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JOHNS HOPKINS STUDIES IN THE HISTORY OF TECHNOLOGY

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INVENTING AMERICAN BROADCASTING

1899–1922

SUSAN J. DOUGLAS

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CHAPTER SEVEN

THE *TITANIC* DISASTER AND THE FIRST RADIO REGULATION

1910–1912

BY 1910, WIRELESS had been a part of America's cultural and economic landscape for a decade. Its use had not, as yet, been regulated in any way. Unlike the European nations, which had agreed in 1903 and 1906 to endorse international treaties regarding wireless communications, the United States had not considered such regulation pressing. For six years, from 1904 to 1910, the wireless companies and the amateurs successfully lobbied against wireless regulation in America. These groups' objections to the treaty of the 1906 International Wireless Conference—that it was premature, technically naive, and restrictive; that it was overly generous to the Germans and exploitative of American inventors; and that it transformed wireless into an instrument of warfare—persuaded congressmen to vote against any wireless legislation that resembled the 1906 treaty. But the power of these lobbying efforts should not be overemphasized. That the regulation of wireless was a low legislative priority is an understatement: Congress was wrestling with antitrust legislation, child labor laws, the Pure Food and Drug Act, and a host of other major legislative controversies during the first decade of the century. All of these issues either had been instigated by books or magazine articles or had been accompanied by ongoing intense journalistic scrutiny. Many important laws were designed by well-organized and entrenched industries seeking state intervention and support. By contrast, the wireless companies in America were small, disorganized, and fiercely competitive, and they had no common interests that regulation might preserve. Also, wireless had received attention in other contexts, but not as a regulatory issue of any import. Its importance as an item on the regulatory agenda paled beside child labor or the meat-packing industry.

Only when wireless was connected to many more lives in a much more critical way would it be a major item on that agenda.

The fact that radio was still so technically and economically undeveloped was also influential in forestalling congressional action. Scientists and academics continued to argue over wireless theory and practice; congressmen could hardly have felt comfortable trying to regulate a young science that was still so poorly understood. Henry Cabot Lodge noted when explaining his "grave doubts as to the wisdom" of ratifying the 1906 treaty, "Personally I confess I do not understand the questions involved and I certainly should not be willing to vote until I am fully informed."[1] Most importantly, no precedents existed for bureaucratic management of such a method of communications. The telegraph, wireless's nearest technical relation, had remained in private hands in America. Again, the American record was quite different from Europe's. In Britain, France, and Germany, for example, telegraph systems were owned by the government; these countries had regulatory precedents to help them confront the regulation of wireless. The United States did not.

At first, what most frequently prompted talk of regulating wireless were complaints about interference. The wireless companies continued to promise technical solutions to interference which would render regulation superfluous. Inventors had finally stopped claiming that the number of available wavelengths was infinite; they now acknowledged that the spectrum was in fact a limited, finite resource. They asserted, however, that through technical advances, each user would soon be taking up less space in the spectrum. They claimed that new and refined transmitters, which emitted more defined, less damped wave trains, took up "narrower" bands, allowing room for more users in the airwaves. In 1909, the *New York Times,* envisioning a technical solution, asserted: "That the difficulty of interference, like that of confining each message to a straight line between the sending and receiving instruments, will finally be overcome nobody much doubts."[2] Three years later, the paper claimed that regulation was already anachronistic because, "as everybody knows, Mr. Marconi has devised a method of preventing 'interference' between different stations by suitable modifications of the wave lengths."[3] A congressman reading this statement might well have asked himself why he should enact legislation if a technical allocation of property rights in the ether was imminent.

Legislators no doubt preferred to wait for the promised technical arbitration because they were faced with an issue that was extremely complicated and emotionally charged—so much so that it is still being debated today: What criteria should Americans use to assign and protect

property rights in the spectrum? The first intellectual leap required in addressing such a question was thinking about something that was invisible, all pervasive, seamless, and still quite mysterious as property. This was not easy for most Americans to do. Americans understood all too well that tangible things—machines, raw materials, a piece of land—were property people vied for, bought and sold, and used to get still more property. But all of these could be seen, touched, and measured. The ether could not. In addition, there was considerable confusion about what, exactly, the ether was; many referred to it simply as the air. The air was an element Americans had traditionally associated with freedom, even transcendence. As Congressman Ernest W. Roberts of Massachusetts put it, "We have been brought up with the idea that the air was absolutely free to everyone."[4] How could something people thought was free and impossible to partition actually become property?

Having made the leap to thinking about the ether as property, one confronted the next question: What kind of property? Exclusive, private property rights could not be established in this domain the way they had been in real estate, for the ether could not be broken up into discrete plots. It was intangible and could not be bought or sold in quite the same way. Rather, the ether, like the oceans or wilderness areas, was a resource held in common in which all Americans potentially had an interest and in which walls or fences could not be built. This may seem quite obvious to us today, but coming to the realization that the ether was both a resource and one Americans had collective rights to was just as difficult as thinking of the ether as property at all. Some tried to resolve the dilemma by arguing that because everyone had a stake in the ether, no one person or group could be assigned overarching rights. Congressman Roberts maintained: "It has always been understood that a man owning real estate owned to the center of the earth and the heavens above and controlled everything above and below the surface of the piece of land he happened to own."[5] Thus, if every property owner in America also owned a small tract of the spectrum, his property rights would be violated if the ether was used without his consent or contrary to his wishes or interests.

Common property resources pose very special and vexing problems. Although the uses to which a common property resource is put can affect entire populations, and although many people believe that because it is a resource held in common, everyone has the right to exploit it, if a common property resource is opened to all, its value is destroyed. As individuals or institutions try to increase their enjoyment or use of the property, it becomes overpopulated, polluted in a variety of ways, and of less

value to everyone. Freedom in the commons, so ideologically appealing, in fact "brings ruin to all."[6] Given this reality, which was being powerfully demonstrated in America's congested airwaves, the dilemma became clear. Who decides who will gain access to the commons, and what will the criteria for access be? These were not easy questions.

