

# Telecommunications in World War I<sup>1</sup>

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## INTRODUCTION

I would like to thank the American Philosophical Society for the honor of this opportunity to address it. The subject of World War I is an enormous one, and I trust that the presentations this morning will whet your appetite to learn more about it.

Let me begin, however unexpectedly, with Benjamin Franklin. The founder of this society, Franklin also served as an essential diplomat for the colonies during the Revolutionary War. One of the challenges Franklin confronted in France was the need to maintain a semblance of secure, reliable communications with the Continental Congress. He needed to protect the information acquired through the negotiations with the French court and get it to Philadelphia as quickly as possible without it falling into British hands. As we know, Franklin brought his grandson Temple along as secretary in part because he could trust him; however, Franklin erred when he also relied on Dr. Edward Bancroft as secretary and interpreter. A scholar and a spy for the colonists, Bancroft was also a double agent, a spy working for the British. Through Bancroft, the British knew within days of the signing of the treaties with France in 1778. Still, despite gaining this information, they could not act on it faster than Franklin could dispatch it back to Philadelphia. Having pushed the colonists too far, they could not avert a widening of the war.<sup>2</sup>

The problems of time and distance, as well as the dangers that the words would not arrive in time or that the other side would read them first, were certainly not new when Franklin confronted them. Although it would have astonished Franklin, the global communications grid that evolved through the nineteenth century and the beginning of the twentieth mitigated some of these problems, but it also created new

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1 Read 26 April 2014 as part of the symposium *100th Anniversary of World War I*.

2 On the life and espionage activities of Dr. Edward Bancroft, see the judicial treatment by Thomas J. Schaeper, *Edward Bancroft: Scientist, Author, Spy* (New Haven: Yale University Press, 2011); on the diplomacy of the American Revolution, see Jonathan R. Dull, *A Diplomatic History of the American Revolution* (New Haven: Yale University Press, 1987).

ones. At no time was this fact more evident to the Great Powers than during World War I.

The central focus of the current article is telecommunications in World War I. Specifically, I wish to address this subject at the strategic level, where the Great Powers saw the international telecommunications systems and networks as key elements in being a Great Power. I will not address tactical or operational matters, although these are indeed important, nor will I address propaganda or mass communications. The information that the Great Powers worried about first and foremost were the messages moving around the globe relating to diplomacy, military strategy, finance, and logistics. Without this information, the war could not happen nor unfold in the manner they wished.

The subject of telecommunications in wartime has received comparatively less attention over the years by historians of World War I. However, the concerns of our generation have helped to trigger new questions about the past, and the answers to those questions merit close attention in our time. I have explored this topic further in my own research, in both *Nexus* and my current book projects.<sup>3</sup> It is a complex topic, but in the interests of simplicity and understanding, I want to suggest the following three perspectives on telecommunications in World War I: (a) telecommunications as a strategic tool, (b) telecommunications as a strategic target, and (c) telecommunications as a strategic vulnerability.

#### TELECOMMUNICATIONS AS A STRATEGIC TOOL

Why and how did the Great Powers consider telecommunications such a valuable strategic tool? The global submarine telegraph cable network, developed gradually from 1872–1914, linked all inhabited continents by the eve of war. Together with the domestic telegraph lines, information could move around the world within the space of 30 minutes to 1 hour. By the final decade before World War I, the art and science of wireless had progressed to the point that ship-to-shore traffic and intercontinental radio transmissions were becoming reliable, if not especially rapid.<sup>4</sup>

The effects of these developments for the Great Powers were multiple and significant. International electrical communications, both in reality

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3 See, inter alia, Jonathan Reed Winkler, *Nexus: Strategic Communications and American Security in World War I* (Cambridge, M.A.: Harvard University Press, 2008); and idem, "Information Warfare in World War I," *Journal of Military History* 73, no. 3 (July 2009): 845–67.

4 The best overview of the nineteenth century remains Daniel Headrick, *The Invisible Weapon: Telecommunications and International Politics, 1851–1945* (New York: Oxford University Press, 1991).

and in their promise, altered fundamentally key problems associated with homeland and imperial defense. For example, it became easier to coordinate warship movements and use information passed through the electrical network to cover more area with fewer ships. Thus, prior to World War I, the Royal Navy developed a global plot room where it could track the movement of all merchant vessels and warships. Information received and information denied the enemy would serve as a force multiplier for the side that possessed the better global information network. But the benefit was far more than a military one because the global information network permitted a country in wartime to maintain access to allies and neutral sources of supply and finance. Censorship of the information moving through the network permitted a country to monitor not only the financial, commercial, and diplomatic position of neutrals, but also that of an enemy, forced by the destruction of its own network to rely on those of others. As the historian Nicholas Lambert has recently shown us, exploitation of the information moving through the global networks under its control became a key part of Britain's prewar planning for economic war against Germany.<sup>5</sup>

