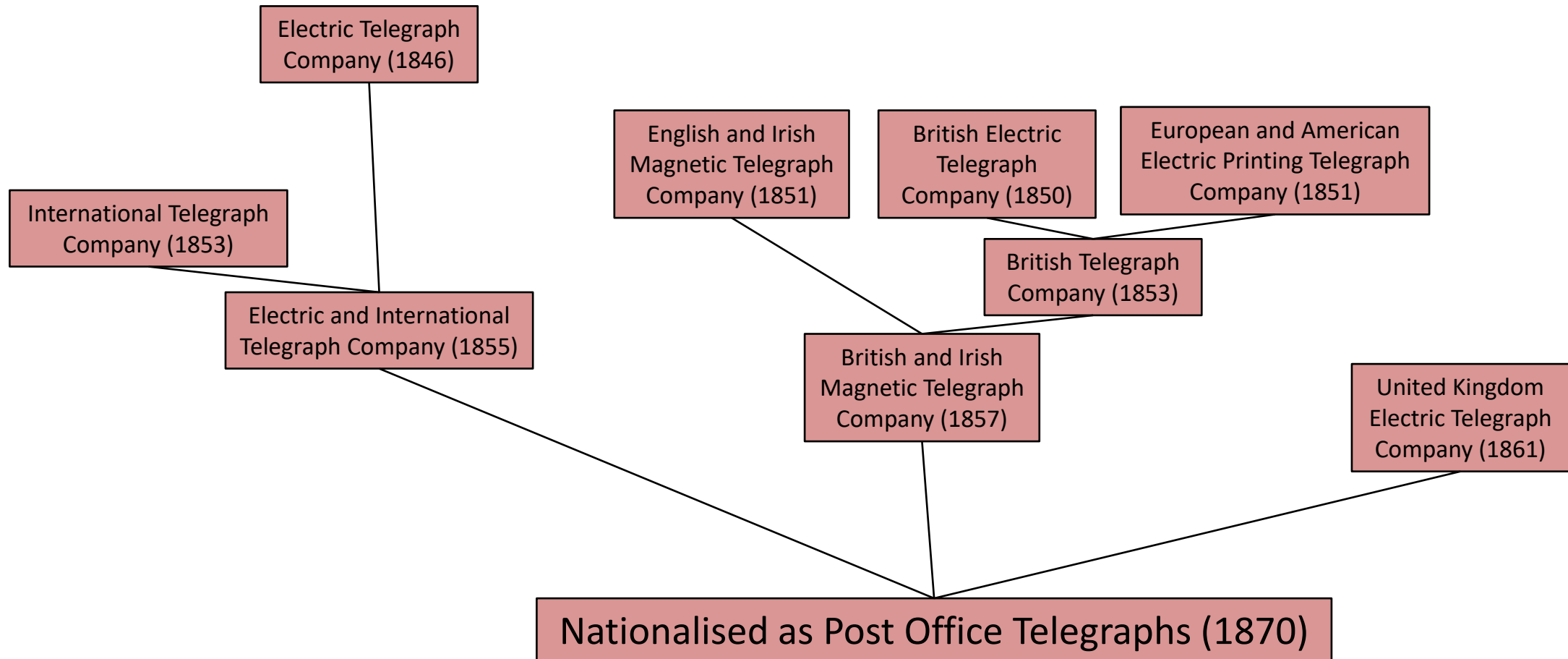
# The Victorian altnet boom

The permissive approach of the British government made possible an early experiment in network competition. Until 1851, the Electric Telegraph Company was protected from competition by its patents. Once the patents expired, Britain experienced its first altnet boom.

As always, altnets struggled to get the authorization required to lay wires – especially as incumbent telegraph companies had the exclusive right to lay wires along railway tracks. The 1863 Telegraph Act gave them the right to lay wires along roads.

By the mid-1860s, three national networks had emerged. However, although there were periods of genuine competition, for the most part the networks operated as a cartel. And this was before competition law might have provided a response.

The government responded by nationalizing the telegraph companies. However, it was forced to pay a high price for the companies, to buy them off. That high price led the government to create a statutory monopoly over telegraphy, to protect its investment.