In 1910 the groups vying for access to the ether were the military, the wireless companies, and the amateurs. The military, citing national security reasons, had a socially and politically valid claim, but bureaucratic control was unpopular in the press and in Congress. The amateurs represented independent, individual access, which was sentimentally appealing but increasingly disruptive. Companies such as Marconi and United Wireless had commercial claims on the ether, some of them politically persuasive and others less so. All of these interest groups had to be considered in any political solution to the interference and overpopulation problem. Congress was being asked with increased frequency between 1908 and 1912 to limit admission to this common property resource and to decide whose claim to the ether was valid, who had a right to transmit in a given area. Establishing such a hierarchy was an unprecedented and unwelcome task, and Congress postponed acting until events forced its hand.

The two radio-related issues confronting Congress were increasing interference and shipboard safety, and the two were intertwined. Interference was not a problem one hundred miles out at sea, but in American ports the cacophony was frustrating and dangerous. Not all ships were wirelessly equipped, which meant that some passengers were unprotected in case of an accident. Yet to equip every ship was to increase ethereal population, and passengers would not necessarily be better served, because ships equipped with wireless would still be helpless if they could not get their distress calls through the clamor. Congressmen began introducing bills to codify the use of radio. From 1910 to 1912, wireless successes and failures at sea provided the catalysts for legislative action.

The collision of the *Republic* and the *Florida* in January 1909, in which wireless played a central role in saving people's lives, precipitated the first government regulation of wireless in America, the Wireless Ship Act of 1910. If Jack Binns had not had his wireless, more than twelve hundred people might have died. Wireless had been installed early on the large, luxurious ocean liners such as the White Star liner *Republic* which catered to the more privileged classes. At sea, wealth assured access to the resource. But ships less grand, those that transported immigrants or steerage passengers, like the *Florida,* usually had no wireless aboard. If

Congress could not agree on how to assign rights in the spectrum, it could appreciate the merits of making wireless mandatory equipment aboard ship. Congress assumed its protector role, noting that the ingenuity of American inventors and America's "open door . . . to hundreds of thousands of immigrants" annually were compelling reasons "to take the lead in legislation."[7] On February 8, 1909, President Roosevelt sent a message to Congress urging, in light of "recent events," the quick passage of legislation making shipboard wireless mandatory.[8] By Feburary 18, the House Committee on Merchant Marines and Fisheries had favorably reported out such a bill, but Congress did not act on it prior to adjournment on March 3. Not until more than a year later did the Sixty-first Congress enact wireless legislation.

On June 24, 1910, the Wireless Ship Act was passed. It provided that any oceangoing steamer sailing in or out of United States ports, carrying fifty or more persons, and plying between ports two hundred miles or more apart be equipped with "efficient apparatus for radiocommunication, in good working order, in charge of a person skilled in the use of such apparatus." The apparatus was to be capable of receiving and transmitting messages over one hundred miles, day or night. Intercommunication between competing systems was mandatory. The law was to go into effect in July 1911, giving shipowners one year to equip themselves.[9]

Arguing against the Wireless Ship Act was difficult. The measure sought to democratize the advantages of wireless at sea, and it provided enterprising wireless concerns with additional business, because many ships still needed to be equipped. But rather than limit access to and movement within the ether, this legislation mandated access for still more people. The 1910 act officially recognized the importance of wireless as a life-saving device, yet that usefulness was being eroded by the ever-increasing number of wireless transmitters, an increase the 1910 act fostered. Thus, while passengers on most ships now had potential access to the ether, that privilege was made less valuable to all by the overpopulation. The law exacerbated interference.

Congress had addressed the issue of using wireless to improve shipboard safety. As reports describing malicious interference increased, military officials continued to appeal to Congress to enact legislation to remedy that problem as well. Secretary of the Navy G. V. L. Meyer charged that "vicious" California amateurs had "tapped" official messages originating from Mare Island and leaked them to "sensational newspapers" for publication. Were there no rights to privacy in the ether which should be backed up by law? Charles Norton, acting secretary of the treasury,

submitted excerpts from the wireless logs of revenue cutters to document the altercations and standoffs in the air waves. The log of the *USS McCulloch* for November 4, 1909, read:

> 3.20 P.M. called TI, sent him an official message; when I listened in for acknowledgement or OK for our message, CH (United Wireless) operator CX, maliciously broke in on us and said "we will show RCH (McCulloch) that our spark is stronger than his and drown him out." 3.35 P.M. told CH to please keep out, as our message was a rush government message. He said "you needn't think you are so damned much; wait until 4 P.M." His station being the stronger TI received our message at 4.10 P.M.[10]

Because the ether was still a frontier, might made right, and the military often did not have the technical might. Other testimony recounted amateurs sending false CQDs "for fun" and to get attention. The parameters that circumscribed free speech in a public place such as the proverbial movie house had not yet been imposed in the ether, yet an anonymous cry of "Fire" in the airwaves was equally, if not more, dangerous.

A Telefunken operator aboard the SS *Bremen* submitted a letter to the House of Representatives complaining about interference that, judging by its content, originated from a source other than the amateurs. "First," the operator reported, "I heard some very profane language: 'God-damned Slaby-Arco, rotten louse, humpbacked monkeys,' and other slang."[11] While this sort of transmission may have been amusing to Marconi Company operators, and may even have been useful corporate propaganda, it was hardly a noble exploitation of a limited natural resource. As each company and interest group tried to maximize its use of and position in the ether, the negative effects of the overuse and jockeying for position hurt all users. The government was becoming increasingly concerned about pollution of the ether. By 1910, six bills addressing these problems were circulating in Congress.

The three bills that received the most press coverage in 1910 were the Greene, Depew, and Roberts bills. The Greene (House) and Depew (Senate) bills were similar: they were intended to legislate away the interference afflicting the government stations. They sought to license wireless operators, to impose fines for malicious interference, and to establish the priority of distress signals and official messages. As an additional safeguard against private interference with government stations, the president of the United States would be empowered to "establish from time to time regulations by designation of wave lengths or otherwise to govern said private or commercial stations."[12] The wireless

companies and operators were to be licensed by the Department of Commerce and Labor, and if any provisions of the law were violated, the department could revoke licenses. The secretary of commerce and labor was selected to oversee wireless because he already had general control over the regulation of life-saving appliances on shipboard.[13] The transmission of fraudulent messages was to be punishable by a fine of not more than $2,500 or imprisonment for not more than five years.

