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GLOBAL COMMUNICATIONS

Heidi J.S. Tworek and Richard R. John

The harnessing of steam and electricity in the mid-nineteenth century created a new world of possibilities in business, politics, and public life. In no realm was this transformation more momentous than in communications, an activity commonly understood at this time to embrace not only the trans-local circulation of information, but also the long-distance transportation of people and goods (Matterlart 1996, 2000). For the first time in world history, merchants could convey overseas large quantities of goods on a regular schedule and exchange information at a speed greater than a ship could sail. New organizations sprang up to take advantage of this "communications revolution," as this transformation has come to be known (John 1994). Some were public agencies; others were private firms. Each was shaped not only by the harnessing of new energy sources, but also by the institutional rules of the game. These rules defined the relationship of the state and the market, or what economic historians call the political economy.

This chapter surveys this transformation, which we have come to view with fresh eyes following the commercialization of the Internet in the 1990s. It features case studies of two well-documented global communications organizations that originated in the nineteenth century – undersea cable companies and news agencies – which we have supplemented by a brief discussion of other important global communications organizations: radio, telephony, and the mail. We have not surveyed film, a topic addressed by Peter Miskell's chapter in this *Handbook*.

Four premises shape our chapter. First, the makers of global communications are best characterized as *organizations* rather than *private firms* or *public agencies*. They have sometimes been government owned and government operated and, especially recently, are often coordinated by ostensibly nonprofit and non-governmental technical bodies such as the Internet Corporation for Assigned Names and Numbers (ICANN) (Mackinnon 2012; DeNardis 2014). Many are multinational enterprises (MNEs), making this topic particularly pertinent for historians interested in the relationship between international business, technology, and the state.

Second, the organizations that the makers of global communications established are most aptly characterized as *networks* that consisted of links, nodes, and spaces-in-between, rather than as more-or-less seamless *systems*. All metaphors raise interpretative issues, and network is no exception (Marx 1994: 21–25). Yet *networks* are explicitly spatial, in contrast to *systems*, and, for this reason, better describe organizations that are entwined with sovereign states, technical standard-setting bodies, and multinational enterprises. In rejecting the system metaphor, we

break with much innovative recent scholarship on long-distance communications, which has posited that the leading organizations are best understood as components of a "large technical system," a concept popularized by historian of technology Thomas P. Hughes (1998, 2005). While this construct has the advantage of shifting attention away from the internal dynamics of particular firms, it presupposes a spatial uniformity that is hard to square with the historical record.

Our third premise is that the most influential makers of global communications were not confined to the ranks of visionary entrepreneurs or venture capitalists. Rather, they also included the political economy that facilitated – or in the case of the Soviet Union, stymied (Peters 2016) – the innovative process. Every political economy has a distinctive structure. And in global communications, as in so many other realms, *structure* shaped *strategy*: that is, the *political structure that incubated global communications organizations shaped the management strategies of private firms, the administrative mandates of public agencies, and the technical directives of standard-setting bodies.*

Our final premise is that the present is not the first historical epoch in which enormous technical advances in communications technology have reshaped the world economy, recalibrated perceptual horizons, and reordered conventional assumptions about time, space, and speed. On the contrary, the foundations of the present digital age were laid in a mid-nineteenth-century communications revolution that transformed the informational environment long before the laying of the first fiber optical cable (John 2000; Rosenberg 2012, Osterhammel 2014; Balbi and John 2015). The dominant organizations that this revolution spawned were not only or even primarily the byproducts of technical imperatives and economic incentives. On the contrary, they benefitted from institutional arrangements designed to promote political goals. In communications, probably more than in any other realm but national defense, governments have played favorites – hence why a small number of huge organizations with close ties to the state dominated the informational environment of modernity.

In the opening years of the twentieth century, German publications buzzed with excited reflections on a new concept: "the world economy" (*Weltwirtschaft*). New concepts are often devised to describe innovations in material life and this coinage was no exception. *Weltwirtschaft* received much of its plausibility from its association with "world traffic" (*Weltverkehr*), a related concept that described the circulation of information, people, and goods in commerce, communications, and transportation (Tworek 2015a). References to *Weltverkehr* became increasingly common in Germany in the decades following national unification in 1871, when the country emerged for the first time as a global economic powerhouse. This new way of thinking about business and technology would become so common by 1912 that a group of German academics established a journal entitled *Weltverkehr und Weltwirtschaft*.

But just how large was the world that these Germans imagined? To answer this question, postal administrator Max Roscher distinguished in 1914 between traffic that was merely national or international and traffic that was truly worldwide. Traffic linking neighboring countries such as Germany and France was international, but not global. *Weltverkehr*, by contrast, referred to "trade relationships encircling the whole world between areas … that lie far apart" (Roscher 1914: 305, translated by the authors).

