

Music and the Rise of Radio in 1920s America: technological imperialism, socialization, and the transformation of intimacy

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The effect of radio cannot be underestimated. It was perhaps the most important electronic technological innovation of the 20th century, at least in the US. It re-configured notions of public and private, helped usher in a new form of the consumer economy, played a large role in the creation of the star system in the entertainment industry, gave the country the first mass-media superstar in popular music, Rudy Vallee, and more.

While some scholarly literature (though not much) has paid attention to the programming of music on the air, this essay considers the early days of radio and the rhetoric surrounding the period immediately following its development, and the role that music played in promoting radio. This historical moment in the rise of a technology seems to be a particularly interesting juncture, especially with respect to radio. Workers in the field of science and technology studies (STS) tend to concentrate on the development of a new technology, or its subsequent uses, but less attention is given to the way that a technology in development is pushed and cajoled into social existence.

It is this long moment that is of interest here. Radio hobbyists proselytized on its behalf in countless articles. Dozens of discussions in the early radio press suggested ways of using the radio—on the beach, in the car, in the boat, camping—so that readers could learn how to integrate the new technology into their everyday lives. Since music was prominently featured on the air in the early days of radio, especially before the rise of the comedy programs, music played an important role in the championing of radio and its early uses.

Technological Imperialism

Radio was advocated, in part, by employing discourses of modernity. The rhetoric about radio in the 1920s was caught up in an ideology of modernity, a technological modernity marked not only by radio itself, but by other recent technologies such as film, the phonograph, the automobile, and the airplane. ‘Are your new neighbors modern people?’ asks an unnamed person in the *Buffalo Express* in 1922. ‘Modern?’ replies another. ‘Say, they sent in last night to borrow our Radio set!’ [1]. This exchange reveals as much about conceptions of modernity as it does the importance of consumption, of owning a radio that one’s neighbor doesn’t have.

Don Slater identifies the 1920s as probably the first moment in which people actually believed themselves to be moderns, inhabiting modernity: a contemporary state, not one being striven toward [2]. This technological modernity, marked both by the dominance of machines but also by an underlying ideology that promotes them, was called ‘technopoly’ by Neil Postman, an ideology that arose in the mid-1920s [3]. Whether or not one adopts Postman’s term, it is clear that this ideology arose for a number of reasons. First, of course, there were the new technologies just mentioned. Also, industrial production was made more scientific, as is well known, thanks to the writings of Frederick W. Taylor and the practices of Henry Ford. Manufacturing was increasingly updated technologically. Lynn Dumenil writes that 70% of industries were electrified in 1929, whereas only 30% had been a decade before. Electrification and mechanization, she writes, vastly increased productivity in this era [4].

There was a downside, of course, with workers’ jobs becoming increasingly banal and mind-numbing. Even low-level white collar workers were not immune. Artworks of the time thematized the increasingly technocratic nature of the era and the mindlessness of work, such as King Vidor’s 1928 film *The Crowd*, which depicts the utter mundanity of everyday life of a white collar worker; or Charlie Chaplin’s 1936 *Modern Times*.

But the majority of the middle class, in a position to reap the benefits of this new technological era, celebrated technology [5]. The middle class promoted radio, proselytized for it. Susan J. Douglas has cogently written of the ways that broadcasting was socially constructed, but it is useful to discuss one important strategy employed by radio’s enthusiasts that Douglas doesn’t examine [6]. This tactic was simple: the technological modernity represented by radio was emphasized by juxtaposing it to peoples thought to be premodern [7]. The burgeoning publications on radio in the 1920s frequently featured radio and indigenous peoples, both as listeners and performers (see Figs 1–3; Fig 2 looks particularly stagy) [8]. Most of these treatments of racialized others were in photographs with occasionally negatively stereotypical captions, such as a photograph published in *Radio World* in 1922 captioned ‘Hears white fathers’ Signal Fire’. This photograph showed Chief Sherman Charging Hawk, in suit, tie, and headphones, seated at a table with a small radio set. The text under the photograph reads:

Chief Sherman Charging Hawk whose only knowledge of sending and receiving long-distance messages was that of the Indian’s beacon fire placed on a high hill. Here he is photographed, experiencing, for the first time, the receiving of messages by the white father’s latest invention. A concert broadcast over distant leagues has given him his first idea of the world’s greatest advancement [9].

This copy is perhaps disingenuous, for it is difficult to believe that Chief Sherman Charging Hawk had never heard of the telegraph or the telephone. Note also the concluding phrase about radio as ‘the world’s greatest advancement’, which emphasizes the achievement of radio against the primitive mode of communication thought to have been used by the Chief in the photograph.

Photographs and articles such as this were fairly common, both in ‘reporting’ and advertising. For example, a full-page ad in the mid-1920s placed by the Crosley Radio Corporation, a leading manufacturer, featured a picture of a Native American couple in front of a fire, the copy referring to the radio as ‘the modern signal fire’ [13].