Although the clause establishing presidential power to regulate the private stations by "wave lengths or otherwise" was attacked as too vague and impracticable by the wireless companies, Congress did not know what other standard to use; wavelengths seemed to the layman the most equitable and least arbitrary way to allocate the resource. Technical guidelines seemed more rational and fair than economic and political ones. If, however, the president chose to impose the wavelength allocations selected during the 1906 conference, the assignments would not, in commercial eyes, be equal. The inventors argued that those wave allocations would exacerbate interference rather than reduce it. NESCO representatives pointed out that the 300-meter assignment created a party line for all maritime business and that in a busy port, some ships would wait for hours to get on this communal wavelength: "No way could possibly have been devised better calculated to give the maximum of interference and the minimum of practical service than this proposed rule requiring all ships to use the same party line."[14] Congress was careful not to spell out wavelength allocations. The words *or otherwise* were included because the House Committee on Merchant Marines and Fisheries sensed it did not yet have all the pertinent information. The committee anticipated that in the future, standards other than wavelengths might be used to sort out competing claims. "What those standards may be," the committee maintained, "cannot be forecast in fact, much less in the terms of a statute, for the advance of the art may add new words to the language."[15]

Hearings began in 1910 on both bills, in the House committee and in the Senate Committee on Commerce. Each side of the wireless regulation argument produced evidence to support different criteria for establishing priority in the airwaves. The amateurs claimed that official messages should not have priority because the messages were rarely authentically official. Their position was endorsed by the *New York Times*, which asked: "Must the splendid wireless operations of the transatlantic liners and of the radio telegraphic companies on land . . . be suspended whenever two subalterns choose to greet each other through the ether?"[16] In 1910, America's amateurs were not sufficiently organized to orchestrate a coordinated lobbying campaign against the proposed legislation, but members of the Junior Wireless Club of New Jersey traveled to Washington in April to argue against the Depew bill. Their testimony was described in headlines such as "Senators Hear Boys' Plea." The *New York Times* reported that W.E.D. Stokes, Jr., president of the club, who was still in his early teens, testified "on behalf of the inventive genius of the American boy."[17] Hugo Gernsback encouraged members of his Wireless Association of America to mail in protests to Senator Depew and Congressman Greene.[18] The amateurs advised Senator Depew that if the navy modernized its equipment and sent all its messages in cipher, much of the interference could be reduced without resorting to legislation. "Any skilled government operator knows the touch and tone of every other government operator," the amateurs claimed, "just as you know the voice of your wife from the voice of your son. . . . If our government used only certain wave lengths, they should be able to tune out all other interferences."[19] The amateurs were not objecting to the establishment of a party line in the ether; they simply wanted the navy, rather than the private sector, to be obliged to use it.

The press had begun to denounce the irresponsibility of some of the amateurs; nevertheless, editorials generally did not support the proposed solutions. The last thing the press wanted was regulation that would transfer some of the prerogatives of private enterprise to the state. The features to receive the most criticism were the automatic priority granted to official messages and the power bestowed on the secretary of commerce and labor. The militarization of the ether was especially unpopular. *Electrical World* opposed the "exaltation of the military over the other classes of American people" and questioned the assumption "that the government has some sort of prescriptive right to an art which a long line of scientists and inventors has endowed the world."[20] The *New York Times* maintained: "This Nation and the pursuits of its people are not maintained for the sake of the army and navy, and their officialism." "The pathways of the ether should not be involved in red tape," the newspaper added.[21]

Editorials charged that the Greene and Depew bills would make the secretary of commerce and labor a wireless czar, a position deemed incompatible with American democratic principles. The *New York Times* claimed that the bills were "doubly mischievous" because they conferred on the secretary, "an official who can know nothing about the technical demands of private wireless business, practically unlimited power of determining its conduct."[22] *Scientific American* agreed, maintaining that the power such bills gave to the secretary was "excessive" and might

lead to "gross abuses." "To suppose that one person in a short term of office could gain a comprehensive knowledge of so large a subject—one which he must handle as a dictator—is absurd," the journal asserted.[23] The *Times* warned, "As for permitting government bureaus to issue, modify, amend, and revoke the rules that shall govern wireless, the idea ought not to be tolerated, save in time of actual war. Official control of commercial wireless business would be always in the bureaucratic interest, and not in the interest of progress and enlightenment."[24] The technical journals complained that the wireless bills were drafted by people who knew nothing about wireless.[25] *Scientific American* lectured, "This question of radio-telegraphy is too big for settlement through legislative 'jokers.' . . . The reports of wireless committee conferences, ludicrous in the extreme from a scientific standpoint, prove this fact."[26] United Wireless representatives wondered if the secretary of commerce was going to exercise any discretion in granting licenses. Otherwise, he would have to issue them to all applicants, and this was not a policy that would reduce interference.[27] Repeatedly, the press endorsed and legitimated commercial claims to the airwaves, equating those claims with democracy and progress, and government claims with inefficiency and inequity.

In supporting the Greene bill and the proposed priority of official messages, the Department of Commerce and Labor noted that the "priority of government messages by ordinary telegraph lines [had] been guaranteed in the United States since the Act of July 24, 1886."[28] The report of the House Committee on Merchant Marines and Fisheries maintained that the bill would not "deprive many bright American boy amateurs with a scientific turn of mind of a harmless and improving pastime, from which the country may hope to reap the benefit in future inventions." The committee wanted the government, through licensing, to police the amateurs, not eliminate them: "The police regulations of nearly all large cities prescribe a permit before a boy is allowed to carry a revolver, which at most could shoot a few hundred yards and possible hit one man. Amateur wireless . . . may readily interfere with messages from a ship in distress with hundreds of lives on board."[29] The committee also noted that the legislation would be instructive: "The Committee means fair play for industrious, inventive American boys. . . . In learning wireless these boys may well at the same time study their duties to others and the obligation of an American citizen to obey the law."[30] While the committees felt obliged to address the amateurs' concerns, they were not won over by amateur or commercial testimony. On March 28, 1910, Merchant Marines and Fisheries reported out the Greene bill by unanimous vote. The Committee on Commerce favorably reported out the Depew bill on April 28, 1910, and the bill passed the Senate on June 16, 1910. The House, however, did not act on the Depew bill, and no consensus legislation emerged.[31]