This chapter follows Roscher's lead by surveying historical scholarship on organizations that coordinated the movement of information, people, and goods between distant regions that were often separated by sea. These organizations relied upon two new energy sources: electricity, the circulating medium for the world's cable and telegraph networks; and steam, a motive power indispensable for overseas shipping. The first regularly scheduled steamship service between Great Britain and the United States went into operation in 1840. Before long, steamships would

link most of the world's major ports (the subject of Harlaftis's chapter in this *Handbook*). The influence of steam and electricity upon commerce, politics, and the economy in the nineteenth century was "astounding," reflected a New York City-based wholesale merchant in 1875:

> Now, the whole world has become producers or traders, and in the event of scarcity at a given place, the news is flashed to the point of supply – under the ocean and around the earth even – and the giant power of steam hurries the products of the world to our doors.
>
> *(Thurber 1875: 623)*

The symbiotic relationship between innovations in communications and ocean-borne transportation has persisted to the present. In the early twentieth century, for example, private firms such as the U.S.-based United Fruit Company joined public agencies such as the British admiralty and U.S. Navy as early adopters of wireless telegraphy, or what we today call point-to-point radio (Hugill 1999; Winkler 2008). Following World War II, further innovations in information technology would transform supply-chain logistics in overseas trade (Levinson 2006; Miller 2012).

The transformations set in motion by steam and electricity hastened a new sensibility that can be properly called global, in the sense that they encouraged new and often highly expansive ways of thinking about knowledge, territoriality, and power. French scientists devised a new cosmology to describe a world in which steam power and the electric telegraph supplanted the clock as a metaphor for the natural order (Tresch 2012); American liberals linked technological innovation in transportation and communications with a more spatially expansive conception of moral progress (Ninkovich 2009); while British and American commentators invoked organic metaphors such as "nerves" and the global "body" to link the telegraph and cable with imperial projects and territorial expansion (Bell 2007; Otis 2011).

For the vast majority of the world's inhabitants, the most important long-distance communications network until quite recently was not the telegraph or the telephone, but the mail. The world's postal network expanded enormously in the nineteenth century, partly because of the widespread adoption of the steamship as a mode of transportation, and partly because of the establishment of an international organization – the Universal Postal Union – to coordinate the transnational movement of the mail (Hyde 1975; Laborie 2010; John 2015; Shulman 2015). Merchants relied on the mail to conduct routine business. Migrants used it to remain in touch with friends and family members back home (Gerber 2006; Laako 2007; Maischak 2013). The mail – and not the telegraph, as a journalist erroneously contended in a popular history written shortly after the commercialization of the Internet in 1995 (Standage 1998) – was the true "Victorian internet" (John 2010, 2013).

Until quite recently, all of the world's major postal systems were owned and operated by national governments and operated as monopolies, an uncomfortable fact for neoliberal champions of economic development, since the mail has long been an indispensable agent of globalization. Steamships remained the primary mode of long-distance postal conveyance until the mid-twentieth century, when they would be supplemented, and eventually largely replaced, by airplanes, the primary mode of long-distance postal conveyance today. Most of the organizations that conveyed the mail – from the Cunard Company in the mid-nineteenth century to Pan American Airlines in the 1930s – were not public agencies, but private firms. Even so, these companies relied on substantial government subsidies, particularly early on. Predictably, they quickly became oligopolies, which they largely remain today (Robinson 1964; Linden 2001).

By almost any measure, the mail remained the primary long-distance communications medium for almost everyone from the nineteenth century until the commercialization of the Internet in the 1990s. This included not only migrants eager to remain in touch with friends and family members back home, but also MNEs such as the Ford Motor Company, whose far-flung managers routinely relied on the mail to conduct routine business (Wilkins and Hill 1964). For certain groups of highly specialized users, however, the mail was supplemented – and partly supplanted – by a constellation of electrically mediated long-distance communications media: first the cable (or undersea telegraph), then wireless telegraphy (or what would come to be known as point-to-point radio), and eventually the telephone and the fax (Coopersmith 2015).

The electric telegraph was not the first long-distance communications medium to transmit information faster than a horse could gallop (Headrick 2000). That distinction goes to the optical telegraph, which, along with the guillotine and the metric system, deserves pride of place as one of the most fundamental of the technical advances to have emerged from the French Revolution. It was this innovation that gave the world the term "telegraph," a French neologism meaning, literally, writing at a distance. The French government owned and operated the most important optical telegraph. In its heyday in the early 1850s, it linked 556 towers in a network that extended over 2,900 miles. Except briefly during the Napoleonic era, this network did not operate outside France's borders (John 2010).

