

AWA Review

ABSTRACT

Everyone “knows” that Reginald Fessenden conducted the first broadcast of voice and music on Christmas Eve of 1906 . . . or did he? The authors, finding no reference whatever to that event until more than two decades later, explored both the archival and published records of the period and find the iconic event only becomes well known after the inventor’s biography, written by his widow, appeared in 1940. A careful search of the available Fessenden documents in two key archives reveals but a single mention of the event—and that in a copy of a 1932 letter. While there is little doubt of Fessenden’s earlier transmissions (1900–1906) of voice and music, many of which were witnessed, they have (perhaps ironically) become lost to most historians. This article reviews the published and archival record, and then suggests some reasons for this strange anomaly, including the need to keep such a “frivolous” event from the ears of his financial backers who were seeking success with other lines of wireless business.

Fessenden’s Christmas Eve Broadcast: Reconsidering an Historic Event

Donna L. Halper & Christopher H. Sterling¹ ©2006

The scene is both captivating and widely cited in most histories of broadcasting—especially in this centennial year. Along the Atlantic Coast, on a desolate bluff just south of Boston, on two chilly winter nights a century ago, snow remained on the ground from a storm several days earlier.

On Christmas Eve and New Year’s Eve of 1906, *the first broadcasting* occurred. Three days in advance Reg[inald Fessenden] had his operators notify the ships of the U.S. Navy and of the United Fruit Co. that were equipped with the Fessenden apparatus [a wireless signal detector] that it was the intention of the Brant Rock Station to broadcast speech, music and singing on those two evenings. Describing this, Fessenden [later] wrote:—

“The program on Christmas Eve was as follows; first a short speech by me [Reginald Fessenden] saying what we were going to do, then some phonograph music. ...Handel’s ‘Largo.’ Then came a violin solo by me . . .then came the Bible text, ‘Glory to God in the highest and on earth peace to men of good will,’ and finally we wound up by wishing them a Merry Christmas and then saying that we proposed to broadcast again on New Year’s Eve.

“The broadcast on New Year’s Eve was the same as before, except that the music was changed and I got someone else to sing. I had not

picked myself to do the singing, but on Christmas Eve I could not get any of the others to either talk, sing or play and consequently had to do it myself. . . .

"We got word of reception of the Christmas Eve program as far down as Norfolk, Va., and on the New Year's Eve program we got word from some places down in the West Indies."² (Fig. 1)

Questioning the Story

Though widely cited in secondary literature appearing in the decades since (now including the Internet), we find at least two aspects of this charming story rather odd. First and foremost, there appears to have been virtually *no* notice taken of either broadcast at the time (which is what led us to research the event). Despite an extensive search, we have been unable to discover *any* contemporary documents, let alone published reports, that refer to either broadcast. Numerous articles written by Fessenden himself in the weeks and years following those broadcasts make no mention of them.³ Nor does his own appointment book for 1906.⁴ Nor, for example, does an extensive 1910 article about Fessenden's work that covered at least a page in the *Boston Globe*.⁵ Nor does a published letter defending Fessenden written by a former colleague in 1914.⁶ Nor does Raymond Francis Yates, (formerly editor of *Popular Science*), who co-

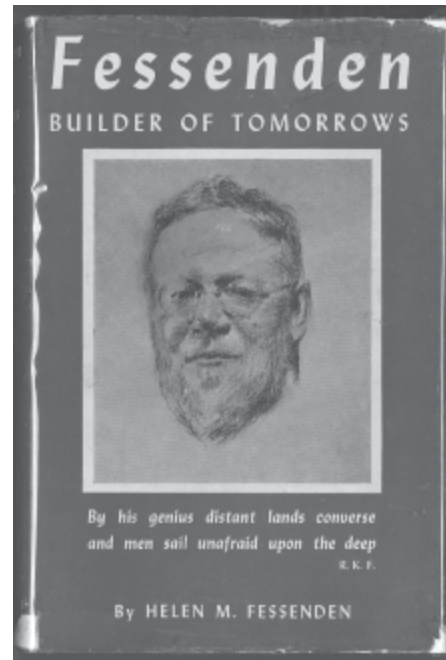


Fig. 1. Helen Fessenden's book was published in 1940, eight years after her husband's death. The famous 1906 broadcast is described on pp. 153-4 and the back cover of the dust wrapper claims this was "the First Radio Broadcast."

authored *The Complete Radio Handbook* in 1922, or Austin Lescarbourea (former managing editor of *Scientific American*), in his 1923 book *Radio for Everyone*.⁷ Nor did any of the many 1932 Fessenden obituaries in major newspapers or magazines (including those for which he wrote, such as *Radio News*) note such a broadcast.⁸ This seems especially odd given the widespread appeal of broadcasting by then, as well as a growing interest in its development.

In the decades since, it appears that most historians and radio history fans have accepted without question Mrs.

Helen Fessenden's detailed account (in her 1940 biography of her husband which appeared 34 years after the events in question) as an adequate and reliable record of what took place, though we don't know whether she was present. For while as noted below, the first published report appeared in 1928, it is only after the appearance of details in her book that the 1906 broadcasts came to be more widely recognized and cited. But if these are the historic, even landmark, events they are now widely thought to be, why were they not recognized as such much earlier?

Second, the statement is odd because Fessenden had already accomplished several *earlier* transmissions of voice and music, from a 1900 experiments from the Outer Banks in North Carolina, to a 1905 demonstration in Washington, DC—as well as a witnessed experiment in wireless telephony that took place at Brant Rock on December 21, 1906, just four days earlier. The only distinction? These were *intended* as point-to-point experiments rather than broadcasts for anyone to receive. Indeed the modern concept of “broadcasting” did not then exist. Though his intent varied, the fact is that voice and music signals were transmitted by Fessenden *before* Christmas Eve 1906. We are *not* questioning his pioneering broadcast role, yet these *earlier* events, despite being better documented, are rarely cited today. How and why, then, did the Christmas Eve and New Year's

Eve broadcasts, virtually ignored at the time, achieve such widespread (if not universal) recognition in more recent histories? How have they become landmarks, a part of radio's “accepted” history? Braced by these concerns, and the seeming lack of contemporary supporting evidence, we began our quest for how the story had come to be so widely accepted.⁹

Belatedly Spreading the Word

We began by examining a fairly extensive sample of wireless and radio books written after 1906, and that review soon made clear that despite its iconic reputation now, the Christmas Eve story was not mentioned for more than two decades after it supposedly took place.¹⁰ While Fessenden's wireless work (with the Weather Bureau in 1900-1901, and then with the National Electric Signaling Co, or NESCO from 1902-1910) and his Brant Rock facility are often discussed in early books and articles (those appearing up to about 1920), not one of them mentions any Christmas Eve 1906 broadcast.¹¹ Of course broadcasting itself was a little known idea until about 1920.

