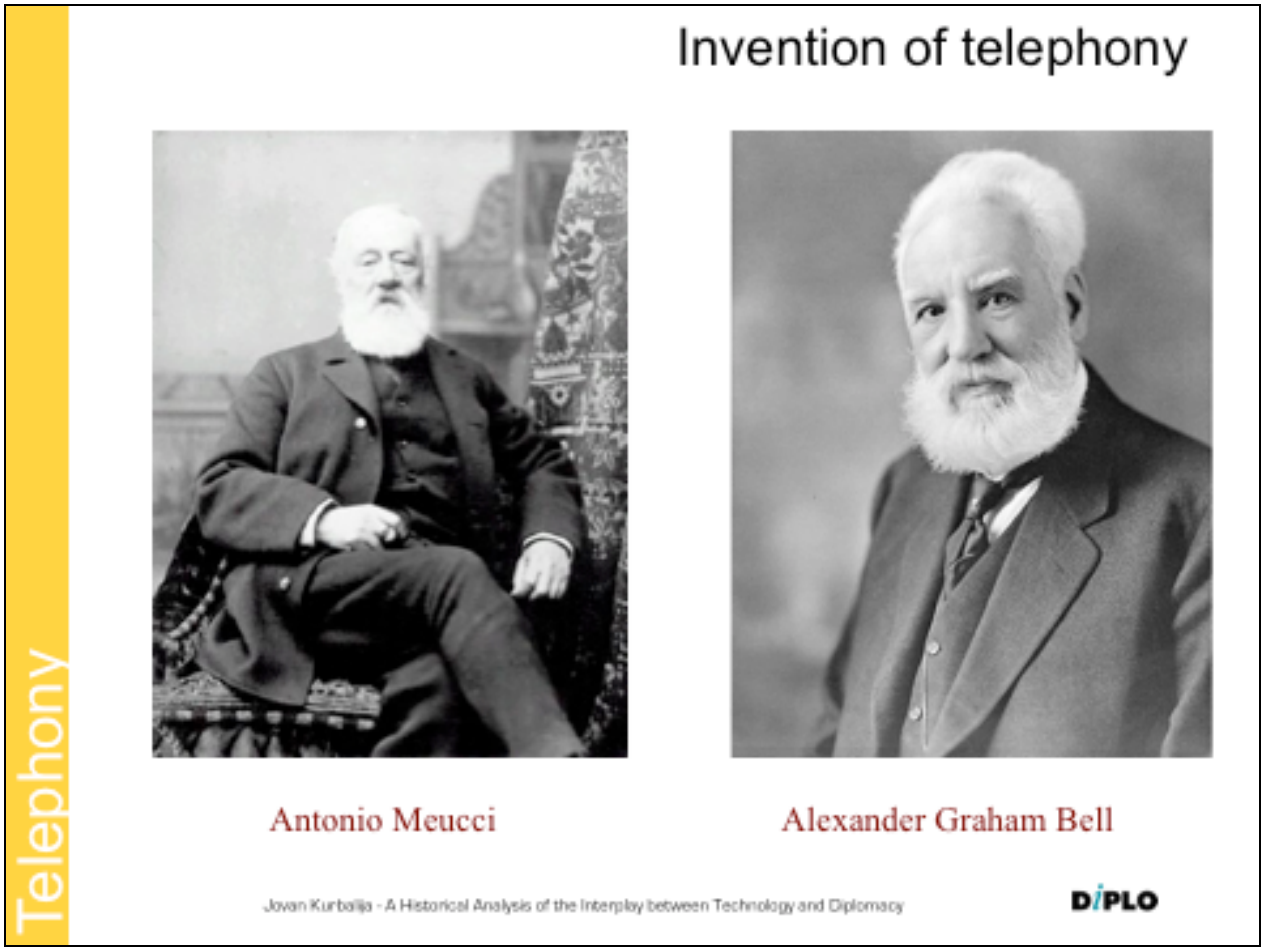
Diplomacy and the invention of telephony and wireless communication

Webinar on 26 July 2013
by Jovan Kurbalija

DiPLO

Telephony and wireless (radio), together with telegraph, constitute the three most important inventions that have shaped communication up until today. They have also strongly influenced diplomacy. The telegraph delinked communication from physical transportation and travelling. The telephone transferred voice over distance. And, wireless (radio) delinked communication from any physical medium.

In diplomacy, the telephone made close contact among heads of state possible, including various 'red lines'. Wireless communication (radio) had a strong impact on communication geo-politics. Late arrivals in the telecom field (mainly Germany) tried to catch up with the 'cable powers' (e.g. United Kingdom) by developing wireless communication. Some diplomatic issues – security, privacy, neutrality – that were raised in discussions on telephony and wireless communication are still being discussed today in the context of Internet governance.