The international communications network also served as an essential tool for wartime diplomacy and alliance management. I would be remiss if I did not mention the Zimmerman Telegram—or its lesser-known Argentine cousin, the Luxborg Telegram—but consider here instead the absence of such embarrassments for the British government. Its assurance of reliable, secure, and redundant lines of communications with allies and the United States meant that it did not have to be afraid of Germany exploiting information passing through its hands. In peace and war, access to a global telecommunications network through which critical information could move reliably, securely, and swiftly had become essential for being a great power. It also meant that the enemy's conduits and nodes merited careful consideration as targets.<sup>6</sup>

#### TELECOMMUNICATIONS AS A TARGET

In World War I, both Great Britain and Germany identified the global communications networks of their enemies as legitimate targets for attack during wartime. Indeed, this view did not emerge during the war

5 Nicholas Lambert, *Planning Armageddon: British Economic Warfare and the First World War* (Cambridge, M.A.: Harvard University Press, 2012); idem, "Strategic Command and Control for Maneuver Warfare: Creation of the Royal Navy's 'War Room' System, 1905–1915," *Journal of Military History* 69, no. 2 (April 2005): 361–410.

6 On the Zimmermann Telegram, see the recent work by Thomas Boghardt, *The Zimmermann Telegram: Intelligence, Diplomacy, and America's Entry into World War I* (Annapolis, M.D.: Naval Institute Press, 2012). The embarrassment of Count Karl von Luxborg is much less well known, but see Winkler, *Nexus*, p. 126.

but had been an element of prewar planning. The two sides engaged in what we today would describe as information warfare, starting with the very real physical destruction of the submarine telegraph cables and intercontinental radio transmitters that connected Europe to the rest of the world.<sup>7</sup>

The British were the first to act. On the opening night of the war, the British cable ship *Alert* located, raised, and severed the five submarine telegraph cables transiting the English Channel that linked Germany to the existing global cable network. Doing so effectively cut Germany off from direct contact with the Americas, Africa, and Asia. Following guidelines laid out in a 1911 review by the Committee of Imperial Defense, British forces subsequently attacked other elements of the German network, including cables in the southern Atlantic and Pacific and radio stations in the German colonies in Africa. Indeed, the very extension of the war into Africa came about from the need to silence radio stations that might help Germany coordinate its scattered naval forces to attack imperial reinforcements coming to Europe. After these strikes, with a complex censorship regime and active diplomatic pressure on neutrals, including the United States, Britain was able to greatly constrain Germany's routing of information to neutral countries for the remainder of the war.

But Britain was not alone in targeting the conduits and key nodes of the global communications network. Germany also pursued the destruction of those parts that linked Great Britain to the rest of the world. It did so in three distinct phases, the last of which threatened significant consequences. The first was a series of German attacks to hinder or sever completely the telecommunications links between Russia and the Western allies. Occurring in late 1914 on the submarine cables in the Black and Baltic Seas, these attacks broke the only direct contact between the allies. It forced a growing volume of traffic onto alternate, less efficient routes through the Pacific and Indian oceans.

The second phase, unfolding between May 1915 and April 1917, was the systematic cut of every cable touching on the British Isles, except for the transatlantic ones. These strikes were carefully considered attacks. In one instance, a Norwegian crew discovered a rheostat attached to the end of a cable, the purpose of which was to confuse the repairers about the actual location of the break by altering the electrical flow. Tucked inside the rheostat was the following note: "No more Reuter war-lies on this line! Kindest regards from a 'Hun' and a

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7 For a more thorough treatment of wartime attacks on the global communications grid, from which this section is drawn, see Winkler, "Information Warfare in World War I," *supra*.

‘Sea-Pirate.’” As with the first phase, the lack of German sea control meant that these cuts were not permanent.

It was the third phase of Germany’s attacks that is most significant. Following the declaration of war by the United States, German officials decided to extend the attacks on submarine cables to those connecting the United States to Europe. Planning for how to do this began in the summer of 1917, and the German admiralty concluded that it would use specially equipped submarines to carry out the attacks. The Germans attempted to cut every single operational transatlantic cable—there were 17 at the time—on both ends. These attacks would occur in January 1918. If successful, the effects would be substantial. Repair would have taken months even without the threat of U-boat attack. The backlog of traffic would have been enormous. There was no way to route more than a fraction of the war traffic through alternate means. The financial, industrial production, shipping, and troop movement information would have overwhelmed the remaining cable lines and the few radio circuits. It would have thrown diplomatic and military strategy traffic into confusion for weeks. Civilian communications and international news would have ceased to move for the better part of a year while high-priority government traffic moved to the front of the line. Although the German naval documents do not explicitly make this connection, the timing is significant: The great German spring offensive of 1918 was only weeks away. Severed links between the United States and Europe at just that moment would have compounded the confusion created by the offensive and might, just possibly, have helped Germany end the war on favorable terms.