As far as we can determine, the first *published* statement concerning the Christmas Eve 1906 broadcast appeared more than two decades later when Westinghouse vice president H. P. Davis spoke at Harvard University in April 1928, a speech soon included in a book:

Attempts have been

made, and some successful results had been accomplished prior to the World War, in adapting telephonic principles to radio communications.

Reginald Fessenden, probably the first to attempt this, broadcast a program Christmas Eve 1906.

Later, Mr. Lee DeForest [sic] did the same . . .¹²

We find it interesting that a highly complex two-year battle over Fessenden's wireless patent rights had been settled by RCA that very month, granting him a substantial payment for use of his patents, ownership of which had changed hands several times over the previous dozen years.¹³ Because of his role within Westinghouse (then part of the RCA patent pool), Davis was well-acquainted with that patent struggle and its settlement which released the parties to comment more freely on past events.

One of Davis's management colleagues at Westinghouse was Samuel M. Kintner (1871-1936), who is an important figure in the Fessenden story. Kintner had been an undergraduate student under Fessenden at Purdue in the 1890s, served as one of his graduate assistants at the University of Western Pennsylvania (after 1908 the University of Pittsburgh), and then became a faculty member there, following his mentor. He joined Westinghouse in 1903 and later became a research official there.

Kintner had served as manager and then bankruptcy receiver for the failing NESCO in 1911, at which point he and Fessenden appear to have ended their friendship. He returned to Westinghouse and both he and Davis also served on the board of the International Radio Telegraph Co. when it purchased NESCO's Fessenden patents. In complex 1920 arrangements, Westinghouse purchased control of the Fessenden patents, reselling them immediately to RCA—which ended up paying the settlement to Fessenden in 1928.

Eight years later, Alvin Harlow's history of telecommunications referenced (but did not document) the Christmas Eve event.¹⁴ And the first volume of Gleason Archer's massive radio history, appearing in 1938, cited Harlow's report to retell the story.¹⁵ With the appearance of Helen Fessenden's biography in 1940, references to the Christmas Eve story begin to pick up. Orrin Dunlap, by then with RCA after years as radio editor for the *The New York Times*, noted it in a biographical anthology four years later, though he had not mentioned it in his several earlier volumes on radio.¹⁶ Robert Landry, the widely-read editor of *Variety*, repeated the story in his popular postwar survey of radio.¹⁷ Numerous other references appeared through the 1950s, though if they were documented at all, they referenced Helen Fessenden's book.

The huge 50th anniversary issue of the Institute of

Radio Engineers journal in mid-1962 cited the Christmas Eve event as the “First documented, successful broadcasting,” suggesting the engineering community accepted the notion, even though the “documentation” was, again, that of Mrs. Fessenden’s informal biography.¹⁸ So did Howeth’s fine history of naval radio issued a year later, though it mentions the event only in a chronological appendix.¹⁹ Three years later, the first volume of Erik Barnouw’s historical trilogy on broadcasting reproduced the story, quoting Harlow and citing Helen Fessenden—thus giving the story further substantial support.²⁰ So did two later scholarly assessments which were otherwise well documented: Hugh Aitken’s study of early radio,²¹ and Frederick Seitz’s monograph on the inventor’s life.²² But in this case neither provided any citation for the Christmas Eve 1906 story.

Clearly the Fessenden 1906 broadcasts are now widely accepted as historical facts and important firsts. As the centennial of the broadcasts approaches, the story is again cropping up. Researcher James Brittain referenced its 90th anniversary in an IEEE journal.²³ And prolific technology historian Russell Burns includes it in his documented history of communications technology.²⁴ Yet another version appeared in *Invention & Technology*,²⁵ and one retrospective piece ran in the *Boston Globe* as we were researching this paper.²⁶ The

Internet is rife with pages on Fessenden which cite the “eves” broadcasts. Doubtless more accounts have appeared and will continue to do so. But what are the facts?

Fessenden’s Brant Rock Station

Brant Rock (Fig. 2) lies on the Massachusetts coast some 30 miles south of Boston, near Marshfield and just south of Plymouth. It was a pretty

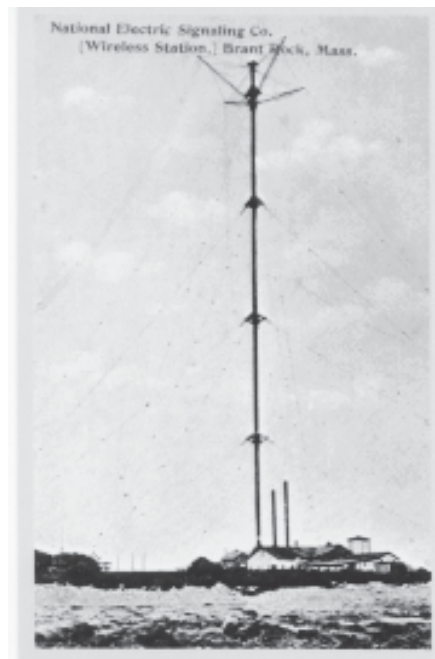


Fig 2. This period postcard view makes clear how dominant the 420-foot tubular tower with its cable stays was. Most of what we can see here is long gone, with two exceptions. Two houses survive as private residences, more than a century after the station began operation. The main buildings which included transmitter and other equipment, along with the tower, were taken down after NESCO went into receivership. The fact that many postcards exist for the station attests to its popularity at the time.