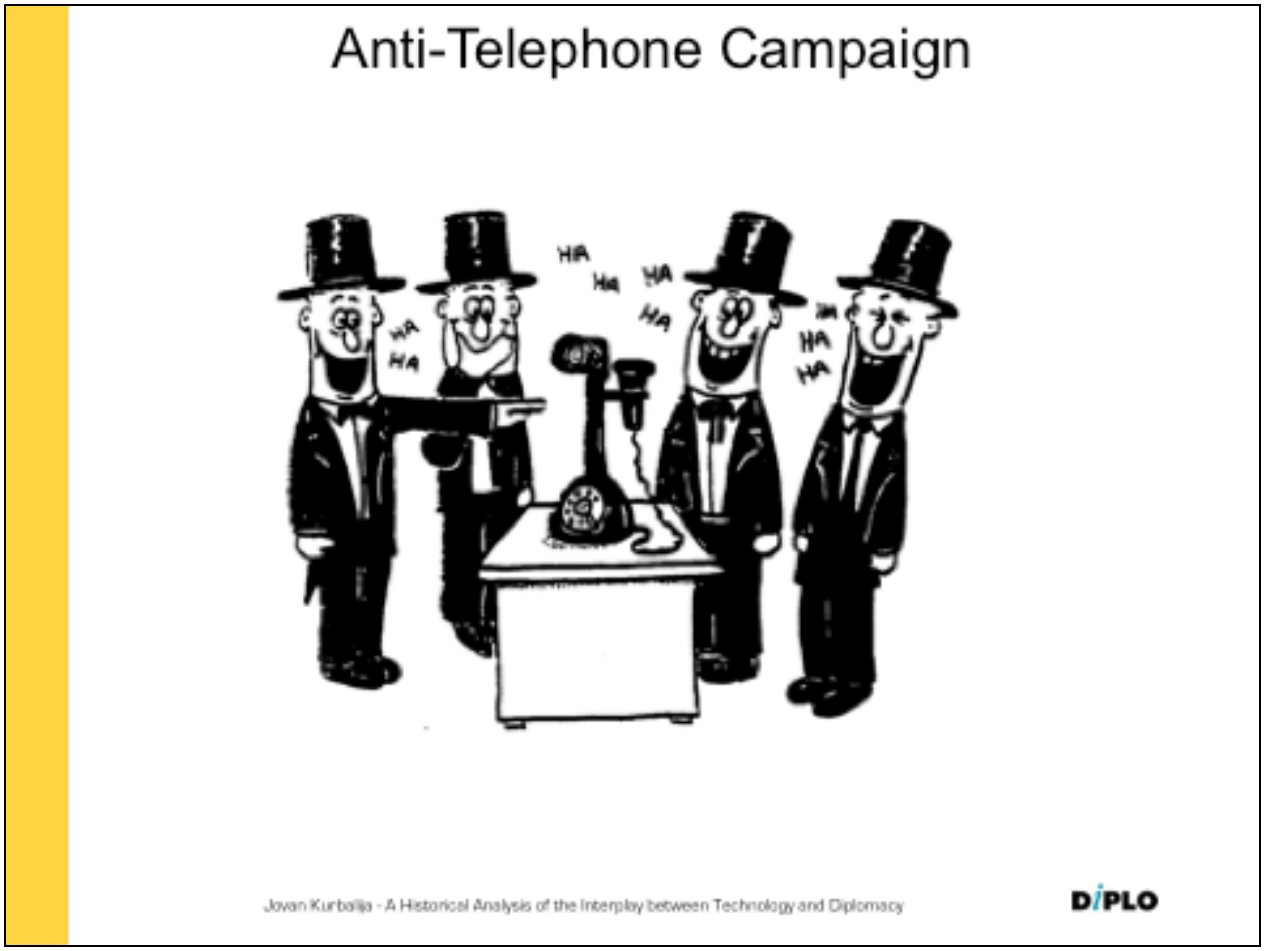


The general and widely accepted view is that the inventor of telephony was Alexander Graham Bell.[1] Incidentally, Bell and Elisha Gray applied for a patent for the telephone on the same day, 14 February 1876. However, there is historical evidence that prior to Bell and Gray, there were successful prototypes of the telephone.

One of the early successful experiments with telephony was done by Italian immigrant Antonio Meucci back in 1850. He was recently officially acknowledged as the inventor of telephony by the US Congress.[2] In addition, German Philippe Reis created a prototype of the telephone in 1861. Apart from the controversies linked to the invention, what makes Bell important in the history of telephony is that he had enough capital and creativity to make telephony a practical utility.

[1] Kern S (1983) *The Culture of Time and Space 1880–1914*. Cambridge, MA: Harvard University Press, p. 9.

[2] Antonio Meucci was a poor Italian immigrant who prototyped the invention of the telephone (he called it the 'teletrophone'). He did not have enough money (US$250) to register his patent. Moreover, after he became ill in 1870, he sold his first model of the telephone for $6. A later model, given in 1874 to Western Union Telegraphs, reached Alexander Bell, which he registered as a patent in 1876. The historical injustice to Antonio Meucci was finally rectified by a US Congress Resolution (http://www.popular-science.net/history/meucci_congress_resolution.html).



In 1877, Alexander Graham Bell produced 'the first telephone capable of transmitting speech with adequate quality'.[3] Bell encountered opposition from Western Union, which had a monopoly on telegraph communication. When Western Union could not stop the development of telephony, it signed a contract with Bell in 1879, stating that the telephone should only be used for personal conversations while the telegraph would remain the main communication tool for business. Obviously, such a proviso could not be sustained, as the telephone became a frequently used communication tool by stockbrokers, bankers, lawyers, doctors, and other professionals who depended a great deal on communication. For a long time the spread of the telephone was limited by the problems encountered in sustaining the strength of telephone signals over longer distances. It took a few decades to get the first direct telephone line between New York and San Francisco (1914) and even longer for trans-Atlantic telephone lines between the USA and Europe (1956).

The diffusion of this new technology was uneven, influenced by various technical, economic, and social factors. In 1900, an early communication divide, similar to the modern digital divide, was in evidence.

[3] Kern S (1983) *The Culture of Time and Space 1880–1914*. Cambridge, MA: Harvard University Press, p. 65.

Table 1. Number of telephones in 1900.