However, it did not come to pass because it was too ambitious of a project given the technological means available to the submarine commanders and the expected timeframe for completion. But there was some disruption, and the repairs to these damaged cables took weeks. The threat of German U-boat attacks on the cable repair ships was not inconsequential. By the summer of 1918, one-half of the transatlantic cable network was nonfunctional and allied officials worried whether future German attacks might overwhelm the system. For both sides, telecommunications were a target throughout the war.

#### TELECOMMUNICATIONS AS A STRATEGIC VULNERABILITY

The Great Powers also saw the global communications network as a strategic vulnerability. As early as 1898, the Germans and the French had realized that British control over the global network permitted it to censor the traffic as it wished. Consequently, Germany attempted to construct its own network of international cables and radios.

Unfinished at the outbreak of the war, it was this network that the British targeted in the opening hours and weeks. Attempts to craft a new network during the war were unsuccessful.

U.S. officials came to realize, through the experience of being a neutral and then a belligerent, the extent of the deficiencies, vulnerabilities, and potentialities that lay in the existing global communications network. The U.S. military had intended to use submarine cables to connect with the American Expeditionary Force in France. German attacks on the cables and deferred maintenance in dangerous waters meant that this now-critical tool was also the weakest link in the information chain across the ocean. There were no effective alternate routes because the United States was on the periphery, not at the center, of the global communications network, and radio technology was not yet adequate.

The conclusion that U.S. naval officers, including later Rear Admiral Stanford C. Hooper, took from this was that the United States, without question, needed to have available to it an information network of global reach with the capacity, reliability, and speed to handle the volume of wartime traffic just experienced in 1914–19. It could not be controlled by any foreign power, least of all one allied with the only likely opponent of the United States. The only way to meet these objectives, in their view, was through a long-distance radio network, but such a network needed to be operated by a civilian company, one that, because of competition, would keep itself at the leading edge of science and innovation in radio technology.

Because of the understanding at the time about radio technology and the fears of inadequate spectrum, the solution in the view of the U.S. Navy was to shepherd the establishment of a new company, the Radio Corporation of America (RCA), spun off from General Electric (GE), to purchase the most powerful transmitters in the world, which GE manufactured. With those transmitters, RCA would be able to establish a global radio network on U.S. terms, using the frequencies most important to the United States to connect with the places of commercial, diplomatic, and military significance to the country. With such a civilian asset in place, the Navy in future wars could be assured of having the multiple, redundant lines of electrical communications free from foreign influence and capable of handling the wartime traffic. However, that mission would change, the technology would shift, and by World War II, the situation would be very different from what it had been in 1919. But what did not go away was a fear that the U.S. could be cut off and a sense that only by planning ahead effectively could the United States ensure that this disaster never happened. Since the 1930s,

this fear has continued to lie at the heart of U.S. national security policy regarding communications.

## CONCLUSIONS

Although this paper could only scratch the surface of an incredibly complex subject, the story of telecommunications in World War I is one that shows us how the tools of modern economic life could also be used as tools of war, specifically to enhance national strength and solve certain problems relating to strategic defense and offense in wartime. Such power meant that these telecommunications networks made inviting targets, ones attacked repeatedly by both sides in the war. Furthermore, because of these advantages and this significance, the communications networks or their absence introduced a new form of vulnerability to the United States, one not considered before the war. For all the attention to neutral rights and interference to shipping, it is notable that no corresponding idea of neutral rights for information existed.

One hundred and thirty-nine years after Benjamin Franklin secured the treaties with France, Lieutenant Colonel Charles E. Stanton of the American Expeditionary Force expressed the sentiment of many before the tomb of another critical figure of the Revolution: “Lafayette, we are here!”<sup>8</sup> Looking at the world in 1917—or at the world today—Franklin would have been astonished with a world where continual, reliable, instantaneous electrical communications permitted diplomats—or U.S. military officers—to exchange critical information with superiors across the vast oceans. He also could never have envisioned a world in which the government he helped establish would be able to make such use of that global communications network to accomplish the amazing things that, according to Edward Snowden, we are now apparently able to accomplish.<sup>9</sup> But, for those in World War I, the actions of today are the logical conclusions of the fears, doubts, hopes, and efforts of that era. Worth it or not, the origin of that story, of how the U.S. came to be at the center of global communications in the twentieth century, lies in the history of telecommunications and World War I.

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8 Stanton, a member of General John J. Pershing’s staff who spoke French, delivered the address that ended with these words following a ceremony on 4 July 1917 at the Tomb of Lafayette at Picpus cemetery in Paris.

9 Glenn Greenwald, “NSA Collecting Phone Records of Millions of Verizon Customers Daily,” *The Guardian*, 5 June 2013.