The first medium to transmit electrically mediated information over long distances between countries that lacked a common border was the undersea (or "submarine") cable. Undersea cables were almost always owned and operated as private firms, though they depended on the governments of the countries they linked for various privileges, particularly landing rights (Müller 2016).

Cable companies operated closely with country-specific land-line (or "inland") telegraph networks that were often government owned and government operated. Important exceptions (and there are others) included the British inland telegraph network before 1870 and the U.S. land-line telegraph network during its entire history. The cable network expanded rapidly: the English Channel was spanned in 1851; the Atlantic in 1866; and the Pacific in 1902. By 1879, around 100,000 miles of undersea cables had been laid. This total nearly doubled to 190,000 miles by 1900, when a wire network linked every continent other than Antarctica (Müller 2016: 227).

Historical writing on undersea cables is highly developed and falls into three main traditions. The first tradition highlights the close relationship between the cable network and the imperial designs of the European Great Powers, particularly Great Britain (Innis 1950; Headrick 1991; Hugill 1999; Headrick and Griset 2001; Wenzlhuemer 2013). The cable network, Daniel R. Headrick famously posited in 1991, was an "invisible weapon" that the British government deployed to maintain control over its sprawling imperial domain. The second tradition contends that the focus on imperial designs is often exaggerated (especially before 1890) and emphasizes the business strategy of individual cable companies and the economic benefits of oligopolistic collusion (Winseck and Pike 2007). The third tradition, and the one most aligned with this chapter's perspective (Müller and Tworek 2015; Müller 2016), shifts the focus to political economy, and, in particular, to the institutional rules of the game in which the global cable network evolved. This tradition has been shaped by the recent emergence of global history as a discrete field of inquiry. By decentering both the nation-state and the firm, it has shifted our attention to the network as the primary unit of analysis (Grewal 2008; Conrad 2016).

Though cable companies barely figure in standard accounts of large-scale enterprise, they share many features that historians associate with the rise of managerial capitalism (Chandler

1977). Capital-intensive and technically advanced, they were operated by an elite cadre of engineers who did much to invent the modern field of electrical engineering (Hunt 1997). The most important cable companies were headquartered in London, where a cohort of like-minded Anglo-American promoters, investors, and engineers – the "class of 1866" (Müller 2016) – oversaw the construction and operation of the global cable network during its heyday, which stretched from 1866 until World War I. Prominent among them was Cyrus Field, an American paper manufacturer who helped fund an unsuccessful 1858 Atlantic cable, and John Pender, a British textile manufacturer who invested heavily in the 1866 successful Atlantic cable, as well as the various telegraph companies linking the United Kingdom with its colonial possessions in South Asia. Though U.S.-based companies would contest the dominance of British firms in the North Atlantic market, only the British had the know-how, the natural resources, and the equipment to operate and maintain a global network (Winkler 2008). And since the fastest and most widely used North Atlantic cables all touched on British or Canadian soil, the British government retained the ability to monitor cable traffic to and from the United States, an affordance that would prove useful during World War I.

One of the most vital natural resources upon which cable promoters relied was gutta percha, a tree-based resin from Malaya that, beginning in the 1850s, cable manufacturers relied on to insulate undersea cables. British imperial control over much of Southeast Asia helped to guarantee British cable manufacturers cheap and reliable access to this indispensable raw material. By the early twentieth century, so much gutta percha had been extracted from the rain forests of the region that they had been stripped bare, creating a "Victorian ecological disaster" (Tully 2009).

The cable network was dominated by a small number of capital-intensive organizations that nineteenth-century economists dubbed "natural" monopolies (Mosca 2008; Wagner 2014). The huge sunk (literally!) costs of laying telegraph cables created formidable barriers to entry, as did the restrictions governments imposed on the granting of landing rights. The New York, Newfoundland and London Telegraph Company, for example, obtained from the Newfoundland government a fifty-year exclusive monopoly on cable landings in 1854, an enormously valuable asset, given the strategic location of Newfoundland in the North Atlantic market (Müller 2016).

Three business groups dominated the global cable network in its heyday: the Atlantic pool, the Eastern and Associated Companies, and a constellation of firms whose interests were often aligned with the Great Northern Telegraph Company. The Atlantic pool was dominant in the lucrative North Atlantic market. Led by the British-owned and British-operated Atlantic Telegraph Company – the firm that had laid the first successful Atlantic cable in 1866 – this pool was challenged in the 1880s by a number of rivals, including two based in the United States. Following a brief price war, the main players agreed to divide the market. By 1900, the thirteen cables that spanned the North Atlantic were owned and operated by a mere four companies, with a capitalization that was estimated to top £17 million, making them among the world's largest multinationals. Together, they sent around 10,000 messages each day between Europe and North America, in what was and would remain the single largest cable market in the world (Müller and Tworek 2015: 265).