Fessenden

desolate spot a century ago. And in that desolation lay part of the appeal for locating an experimental wireless transmitter, far from prying eyes and potential local sources of electrical interference. The facility's 420-foot tubular steel antenna, transmission building and support structures were constructed in 1905, completed at the end of December. On January 2, 1906, the Brant Rock wireless station, owned by NESCO which then employed Fessenden (at a salary of \$300 a month—a very respectable salary in that time), began sending wireless Morse code communications to a sister facility across the Atlantic in Machrihanish, on the West coast of Scotland. Soon Brant Rock picked up the first transatlantic reply to the effect that the Brant Rock condensers worked satisfactorily. Within several months, operators at the Scottish station reported hearing voices for the first time, accidentally overhearing a conversation between radio operators in Brant Rock and nearby Plymouth.²⁷ These were probably the first voice transmissions across the Atlantic.

Then, on December 6, 1906, calamity struck when the antenna tower at the Scottish station (the same design as the tall metal tube used at Brant Rock) was blown down in a gale, apparently due to defectively installed guy wires.²⁸ As the facility was not rebuilt (NESCO's supporters apparently declined to foot the cost), this ended Fessenden's promising trans-

Atlantic tests.

Late in 1906, after installation of a 2 kw alternator transmitter manufactured by General Electric, the Brant Rock station conducted a witnessed demonstration of its wireless telephony capabilities. Among those to whom invitations were mailed on December 11 and 12, 1906²⁹ were such major companies as Bell Telephone in Boston and Westinghouse, technical journals (*The American Telephone Journal*, *Scientific American*), the Associated Press, foreign embassies (of Britain, France, and Germany), particular individuals (Arthur Kennelly of Harvard who was unable to be present, Elihu Thomson who did attend as a representative of General Electric, and Peter Cooper Hewitt, a noted wireless inventor), as well as a representative of the U.S. Patent Office. We know that at least one trade magazine journalist (John Grant of the telephone journal), AP reporters Keating and Davis, Thomson of GE, and Greenleaf W. Pickard representing AT&T were present on that chilly winter day.³⁰

F e s s e n d e n ' s "programme for telephone tests" issued with the invitations on December 11th, called for a schedule of 20-minute segments of material to be transmitted between Brant Rock and Plymouth. These included use of a "phonograph advertising record" for 2.5 minutes followed by two 5-minute periods of "talking by operator" and a final "five minutes advertising

record on the phonograph.” The record, despite the term describing it, included a violin solo, and this test thus appears to have included both voice and music transmissions.³¹ According to one witness, the Friday afternoon demonstration transmitted these sounds the 11 miles separating Brant Rock from the waterfront reception site in Plymouth, most of that distance being over water which aided the transmission. Sound quality varied as did loudness of the signal, though speech was picked up better than the recorded music.³² An unnamed representative of the Bell interests (either Pickard or another engineer) returned the very next day for a repeat performance of some of the tests.³³

A vital distinction to be made is that one can argue this clearly constituted a *broadcast*—voice and music sent out over the air, even if it was only intended for reception by a single station. Anybody with the proper equipment within range of the transmitter could have picked it up. By combining voice and music (as opposed to code) with radio waves, Fessenden provided a very basic broadcast in effect, even if not in intent. The Christmas/New Years Eve 1906 transmissions differed only in that they were *intended* for anyone who could hear them (yet even in this case, apparently U.S. Navy and United Fruit ships, some of which used Fessenden or Fessenden-like receiving apparatus, were notified in advance, so the intent is very similar to

the December 21st witnessed experiment).

Many more tests of both wireless telegraphy and telephony were conducted at the station in the months and years to come, though Fessenden eventually fell out with his financial backers. Fessenden had left the scene and NESCO by 1911, and Brant Rock’s 420-foot antenna tower was apparently torn down in 1912 or 1913, leaving little behind.³⁴ As a local paper noted in a centennial observation,

Today, the remnants of the original radio signal tower — bare slabs of reinforced concrete, conical porcelain insulators sandwiched in between, and a huge bell-shaped pivot point on top — are nestled behind homes in Blackman’s Point trailer park, far from view.³⁵

Interestingly, a few of the station buildings of the 1906-11 period still survive—the transmission shack and the home and office used to house operators are presently private residences.

Seeking Substantiation

Not surprisingly, we found that information about Fessenden abounds in the early periodical literature on wireless.³⁶ While the earliest published reference we have located that refers to the Christmas Eve 1906 event dates to the previously noted H. P. Davis lecture and book chapter of 1928, a handful of newspaper stories

early in the 1930s also began to mention the broadcast. The first we've been able to find appeared in November 1930, written by reporter Robert Mack of Consolidated Press. Discussing the tenth anniversary of KDKA, he traced broadcasting back to Christmas Eve 1906, much as H. P. Davis had done in his 1928 lecture.³⁷ Two years later, *The New York Times* in a May 1932 story reported on a recent paper by Westinghouse's Samuel M. Kintner, who outlined Fessenden's career and—something Kintner had not done before—offered details about the Christmas Eve broadcast.³⁸ The *Times* also featured radio and technology columnist T. R. Kennedy Jr. who championed the Christmas eve event, which he mentioned in several 1940 and 1941 articles. But for the most part, newspapers and magazines of the period made no reference to Fessenden's Christmas eve broadcast.

In addition to the Fessenden-authored series of autobiographical articles that ran in *Radio News* through much of 1925 (which made no mention of the Christmas eve event), many other popular journals reviewed the inventor's work, though none mentioned the Christmas Eve broadcast until after the 1940 appearance of Helen Fessenden's book. In 1945, for example, the respected weekly magazine *Science*, in an article about the 25th anniversary of KDKA, noted, "The first radio broadcast in history, it is claimed, was on Christmas eve 1906, from the Fessenden sta-

tion at Brant Rock, Mass." ³⁹ And by the early 1950s, inclusion of the Christmas Eve broadcast was a common part of syndicated "Today in History" columns.⁴⁰

Frustrated with the published record, our search for earlier material thus turned to relevant primary documents. In Fessenden's case that is a mite complex given the number of different employers (the Weather Bureau and NESCO chief among them) and parties involved. There are two important archives holding substantial Fessenden papers—the first was gathered over many decades by George Clark and is now housed at the Smithsonian's National Museum of American History in Washington, DC.