The 1910 bill that was more comprehensive and proposed a long-term approach to radio regulation was the Roberts bill, House Joint Resolution 95. This bill proposed that the president create a board of seven members with one expert each from the war, navy, and treasury departments, three experts representing the commercial wireless interests, and one scientist "well versed in the art of electric-wave telegraphy and telephony." The board would, throughout 1910, "prepare a comprehensive system of regulations to govern the operation of all wireless plants afloat and ashore . . . with due regard alike to government and commercial interests." The board's report would be submitted by December 1, 1910.[32] The bill anointed no one as wireless czar, but sought to distribute influence among seven "experts." Amateurs and those who manufactured apparatus for the amateurs opposed the Roberts bill because the proposed board had no member representing the independent operator. The amateurs tried to present themselves as representing the general public to imbue their position with more legitimacy and import. They claimed that to consider only the needs of government and business was undemocratic. As one amateur wrote in opposing the Roberts bill: "To vest legitimately in a wireless board, then, the proposed jurisdiction, it would seem but proper that all those individuals who are rightful owners of the atmosphere over their respective properties transversible by wireless messages should be consulted in the matter."[33] Although the Roberts bill set an important precedent by suggesting an alternative mechanism for wireless regulation, it did not pass in 1910. Yet it helped establish the legislative choices: Should wireless be administered by one man or by many? Did administration of wireless require autocratic powers, or bureaucratic management informed by experts?

With each new congressional session, bills to regulate wireless were introduced. None passed. In 1912, thirteen such bills were submitted.[34] The chairman of the Committee on Merchant Marines and Fisheries, Congressman J. W. Alexander, and the chairman of the Committee on Commerce, Senator Knute Nelson, introduced similar bills designed to reduce interference. The Nelson bill, introduced on December 11, 1911, was like its predecessors in that it provided regulation of wireless by the secretary of commerce and labor. It was referred to a subcommittee of the Senate Committee on Commerce. Early in 1912, the subcommittee reported that it had become "convinced that the bill bestowed too great

powers upon the departments of Government and gave too great privileges to military and naval stations, while it did not accurately define the limitations and conditions under which commercial enterprises could be conducted." In February of 1912 the subcommittee began revising the legislation.[35] The one significant regulatory development that occurred at this time was the ratification of the treaty of the International Wireless Convention on April 3. A third convention was scheduled for June 1912, and the United States was informed that its delegates would not be welcome unless it ratified the treaty.

The conflict in the airwaves did not appear to involve the general population, and the military services, the wireless companies, and the amateurs were not, in 1910, politically powerful interest groups. Although congressional willingness to regulate wireless was clearly increasing, the interference problem would have to touch many more people before both houses of Congress would get together to enact more comprehensive wireless legislation. Overpopulation in the spectrum would have to affect those who barely knew the spectrum existed or that activity in it could profoundly affect their lives. A 1910 House report warned that waiting for such a time could prove irresponsible: "If the use of wireless is not to be regulated, it may in the future result in disaster."[36] In 1912, that disaster occurred.

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ON APRIL 10, 1912, the world's largest and most sumptuous ocean liner set sail from England for New York City.[37] The *New York Times* carried photographs of the ship's elegant interior and listed the luminaries who had booked passage on the *Titanic* for its maiden voyage. The ship represented technological audacity and arrogance taken to their limits. The owners proclaimed the ship unsinkable. It was what men dreamed of when they worked on machines: it was the biggest and the fastest, and it was impervious to the whims of nature. Guglielmo Marconi had booked passage on the ship, but a change in plans forced him to cancel. The captain of the ship, appreciating that the owners wanted to set a new transatlantic speed record, sought to make the crossing as quickly as possible.

On April 15, the *New York Times* reported that it had learned from the Marconi Cape Race, Newfoundland, station that the *Titanic* had hit an iceberg, but the article expressed no alarm. The newspaper reassured its readers by listing all the other ships in the *Titanic*'s vicinity and all the other liners that had in the recent past hit icebergs and nevertheless arrived safely in port. Supporting this sanguine tone was a wireless

message reading "All Titanic Passengers Safe; Towing to Halifax," which was picked up by stations on both sides of the Atlantic, as well as by Lloyd's and the London *Times*.[38]

Few were prepared for the next day's horrifying headlines. The *Titanic* had sunk in less than three hours, at approximately 2:30 A.M., taking more than fifteen hundred passengers with it. Between eight hundred and nine hundred survived, mostly women and children. Although the ship had been drastically underequipped with lifeboats, and the captain had taken the ship too quickly through an ice field, wireless emerged as the invention that had both permitted many to survive and caused many more to die. As the story unfolded in the press during the next few weeks, the status of wireless and wireless regulation were permanently altered.

As soon as the *Titanic* struck the iceberg, Jack Phillips, one of the ship's wireless operators, began sending distress signals and the ship's position. The Marconi Station at Cape Race received the news Sunday night at 10:25 New York time—almost immediately after the collision occurred. Two other liners, the *Parisian* and the *Virginian,* also received the news immediately, but they were twelve hours away from the *Titanic.* Tragically, ships in the *Titanic*'s vicinity never heard Phillips's call. The only nearby ship that received the repeated CQD and SOS messages was the *Carpathia,* which caught the message only "by a lucky fluke." Like most other ocean liners, the *Carpathia* had only one wireless operator, who worked for twelve or sixteen hours straight. When he retired for the evening, the wireless apparatus was unattended. On this particular night, the *Carpathia*'s operator, Harold Cottam, had finished his work for the evening but had returned to the wireless room to verify a "time rush," which was a comparison of two ships' times to check the agreement of their clocks. When he put on his headphones, he heard the *Titanic*'s call for help. Had Cottam not returned to his wireless set, no help would have arrived until late the following morning. Such were the consequences of not having a loudspeaker, a relief operator, or a distress alarm for the sleeping operator. The *Carpathia* was fifty-eight miles from the *Titanic,* and when it arrived at the scene three and a half hours after hearing the distress call, it could only rescue those who had managed to get into the lifeboats.[39]

The *California* was less than twenty miles from the *Titanic* when the accident occurred. But the *California*'s only wireless operator was asleep when the *Titanic* broadcast its distress calls. Also, because the *California* was traveling through the same ice field as the *Titanic,* its captain, as a matter of safety, had shut down the engines and decided to

"All the News That's Fit to Print."