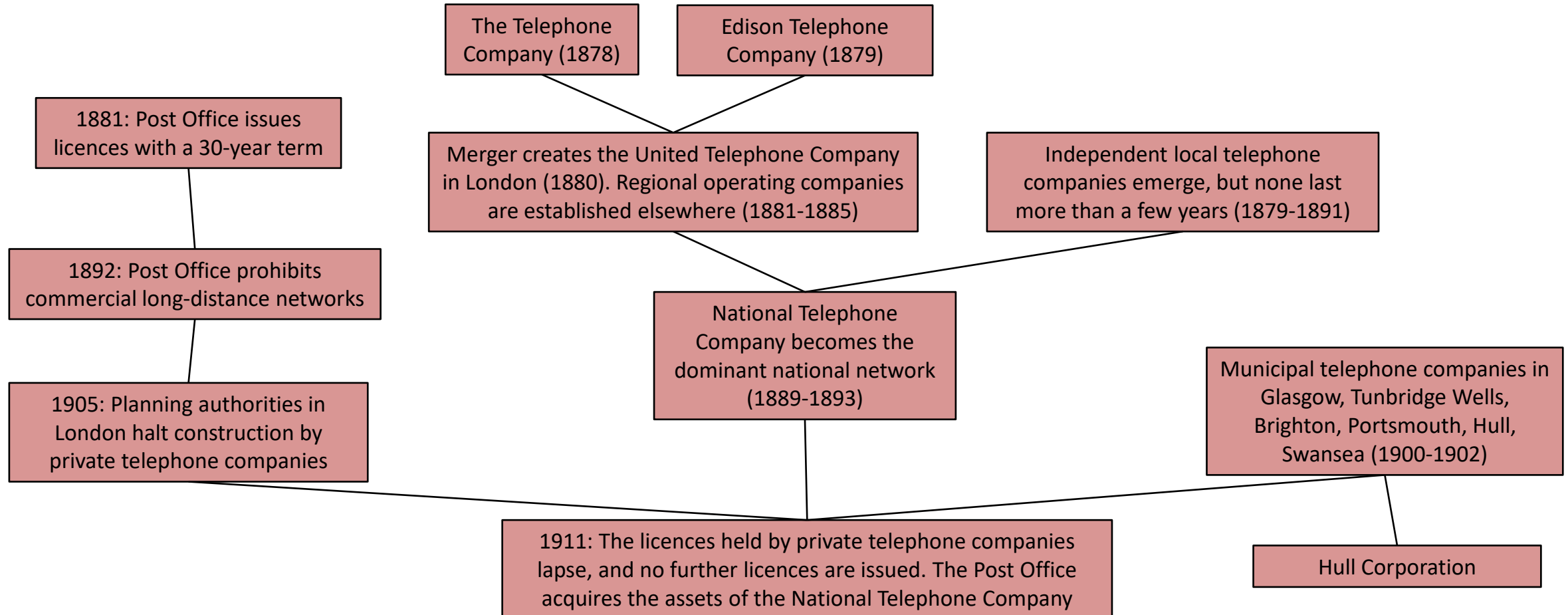
# The telephone as collateral damage

The Post Office was sceptical about the value of the telephone but decided to control its development, to protect its telegraphy revenues. It was able to do so thanks to a legal judgement that the telephone was a type of telegraph, so within scope of its existing monopoly.

The Post Office licenced private telephone companies to operate, but with onerous licence conditions. The companies had to pay 10% of their revenues to the Post Office and were not permitted to offer services that might compete with telegraphy.

Perversely, the main effect of the licencing framework was to entrench the dominance of the National Telephone Company. The government made a last-ditch attempt to introduce competition by licensing municipal networks, but only one survived.

These muddled policies made it hard for either the National Telephone Company or the Post Office to make the most of the telephone. By January 1914, the UK had a teledensity of 1.7, compared to 2.1 in Germany, 4.1 in Sweden and 9.7 in the US.