The Clark "Radioana" collection proved fascinating but a search of 15 boxes of the most relevant NESCO/Fessenden material revealed no "smoking gun" document proving that the Christmas Eve event ever took place—or, indeed, even mentioning such an event. We did find confirmation of the December 21st witnessed demonstration at Brant Rock, as well as references to numerous earlier tests elsewhere. And we found a crucial 1932 letter from Fessenden to Kintner that is the *only* mention by the inventor of the Christmas Eve broadcast. More on that below. The remaining records are, after a century and more, incomplete. For example, in the Clark archive we found Brant Rock station record books for

1905 and early 1906, and some for 1912 (by which time Fessenden had left), but nothing in between—including the period of focus here. Presumably those records once existed. Likewise surviving scrapbook collections of newspaper clippings were tantalizingly incomplete and did not include the critical 1906-7 period.

Fessenden's personal papers were deposited in the North Carolina state archives (in Raleigh) by his son in 1944, a dozen years after his father's death, and only shortly before his own.⁴¹ This is an extensive collection covering the inventor's whole life, and thus includes much that does not relate to the question at hand. Indeed most of this collection contains material after our 1906-07 period of interest. A careful search of the relevant wireless material across nearly 30 boxes of this collection failed to find a single reference to any Christmas Eve broadcast. Thus, to our disappointment, we found that neither of the archives holding primary Fessenden material provides any contemporary evidence to support the oft-reported story.

Earlier Fessenden "Broadcasts"

What makes the iconic nature of the Christmas and New Years Eve broadcasts odd to us is that the widely-cited broadcasts were far from Fessenden's first ventures in radio telephony. He conducted several earlier demonstrations, held in at least three different

states between 1900 and 1905.

Maryland, for example, claims it all began six years prior to the Christmas Eve broadcasts. An official state historical roadside marker states

Milestone in Radio History

"Here, on Cobb Island, in December 1900, Reginald Aubrey Fessenden, assisted by Frank W. Very, while experimenting in wireless telephony, for the first time sent and received intelligible speech by electromagnetic waves between two masts 50 feet high and one mile apart." (see Fig. 3)



Fig. 3. Maryland historical marker on Cobb Island along the Potomac River south of Washington, DC.

Fessenden's wireless experimentation lab was located some 50 miles southeast of Washington, DC, on Cobb Island, on the north shore of the Potomac River. He and his assistant Alfred Thiessen perfected Morse transmissions using a new generator and in October 1900 he experimentally hooked up a microphone (a telephone handset) to his apparatus. On December 23, 1900 Fessenden said into his microphone, "One, two, three, four. Is it snowing where you are Mr.

Fessenden

Thiessen? If so telegraph back and let me know.” Thiessen replied by telegraph in Morse code that it was indeed snowing. In great excitement Fessenden wrote at his desk, “This afternoon here at Cobb Island, intelligible speech by electromagnetic waves has for the first time in World’s History been transmitted.”⁴²

This was six years before the widely-cited Brant Rock transmissions and almost a year before Marconi’s transmission of the wireless telegraph code letter “S” from Poldhu, England to Signal Hill, Newfoundland. Fessenden’s employer, then the U.S. Weather Bureau, was pleased and Willis Moore, his immediate supervisor, suggested shifting experiments to North Carolina to test wireless signaling between Cape Hatteras, Roanoke and another mainland location to create a 100-mile triangle.⁴³

And thus North Carolina chimes in with its own moment in the sun, with roadside sign B53 on the Outer Banks near Cape Hatteras, placed in 1988:

Radio Milestone

“From near here in 1902 R.A. Fessenden sent the first musical notes ever related [sic] by radio waves. Received 48 miles north.” (see Fig. 4)

And both the 1900 Maryland and 1902 North Carolina events do, indeed, show up in the literature of the time. For example, a Boston paper spoke of “wireless words” being sent clearly upwards of 200 miles or more, with many improvements



Fig. 4. North Carolina historical road marker B-53, erected not far from Cape Hatteras on the state’s Outer Banks.

expected to come.⁴⁴ And it happened again when on February 13, 1905, witnesses saw Fessenden transmit “words, sentences and tunes” from the Forsberg & Murray Yard, at 8th and Water Streets in Washington, D.C.⁴⁵ Yet modern citations of these documented early transmissions of wireless telephony now seem all but lost to posterity.

Evidence versus Event

We are *not* arguing here that Fessenden’s Christmas and New Year’s Eve broadcasts never took place. For one thing, proving a negative after a century is nearly impossible. Nor do we question anybody’s role or intentions—we are not accusing anybody of doing anything. What we do continue to question, however, is (a) why there are so few references to these now-legendary broadcasts prior to Helen Fessenden’s 1940 biography of her husband, and, just as curious, (b) why *documented and earlier* Fessenden wireless telephony tests that most assuredly took place are today all but forgotten? Do we

know about the Christmas Eve event today mainly because of a romantic date connection that has slowly become accepted over the decades?

The absence of any reports in contemporary (or later) press or periodicals (prior to about 1940, that is) suggests several potential explanations. Among them, of course, though thoroughly unprovable at this juncture, is the unlikely possibility that the famous broadcasts never happened and were merely a fault of memory or an invention of later years. Given that most early wireless pioneers actively sought (and received) publicity for their efforts, the lack of any press attention then or later does at least raise questions about whether journalists even knew of these broadcasts, let alone thought them important. There are widespread press, journal, and book references to Fessenden's many other accomplishments—just not this one.

There are several possible reasons the broadcasts were ignored in the press. For one, Fessenden was not good with most reporters — his own ego and certitude of his superiority in wireless development got in the way of effective press relations time and again. Another circumstance, entirely beyond his control, was that during the last weeks of December, a contentious battle broke out between the dominant New England Telephone Company and an upstart independent which sought permission to compete in Boston. The so-

called “telephone wars” dominated the city's newspapers,⁴⁶ keeping reporters busy at the very time when some might otherwise have covered other stories—such as the wireless events at Brant Rock.