The New York Times.

THE WEATHER.

NEW YORK, WEDNESDAY, APRIL 17, 1912—TWENTY-FOUR PAGES. ONE CENT

ONLY 400 TITANIC SURVIVORS NAMED BY CARPATHIA; WIRELESS SEARCH OF THE SEAS FOR FURTHER NEWS

President Taft Early Wired for News of Major Butt.

VINCENT ASTOR'S GRIEF

Son of John Jacob Offers a Fortune for Word of His Father.

WIDENER WORRIES OVER SON

Mrs. S. Guggenheim Blames Company for Shortage of Lifeboats.

MRS. CORNELL PROBABLY SAFE

But Magistrate Was First Told Her Name Was Not in List of Saved.

NO RESCUES BY ALLAN LINERS

Carpathia Not Expected Until Thursday Night with Survivors.

NOT IN WIRELESS TOUCH

Vain Attempts All Day to Reach Her for Details of the Disaster.

TITANIC OFFICERS ABOARD

Four of Them Picked Up from Boats with Second Marconi Operator.

SCOUT CRUISERS SENT OUT

Ordered by President Taft to Get into Touch with the Rescue Ship.

HOW TO MEET SURVIVORS

Some Who Were Saved when the Titanic Went Down

Olympic, Too Late to Help, Wired On.

The *Titanic* disaster made wireless telegraphy front-page news.

wait for daylight before proceeding. Captain Lord explained: "With the engines stopped the wireless was, of course, not working, so we heard nothing of the *Titanic*'s plight until the next morning. . . . Had we only known of the *Titanic*'s plight all the . . . passengers could have been saved."[40] Another ship, the freight steamer *Lena,* was within thirty miles of the *Titanic.* But it was not equipped with a wireless outfit. The tragedy exposed how very inadequate shipboard use of wireless had been. To have only one wireless operator providing communication for only half a day was gambling with very high stakes. The lack of auxiliary power to operate wireless apparatus in the event the ship's main boiler plant failed was equally dangerous and easily remedied.

Although this somewhat cavalier attitude toward wireless use aboard ships caused concern, no aspect of the tragedy outraged people more than the ceaseless interference, cruel rumors, and misleading messages that filled the air from unknown sources during the disaster. Friends and relatives were desperate for information. Marconi, in New York, wrote to his wife, "I've witnessed the most harrowing scenes of frantic people coming here to me and to the offices of the Company to implore

and beg us to find out if there might not be some hope for their relations."[41] Shortly after the *Titanic* struck the iceberg, wireless stations along the northeast coast of North America clogged the airwaves with inquiries and messages. The *New York Times* described the Sable Island, Nova Scotia, station as "the storm centre of a great battle for news of the missing passengers and crew. . . . The wireless operators at Sable Island are overwhelmed with messages which have come from all quarters from relatives of passengers craving for news." The Marconi Company complained about the interference Marconi operators were subjected to by "outside unrecognized stations." Out of this early "congestion of inquiries" emerged the message reporting that the *Titanic* was moving safely toward Halifax. When the American and British press learned that this news was completely false and that the *Titanic* had, in fact, sunk, its editors were appalled. The amateurs were accused of manufacturing the deception and were universally condemned.[42] *Electrical World* wrote, "Someone, perhaps in carelessness, perhaps in fear or in greed, sent false messages of rescue. Such a person . . . ought to serve a long term in a federal prison. No measures of repression are too severe for the emergency before us."[43] *Literary Digest* referred to the false message as "essentially the act of a coward." "That persons of sufficient education and skill to operate wireless apparatus will stoop to such things," the *Digest* lamented, "is almost unbelievable." The *Times* of London described such messages as "inventions of a cruel and heartless kind." President Taft denounced the malicious interference as "perversion."[44]

On April 21, Captain Haddock of the *Titanic*'s sister ship, *Olympic,* offered an explanation for the erroneous report of the *Titanic*'s safety. As soon as Glace Bay transmitted news of the *Titanic*'s plight, operators from all over asked the question "Are all *Titanic* passengers safe?" At the same time, the steamship *Asian*'s operator sent the message "Towing oil tank to Halifax." Captain Haddock "suggested that the two Marconigrams quoted above had been tapped in transit by amateurs or otherwise unskilled operators, who omitted the interrogatory 'are' in the first message, and caught the words 'towing' and 'to Halifax' in the second, making the whole cloth message." The Halifax station tended to confirm this explanation. Its operators stated that "the air was full of wireless flashes from ship and shore stations, and . . . it was very difficult to piece together connected statements." However, by now intent and motivation were irrelevant. The false messages had been transmitted; interference had reached a dangerous level. In the eyes of the press, the ether could no longer be used as a playground for youngsters.[45]

After the newspapers had established that the *Titanic* had sunk, and

the *Carpathia* was en route to New York City with the survivors, communication between the *Carpathia* and the shore stopped. The *Carpathia*'s wireless range of eighty-five miles was not nearly as great as the *Titanic*'s or the *Olympic*'s, and its operator had relayed news of the rescue to New York via the *Olympic*. Without this relay, the Siasconset station could not pick up the *Carpathia*.[46] Because so many people were desperately awaiting the publication of the survivors list, President Taft sent two navy scout cruisers to intercept the *Carpathia* on its way back to New York so that the names of the survivors could be wirelessed in advance of the ship's arrival. The wireless range of the two cruisers was claimed to be 1,500 miles, and the headlines describing their mission read "Wireless Search of the Seas for Further News." Inability to receive news from the *Carpathia* illustrated another deficiency. Despite recent legislation mandating 100-mile performance, the *Carpathia*, like many ships, had an extremely limited range—had it been the ship to hit the iceberg, her distress signals would never have reached the shore. Communication with the *Carpathia* remained elusive despite the scout cruisers, and when the liner arrived in New York, the *Titanic*'s surviving wireless operator, Harold Bride, who helped man the *Carpathia* station, explained why: "The navy operators aboard the scout cruisers were a great nuisance. I advise them all to learn the Continental Morse and learn to speed up in it if they ever expect to be worth their salt. The *Chester*'s man thought he knew it but he was as slow as Christmas coming."[47]