The second group was the Eastern and Associated Telegraph Companies, a federation of British-owned and British-operated firms that controlled the cable network between Great Britain, its vast colonial empire, and much of the rest of the world. The most important cables in this group linked Great Britain, India, China, and Australasia; additional cables linked Great Britain to Central and South America (Brown 1927: 11–19). In 1898, this group owned and operated one-third of the world's total global cable mileage and transmitted two million messages

(Bright 1902: 167). By 1914, it had become, in the words of Daniel R. Headrick, "one of the world's most powerful multi-national conglomerates" (1988: 105).

The third group linked Europe with Asia and the United States with Latin America. While harder to characterize than the first two groups, it was dominated after 1869 by the Danish-based Great Northern Telegraph Company, which combined the assets of Danish, Norwegian, Russian, and English investors to link Europe with East Asia via the Baltic Sea by undersea cable and the vast Russian interior by land-line telegraph. Between 1871 and 1943, Great Northern partnered with a Japanese-based cable firm to boost East–West trade and reduce the cost of diplomatic dispatches (Yang 2010). Other cable companies linked the United States with Brazil and other South American countries by way of the West India and Panama Telegraph Company, the Brazilian Submarine Telegraph Company, and the Western and Brazilian Telegraph Company (Ahvenainen 2004; Britton 2013).

The cable network shaped global business in various ways. Though it did not annihilate time and space, as some contemporaries claimed, it helped to standardize time zones (Ogle 2015) and expand the futures market, a new economic institution that was based on the buying and selling of agricultural commodities in time rather than space. The new medium, or so Karl Marx predicted in 1855, was rapidly "transforming" the "whole of Europe" into "one single stock exchange" (Marx 1855: 167). Marx was wrong. Regional markets persisted and, in some places, the creation of a futures markets predated the laying of the first undersea cable: in Japan, for example, a futures market dated back to the Dojima rice market in Osaka in the early seventeenth century (Schaede 1989). Yet it was only after the Atlantic cable had linked the United States and Europe that a large-scale futures market emerged in Chicago (Engel 2015). Cable telegraphy also enabled steamship lines to buy, sell, and move goods around the world, while reducing the time that fleets had to remain in port (Lew and Cater 2006).

Undersea cables were most emphatically not the Victorian Internet (*contra* Standage 1998). Rates remained extremely high, and facilities limited. In the first several decades of the Atlantic cable, fewer than 100 businesses used it with any regularity. In fact, the cost of sending a cable was *so* exorbitant that one British MP, Henniker Heaton, complained in 1912 that the new medium was "beyond the means of 99 percent of the population" (Müller 2015). Until the 1890s, most cable investments strengthened pre-existing ties between major urban trading centers (Hoag 2006). Many parts of the world remained outside the network, an outcome based partly on prevailing assumptions about race, gender, and class. The vast majority of investors were men, though women would come to hold substantial shares in certain cable companies, just as they did in sailing vessels (Doe 2010; Müller 2016).

The cable network changed significantly in the 1890s, partly as a result of Great Power competition between Great Britain, France, and Germany, and partly because of the heightened U.S. presence in the Pacific that followed the U.S. acquisition of the Philippines and Guam during the Spanish–American War. No longer could it plausibly be contended that cable companies operated more-or-less independently of political fiat, a contention that had been at least partly true before this time for certain markets outside South Asia and Africa (Headrick 1988: 100, 107). The German government subsidized German cable companies because officials feared that Anglo-American cable companies put German firms at a disadvantage in international markets. The British government worked with its Canadian counterparts to lay a trans-Pacific cable that, when it went into operation in 1902, completed a global "All-Red Route" that linked British imperial possessions by landing only on British-controlled territory. And in 1903, the U.S. government provided technical assistance to a U.S. Pacific cable project that provided a direct cable link to Hawaii, the Philippines, and Guam. Neither Pacific cable was an economic success. Then and now, politics has its limits:

though geopolitical rivalry hastened their completion, it could not conjure new markets into existence. Built ahead of demand, the Pacific cables never generated enough traffic to cover their huge sunk costs (Müller and Tworek 2015).

