Network Nation: Inventing American Telecommunications

By Richard R. John. Cambridge, MA: The Belknap Press of Harvard University Press, 2010. 520 pp.

Histories of communication that include the telephone often focus on inventor Alexander Graham Bell or, more likely, on the interwoven accomplishments of American Telephone and Telegraph (AT&T), the Bell System, and Bell Labs. The era from Bell's development of the telephone in 1876 to AT&T's transcontinental telephone line in 1915 is usually presented as a series of technical achievements, and the popularization of the telephone is taken as a foregone conclusion.

Similarly, if the telegraph is addressed at all in histories of business, communication, or technology, it is typically presented in two snapshots: first, as the brainchild of Samuel Morse, second, as telegraph lines crisscrossing the nation alongside busy railroad tracks. The years and developments between those two moments are omitted. Perhaps Thomas Edison, yet another inventor in this technology, is mentioned for developing the telegraph quadruplex, the profits from which he invested in his Menlo Park research laboratory. More recently, in works such as Tom Standage's *The Victorian Internet*, the telegraph has enjoyed newfound popularity as a harbinger of our contemporary wired world.

In *Network Nation: Inventing American Telecommunications,* Richard R. John resists this technological determinism. Although Bell and Morse both appear in his history of electrical communication, they are two individuals among many. Rather than merely focusing on inventor and invention, John examines how the telegraph and the telephone systems developed in the United States between 1840 and 1920, with an emphasis on political economy. Indeed, John argues that the American system of government – at the federal, state and municipal level – directly and crucially shaped the telegraph and telephone networks and their operations.

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John, a historian at the Columbia University School of Journalism, develops his theme through eleven chapters, organized chronologically. He examines the telegraph largely through the lens of Western Union, one of the largest corporations in the United States circa 1870, a fact that bears emphasis here. The later chapters on the telephone address the interconnected American Bell, American Telephone & Telegraph, and Bell System companies. The author deploys these companies' extensive business archives, in addition to government publications and documents, personal correspondence, magazines, newspapers, and pamphlets, to build a thoughtful and thorough argument. For John, the fortunes of Western Union and AT&T were very much tied to their employees. *Network Nation* is populated and enlivened by these individuals, and by the politicians and protesters who challenged the two telecommunications companies.

Network Nation opens with a short four-page introduction, and the first chapter acts as an extended introduction, but an outstanding summary of the book appears at the end as the "Chronology of American

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Telecommunications" (p. 415). This nine-page detailed timeline cogently presents John's central themes and characters. The dates and developments here have little to do with scientific breakthroughs and technological innovations. Rather, the chronology is dominated by federal and state legislation, Supreme Court decisions, and Congressional endorsements. The people involved are patent commissioners, politicians, business executives, civic crusaders, and even good old-fashioned robber-barons.

In the second chapter, Samuel Morse and Henry Ellsworth embody John's theme of the federal government's role in technological innovation. John explains that not only did Congress fund Morse's 1844 demonstration telegraph between Washington, DC, and Baltimore – the first working electric telegraph in the United States – but the government also played a critical role in stimulating invention by issuing patents. Readers learn that Morse actually wanted the government to buy out his telegraph patents and create a United States Telegraph Service.

Morse feared the abuse of the telegraph in private hands, and he viewed a government telegraph (in conjunction with the postal service) as executing the federal government's responsibility of disseminating news to its citizenry. Patent Office Commissioner Ellsworth celebrated Morse as a homegrown American inventor in his office's publications; moreover, Ellsworth shrewdly deployed those publications – along with his idea of free distribution of seeds to farmers – to build support for his office. Between 1793 and 1836, patents had been awarded simply upon a fee paid, but 1836 legislation required the Patent Office to certify patents by examining patent applications for novelty and utility. Ellsworth's publicity campaign on behalf of this certification process enhanced its stature and, more importantly, transformed patents into verified and valuable assets that could be traded. John's nuanced description of Morse's relationship with Ellsworth's daughter Anne, who supposedly supplied the inventor with the first-telegraphed-phase "What Hath God Wrought" rounds out the chapter.

While the second chapter is firmly grounded in a federally-oriented political economy, the third chapter illustrates the transition to a competitive state-oriented civic ideal. Amos Kendall personifies the federal approach, struggling in comparison with savvy businessman Hiram Sibley. Morse hired former Postmaster General Kendall to manage his patents, to build a telegraph business, and to continue lobbying Congress for buyout of that telegraph business. Yet Kendall's vision of the mail as unifying the nation, based on his experience as Postmaster General, obscured the fact that with the telegraph, unity – in the form of a system – had to be developed.

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In contrast, Sibley, a successful textile manufacturer, raised funds from his close-knit Rochester, New York, community and ingeniously deployed the right-of-way contract to build the Western Union telegraph empire. These contracts gave railroads free use of Western Union lines for routine business in exchange for Western Union's exclusive right to operate lines along those railroads. In a critical passage, John explains, "[P]atent rights protected the nodes in the network, whereas right-of-way contracts protected the links. Patent rights were federal monopoly grants; in a political economy that vilified special privilege, this made them vulnerable to legal challenges… Right-of-way contracts were private agreements between consenting parties; in a political economy that glorified equal rights, this rendered them sacrosanct" (p. 95).