Another possible option is that the “eves” broadcasts were later confused for events for which contemporary evidence clearly exists. Here, the most likely scenario is that the witnessed December 21, 1906 experiment over time might have been confused with Christmas Eve, a mere three days later. After all, the content of both was similar. Of course the earlier transmission was directed from one station to another as opposed from one station to any who might listen—seemingly the aim of the Christmas and New Year's Eve events. Despite advance notice supposedly given to U.S. Navy and United Fruit company vessels three days before the 1906 broadcasts, however, we could find no surviving record of any such notice.⁴⁷ While their *intent* may have differed, the voice and music content of the two December 1906 broadcasts was very similar, though the earlier event was apparently about half as long. *The fact remains that Fessenden is almost definitely the first man to broadcast.*

The likelihood of this is strengthened by the single piece of written evidence that the Christmas and New Years Eve broadcasts actually happened. Writing from Bermuda on January 29, 1932, Fessenden, in response to a now-lost inquiry

Fessenden

from Samuel Kintner of Westinghouse, stated

By broadcasting I suppose you do not mean the transmission of speech, music and singing to other stations for the same firm which is sending but to receiving stations operated by other firms than the sending station, and also programs advertised or notified in advance.

If you mean by broadcasting the transmission of speech, music and signing [*sic*] to other stations of the same ownership as the transmitter, then the program given to Dr. Kennelly,⁴⁸ Prof. Elihu Thompson, the engineers of the Western Electric and A. T. & T. and other companies, and the editors of several of the New York Papers at the exhibition which you will find described in the American Telephone Journal, January 26th and February 7th, 1907, would be a broadcast, *as indeed would be the exhibitions of wireless telephony between Washington and Annapolis in 1903, and 1905.* (Emphasis added)

If, however, you do not call this a broadcast, then the program sent out Christmas Eve and New Year's Eve, 1906 would be the first broad-

cast. This broadcast was advertised and notified three days in advance of Christmas, the word being telegraphed to the ships of the U.S. Navy and the United Fruit Co., which were equipped with our apparatus that we intended broadcasting speech, music and singing on Christmas Eve and New Year's Eve.⁴⁹

What we find fascinating and telling about these paragraphs is that Fessenden himself suggested three differing definitions of what a broadcast could be, his own example of each, and then left the decision to Kintner. The latter chose the Christmas Eve event (Fessenden's third option)—but he was making his decision after a dozen years of established broadcasting, rather than in the very different context of 1906 when the whole concept was new.

Another possibility is that information about the Christmas Eve event was suppressed at the time for business reasons. A detailed report on the state of his experimentation, written by Fessenden to his backers on January 1, 1907—seemingly less than 24 hours after the second reputed broadcast, makes no mention of them.⁵⁰ Fessenden's investors were supporting the inventor's effort to create a viable point-to-point system of wireless telegraphy to compete with telegraph cables as well as other

wireless systems. The inventor, already suffering friction with those backers,⁵¹ might well have preferred they not find out about a wireless telephony experiment that seemed unrelated to that system. Still, it seems odd that no mention or record of either of the supposed broadcasts is evident even in the inventor's private communications or files.

There is another option—caution. Fessenden noted in 1918 that he had not claimed the feat of having sent a voice signal across the Atlantic back in 1906 due to the many false claims made by other inventors—and his inability to prove the case after the antenna tower collapsed at the Scottish station in 1906 and was not subsequently rebuilt.⁵² He may have felt much the same about the supposed Christmas and New Year's Eve broadcasts, especially after the witnessed and reported December 21, 1906 transmissions. Yet while that may have been the case at the time, surely it was no longer so even a few years later? Radio magazines of the time might not have mentioned the "eves" as they were well aware that Fessenden had already broadcast voice and music signals earlier than late 1906.

One final option is that the broadcasts were simply considered as fun—a holiday celebration by a few key staff members, not worthy of further serious notice, let alone being recorded for posterity. Given Fessenden's earlier transmis-

sions of voice and music, the Christmas Eve and New Year's Eve events were not technical landmarks, but may be seen as just a bit of seasonal fluff by the staff. But even if this is the case, we find it strange there is absolutely *no* reference to the events in the archival material that survives. It seems odd that *nobody* supposedly present—friends, colleagues or co-workers—ever mentioned the broadcasts at all, even in later years. Yet even those who knew his wireless telephony work sometimes failed to attach importance to it.⁵³

Finally, we stress again that our research does not in any way seek to diminish the credit that Reginald Fessenden clearly deserves as the first man to send voice and music signals through the air by wireless. There is little question he accomplished that—whether in late 1906, or on several earlier occasions as is well documented. His was the innovative spark that set others on the path toward the widespread radio broadcasting of today. But so far as we can determine, neither Christmas nor New Year's Eve of 1906 marked the true *first* broadcast.

Notes

1. We acknowledge the vital support of the Shiers Memorial Fund in our archival work and travel related to researching this paper. George and May Shiers, through their several bequests, continue to support valuable research efforts. See Christopher H. Sterling, "Television Historian: An Appreciation of George Shiers (1908-83)," in this issue of the *AWA Review* (2006). We also very much appreciate the comments, suggestions and occasional tweaks from Michael C. Keith of Boston College. He was an important cheerleader in this process. And we are grateful for the many good questions and suggestions (which helped to tighten the manuscript) from John Michael Kittross, retired professor at Emerson College. Finally, though we substantially disagree on many aspects of this story, we appreciate the many comments of John Belrose, a Canadian radio engineer who has written extensively about Fessenden's career.
2. Helen M. Fessenden, *Fessenden, Builder of Tomorrows* (New York: Coward McCann, 1940; reprinted by Arno Press, 1971), pp. 153-154, italics in the original. The author, the inventor's widow, died of a heart attack only months later, in April 1941. To *whom* or *when* her husband wrote these details is not identified in her biography, but quotes exactly from a letter written by Fessenden to Samuel M. Kintner, then Vice President of Engineering at Westinghouse, on January 29, 1932, six months before the inventor's death, and in response to a request (now lost) for information from Kintner dated January 9th. See Clark "Radioana" Collection, Smithsonian Archives, Letter of January 29th, 1932, Reginald A. Fessenden to S.M. Kintner, CWC 135-246A. See also: Elliot Sivowitch, "Broadcasting's 'Pre-History, 1876-1920,'" *Journal of Broadcasting* 15:1 (Winter 1970-71) at p. 19, note 24. As noted below, Kintner included a reference to the Christmas Eve broadcast in a paper he delivered later in 1932.
3. See, for example, these papers, all