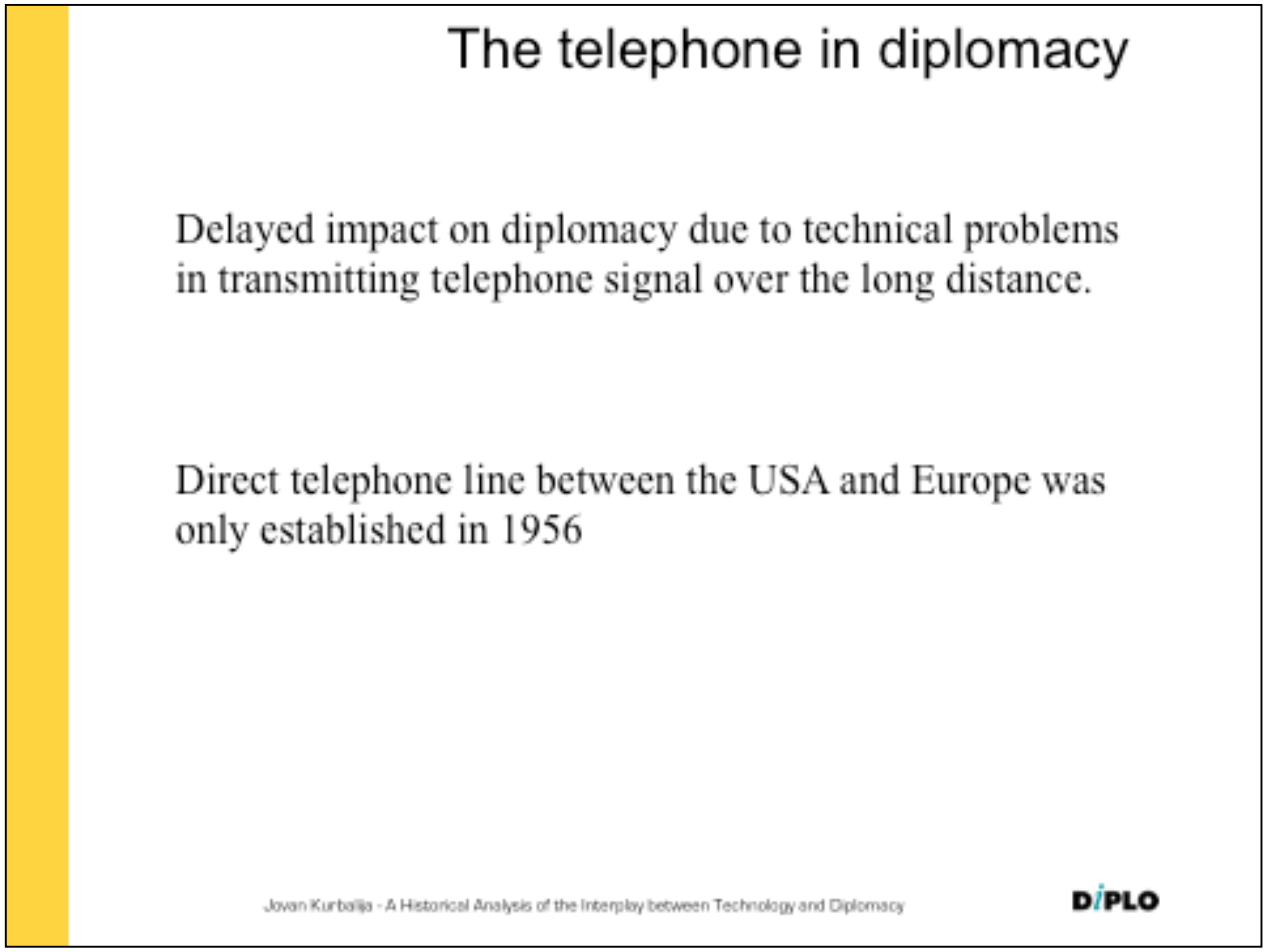
COUNTRY	INDIVIDUALS PER TELEPHONE
USA	60
Sweden	115
Germany	397
France	1216
Italy	2629
Russia	7000

A considerable difference between the USA and Europe was manifest, as was a north-south division within Europe itself, with the most dense telecommunication network in Sweden and much lower in Italy.[4]

Sometime, such as in the case of France or Germany, who had similar levels of overall technological development, the same patterns did not apply to adaptation of the telephone: Germany had three times higher telephone penetration than France.

Patrice Flichy proposes the following reasons for the slower dissemination of the telephone in France: 'France's population remained essentially rural and distances between farms, even in wooded areas, were small. The telephone did not yet appear as a necessary instrument in social life. People still used traditional channels – meetings in hamlets and towns, at washing places, in the fields – for social exchange…. As far as the towns were concerned, urban density remained high and sub-urbanisation was barely starting in the Parisian region.'[5]

[4] Mattelard A (1994) *Mapping World Communication (War, Progress, Culture),* translated from the French by Emmanuel S and Cohen JA. Minneapolis: University of Minnesota Press, p. 12.
[5] Flichy P (1995) *Dynamics of Modern Communication: The Shaping and Impact of New Telecommunication Technologies*. London: Sage Publications. p. 92–93.



The telephone had an enormous social impact. It became an integral part of private, professional, and official life in most societies around the world. The real impact of the telephone on international relations was felt after the Second World War. Country leaders, especially those of the two super-powers, started using the telephone in order to avoid further escalation in international crises. It has been reported that the telephone played an important role in all of the following international crises: the Six-day War in the Middle East in 1967, the India-Pakistan crisis in December 1971, the Middle East war of 1973 and the invasion of Afghanistan by the USSR in 1979.

During the Cuban Crisis (1961), the USA and the Soviet Union were on the brink of the war. Both sides realised the risk of a potential miscommunication. They established a direct communication link between Moscow and Washington. Although it was called the 'red telephone', it has never been a telephone. Initially, it was a telegraph (as seen in this photo), followed by a fax, and, lately, an advanced e-mail system. The red telephone is supposed to be used for direct communication between the leadership of the two countries in the case of a crisis. It became a symbol of importance and exclusivity in relations between countries. It made other countries, mainly the UK and France, establish exclusive communication lines with Moscow. Today, leaders maintain exclusive contact via mobile phones.