# The first global digital platform

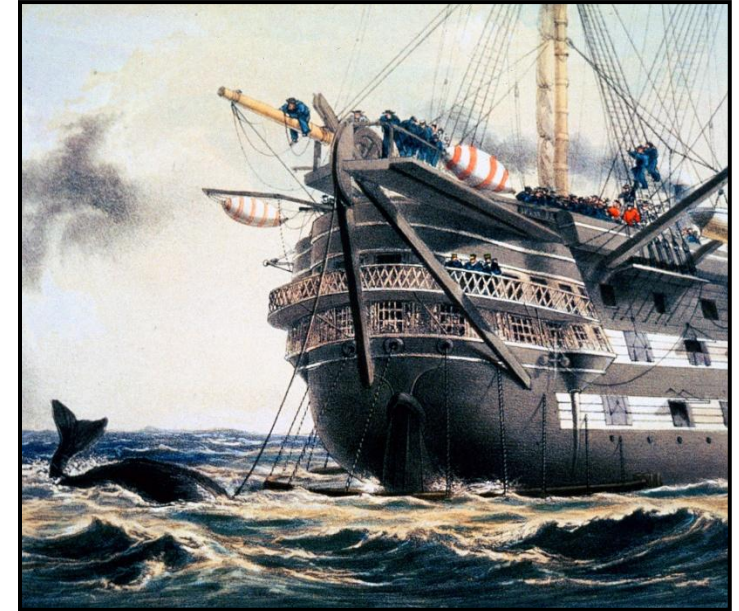
The second half of the 19<sup>th</sup> century saw the creation of a worldwide web of telegraph cables, the first global digital platform. Several different countries constructed subsea cables, but Britain led the way. Its navy controlled the seas, and its empire created demand for rapid and reliable communications across those seas. Britain also controlled access to one of the raw materials required for subsea cables, an insulating material called 'gutta-percha'. Thus, British companies established a similar degree of dominance to that currently held by American digital platforms.

1850: Jacob and John Brett lay the first cable from Dover to Calais, but it is cut by a French fisherman. A second attempt is more successful, and in November 1852 the first telegram between London and Paris announces that it is 'foggy in Paris'.

1858: HMS Agamemnon and USS Niagara lay the first transatlantic telegraph cable, and Queen Victoria and President Buchanan exchange telegrams. The cable fails a few weeks later, due to the electrical characteristics of transmission lines being poorly understood. In 1866, Brunel's 'Great Eastern' lays the first operational transatlantic cable.

1870: John Pender and associates lay a subsea cable to India. They then extend it to Singapore, Hong Kong, and Australia. They create the Telegraph Construction and Maintenance Company to manufacture cables, and the Eastern and Extension Telegraph Companies to operate them.

1902: Sir Sandford Fleming succeeds in his campaign to create an 'All Red' telegraph line, that circumnavigates the globe using landing stations within the British Empire. The final link in the chain is a subsea cable across the Pacific, connecting Canada to Australia. On 31st October 1902, Fleming sends the first telegraph message to circumnavigate the globe, which takes 10 hours and 25 minutes to complete the journey.



Market shares (km of subsea cable)	UK	US	France	Denmark
1892	66.3%	15.8%	8.9%	5.3%
1923	50.5%	24.2%	11.0%	2.6%

# The fight for digital sovereignty - cables

A policy debate about digital sovereignty has gathered pace as governments around the world have recognised their dependence on powerful digital platforms, mostly controlled by the United States – a concern sharpened by current geopolitical tensions. But such concerns are not new – at the end of the 19<sup>th</sup> century it was British companies that controlled the first global communications network – so it is interesting to review how other countries responded.

The route across the Atlantic was particularly important and was served by numerous cables – 12 operational cables in 1898. But these were not independent - the 'Atlantic Pool' cartel coordinated the operation of these cables and set prices for transatlantic telegrams. The cartel was led by the Anglo-American Telegraph Company, a company that was controlled by British investors.

France and Germany did lay transatlantic cables of their own:

- The Société du Cable Transatlantique laid its cable in 1869, and the Compagnie Française du Télégraphe de Paris a New York followed in 1879. In both cases, the Anglo-American Telegraph Company launched price wars which forced them to join its cartel.
- The Deutsch-Atlantische Telegraphengesellschaft laid its first cable in 1900, and a second a couple of years later. One of Britain's first hostile acts in World War 1 was to cut both cables. At the end of the war, Britain and France divided these spoils of war between them.

American companies were more successful. Notably, Western Union, the dominant provider of telegraph services within the United States, laid its first transatlantic cables in 1811. For several decades it cooperated with the Atlantic Pool, but in 1911 it withdrew from the cartel, and took control of the British cable companies. It was able to do so because it controlled most eastbound transatlantic messages, so was able to deny this business to its competitors.