- by Fessenden: "Recent Progress in Wireless Telephony," *Scientific American* (January 19, 1907), pp. 68-69, which refers to the witnessed December 21st experiments; "The Continuous Production of High Frequency Oscillation," *The Electrician* (February 22, 1907), p. 710, which also notes the earlier December experiment; "Wireless Telephony," *Transactions of the American Institute of Electrical Engineers*, 27:1283-1358 (June 1908), reprinted as "Wireless Telephony" in *Smithsonian Report 1908* (Washington: Government Printing Office, 1908), pp. 161-195; and "Wireless Telephony," *Scientific American Supplement*, 67:172-174, 180-182, 196-198 (March 13 and 27, 1909) which are excerpts from the 1908 paper. While each of these refers to the December 21, 1906 witnessed wireless telephony demonstration, *none* mentions any Christmas or New Year's Eve broadcast.
4. Fessenden's annual appointment books for several years in the early 1900s are found in the Fessenden Papers, State Archive of North Carolina, Box 1140.100. The 1906 book contains no entries after October 8, 1906, though all pages are present.
5. "Wireless Station at Brant Rock Has Been In Touch with Egypt," *Boston Globe* (June 26, 1910), p. SM 3.
6. "Wireless Telephony" Letter to the editor from S. M. Kintner, *New York Times* (May 21, 1914), p. 10.
7. Raymond Francis Yates and Louis Gerard Pacent, *The Complete Radio Book* (New York: Century, 1922) briefly notes Fessenden (but not the broadcasts) on p. 294; and Austin C. Lescarbours, *Radio for Everybody* (New York: Scientific American Books, 1924) which is largely "how-to" in orientation.
8. See, for a telling example, "In Memoriam: Reginald Aubrey Fessenden," *Radio News*, 14:6, pp. 334-5 (December 1932). This journal had carried Fessenden's own autobiographical series of columns just a few years earlier.
9. As with many other fields of study, myths in radio have often become part of generally accepted history.

One example underlines the point—the often-retold story of David Sarnoff manfully taking down the names of *Titanic* survivors in April 1912 as President Taft ordered all other wireless operators off the air. Gripping, heroic—and totally untrue. While it never happened (as even a scan of contemporary newspapers would have made clear to anyone who looked), it took Kenneth Bilby's *The General: David Sarnoff and the Rise of the Communications Industry* (New York: Harper & Row, 1987) to finally put that tale to rest with the facts on Sarnoff's real and more limited role.

10. We would be happy to share the full list of all the material we looked at—books, magazines, journals, primary documents—merely send the senior author an email. She can be reached at dlh@donnahalper.com.

11. Books of this period often demonstrate a national bias, emphasizing the work of fellow-countrymen (e.g., British books usually tout Marconi or Fleming, while American authors speak more of Fessenden or de Forest). Among several representative examples (and, as noted in the previous note, we are happy to demonstrate that we checked many more):

James Erskine-Murray's translation of Ernst Ruhmer's *Wireless Telephony in Theory and Practice* (London: Crosby, Lockwood, 1908)—one of the first books devoted to the subject—includes details on the 21 December 1906 event but makes no mention of any Christmas Eve broadcast. Erskine-Murray exchanged several letters with Fessenden in mid-1907 to be sure he had Fessenden's work accurately described—but there was no mention of Christmas Eve broadcasts in those letters [Clark "Radioana" archive, Smithsonian Archives, box 384].

James Erskine-Murray, *Wireless Telephones and How They Work* (London: Crosby, Lockwood, 1910), makes several references to Fessenden's work and includes a photo of the Scottish station whose tower had been destroyed by wind four years earlier—but does not men-

tion any Christmas Eve broadcast.

A. P. Morgan, *Wireless Telegraphy and Telephony Simply Explained* (New York: Munn, 1912), on p. 128 includes a photo of the "Fessenden wireless telephone transmitting phonograph music," almost definitely at the Brant Rock station, but does not note any Christmas Eve event.

Charles G. Ashley and Charles B. Hayward, *Wireless Telegraphy and Wireless Telephony* (Chicago: American Technical Society, 1916); and Alfred M. Goldsmith, *Radio Telephony* (New York: The Wireless Press, 1918): neither notes the broadcasts, though both mention Fessenden's work (and Goldsmith includes photographs of the Brant Rock station).

Year-Book of Wireless Telegraphy and Telephony (London: Wireless Press, 1913 to 1925 inclusive): none of the 13 annual volumes mentions such an event, though there is occasional reference to Fessenden.

John V. L. Hogan, *The Outline of Radio* (Boston: Little, Brown, 1928, 3rd ed.) rather tantalizingly notes, on p. 20, "It is well known, however, that in 1906, Fessenden gave numerous practical demonstrations of radio-telephony between his experimental stations at Brant Rock, and Plymouth, Massachusetts..." but then moves on to later developments. Hogan was himself an active radio innovator.

12. H. P. Davis, "The Early History of Broadcasting in the United States," in *The Radio Industry: The Story of Its Development* (Chicago: A. W. Shaw, 1928; reprinted by Arno Press, 1971), pp. 189-225, at p. 190, emphasis added. The April talk, focused heavily on station KDKA, was initially issued as a free-standing booklet. Davis repeats the claim with almost the same sentence in his "American Beginnings," in Martin Codel, ed. *Radio and Its Future* (New York: Harper, 1930), p. 4. As best we can tell, the first published article connecting Fessenden with later (KDKA) events in Pittsburgh appeared in 1923: "R.A. Fessenden: A Pioneer in

Perfecting Radio Phone: Pittsburger's [sic] Idea, Presented 20 Years Ago, Contained Factors Which Made Modern Radio Telephony Possible," *Boston Globe* (July 15, 1923), p. 52. Fessenden had taught in the late 1890s at what is now the University of Pittsburgh, and Kintner had been one of his assistants there.