The rush for new inventions marked the whole of the nineteenth century. Towards the end of the century, the scientific frontier became wireless communication. How controversial this invention was can be gathered from the fact that the five great encyclopaedias attributed the invention of wireless communication to five different sources: German – Hertz, Russian – Popov, Italian – Marconi, French – Branly, and British – Lodge.[6]

James Maxwell (Britain) and Heinrich Hertz (Germany) established the scientific basis for electromagnetic waves. Maxwell provided the theoretical basis which Hertz confirmed through experiment. Their scientific discovery was used for subsequent inventions in the field of wireless communication, starting with wireless telegraphy, through wireless telephony, and concluding with radio broadcasting. Spectra were introduced as new communication media alongside existing cable communication.

Among inventors, Nikola Tesla was particularly noticeable for designing both emitters and receptors of electromagnetic waves. He used the term 'wireless telegraphy'. 'Radio' as a term appeared only after the First World War. Tesla had also designed a technical solution for transmitting power wireless.

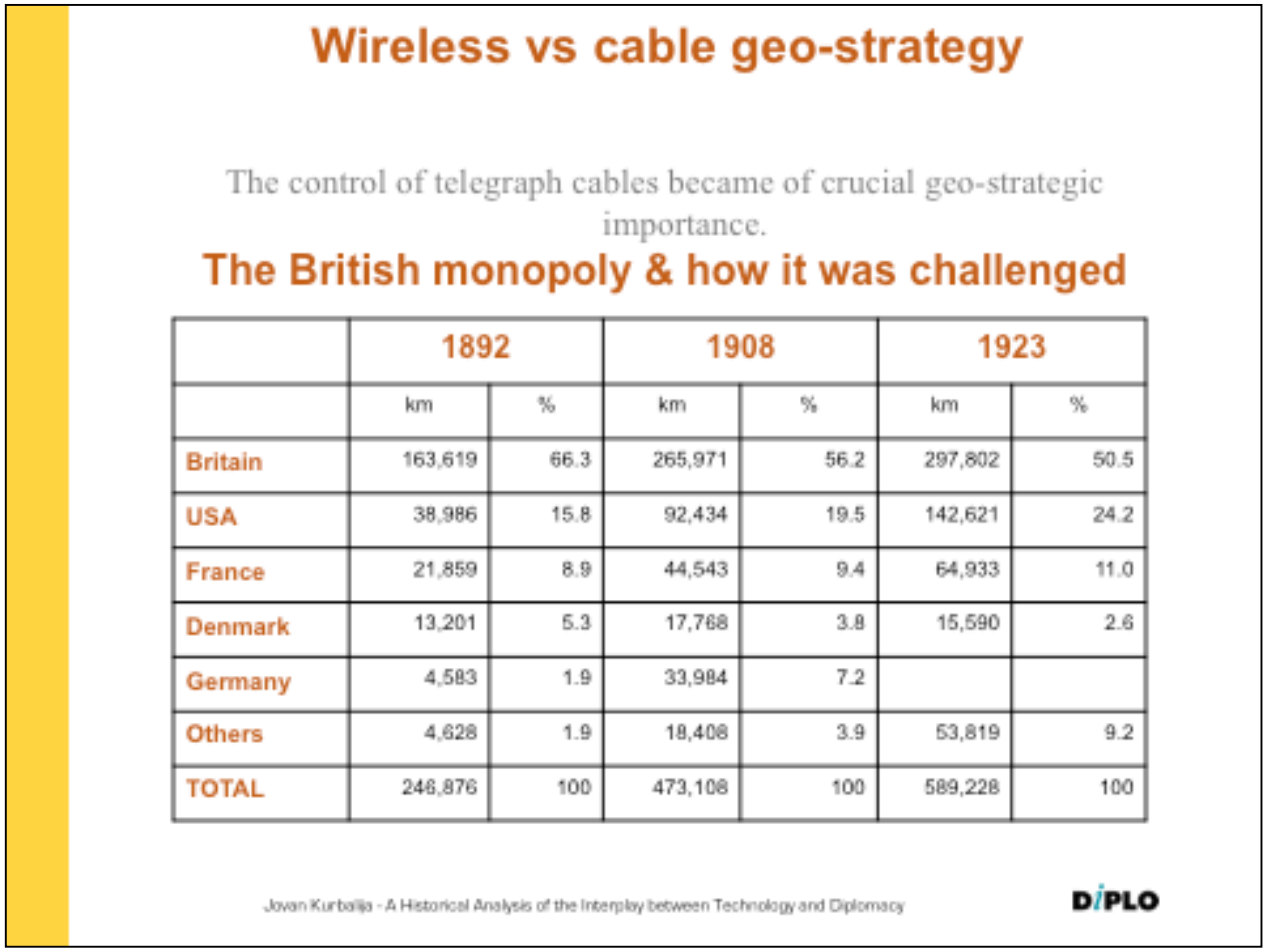
[6] Flichy P (1995) *Dynamics of Modern Communication: The Shaping and Impact of New Telecommunication Technologies*. London:Sage Publications, p. 99.

Without the inventions of the first wireless detection device by Indian professor Jagadis Chandra Bose from Calcutta Marconi's inventions wouldn't have been possible (although Marconi never acknowledged that he used Bose's inventions).

Wireless telegraphy

Capitalising on the previously described theoretical inventions, Italian scientist Guillermo Marconi invented a wireless communication device.[7] In 1897, he registered a patent on his wireless telegraph. In addition to his invention, Marconi had other advantages and talents that helped him to disseminate this device. He had family ties, and later on business links with Great Britain, the world leader in telecommunications at the end of the nineteenth century. His marketing and public relations talents helped him to secure a few lucrative deals with the British Admiralty and British shipping companies. In 1907, 'Marconi's wireless telegraphy system [became] a public service for transatlantic exchanges between Europe and the USA.'[8] Paradoxically the importance of wireless communication was realised in 1912 when the sinking *Titanic* was able to send a wireless SOS alert to the rescue boats. The main users of Marconi's wireless telegraph were the British and Italian militaries.