An even more fundamental challenge to the cable network would emerge in 1901, when the British-Italian inventor-turned-promoter Guglielmo Marconi successfully demonstrated that he could transmit a point-to-point radio message across the Atlantic. The military and commercial significance of wireless telegraphy (as point-to-point radio transmission was then known) was self-evident to government officials in Great Britain, Germany, and the United States, setting in motion a global communications arms race that would ultimately have major implications not only for commerce, but also for geopolitics. To cement Marconi's dominant position in the wireless market, his company – Marconi Wireless – refused before 1912 to interconnect with rival wireless network providers, a business strategy that put Marconi at odds with government officials and rival network providers in the United States and Germany (Raboy 2016). The stakes were high: for the first time in world history, it was now possible for naval officers to maintain ship-to-shore contact with their fleets anywhere on the high seas, a logistical advantage that no great power could ignore. The geopolitical significance of technical advances such as wireless varied widely from nation to nation. For the British, as one historian has explained, technical advances helped "stabilize an international status quo" that was already "favorable to their nation"; for the Germans, in contrast, they could help "transform the international environment that stifled their political ambitions" by improving the position of German business and the German government in the global economy (Rieger 2005: 18).

The German government fostered innovation in wireless by restructuring private enterprise. In 1903, for example, it convinced two competing electrical manufacturing companies – Siemens & Halske and AEG – to form a jointly owned subsidiary known as Telefunken to undertake research and development in the mysterious new medium and manufacture wireless receivers. During the first eight years of its existence, Telefunken obtained between 70 percent and 80 percent of its revenue from government contracts. German officials were also active on the diplomatic front. Following an almost decade-long diplomatic standoff, German officials joined with British and U.S. officials in a 1912 international standard-setting meeting in London to force Marconi Wireless to make its receivers compatible with those of its rivals.

Within two years, Telefunken and Marconi established a cartel in wireless equipment. To gain control of market for ship-to-shore communications, the two companies agreed to pool patents. Of the 1,554 ship-to-ship stations then in existence, only 294 remained outside their control (Evans 2010: 213). Taking to the offensive, German officials underwrote the establishment of a global "All-Wireless Route" to link Germany and its colonies. Germany's defeat in World War I hastened the surrender of its wireless patents to the U.S. government, which transferred them to incumbent telephone network provider American Telephone & Telegraph (AT&T) and newly established radio equipment manufacturer Radio Corporation of America (RCA). These companies, in turn, would become major players in the U.S. radio broadcasting industry following its beginnings in 1920 (Aitken 1985). While Germany never regained its prewar position in wireless, it would remain a major player in the interwar period in broadcast radio (Tworek 2016).

The slow yet steady ascendency of the United States in global communications during the interwar period created path dependencies that have lasted until today. Rising American influence was on display in 1927 when an international radio conference agreed to allocate the spectrum by function rather than nation, a victory for U.S. companies and a defeat for Great Britain, France, and the other European Great Powers (Schwoch 1987). International standard-setting has a political dimension, as political theorist David Grewal has observed, since a successful standard can exert

"network power" by fostering cooperation among network members, excluding non-members, and convincing would-be members to join the network even though membership might in certain respects be disadvantageous (Grewal 2008: 10). Since 1927, this kind of power increasingly bene-fitted the United States in its contest for global communications dominance first with Great Britain and, after 1945, the Soviet Union (Hills 2002, 2007). U.S. global communications policy has consistently favored private management over government administration. Since 1970, this pref-erence has become increasingly influential in global communications with the deregulation of many of the world's largest state-owned telecommunications network providers (Fitzgerald 2015).

For a brief period following World War II, it seemed conceivable that satellites might replace cables as the primary carrier of the world's global communications. Funded primarily by the United States and the Soviet Union, the first satellites – Sputnik for the Soviets; Comsat for the Americans – were players in a global Cold War (Schwoch 2009; Slotten 2013). Following the discovery of fiber optics, however, the balance has shifted back to undersea cables. As a con-sequence, today's Internet network resembles the global cable network in 1902 far more than the satellite network in 1970 (Finn and Yang 2009; Starosielski 2015). Little wonder, then, that one leader of a developing country, Tanzanian president Jakaya Kikwete, characterized the laying in 2009 by a pan-African business consortium of the first fiber optic cable between East Asia and the Arabian Peninsula as "the ultimate embodiment of modernity" (cited in Müller and Tworek 2015: 282).

While the cable network has long been hailed as a technological icon, the news agencies report-ing international news for the world's newspapers, radio programs, and television broadcasts are largely unknown even to specialists in the field. This is unfortunate, since their history reveals much about the evolution of global communications following the harnessing of steam and electricity.

Historical writing on international news agencies falls into two main categories: monographs on specific organizations and interpretative surveys. Organization-specific monographs are typically fact-laden and narrowly focused (Read 1992); interpretative surveys are more wide-ranging and often emphasize the interconnected influence of politics, new media, and business competition (Rantanen 2013; Silberstein-Loeb 2014; John and Silberstein-Loeb 2015; Stamm 2015; Shu 2016).