A similar pattern played out on other major routes. Alternatives to the dominant British cable companies did emerge, but they found it easier to cooperate than compete.

On the route from Europe to India, cables were laid by the Eastern Telegraph Company (controlled by John Pender and associates), and by the Indo-European Telegraph Company (controlled by the Siemens Brothers). These companies created a 'joint purse' mechanism, under which all revenues on services to India were paid into a common fund, and then distributed in fixed proportions.

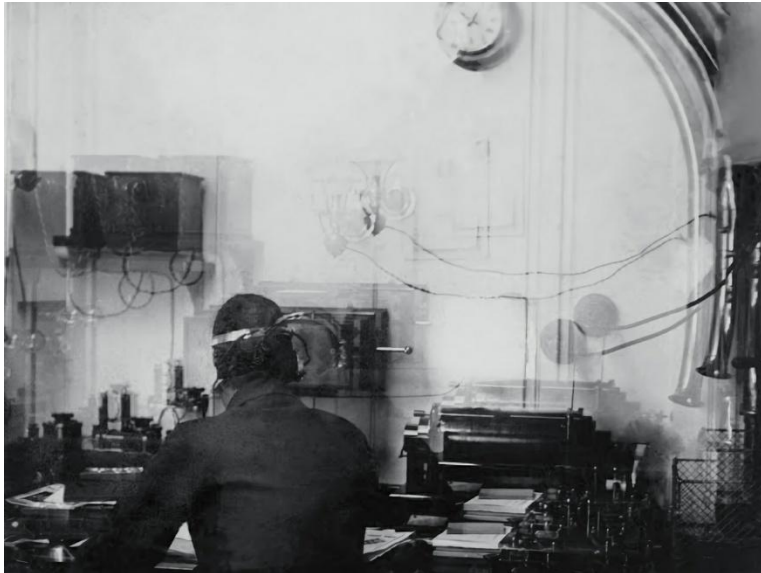
On the route from Europe to the Far East, cables were laid by the Eastern and Extension Telegraph Company (controlled by John Pender and associates), and by the Great Northern Telegraph Company (controlled by Carl Frederik Tietgen, a Danish financier and industrialist). These companies agreed to set a standard price for messages to China and pooled all revenues that were generated.

# Wireless telegraphy as a disruptive alternative

Marconi founded what became known as the Marconi Company in 1897. Before the first world war, his main competitor was Telefunken, founded in Germany in 1903. The main battleground during these early years was maritime communications, a market which Marconi was able to dominate - by 1909, he had supplied two thirds of the radios being used by ships.

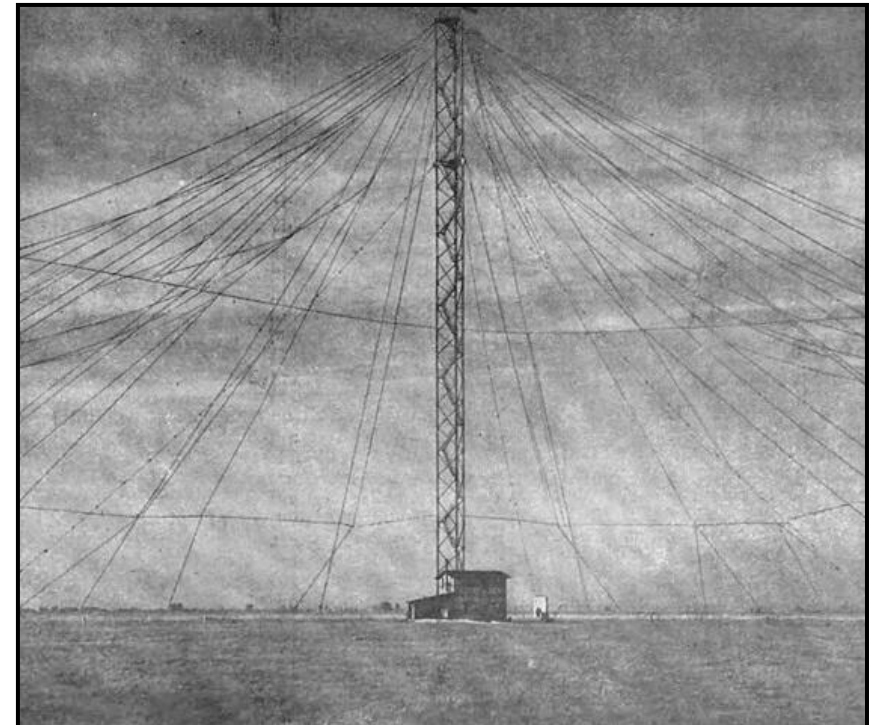
One reason for this dominance was that the Marconi Company prohibited 'intercommunication' between its radios and those of other manufacturer. Thus, most ships had little choice but to buy from Marconi. Several countries opposed this policy (Germany, France, United States). So, in 1906, delegates to the first meeting of the International Radio Telegraph Union agreed that maritime systems must 'exchange radiograms without distinction of the radio system adopted'