[7] While his scientific and business careers were very successful, Marconi's excursion into politics and diplomacy was less so. Guided by his love for money and power Marconi joined Mussolini's movement. He was Mussolini's roving ambassador, trying to lift the international community's boycott against Italy.
[8] Flichy P (1995) *Dynamics of Modern Communication: The Shaping and Impact of New Telecommunication Technologies*. London: Sage Publications, p. 66.



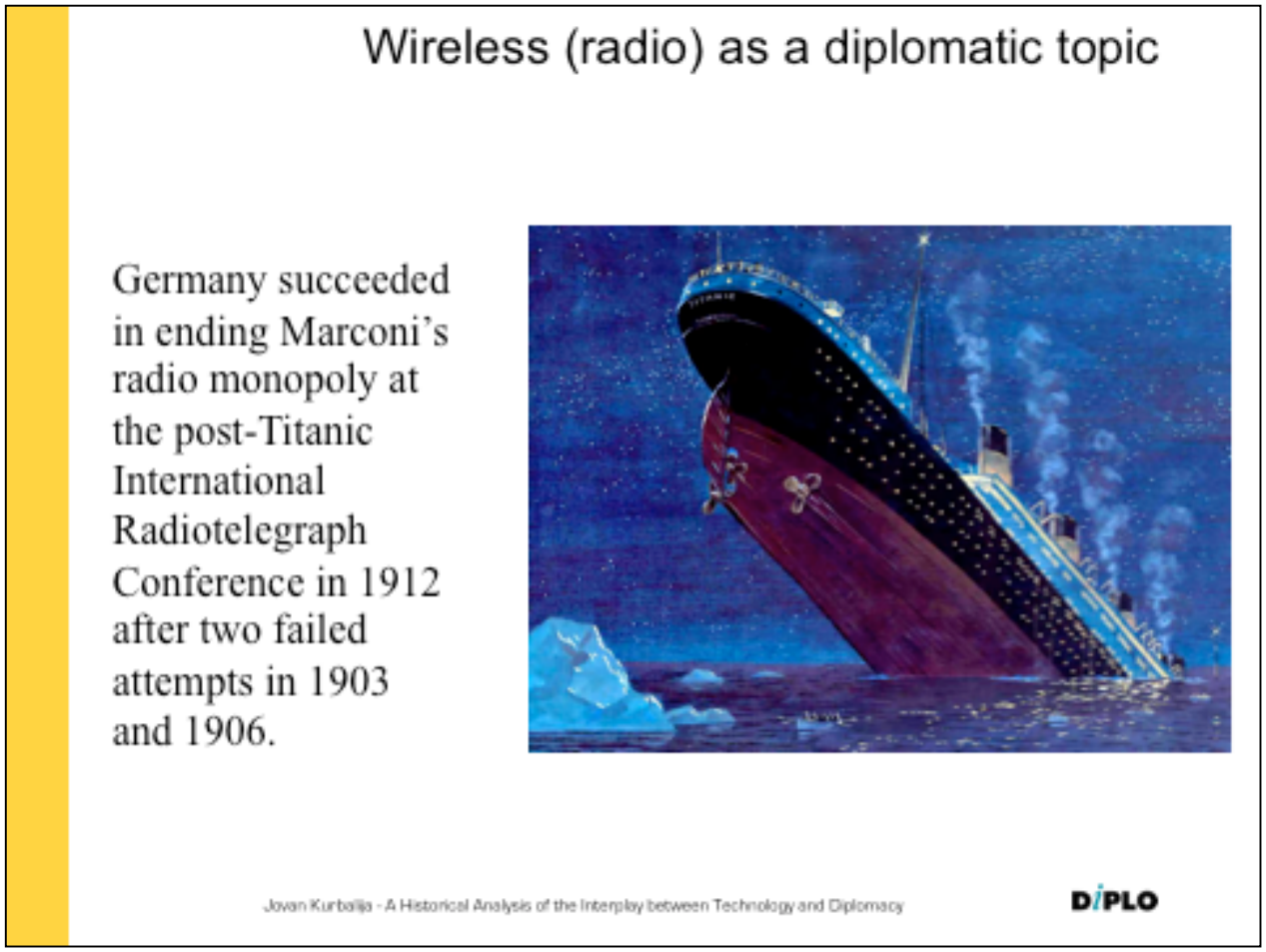
	1892		1908		1923	
	km	%	km	%	km	%
Britain	163,619	66.3	265,971	56.2	297,802	50.5
USA	38,986	15.8	92,434	19.5	142,621	24.2
France	21,859	8.9	44,543	9.4	64,933	11.0
Denmark	13,201	5.3	17,768	3.8	15,590	2.6
Germany	4,583	1.9	33,984	7.2		
Others	4,628	1.9	18,408	3.9	53,819	9.2
TOTAL	246,876	100	473,108	100	589,228	100

As the table in this slide shows, the main communication players were the UK and the USA, who between them ran 70% of global telegraph cable system. The wireless telegraph provided other countries, mainly Germany and France, with the technical possibility of developing alternative communication systems. This was particularly important to Germany, whose geographic position and late start in the cable race meant that it was seriously disadvantaged when it came to global communication.

A very weak cable-based communication infrastructure could not match Germany's increasing geo-strategic ambitions. The German government made a concentrated effort to support research and development in the field of wireless communication. In 1903, two pioneering producers of wireless telegraphy sets, Slabo-Arco-AEG and Braun-Siemens-Halske, merged under government pressure into a new company, Telefunken.