Like Jack Binns of *Republic* fame, Bride became a national hero. After being rescued by the *Carpathia*, where he was hospitalized, he went on crutches to the ship's wireless room to begin sending messages. When the *Carpathia* arrived in New York, Marconi himself went to the wireless room to see Bride. The *New York Times* offered this romanticized account of the meeting: "Slowly the youth turned his head around, still working the key. The hair was long and black and the eyes in the semidarkness were large—staringly large. The face was small and rather spiritual, one which might be expected in a painting. It was clear that from the first tragic moment the boy had known no relief. Mr. Marconi asked the operator how his feet were. Both were in bandages and he was working seated on the edge of his bed. A plate of food at his side told how he had eaten." Bride's partner on the *Titanic*, Jack Phillips, had died while sending the distress calls. Bride told the *New York Times* how Phillips had heroically continued to send distress signals even after the captain told him to abandon ship. Phillips became a legend, and statues were erected on both sides of the Atlantic to commemorate his courage.

Marconi was deified in the press: some editorials gave him sole credit for saving the lives of the *Titanic*'s survivors. The *New York Times* wrote: "If Guglielmo Marconi were not one of the most modest of men, as well as of great men, we would have heard something, possibly much, from him as to the emotions he must have felt when he went down to the Cunard wharf, Thursday night, and saw coming off the *Carpathia*, hundred after hundred, the survivors of the *Titanic*, every one of whom owed life itself to his knowledge as a scientist and his genius as an inventor."[48] While presenting an address to the New York Electrical Society on April 17, he was continuously interrupted by "tumultuous applause."[49] He confided to his wife, "Everyone seems so grateful to wireless—I can't go about New York without being mobbed and cheered—worse than Italy."[50] The *New York Times* viewed the event this way: "To realize what the wireless did in this case one must think, not of those who were drowned, but of those who were saved."[51]

Yet people could not get those who were drowned out of their minds. Newspapers and magazines were filled with wrenching eyewitness accounts of husbands and wives parting, of women refusing to leave their husbands' side, preferring to die instead, and of the horrible screams of death the shocked and freezing survivors would never forget. Other stories told of people in packed lifeboats who were forced to refuse to let another survivor in because one more person would sink the boat. It was a hideous choice to have to make, and those in the lifeboats sometimes watched the one they had denied die in the sea. These, the press lectured, were the costs of technical arrogance, of the quest for speed and luxury instead of safety, of the desire to be biggest and fastest, of the belief that machines could make men impervious to nature. They were the costs of unregulated industrial capitalism writ large and indelibly.

In every leading newspaper and magazine, the reaction to the tragedy was the same: the "permanent cure . . . should be, and no doubt will be, fixed government regulations."[52] *Electrical World* editorialized, "The recent disaster to the *Titanic* points with terrible and fateful directness to the absolute necessity of a controlling power to regulate wireless telegraphy."[53] The press advocated that the number of lifeboats, the use of wireless, and even the speed ships could travel through ice fields, all be fixed by law. Journalistic rhetoric emphasized the two ills such regulation would address: corporate lack of conscience and the vulnerability such disregard imposed on innocent people. As *World's Work* put it, "A disaster that shocked the whole civilized world was necessary to awaken us from a false sense of security."[54] What Americans had to be awakened to was not that corporate control of transporta-

tion or communication was in and of itself bad, but that such control had to be monitored better. The press laid out the terms under which state intervention in corporate activity—in this case, wireless—could take place, and under what circumstances it was justified.

The regulation of wireless now was framed in the same terms that had framed earlier social or antitrust legislation. The *Titanic* disaster happened, after all, during the Progressive Era, when the call for regulating many aspects of American society was incessant and insistent. The Progressive Era marked the ascendancy of the conviction that the state had to assume a more interventionist role in the marketplace as a way of making individual Americans less vulnerable to institutional forces beyond their control. When scandals broke out in the meat-packing industry, or a crisis occurred in the oil cartels, or graft and corruption was discovered in city government, the response was the same: correct the ills through regulation. Newspapers and magazines cast the federal government as the agent of "the people" whose duty was to give the people more control over the trusts, to circumscribe corporate arrogance and hegemony, and to make people less vulnerable to business's self-serving agendas. This idealistic prose often disguised the fact that many of the newly regulated industries benefited from, and in fact helped design, Progressive Era legislation. Journalistic rhetoric surrounding new laws made certain legislation seem onerous to business, whereas these laws often brought much desired predictability and stability to corporate activities.

The press distilled and articulated the ideological debates surrounding regulation, and made clear which long-held American values and traditions were being threatened by corporate combination. Through political cartoons, inflated and flowery language, and sheer expressions of outrage, the press maintained that values, ethics, and aspirations did matter, and that there were certain things in which Americans believed, certain images Americans had of themselves and their country, which could not be sacrificed on the altar of industrial capitalism. Although corporate agendas may, in many cases, have overridden the plea to preserve traditional values and ideals, that such rhetorical protests played a critical role in the regulatory process—that these pleas had to be taken into account, even if they were co-opted later—was a significant aspect of America's regulatory process.[55] Certainly with a question such as "Who owns the airwaves?" sentiments, dreams, and ideology had as much to offer the debate as did legal precedent, which was extremely skimpy, or corporate intent, which was as yet ill defined.

As soon as the *Carpathia* arrived in New York, the Senate Committee on Commerce began investigating the *Titantic* disaster, holding its preliminary hearings at the Waldorf-Astoria on April 20 and 21, and moving the hearings to Washington on April 22. Within four months, American radio would come under government supervision, and transmitting in the ether would be not a right, but a privilege assigned by the state.