Another photograph from 1922, captioned, in *faux* Native American dialect, ‘Little Chief Bear hears big radio’, depicts Little Chief Bear in traditional garb listening to a large radio. The text under the photograph reads, in full: ‘Little Chief Bear, son of Big



FIG. 1. The Buffalo nickel Indian broadcasts (author's collection) [10].



FIG. 2. Onondaga Indians (author's collection) [11].

Chief Bear, who was killed in Custer's Last Stand, had his first experience with radio at the National Hotel and Restaurant Show in Chicago. The chief donned the head piece while music was coming over the ether and insisted on keeping time on his tom-tom' [14].



FIG. 3. An Eskimo lullaby at WGY (author's collection) [12].

A 1926 article in *On the Air* about one Kiutus Tecumseh, great-grandson of Chief Tecumseh, began, 'What a treat it is to hear an Indian musician!' But it transpires that Tecumseh wasn't performing 'Indian music', but rather some undisclosed popular music, having honed his musical skills as a cowpuncher in Washington state, and then as a sailor in the Navy during World War I [15].

There were dozens of such articles and photographs. While they were mainly representations of America's others, particularly Native Americans, foreigners appeared as well, as in Fig. 4.

Representations such as these provide evidence of a phenomenon or strategy that could be called technological imperialism, in which the west's conception of itself as technological and modern is highlighted and reinforced by juxtaposing itself and its technologies against people without that technology. Western technology, in fact, frequently serves as a metonym for the west itself in these representations. The number of photographs and articles featuring indigenous peoples also emphasizes the reach of radio technology: radio as medium traverses space as radio as technology seems to extend across time, into the premodern world [17].

Such representations and articles suffuse the early radio press throughout the 1920s. By the 1930s, however, this campaign was largely successful. Radio had become an integral part of most American homes. But the ideology of technological modernity with technological imperialism as its agent continued with the establishment of successful comedies that put ethnicized and racialized people on display. Representations of indigenous or premodern peoples gave way as the ideology of technological imperialism became wedded to that of the melting pot [18]. Immigrants to the US could participate in this glorious new technological modernity. Program after program—whether *The Rise of the Goldbergs* with Mama speaking in her Yiddish accent, or *Life with Luigi* with Luigi and his Italian accent—emphasize the modernity and shining technological future offered by radio through the juxtaposition of these people who represent the old, the Old World.

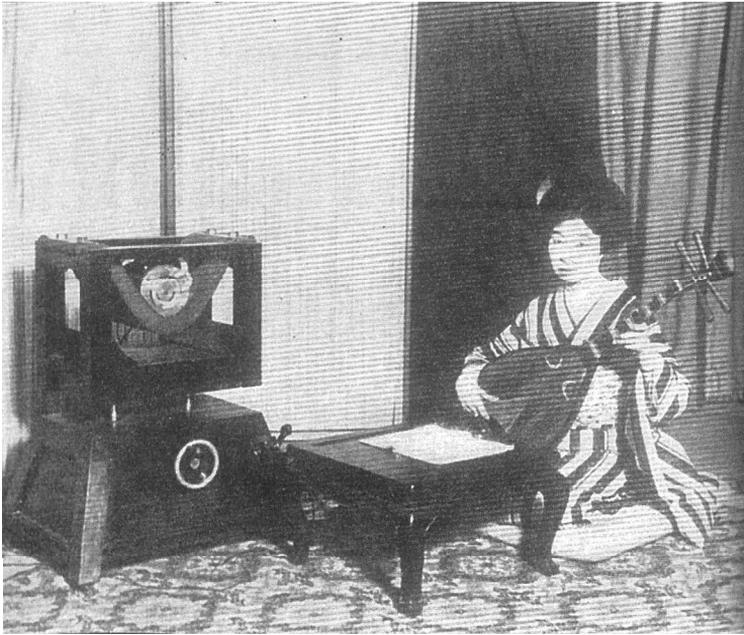


FIG. 4. The Yellow Peril via radio (author's collection) [16].

Emphasizing radio's modernity through such juxtapositions in image and prose in this representational process labeled technological imperialism created an ideology of radio as not only modern, but necessary. Radio's proselytizers had to represent radio as something more than a fad, as something useful, something everyday, something everybody must have. A household without radio was a household that was no better than the native peoples and other groups without radio.

Technology and Everyday Life

Radio, as an important marker of America's technological modernity, was thought to be able to accomplish almost anything. It could make the disparate peoples of the nation one; it could uplift everyone culturally by playing good music; it could provide news; it could provide crucial weather and agricultural information for farmers; it could educate.