The introduction of the telegraph de-linked communication (sending messages) from transportation. However, communication was still linked to geography, through the laying and control of cable systems. Wireless communication severed this link. Although in the early days, wireless communication still depended on the geographic spread of radio stations, ultimately, wireless communication became independent of any geographical considerations.

Germany's technological efforts in the field of wireless communications were supported by political ones. Germany called two international conferences in order to challenge Marconi's emerging international monopoly in the field of wireless telegraphy.



In an attempt to exploit his invention to the maximum, Marconi established a monopoly by not allowing operators using Marconi's system to communicate with radio apparatus by other companies. Germany, which developed its own wireless technology, tried to challenge this monopoly at both the first (1903) and second (1906) International Radiotelegraph Conference. Although the majority of countries were against Marconi's monopoly, the objections of Great Britain and Italy kept the status quo till 1912 by not forcing Marconi to make his system interoperable with other producers.

The sinking of the *Titanic* was a moment of far-reaching consequences for telecommunication policy. One of the reasons why more passengers from the *Titanic* were not saved was that the nearby ship, the *Californian,* (five miles from the *Titanic*) did not receive the distress radio signal from the *Titanic*. The first ship that came to save the passengers was the *Carpathia*, which was 45 miles away. The complete truth as to why the *Californian* did not react faster went down with the *Titanic*. There were quite a few potential interpretations, however:

> 'There were two major companies that provided the equipment and operators: The Marconi Company in New York City and Telefunken in Germany. The *Titanic* was subscribed to Marconi. Shortly before the *Titanic* set to sea, there was a big flap about exchanging weather and iceberg information between ships, that is, between these two different companies. So the Marconi Company issued an edict that any operator who

> "talked" to a Telefunken ship would be immediately relieved of duty upon his return. Telefunken, in turn, issued the same order to their operators. Therefore, at the time of the *Titanic,* Marconi operators did not talk to Telefunken operators and vice versa for fear of losing their jobs. This is why the *Titanic* SOS's went unanswered by the *Californian,* a Telefunken ship, which we know now was adrift for the night only miles away. The *Carpathia* was a Marconi ship, and at midnight when the operator checked his gear following some repairs, he heard the SOS and was able to respond, even though they were some distance away.'[9]

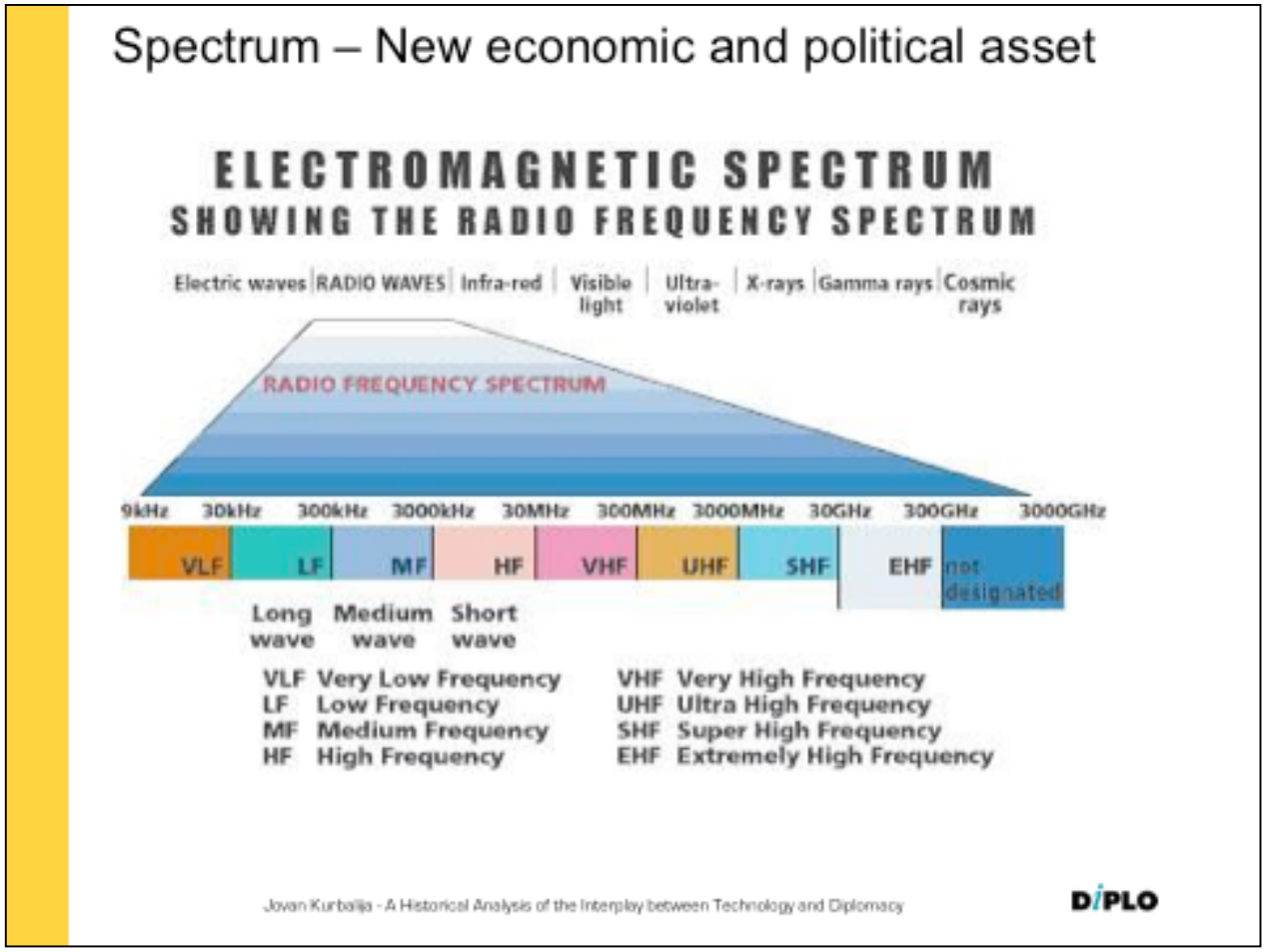
While it is not certain what happened in the communication with the *Titanic*, it is clear that the sinking of the *Titanic* had a far-reaching impact on global telecommunication policy.