* * *

AFTER THE *TITANIC* tragedy, the perceived value of the ether as a resource increased immeasurably, and the resource had to become more serviceable. The necessary reforms were now obvious to the press and to Congress. Mandatory shipboard wireless was insufficient; the wireless had to be manned at all times. Auxiliary power in case of engine failure was essential. A strict and formal procedure for the transmission and reception of distress calls had to be officially established. Most importantly, the amateurs had to be purged from the most desirable portion of the broadcast spectrum. They had to be transformed from an active to a passive audience, allowed to listen but not to "talk." "Private stations of all kinds should be rigorously limited in wavelength and power," maintained *Electrical World,* "particularly the amateur stations which have no need for anything more than trivial energy." The magazine added that "the wireless meddler" would have to be repressed."[56]

The amateurs tried to exonerate themselves from blame for the false messages and interference. One amateur, in a letter to *Scientific American,* claimed that the amateurs had become scapegoats: "A reason had to be given the public for the delay [of messages]. The blame was laid to the parties least able to defend themselves, as is usually the case. At once great headlines flared forth the atrocities of the 'Wireless Meddler.' "[57] But what the amateurs had to face was that in the aftermath of the *Titanic* disaster, an interest group more important than the amateurs or the military emerged to stake its claim to the ether: the general public. Regulation was necessary "to insure to the people of the United States an uninterrupted wireless service twenty-four hours a day for every day in the year."[58] The ability of institutions, both government and corporate, to serve the public, particularly in life-or-death situations, surpassed any other claims to the ether, especially those voiced by seemingly scattered and unorganized individuals.

Harold Cottam, the *Carpathia* operator, had testified at the Senate hearings that there were no regulations specifying what hours an operator was to be on duty and that there was "nothing in the Marconi system at present to detect signals if the operator [was] not present." The

first act by Congress was to revise the 1910 law, now requiring ships carrying fifty or more persons to carry at least two skilled operators, with someone on duty at all times, and to have an auxiliary power supply available for the wireless. Shipping on the Great Lakes was included in the legislation. President Taft signed this bill on July 23, 1912.[59] The more sweeping bill that was to regulate wireless, and then radio broadcasting, until 1927, was the Radio Act of 1912, passed on August 13. It took effect four months later, on December 13.

The Radio Act required that all operators be licensed, that stations adhere to certain wave allocations, that distress calls take priority over all other calls, and that the secretary of commerce and labor be empowered to issue licenses and make other regulations necessary to sort out the wireless chaos. Congress mandated that stations use undamped waves and issued specific technical guidelines for transmitters. Amateurs were relegated to a portion of the spectrum then considered useless: short waves of 200 meters and less. They could listen in on any frequency but could transmit only in this short-wave portion of the spectrum. The amateurs had been exiled to an ethereal reservation.

To protect distress calls from interference, the law required that a station suspend all other work whenever it picked up a distress signal, and not return to its other work until the station could no longer be of service. If the station could not help in the rescue effort, it was to remain silent. Americans were to use the wavelength designated for distress calls at the International Conference: 300 meters. All shore stations were to listen in on the 300-meter band at intervals of fifteen minutes for at least two minutes. Shipboard stations had to have a transmitting capability of 100 nautical miles. The United States formally adopted SOS as the official distress call. Intercommunication between systems was compulsory. Fines were established for irresponsible transmission; up to $500 for "malicious interference," $2,500 for sending false distress calls. The secretary of commerce and labor had the power to suspend licenses for up to one year for violation of the law. Repeated disobedience was cause for license revocation.

Most importantly, the new legislation secured for the navy increased hegemony in the spectrum. Wavelength allocations conformed to those assigned during the 1906 International Conference. Private stations were to use wavelengths below 600 meters or above 1,600 meters. That portion of the spectrum between 600 and 1,600 meters was reserved for government use. Ships within fifteen nautical miles of a government station were to reduce their transmitting power to one kilowatt. Because the act sought to ensure that ships' passengers would have access to

wireless services, even if they were not near a commercial station, naval stations were now required to transmit and receive commercial messages if there was no commercial station within a 100-mile radius. Many naval stations had to be upgraded and modernized to meet this provision. Armed with the new legal mandate and improved technology, the military would continue to increase its influence on activities in the airwaves.

Congress also legally protected the privacy of wireless transmissions; fines were set for "broadcasting" private messages. During the congressional committee hearings of 1910, United Wireless had complained about the difficulty Americans encountered when trying to secure wireless licenses in foreign countries. The 1912 act provided that licenses would be issued only to citizens of the United States. In time of war or disaster, the president was empowered to close private wireless stations, or to authorize the government to take them over.[60]

The only evidence describing the Marconi Company's role in shaping the 1912 act is John Bottomley's statement from 1912 in which he reports, "The greatest care has been taken that no bill detrimental to our work or to the system generally should be permitted to pass."[61] But both the company and Marconi supported regulation. The American Marconi Company enjoyed a virtual monopoly in the United States, having bought out or driven out of business its major competitors. The company was more consolidated and entrenched than ever, and interference from the amateurs was becoming highly costly. The amateurs were interfering both with ship-to-shore work and with Marconi's wireless news services. In news dissemination, they provided unwelcome competition. In an interview published immediately after the *Titanic* disaster, Marconi advocated regulation and "control of amateur experimenters."[62] With the amateurs consigned to short waves and the navy to the 600 to 1,600 meter range, the regulation ensured that in America, the Marconi Company would have portions of the spectrum entirely to itself. Thus, while it is difficult to determine whether Marconi had a hand in designing or promoting the legislation, it is clear that neither he nor his company suffered from it.

By October, the secretary of commerce and labor had issued the regulations governing amateur stations and operators. The United States was divided into nine wireless districts, each district having its own office to manage the wireless affairs of that district. To get their wireless license, amateurs had to pass an examination that involved assembling a wireless outfit, determining if the set was faulty (and, if so, repairing it), sending and receiving messages at twenty words per minute in Conti-

nental code, and passing a written exam. The government did not yet have facilities for administering the exams, so, ironically, the navy conducted them at nine stations throughout the country. The *New York Times* reported that "the general knowledge of wireless matters and the skill displayed [was] a surprise even to the Navy experts. More than 90 percent of all applicants . . . passed the exam." Amateur stations within five nautical miles of military stations were "rigidly restricted as to length of their wave and the power of their sending apparatus."[63]

Amateur response to the 1912 law varied. Some amateurs dismantled their apparatus.[64] Others continued operating as before, but they were more courteous and deferential toward the government and commercial stations. Some amateurs did not stay below 200 meters and got away with the trespassing because the appropriations for administration and enforcement of the 1912 law were insufficient.[65] One amateur from the Pittsburgh area recalled: "Nobody in radio knew anything about licensing. We knew that the commercial stations, by which I mean ship and government stations, had call signs, but I think there were very few people who had even heard of the license regulations, let alone read them . . . [and] no one thought the regulations applied to him, as an individual. It certainly didn't apply to the listener."[66] Amateur activity in the ether, thus, was circumscribed, but it was not eliminated. Hundreds of amateur stations around the country were licensed, as were thousands of operators. The amateurs began exploring their new slot in the spectrum, and adjusting to but not acquiescing to institutional hegemony.