Chapters Four and Five delineate the growth of Western Union during 1867 to 1892 through its leaders, president William Orton and infamous financier and de-facto chief executive Jay Gould. John recounts Orton's efforts to protect Western Union from renewed calls for federal intervention in or buyout of the telegraph business. In the process, he outlines the commonalities between the 1866 National Telegraph Act and the 1890 Sherman Anti-Trust Act, and he elucidates Orton's cultivation of innovations, which included the stock ticker and the telephone. During the 1880s, Gould's leadership of Western Union fomented tremendous public support for a government telegraph, but no significant regulatory or buyout legislation was passed. Indeed, Gould was depicted in periodicals like *Puck* and *Judge* as a villainous corporate raider, a reputation amplified by charges that he used his control of the telegraph network to sway the results of the 1884 presidential election.

Telephone operating companies and telephone subscribers, respectively, drive the action in the sixth and seventh chapters. By this point, John has already introduced the near-simultaneous invention of telephone devices by Elisha Gray, Alexander Graham Bell, and Thomas Edison in the context of maximizing the number of telegraph signals that could be transmitted at the same time over a set of wires. Now, John focuses on the operations of American Bell, which from 1880 to 1899 acted as a holding company for A. G. Bell's telephone patents and which licensed the usage of those patents to numerous independent companies around the country. American Bell transferred its assets to American Telephone and Telegraph in 1899, and AT&T president Theodore Vail later dubbed those independent companies the "Bell System" to associate them with his corporation.

Network Nation continues its theme of political economics in these two chapters on the commercialization of the telephone, describing how the vagaries of patent law propelled American Bell to build a long-distance network, while municipal franchise law prompted frequent telephone switch upgrades in cities. John pithily observes that for the Bell operating companies, "Politics had artifacts" (p. 236). These chapters are especially interesting for their accounts of the operating and technical challenges overcome by the early telephone companies, and of the preferences and protests of early telephone users, who were mainly businessmen and professionals. In fact, those early subscribers wielded significant influence via boycotts, backing rival companies, lobbying for rate caps, and proposing municipal ownership.

The hero of lively Chapter Eight, and the popularizer of the telephone, is Angus Hibbard, the general manager of Chicago Telephone at the turn of the century. Early in the chapter, John offers this corrective: "The popularization of the telephone was not synonymous with the installation of telephones in a majority of the nation's residences…Rather, it consisted of the telephone operating companies' acceptance of the novel idea that they had an obligation to provide the entire population with some kind of access to the telephone network" (p. 270). The quintessential efficiency-focused Progressive Era manager Hibbard dramatically increased the number of telephone users in Chicago through his innovations. His usage charts showed that the efficiency of the network depended primarily on subscribers – so to reduce congestion (and increase profits), he installed coin-box telephones in public places.

The coin-box telephones proved immensely popular, as did three options that Hibbard introduced in 1900: multiple party lines, neighborhood exchanges, and – most memorably – pay-as-you-go nickel-in-the-slots. The nickel-in-the-slots were intended for multiple users and required a coin to complete a connection, but rather than being placed in stores or pharmacies, they were installed in boardinghouses and apartment buildings.

The experiences of Hibbard's fellow managers in other cities, namely New York, San Francisco, and Nashville, complete this chapter. John concludes that each of them "had an intuitive grasp of the interconnectedness of urban life and made it a cornerstone of their business strategy…Henceforth, the telephone became second nature not only for business, but also for the business of everyday life" (pp. 309–310).

The final three chapters address the challenges to and successes of AT&T during the 1910s, culminating with the perceived failure of the government takeover of the telephone system during World War I. Chapter Nine chronicles the campaigns of independent phone companies to supplant the Bell System around 1907, and their setbacks, including the collapse of US Independent and the rechartering of Chicago Telephone.

Chapter Ten highlights Theodore Vail as Bell's charismatic president during 1907 through 1919, emphasizing his strategies for Bell's growth in the context of renewed government efforts at regulation during Woodrow Wilson's presidency. During Vail's tenure, the public increasingly supported government ownership of the telephone, and in 1918, Wilson arranged the transfer of the telegraph and telephone networks to the Post Office Department as a wartime necessity, the subject of Chapter Eleven. John characterizes this transfer as "an abject failure" (p. 371). His epilogue reflects on the twentieth-century ramifications of that failed experiment in government control, namely, the ascendancy of the managerial corporation and the market segmentation of electrical communications, including radio and television.

John's organizing framework of the telegraph and telephone's evolutionary stages of commercialization, popularization, and naturalization provides a tidy way to group and read his eleven chapters. However, it also reveals a gap. He defines naturalization as the process by which "the network was depoliticized through the constant repetition of the seductive dogma that existing institutional arrangements were rooted in technology and economics rather than politics and culture" (p. 7). Although John asserts that in the case of the telegraph, naturalization occurred before popularization, he provides only glimpses of how and why the telegraph was popularized. A thorough account of telegraph popularization in this book would have been a welcome balance to other depictions of the telegraph as the "Victorian Internet." Nonetheless, such an expansive and engaging work is difficult to fault. *Network Nation* will be an invaluable resource for an array of historians in years to come.