News agencies can be thought of as brokers or wholesalers that relied on a network of cor-respondents to generate news items in a specific territory that they repackaged as time-specific fillips of information for their "'retail' clients," which, in the late nineteenth century, were mostly newspapers (Boyd-Barrett and Rantanen 1998: 6). Of these newspapers, only the largest and best capitalized – e.g., the London *Times* and the *New York Herald* – could afford to hire their own international correspondents. As an alternative, many contracted with news agencies to send them up-to-date information via the mail, the telegraph, cable, and also, and in due time, the telegraph ticker, the telephone, and wireless.

The most important nineteenth-century European news agencies were the "Big Three": Agence Havas, founded in the early 1830s; Wolff's Telegraphisches Bureau, or Wolff, founded in 1849; and Reuters, founded in 1851. Each was named after an eponymous founder: Charles-Louis Havas, Bernhard Wolff, and Paul Reuter. Each relied on a far-flung staff of correspond-ents to gather news for newspapers, which were at the time the primary distributor of time-specific information on commerce and public affairs.

Their principal U.S. counterpart was the New York Associated Press (NYAP), which was founded in the mid-1840s, and the Western Associated Press (WAP), which was founded in 1862. The WAP succeeded the NYAP as the dominant U.S. newsbroker in 1892, when it

renamed itself the Associated Press (AP) (Blondheim 1994). The news agency model proved highly successful. In the words of British journalist John Hobson, its ability to transmit real-time news to far-flung locations created an "immediate and simultaneous sympathy" that brought a "new element of sociality" into the world. "In this sense," Hobson elaborated, "we may say that the world has been recently discovered for the mass of civilized mankind" (1906: 17).

International news-gathering was, and is, expensive. To cover its cost, nineteenth-century news agencies relied on a far-flung network of overseas correspondents to report the news, and a global telegraph, telephone, and radio network to transmit it. On the eve of World War I, Wolff spent over $160,000 in news-gathering, while Reuters spent four to five times that much (Hansen 1914: 80). These were large sums for a time in which the capitalization of the then struggling London *Times* was a mere $2 million, the working capital of the entire Northcliffe newspaper empire no more than $8 million, and the financial value of news reporting an open question: then, as now, it was relatively easy to steal the news, or even to fake it.

Given the limited size of the newspaper market and the impunity with which news could be copied, it should come as no surprise that news agencies devoted much attention to protecting their reporting. Some tried to exclude rivals altogether; others to cut deals with government administrators to obtain exclusive access to official dispatches. To gain control over the market, Reuters, Havas, and Wolff formed a global cartel in 1870 that the Associated Press would eventually join. Henceforth, each was responsible for reporting on and circulating to each other whatever news they might have discovered on their particular "beat" (Silberstein-Loeb 2014).

Not everyone found this arrangement to its liking. Troubled by the global news cartel, and eager to tell its own story, the Japanese government in the 1930s entered into an agreement with cable network provider Great Northern (Akami 2012). The Japanese government's desire for autonomy in news provisioning hastened the departure from the global news cartel of the AP. Not until after World War II would the Japanese government give up its dream of a "Greater East Asian Co-Prosperity Sphere" that was independent of First World control (Yang 2010; Akami 2014).

Even more radical in his critique of the global news cartel was the Indian journalist and political activist Mahatma Gandhi. What was the ethical value, Gandhi asked during his years in South Africa, of the rapid transmission of up-to-date news? To answer this question, Gandhi founded a newspaper that championed an alternative ethic of slow reading (Hofmeyr 2013). After returning to India, Gandhi helped to transform the telegraph into "a double-edged sword" (Headrick 2010). Although the British had assumed the new media would consolidate British imperial control, Gandhi and his fellow Indian nationalists deployed it to counterbalance English-language reporting, challenge First World-style economic development, and coordinate pan-Indian resistance to British imperialism (Bonea 2016).

News agencies adapted to the advent of radio broadcasting in the 1920s in various ways. In Great Britain and Germany, the government regulated broadcasting tightly and radio stations were funded primarily by licensing fees. In both countries, news agencies at first provided the limited news sent over the airwaves. Only in the 1930s would the British government-licensed radio broadcaster, the British Broadcasting Corporation (BBC), begin to invest in an independent news-gathering apparatus (Tworek 2015b). The Soviet news agency, TASS, provided news for radio too, but radio in the Soviet Union was broadcast publicly through loudspeakers (Lovell 2015), rather than in private homes – the norm in Great Britain, Germany, and the United States.

In countries such as Argentina, news agencies sold news to advertising-based stations for producers intent on creating "authentically" Argentine programs for the working class (Karush 2012). Radio broadcasting in the United States was even more emphatically commercial. From

the beginning, news agencies provided domestic radio stations with news, which they broadcast in the hopes of catching advertising dollars.