The sinking of the Titanic in April 1912 provided a stark illustration of the value of wireless telegraphy. Many perished, but the distress signal that the wireless operators stationed on the Titanic sent to the nearby liner Carpathia made possible the rescue of over 700 survivors.



The next step forward was from wireless telegraphy as a means of communicating between ships, to wireless telegraphy as a means of communicating between continents. Marconi had already demonstrated that this was feasible, when in December 1901 he became the first person to send a wireless message across the Atlantic Ocean.

During the First World War, several countries constructed transmitters capable of sending messages over very long distances. These supplemented the capacity provided by subsea cable networks and provided some resilience. Notably, after Germany's subsea cables were cut, the high-power transmitter at Nauen became its main communication link with the outside world



# The fight for digital sovereignty - wireless

After the war, two further competitors emerged, the Compagnie Générale de la Télégraphie Sans Fil (CSF) and the Radio Corporation of America (RCA). Thus, by the 1920s, four national champions (Marconi, Telefunken, CSF, RCA) were providing international services. There is a striking contrast between the defensive approach to wireless adopted by the British government, and the aggressive approach adopted by the American government.

The Marconi Company had established an early lead in wireless telegraphy, but the Post Office already held a statutory monopoly over all forms of telegraphy, and it resisted any commercial challenge. Marconi expressed his frustration in an interview with the New York Times:

“England is not the country in which I may hope to accomplish much. They are a little old-fashioned over there, you know. Some of the people do not even want the wireless system tried. They say it’s too much trouble”

A few years later, in 1910, Marconi proposed the construction of an ‘Imperial Wireless Chain’, which would link the countries of the British Empire. A protracted series of negotiations followed, and it was not until November 1926 that the first wireless link came into operation, between Britain and Canada.

It soon became clear that wireless services were cheap enough to threaten the commercial viability of Britain’s subsea cables. In 1928, delegates to the ‘Imperial Wireless and Cable Conference’ agreed that subsea cables still had value because of their ‘secrecy and certainty’. To protect them from competition, the cable and wireless networks were merged into a single company - Cable and Wireless.

This protectionist strategy was fundamentally flawed, as foreign competitors were still free to provide wireless telegraphy on many international routes. Cable and Wireless struggled financially, and in January 1947 it was nationalised.

The United States was always destined to dominate global telecommunications in the 20th century, in the same manner as the United Kingdom had during the 19th century. But the protectionist policies adopted by the British government are likely to have had the perverse consequence of accelerating the transition.

In 1899, Marconi had created the ‘American Marconi’ company, and by the start of the First World War this dominated the American market. At the end of the war the United States government decided that wireless telegraphy was too important to be subject to foreign control, so it forced Marconi to sell his American business to RCA.

RCA prospered. By the end of 1922, just a few years after the American government had sponsored its creation, RCA was handling 20–30 percent of the messages sent across the Atlantic, and 40–50 percent of the messages sent across the Pacific. Plus, it diversified into broadcasting.

At the start of the Second World War, RCA was able to record the greatly enhanced national security that its commercial success had conferred on the United States:

“RCA’s radio communications services, vital to national defense and commerce, maintained direct service with 45 countries, and between 12 cities of the United States. In 1914 such radio service was non-existent, and this country’s international communications were dependent upon cable facilities, which were to a large extent controlled by other nations.”

**Questions?**

# Q&A

# **The Politics of Technology, Then & Now**

**15 April 2026**

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# CW WIRELESS HERITAGE SIG EVENT

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