The Third International Radiotelegraph Conference held in 1912 ended Marconi's monopoly by introducing the principle of interconnectivity among radiotelegraph systems.

In addition, the US Federal Communication Commission (FCC), one of the most powerful institutions in the field of telecommunications, was created after the *Titanic* sank. After picking up some survivors, the *Carpathia* tried to communicate information about the number of survivors ashore. This was not possible due to the heavy amateur use of the same frequencies. The need for regulation of the airwaves became obvious and the creation of the FCC followed.

The coordination of the international telephony system was facilitated by the International Consultative Committee on Long-Distance Telephony (CCIF), which was established in 1924.

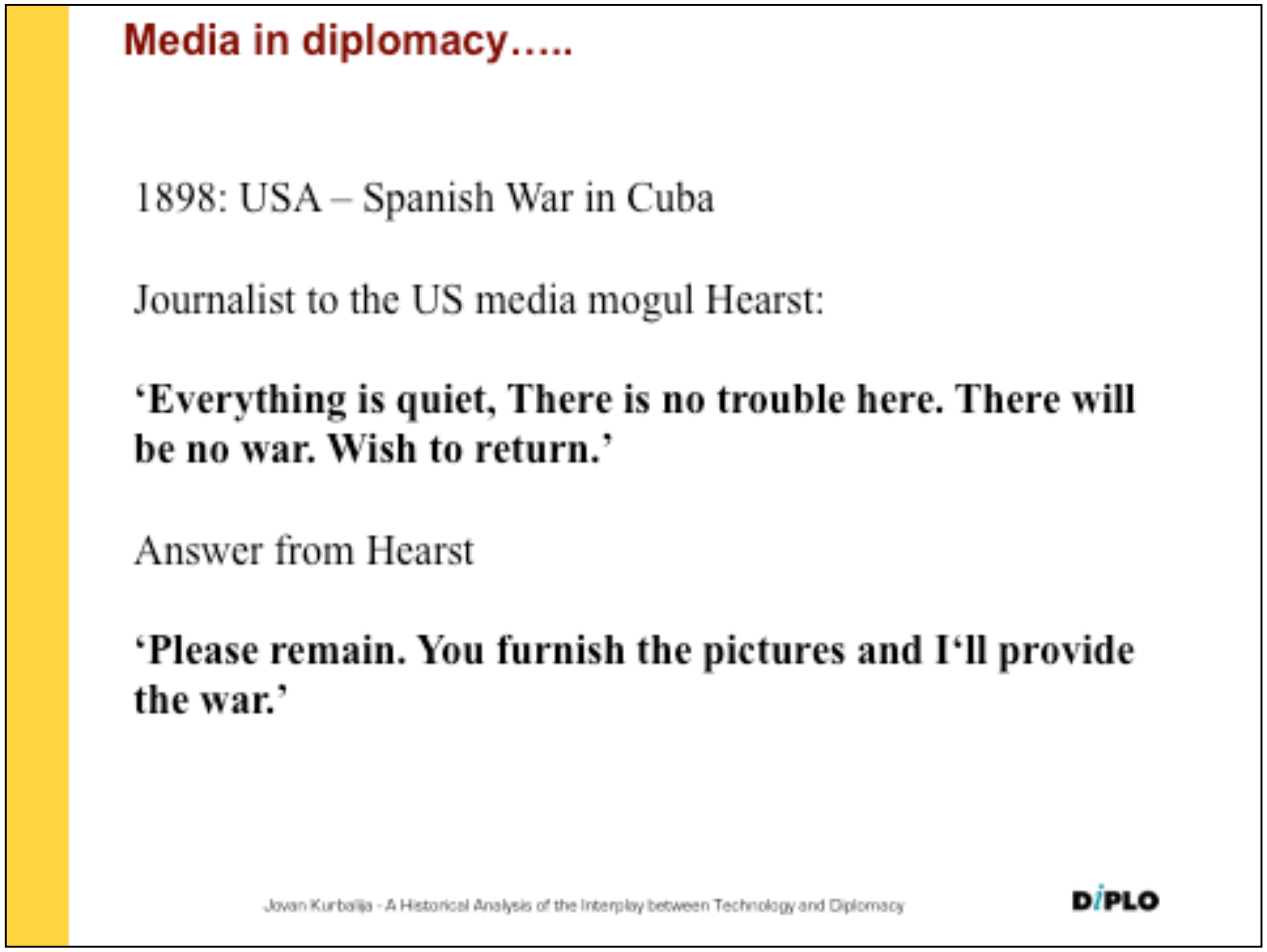
[9] Dawson K (1999) *Browser Wars of the Wireless Telegraphy Age*. TBTF.COM. Available at http://tbtf.com/resource/telegraph-browser-wars.html [accessed 29 July 2013).



The radio spectrum is used for electric wireless communication. It is divided into frequencies measured in the unit known as a hertz (Hz0). International rules for the allocation of frequencies were set in 1912. Although the spectrum remains the same, the range of usable frequencies constantly increases with the development of technology. New, especially digital, technology significantly increased the spectrum range.