International broadcasting, by contrast, operated under different rules. Each of the principal U.S. overseas broadcast networks – Voice of America, Radio Free Europe, and Radio Liberty – were government owned and government operated (Puddington 2015). To prevent overseas news broadcasts from competing with domestic news broadcasts, lawmakers in 1948 prohibited the overseas networks from broadcasting inside the United States. The U.S. overseas networks confronted a different kind of obstacle from the government of the Soviet Union and its satellites. To prevent their broadcasts from penetrating the Iron Curtain, the Soviet government grew adept at blocking, or "jamming," their transmission (Siefert 2003).

The rapid dismantling of the European colonial empires following World War II confronted news agencies with additional challenges. Troubled by the continuing dominance in the global news market of news agencies headquartered in First World countries such as the United States and Great Britain, a coalition of Third World countries joined a group of left-leaning First World academics to establish a New World Information and Communication Order (NWICO) under the auspices of the United Nations Economic, Scientific, and Cultural Organization (UNESCO) (Brendebach 2018). In protest, both the United States and Great Britain briefly boycotted the UN organization.

In hindsight, it would seem indisputable that NWICO failed. Though the commercialization of the Internet has substantially transformed the global informational environment, the global influence of First World news agencies remains substantial. Ironically, several African nations received *more* news from Reuters after decolonization than they had during the colonial era, since Reuters squeezed out its Francophone rivals and pan-African cooperation stalled (Brennan 2015). Decolonization did not foster a new generation of post-colonial news agencies; instead, it consolidated a legacy news agency that was closely linked to the British Empire.

Newcomers such as Qatar-based Al Jazeera, China Central TV (CCTV), and Russia-based RT and Sputnik have tried to push back against what they regard as Anglo-American dominance of global news, thus far with limited success. Even so, the insurgents persist. "The ratings are almost beside the point" noted a *New York Times* reporter, in commenting on a Russian state-funded media project intended for viewers in the United States. What matters, declared Russian president Vladimir Putin, in a remarkably frank statement of his government's media policy, is to "break the monopoly of Anglo-Saxon global information streams," a policy goal that raises troubling moral questions in an age when the "weaponizing" of social media by foreign governments and multinational organizations is shaping popular culture and influencing electoral outcomes (Rutenberg 2017).

The dominant global communications organizations today are different in many ways from those that thrived in the nineteenth century. Yet they too have benefitted from path-dependent processes that owe as much to politics and culture as to technology and economics. For this reason, the organizations featured in this chapter – the cable companies that circulated information between the world's major commercial centers; the news agencies that created the content for the world's newspapers and broadcasters; and the postal and telecommunications networks that connected the world's peoples – created path-dependent institutional structures that have proved remarkably resistant to change.

How global communications will evolve in the future is an open question. Much will depend on the future configuration of the Internet, and, in particular, on the changing structure of the market for long-distance point-to-point communications (Balbi 2013). For much of the twentieth century, most of the world's telephone service was operated either as a

government monopoly (which often combined the post, the telegraph, and the telephone in a single organization, and for this reason were known as PTTs) or, as in the United States, by a tightly regulated private firm, AT&T. The Bell System, as AT&T was known until its 1984 Supreme Court ordered break-up, operated primarily in the United States. Yet it also operated as an equipment manufacturer, Western Electric, that in the early years of telephony moved rapidly into global markets, as well as a research and development laboratory – Bell Labs – that developed a raft of innovations that would shape global communications, including the transistor, fiber optics, and cellular telephony.

Since 1970, the provisioning of telephone service has been unbundled, leading to a veritable explosion in foreign investment in networks that had formerly been government monopolies. This was true not only in Europe, but also in the Global South. Forty percent of all private investment in telecommunications in developing countries in 2000 came from overseas, mostly from incumbent providers in search of new markets. In fact, of the 100 largest nonfinancial transnational corporations in 2002, no fewer than eight were in telecommunications. Interestingly, each of these companies had formerly been a nationally based monopoly telecommunications service provider: six in Europe, one in Asia, and one in the United States (United Nations Conference on Trade and Development 2004: 117, 276–278).

Foreign investment by telecommunications corporations is nothing new. The U.S. telephone equipment manufacturer Western Electric opened a factory in Antwerp in 1882; the German cable manufacturer Siemens & Halske operated ten factories in five foreign countries in 1914, including China (Fitzgerald 2015: 128–132); the Swedish telephone equipment manufacturer Ericsson built one-third of its equipment outside Sweden in the 1930s (Jones 2005: 105). Direct foreign investment in telephone operating companies became increasingly precarious following World War II, as several governments took control of networks that had previously been operated by multinationals (Wilkins 1998: 117; Bucheli and Salvaj 2014). Even so, multinationals continued to supply much of the world's telephone equipment. The post-1970 period is distinguished, instead, by an increased reliance on outsourcing as an alternative to in-house manufacturing. In the period since 2000, for example, Ericsson, which in that year was the largest telecommunications corporations in the world, has reduced its foreign direct investments in manufacturing from seventy plants to fewer than ten (Fitzgerald 2015: 489).