13. The suit, brought against RCA by Fessenden in 1926, resulted in a settlement that paid the inventor a half million dollars—easily worth at least \$5 million in modern values—for the rights to use his wireless patents received during the first decade of the century. See W. Rupert Maclaurin, *Invention and Innovation in the Radio Industry* (New York: Macmillan, 1949), p. 135. See also Reginald Fessenden, "Brief Statement of Case," seven page typed mss dated November 15, 1924, Fessenden Papers, State Archive of North Carolina, box 1140.89. Samuel Kintner was a primary witness early in the proceedings. See "Trade Board Rules in 'Radio Trust' Suit," *New York Times* (April 13, 1926), p. 12. Interestingly, while in his own 1925 talk on radio development, Kintner made no mention of the Christmas Eve 1906 broadcast, he did include it in his later (undocumented) paper: "Pittsburgh's Contributions to Radio," *Proceedings of the IRE*, 20:1849-1862 (December 1932) at p. 1852.

14. Alvin F. Harlow, *Old Wires and New Waves: The History of the Telegraph, Telephone, and Wireless* (New York: Appleton-Century, 1936; reprinted by Arno Press "Telecommunications," 1974), p. 455.

15. Gleason L. Archer. *History of Radio to 1926* (New York: American Historical Society, 1938; reprinted by Arno Press "History of Broadcasting," 1971), p. 86.

16. Orrin E. Dunlap, Jr. *Radio's 100 Men of Science* (New York: Harper, 1944), in his mini-biography of Fessenden, p. 139.

17. Robert K. Landry, *This Fascinating Radio Business* (Indianapolis: Bobbs-Merrill, 1946), p. 22.

18. Raymond F. Guy, "AM and FM Broadcasting," *Proceedings of the*

Institute of Radio Engineers, 50:811 (May 1962). On examination, the documentation refers back to Archer, note 15 above.

19. L. N. Howeth, *History of Communications-Electronics in the United States Navy* (Washington: Government Printing Office, 1963), p. 521. Howeth provides a wealth of documented detail on Fessenden's work, facilities, and battles with the Navy over patent rights, but otherwise makes no mention of any Christmas Eve broadcast.

20. Erik Barnouw, *Tower of Babel: A History of American Broadcasting to 1933* (New York: Oxford University Press, 1966), p. 20.

21. Hugh G. J. Aitken, *The Continuous Wave: Technology and American Radio, 1900-1932* (Princeton, NJ: Princeton University Press, 1985), pp. 74-75.

22. Frederick Seitz, *The Cosmic Inventor: Reginald Aubrey Fessenden, 1866-1932* (Philadelphia: American Philosophical Society, 1999), p. 30. This is the best modern exposition of the inventor's life and accomplishments. With Helen Fessenden's book (note 2) and Ormond Raby, *Radio's First Voice: The Story of Reginald Fessenden* (Toronto: Macmillan, 1970), written for younger readers, there are but three monographs on the inventor, each with drawbacks. A definitive and documented biographical study is badly needed.

23. James Brittain, "Reginald Aubrey Fessenden and the Origins of Radio," *IEEE Proceedings*, 84:1852-53 (December 1996), includes three photos, but sadly no documentation of any kind. In his earlier book on alternator inventor Ernst Alexanderson (see note 30), Brittain made no mention of the Christmas Eve broadcasts.

24. Russell W. Burns, *Communications: An International History of the Formative Years* (London: IEE, 2004), p. 325. Burns cites as his source John S. Belrose, "Fessenden and the Early History of Radio Science," *Proceedings of the Radio Club of America* (November 1993), pp. 6-23. Belrose, a Canadian engineer, has written at least three documented

papers about Fessenden's work, and has others under way.

25. William S. Zuill, "The Forgotten Father of Radio," *Invention & Technology* (Summer 2001), pp. 40-47. The author edited the Bermuda newspaper.

26. Carolyn Y. Johnson, "Radio Days at Brant Rock: 100 Years Ago, A Marshfield Station Created a Buzz That's Still in the Air," *Boston Globe* (January 1, 2006):

http://www.boston.com/news/local/articles/2006/01/01/radio_days_at_brant_rock/

27. Reginald A. Fessenden, "The First Transatlantic Telephone Transmission," *Scientific American* (September 7, 1918, P. 189, notes that the Scottish operator sent a registered letter to Brant Rock, reporting the inadvertent pick up. See also Helen Fessenden, op cit., pp. 154-155.

28. "Trans-Atlantic Wireless Telegraphy," *Engineering* (January 18, 1907), p. 89 includes photos and diagrams of what happened to the antenna support wires. Interestingly, Marconi had similar wind problems with antenna towers at many of his early transmitters.

29. While widely cited in the literature, many sources mistakenly report that the demonstration itself took place on December 11th. Checking with the documents in the Clark "Radioana" archive and the Fessenden Papers in North Carolina confirms that date was actually when invitations to attend the event were mailed. The letter of invitation is also reprinted in Fessenden, "Wireless Telephony," AIEE, op cit, p. 1309, note 1.

30. "Wireless Telephone Tests at Brant Rock and Plymouth, Mass." Eye-witness account typescript of eight pages dated [ironically!] December 24, 1906, p. 1. Clark "Radioana" Archive, Box 74, folder 2. The author is not identified, but was Greenleaf Pickard of AT&T, as identified in James E. Brittain, *Alexanderson: Pioneer in American Electrical Engineering* (Baltimore: Johns Hopkins University Press, 1992), p. 43. The account also ap-

pears as an appendix in Erskine-Murray (1908), op cit. It seems odd that despite the presence of two AP reporters—both referenced in the eye-witness typescript—no story seems to have resulted. We have not only checked a substantial cross-section of newspapers (see note 10) for the days following the demonstration, we have also checked with AP's archives. Indeed, Fessenden had wondered as well—he sent a telegram on December 30th to his backers asking "if Associated Press intended publishing account of tests" and was told by a reply the next day that his backers had inquired and "had no intimation from [AP] as to any publication." Fessenden Papers, State Archive of North Carolina, Box 1140.6, file 2.

31. "Programme for Telephone Tests," dated December 11, 1906, and signed by Fessenden. Clark "Radioana" Archive, Box 74, folder 2. The spelling of "programme" reflects Fessenden's Canadian birth.

32. "Wireless Telephone Tests..." op cit. See also John Grant, "Experiments and Results in Wireless Telephony," *The American Telephone Journal* (January 26, and February 2, 1907), pp. 49-51, 68-70, 79-80.