The Radio Act of 1912 represents a watershed in wireless history, the point after which individual exploration of vast tracts of the ether would diminish and corporate management and exploitation, in close collaboration with the state, would increase. The American spectrum was partitioned: another frontier was partially closed. The 1912 law as a legislative artifact reveals American society's early struggle to come to terms with an invisible, enigmatic, communally held resource whose potential was still only partially appreciated.

The law acknowledged that property rights could be established in the ether and that the main claimants to those rights were institutional users. The amateurs, by exploiting democratic rhetoric, had tried to argue that they represented "the people" and that the public had very legitimate interests in how the spectrum was used. The state acknowledged the latter point but maintained that the *Titanic* disaster had demonstrated all too well that the amateurs did not serve the needs of "the people" but in fact obstructed them. Thus, one critical precedent this law established in broadcast history was the assumption that only consolidated institutions—in this case, the navy and the Marconi Company—could anticipate, implement, and protect "the people's" interest in spectrum use. At the same time, it was clear that government control of America's airwaves, foreclosed for the time being by the 1912 law, was unlikely in the future, as well. Harold Bride, the *Titanic* wireless operator and Marconi Company employee, by complaining about the incompetence of naval operators, suggested what a predicament America might get into if the navy controlled wireless communications. It was a complaint that reaffirmed stereotypes about the pitfalls of bureaucratic management.

Another precedent established was that the state would assume an important role in assigning property rights in the spectrum. In other words, access to particular wavelengths would not be bought and sold on an open market. Rather, the state would determine priority on the basis of claimed needs, previous investment, and importance of the messages. Those claims would be acknowledged by wavelength allocations. What established merit in 1912 was capital investment or military defense, coupled with language that justified custodial claims based on an invaluable service to humanity. This, too, was a significant precedent. For, under the guise of social responsibility, of protecting the lives of innocents, and of managing a resource more efficiently, the military and a communications monopoly secured dominant positions in America's airwaves.

The dilemma of who had a right to transmit and who did not was tackled in newspapers and magazines before it was worked out in Congress. Government control of any communications system was anathema to the press: it threatened their news-gathering capabilities and their organizational prerogatives. It opened the door to censorship, to making the press subservient to the state's agendas. Thus, it is not surprising that the press, relying on the rhetoric of "progress" and "enlightenment," kept asserting that the American people would not tolerate government control of wireless. Editorials against premature regulation assumed an accusatory tone and focused on the evils of military priority in the ether. Commercial claims, on the other hand, particularly Marconi's, were cast as altruistic and forward looking. Marconi's transatlantic wireless service, heralded as a boon to mankind, served the press and continued to cheapen and quicken news gathering. Marconi was used to personify the press's preferred image of itself: socially responsible, concerned with the safety of others, efficient and profitable without being greedy. With the *Titanic* disaster, the press pointed to Marconi as the man responsible for lives being saved, and as the symbol of why commercial management

and hegemony had to be protected and maintained. Commercial control simply had to be regulated so that irresponsible capitalists too greedy to think of others would be compelled to do so in the future.

In other regulation of the period, business leaders often had to listen carefully to bitter and angry critiques of corporate activities, and then figure out how to co-opt this criticism and eventually exploit it to their own ends.[67] This process involved developing public relations departments and learning how to improve press coverage. In the case of wireless, however, the press had a vested interest in how the invention was managed and, thus, in how it was portrayed. By 1912, Marconi had little public relations work to do with the press: newspapers saw his interests and theirs as one and pulled out all the democratic, "common man" rhetoric at their disposal to make readers—the public—see that these interests were also theirs.

The amateurs, who had made such good copy between 1907 and 1911, were less amusing when, instead of toying with the navy, they threatened commercial news-gathering networks. The press unanimously denounced the amateurs after the *Titanic* disaster for interfering with "legitimate" message handling. What caused the amateurs to lose their freedom to roam the ether at will was not so much that the government would no longer tolerate that freedom, but that a very influential business, the press, found their activities a disruptive encroachment on its turf. This violation was cast, in journalistic rhetoric, as a selfish flouting of the safety and freedom of all Americans, as a challenge to basic ideals and values about right and wrong, good and bad. Thus, with wireless as with other regulatory issues of the Progressive Era, journalistic language that asserted the sacredness of certain American values dovetailed very well with and supported selected commercial priorities and investments.

By the summer of 1912, the shape of American broadcasting was beginning to change, setting the stage for subsequent developments. Marconi now monopolized American wireless service and planned to build several major high-power stations on the East Coast. Fessenden and De Forest, both involved in court cases, had ceased to be major actors in the wireless story, but their inventions, particularly the alternator and the audion, were now in corporate hands. The navy was more centrally involved in wireless, but to preserve the hegemony it had gained through regulation, it would have to become more technically and organizationally efficient. And then there were the amateurs, confined to their ethereal ghetto. One law of spectrum use maintains that "relatively deprived users are virtually forced to innovate spectrum-economizing, spectrum-developing technology."[68] Did this hold true for the amateurs?

Would they have any influence at all now that the deck was stacked in favor of institutional users and clients? The 1912 law did not deny the amateurs' assertion that "the people" had a major stake in spectrum use. Many amateurs, seeing themselves, rather than institutions, as representatives of the people, still believed fervently in this position. Did one disaster now mean individual Americans had no rights of access to this resource allegedly held in common? Even after the 1912 act, there were unresolved tensions between individual and institutional claims on the ether. The amateurs had lost their freedom to roam in and out of the airwaves. But whether their vision of how wireless might be used was also lost in 1912 remained to be seen.