Variegated and rapidly evolving – hastened, in particular, by the collapse of the once formidable technical barrier between digital computing and analog communications – these organizations are better characterized as network service providers than as large-scale technical systems. Privatization has fostered rapid innovation: of the ten largest mobile telephone operators in Africa in 2006, five were headquartered in Europe (United Nations Conference on Trade and Development 2008: 111). The results of this unbundling are evident to anyone who has visited Kenya, India, or China: mobile telephony has boomed.

Today's global communications network providers are among the leading beneficiaries of this post-1970 restructuring of the world's information infrastructure. This restructuring is often termed "deregulation," "liberalization," or even "neoliberalism," implying that governments no longer play a critical role in the informational environment of the digital age.

Nothing could be further from the truth. Government support has been instrumental not only in the promulgation of the technical standards that undergird the Internet (Russell 2014), but also in the scientific advances that made possible the Apple iPhone (Mazzucato 2013). Tax policy has shaped the location of brick-and-mortar facilities. The European Union has saddled Apple with huge fines for anti-competitive practices. A 1996 U.S. federal law immunized digital platforms from prosecution for the circulation of false, malicious, or libelous information; this hastened the weaponizing of these platforms by hostile powers. Governments in many countries

work closely with network providers to surveil network users and to block subversive, obscene, or fake information (Tworek 2017).

What *has* changed is the scale on which these organizations operate. The markets in which Apple, Google, Facebook, Tencent, Nokia, and their rivals compete today are global rather than nationwide, making them in certain ways the heir to the undersea cable companies and news agencies of the past. New institutional arrangements abound. Facebook and Google, for example, are investing in fiber optic cables, a development reminiscent of the funding of a new Atlantic cable by the late-nineteenth-century newspaper baron James Gordon Bennett, Jr. More than any other factor, global competition between mobile telephone providers has hastened the quantitatively unprecedented expansion in connectivity on every continent, enabling billions of people to communicate at a remarkably low cost by email, voice, or even video with friends and relatives anywhere in the world.

This restructuring of the informational environment, in turn, opens up new possibilities for historical research. While we know a great deal about nineteenth-century undersea cables and pre-World War II news agencies, we know relatively little about the origins of today's fiber optic network and even less about the long history of global broadcasting, global censorship, and global surveillance. The significance of these phenomena is self-evident now that the relationship between global communications networks and the nation-state has become a topic of considerable contemporary concern. The recent spectacular rise of Google, Facebook, and Tencent also raises a spate of public-policy questions about the relationship between MNEs and the public good. If, for example, a digital platform can obtain a dominant market share in a media market by capitalizing on what economists call "network effects" – that is, the propensity of a network to become *more* valuable to its users as it expands – might not its very success become a rationale for its regulation?

The dizzying recent changes in global communications underscore the relevance of political economy as an analytical lens. Communications infrastructure is enormously expensive, giving the organizations that own and operate the world's communications networks and Internet service providers a vested interest in political stability. Conversely, the absence of political stability – as, for example, during World Wars I and II, or the early years of decolonization – has been enormously disruptive, with unpredictable consequences that have often proved irreversible.

Nothing is permanent. It is for this reason salutary to remember that influential elites have previously predicted that rapid, high-speed, global communications would bring economic prosperity and world peace. Writing in 1912, German economics professor Bernhard Harms hailed the "electrical transmission of news" as a more important factor in hastening overseas trade than even the steamship or the railway (Harms 1912: 141). Influential progressives in Great Britain, Austria-Hungary, France, and the United States went even further, contending that the world had become so interconnected that a global conflagration had become inconceivable.

The visionaries were mistaken. In 1914 – and once again in 1939 – the war came. Even so, the seductive allure of the profoundly mistaken assumption that technical advance will inexorably hasten moral progress endures – as anyone can attest who lived through the Internet boom of the 1990s. Paradoxes abound. International stability has never been more essential, yet diplomacy is disparaged. Information is ubiquitous, yet disinformation is endemic. Maintenance has never been more indispensable, yet disruptive innovation is all the rage. Never has the power of political economy to shape the institutional rules of the game been more palpable, yet rarely has the effects of these institutional arrangements been more emphatically denied. For if the history recounted in this chapter holds any lessons for the future, it is that the huge organizations that

dominate today's global communications networks are driven less by technological imperatives than their champions proclaim, and are more dependent on political fiat than all but their most inveterate critics concede (Price 2002).

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