Today, the question of spectrum allocation is highly controversial, both on national and international levels. The international allocation of frequencies is done in the framework of the International Telecommunication Union (ITU).

The access to spectrum frequencies is directly linked to economic activities and the development of wireless technology. For example, economically highly important Wi-Fi technology has been developed in a very tiny frequency range, usually called 'garbage bands' (used mainly for devices such as baby monitors and microwave ovens). …. .



One development that led to a different operational environment for diplomats was the emergence of radio and the rising importance of the press. The public began to challenge the closed and exclusive club of negotiators assembled through the Concert of Europe.[10] The development of public opinion was fostered by the growing number of newspapers. Towards the end of the nineteenth century, diplomats became increasingly concerned about the reactions of their domestic publics, which had become well-informed about diplomatic activities. The development of public opinion also put pressure on governments and diplomatic services. Faced with this new threat, monarchies and governments introduced censorship and started using newspapers for foreign propaganda.

In 1898, the US invasion of Cuba was the first conflict to be filmed. This war was the first example of the importance of the media in international relations. Many historians believe that if it had not been for media hysteria this war could have been avoided. This was effectively illustrated by the following anecdote. A journalist sent the following message to US media mogul Hearst: 'Everything is quiet. There is no trouble here.

[10] The term 'concert' was derived from the Italian 'concerto', which since the sixteenth century, when applied to diplomacy, had embraced the idea of states acting in accord or harmony. However, during the struggle against the hegemony of imperial France, the word acquired a new connotation. Napoleon's opponents began to associate it with the prospects of a continuing allied coalition, not only for the achievement of victory, but also for the containment of revolution, the maintenance of peace and the re-establishment of a 'general system of public law in Europe'. Hamilton K and Langhorne R (1995) *The Practice of Diplomacy*. London: Routledge, p. 20.

There will be no war. Wish to return.' The reply from Hearst was: 'Please remain. You furnish the pictures and I'll provide the war.'[11]

For example, after it was discovered that the British diplomatic service was opening and reading the Mazzini's correspondence, an Italian leader, then a refugee in London, the Office responsible for intercepting letters was consequently abolished.[12]

Here are two interesting examples from the Crimean War. Strange wrote: 'For years it had been customary in Britain for news of departing ships to be reported as they headed of to foreign conflicts; after all, the news could travel no faster than the ships themselves. But the telegraph meant that whatever information was made available in one country was soon known overseas.'[13] The practice of reporting on departing naval ships soon ceased, since it might provide valuable information to one's enemies.

During the Crimean War, photography was used more intensively than ever before. Concerned that the British public might see photos of dead British soldiers, the British military authorities greatly restricted the use of photography. Photographers were only allowed to take 'ordinary' pictures, which would not disturb the public back home in Britain.

The first examples of public diplomacy started to appear. Foreign ministries started using an early form of public diplomacy with the establishment of the first press bureaus.

[11] Williams F (1969) *The Right to Know*. London: Longman (quoted in Mattelart, 18).
[12] Anderson MS (1993) *The Rise of Modern Diplomacy, 1450-1919*. London: Longman, p. 115–116.
[13] Standage T (1998) *The Victorian Internet.* London: Phoenix, p. 98.

The key diplomatic event for the period 1814–1914 was the Congress of Vienna, which laid the diplomatic framework, through the Concert of Europe, for the longest peaceful period in recent history. The Concert of Europe was characterised by frequent and lengthy meetings. 'Between 1822 and 1913 there were twenty-six conferences attended by representatives of all the great powers – the last of which, in London, lasted nearly eight months; and many more at which two or more great powers reached agreement. As was said earlier, one of the principal assumptions of concert diplomacy was that changes in the territorial order required the consent of the great powers.'[14]

The Concert of Europe faced serious challenges, especially in the second half of the nineteenth century. New technology, new methods of agricultural and industrial production, construction, transportation and communication, as well as new methods of raising capital to finance economic enterprise, and a multitude of other innovations were transforming European society and were soon to begin transforming the societies of much of the rest of the world, more radically and at a faster pace than ever before in the course of recorded history.[15] 'The forces of economic, social [and, for our purpose, above all technological] change exerted immense pressure for political change [for which however, statesmen and diplomats were unprepared], and fostered the development of [various] political ideologies and programmes to meet the needs and aspirations of a changing society. Pre-eminent among these [was] the doctrine of nationalism [which was inherited from Napoleonic France, but which "infected" not only

[14] Hamilton K and Langhorne R (1995) *The Practice of Diplomacy*. London: Routledge,p. 4.
[15] Ibid. p. 28.

smaller powers but also the great powers in the late nineteenth and early twentieth centuries].'[16]

The economic and geo-strategic importance of communication technology started influencing decision-makers. The new political environment, influenced by the development of communication technology, had a considerable impact on questions of war and peace. Both diplomats and the military had to adjust their methods to the changing internal and international operational environment.

High-speed travel brought greater mobility to ministers and other officials. It opened the possibility of holding more direct meetings. The telegraph and the telephone also enabled direct communication and closer links between the top decision-makers of various countries.

New technological tools also introduced new challenges. Urgency led to the problem of coordinating communication. Very often, telegrams would arrive in the wrong order, creating considerable confusion with important consequences, as was the case prior to the First World War. During a delicate exchange on the Alabama dispute, the US Foreign Secretary, Granville, warned his counterpart, the British Prime Minister, Gladstone, of this risk: 'This telegraphing work is despairing. It will be a mercy if we do not get into some confusion.'[17]

[16] Ibid. p. 28.
[17] Cain RJ (1971) Telegraph Cables in the British Empire 1850-1900. PhD dissertation, Duke University, p. 188; quoted in Headrick DR (1991) *The Invisible Weapon: Telecommunications and International Politics 1851-1945.* Oxford: Oxford University Press, p. 74.