33. Fessenden Papers, State Archive of North Carolina, Box 1140.6, file 2.

34. Helen Fessenden, p. 341. Some other sources suggest the tower may have come down as late as 1917.

35. Johnson, op cit (note 26).

36. See, for example, "Wireless Station at Brant Rock has been in Touch with Egypt," cited in note 5. Its review of Fessenden's experimental work was based, in part, on an interview with the inventor. No mention of any Christmas Eve broadcast appears.

37. Robert Mack, "Broadcasting by Radio Came into Being Decade Ago," as printed in the *Appleton [Wisconsin] Post-Crescent* (November 1, 1930), p. 10. Mack wrote for the Consolidated Press, a now-defunct syndicated news service, and the story presumably ran in many other papers as well. It appears to have been prompted by the 10th anniversary of KDKA which figures largely in his

narrative.

38. Orrin E. Dunlap Jr. "Broadcasting Voice by Radio was a Goal of the Pioneers," *New York Times* (May 8, 1932), X:10. Dunlap's story was based on the just-published paper by Kintner in the *IRE Proceedings* cited at the end of note 13.

39. "The Twenty-Fifth Anniversary of Broadcasting," *Science*, New Series (October 19, 1945), p. 14.

40. See, for example, "In December—A List of Coming Events, Anniversaries, and Other Noteworthy Dates," *New York Times* (December 2, 1951), p. 22.

41. Colonel Reginald Kennelly [sometimes cited as Kenneth which is incorrect] Fessenden (1893-1945), was the only child of Reginald and Helen. After some discussions with the Fessenden National Memorial Association (an organization now apparently defunct) and the North Carolina Department of Archives and History, in August 1944, he donated his father's papers to the state archives where they remain today. Col. Fessenden was lost at sea off Bermuda while sailing on June 22, 1945. His body was never found, and about nine months later, Bermuda officials officially ruled that he was dead.

42. See Alfred C. Pickells, "Early Experiments in Wireless Telegraphy," *Modern Electrics* (December 1913), pp. 954-957.

43. A quarter century ago, the state of North Carolina considered developing the site of Fessenden's wireless operation near Cape Hatteras as a state park. See *Fessenden Park in Dare County, North Carolina: A Master Plan and Feasibility Study* (1980) in the Fessenden Papers, State Archive of North Carolina, Box 1140.104. The plan includes photos and detailed layouts of the wireless experimenting site. No action was taken on the proposal to reconstruct the tower and other facilities, no doubt because of the nearly \$1 million projected cost.

44. "Wireless Words—American System Tested at Roanoke Island," *Boston Globe* (April 27, 1902), p. 2. See also, Pickells.

45. Clark "Radioana" Archive, Box 384, file 1. The eye-witness report, which lacks an identified author, cites use of Fessenden's liquid barretter in this test.

46. See, for just one example, "Two Phone System Has Friends and Enemies," *Boston Herald* (December 24, 1906), p. 1.

47. Canadian radio engineer and researcher John Belrose who has extensively studied Fessenden's whole wireless career and accomplishments reports that a late 1906 U.S. Navy listing of ships with wireless equipment shows just two United Fruit vessels, both of which used de Forest devices that were closely copied from Fessenden designs. Three navy ships used Fessenden receivers and three others de Forest devices. Another 36 merchant ships were also using de Forest receivers.

48. Here Fessenden's memory failed him—he had invited Kennelly but the latter could not attend the December 21, 1906 demonstration, and was thus not present.

49. Clark "Radioana" Collection, Smithsonian Archives, Letter of January 29th, 1932, Reginald A. Fessenden to S.M. Kintner, CWC 135-246A. The typescript is labeled at the top as a "COPY." The next and concluding three paragraphs of this letter are quoted in Helen Fessenden's 1940 biography of her husband and form the basis for most subsequent accounts.

50. Reginald A. Fessenden, "Position of the National Electric Signaling Company, January 1, 1907," merely notes on p. 8 of the typescript that "We are of course pushing ahead with the further development of the [wireless] telephone and other work." Fessenden Papers, State Archive of North Carolina, Box 1140.9, file 1.

51. We found plenty of contemporary evidence of this friction. Indeed, in a letter from one of the Pittsburgh financiers written December 27, 1906 (only three days after the supposed Christmas Eve broadcast), Hay Walker complained in a letter to Fessenden that "We are in despair of ever having you keep your promises

and confine yourself to your particular end of the business, in which you have had our loyal support.” Fessenden Papers, State Archive of North Carolina, Box 1140.6, file 3. Given the tone of that plaint, it would make sense for Fessenden not to report what might have appeared in the circumstances as a mere stunt.

52. Fessenden, “The First Trans-Atlantic Telephone Transmission,” op cit.

53. See, for example, S. M. Kintner to George H. Clark, September 8, 1932 (Clark Radioana Collection, Smithsonian Institution, File 55), a one-paragraph letter written several months after Fessenden’s death, when Kintner notes that Fessenden’s work had by then “taken such form as to merit such record [a proposed biography], although at the time the work was done I must confess I, for one, didn’t attach any such importance to it.”

This article was peer-reviewed.

About the authors

Donna L. Halper is a Boston-based educator and media historian. A graduate of Northeastern University in Boston, she was the first female announcer in the school’s history, and went on to have a long career in broadcasting and print journalism. She has taught at Emerson College in Boston for the past 15 years, and has won several teaching awards. She is also pursuing a PhD at the University of Massachusetts. Her historical research has been quoted in newspapers, magazines and encyclopedias, and she has been on the History Channel, ABC Nightline, and WNYC Radio talking about trends in broadcasting and popular culture. Ms. Halper is the author of three books, the most recent of which is *Invisible Stars: A Social History of Women in American Broadcasting*. In her spare time, she collects memorabilia that pertain to the history of broadcasting.



Fessenden

Christopher H. Sterling is a professor of media and public affairs at George Washington University, where he has taught since 1982. A longtime AWA member, he co-authored *Stay Tuned: A History of American Broadcasting* (Lawrence Erlbaum Associates, 2002, 3rd ed.) among 20 other books and a host of articles and reviews on electronic media and telecommunications. For further information, see www.ChrisSterling.com.