But all of these positions comprised the more visible, public discourses about the benefits of radio. It is possible, however, to argue that the campaign to promote radio was waged as much in the realm of the everyday uses of radio, and some of the stories of everyday uses that proliferated in the press in the 1920s will be retold below. Many of these stories, as with those that picturing modern technology alongside premodern peoples, are from 1922, a pivotal year remembered by Erik Barnouw as euphoric with respect to radio. The year 1922 saw the number of new stations skyrocket [19]. Frederick Lewis Allen writes that although radio broadcasting had been publicly available since 1920, it wasn't until the spring of 1922 that radio sales took off. It was a veritable craze, amounting of \$60,000,000 in sales that year, climbing higher afterward [20]. This craze was registered in American culture in many ways, some silly, some creative, some serious.

Who, however, was listening? The original people for whom radio was of interest was mainly a small group of male hobbyists, some of whom had worked with radio during their service in World War I [21]. Other hobbyists were boys and young men who were fascinated by listening long distances, trying to pull in stations from as far away as possible. By about 1920, however, the broadcast of the 1920 James Cox–Warren G. Harding presidential race generated a huge number of phone calls to Westinghouse’s switchboard [22]. In 1921, the Jack Dempsey–Georges Carpentier fight was one of the most-anticipated broadcasts of the day, and it was clear that radio was beginning to find users beyond the hardcore hobbyists and was beginning to insinuate itself into everyday life. The year 1921 saw the creation of 28 new stations; by 1922, Douglas writes, ‘the floodgates were opened’ [23].

The frenzy of interest in radio did not mean that people simply went out and bought them, however. Radio was still a new technology for which ways of integration into everyday life had to be found. The following stories show the many ways that radio was incorporated into everyday life, how it ceased being solely a mere technological novelty and became something that people used in their everyday lives for pleasure, information, and more. Radio hobbyists who became proselytizers extolled the virtues of radio in countless magazine articles, articles about radios being installed in hotels, in hospitals, on buses, on cable cars, in automobiles, in baby carriages for lullabies, how they could be used on camping trips, and more. Here are some of these stories.

An editorial in June 1922 in *Radio Digest* suggested that motorboat enthusiasts take the radio with them while boating [24]. Later that same month, *Radio Digest* reported that ‘a hoopskirt has been successfully used as an antenna’, which meant that ‘ladies will have a distinct advantage in the matter of Radio receiving if this quaint and now remodernized fashion comes back’ [25].

In June 1922, Rudolph Friml, a composer, wrote a song on a steamship bound from New York to Europe and radioed the music back to New York to be heard later that night in a Ziegfeld Follies Show. Friml wrote out the entire melody in solfège (i.e. do re mi) syllables. He had the lyrics with him, as did the Ziegfeld. With this string of *sofège* syllables, it would be easy enough for the *sofège*-trained musician to translate into music notation and deriving the rhythm from the lyrics [26].

In July 1922, Wallace Blood of Chicago outfitted his car with a radio for a driving trip to the Pacific coast, which Mr. Blood said was the first radio tour on record [27].

Also in 1922, there was a suggestion that army buglers be replaced by radio [28].

In September 1922 *Radio World* told of ‘a young man in a large red touring car equipped with loop aerial, receiving set, and loudspeaker. He dashes to and fro along the Great White Way, and—well, you ought to hear the music!’ The anonymous author went on to comment on the quality of reception and tone of the radio [29].

Radio World featured five bathing beauties on its cover of 7 July 1923, instructing readers in the caption that ‘Radio adds to the pleasures of the seashore’; a few weeks later, Velma Carson urged readers of *Radio World* to take their radios camping with them [30].

In 1923, *Popular Radio* discussed a method by which mom could be sure she could hear her programs when she wanted:

When Mother reads in the paper that a song she especially wants to hear is to be sent out by a certain station at nine o’clock Tuesday evening she reserves that hour on the sheet. That holds the hour for that station and for her against claims of other members of the family. Sister may reserve Thursday evening



FIG. 5. The newest radio bob (author's collection).

for jazz from her favorite band and invite in her friends, secure in the knowledge that no one else will have pre-empted the set that evening for a missionary lecture or the report of a prize fight [31].

Note it's the mother and sister who are targeted here, as part of the strategy of extend radio out of the realm of the male hobbyist and military.

In 1924, a barbershop in Washington, DC installed a nickel-in-the-slot radio receiver so that people getting their hair cut could listen to the radio while the barber worked [32]. The *Popular Radio* story of this phenomenon was accompanied by a photograph of a young girl balefully getting her hair cut by an African American man (see Fig. 5).

In one American city in 1924, the organ grinder was replaced by the 'radio barrel organ' in a cart drawn by a donkey [33].

Even some cowboys employed the radio for singing their cattle to sleep. 'It sure is a big saving on the voice', Tom Blevins, a Utah cowboy, wrote in to his local radio station in 1926. 'The herd don't seem to tell the difference. Don't put on any speeches, though. That'll stampede 'em sure as shootin' [34].

In Lancaster, Pennsylvania, in January 1927, radio opera lovers offered a \$100 reward for information on a man who interrupted Giuseppe Verdi's *Il Trovatore* being broadcast by the Chicago Opera company. 'Good evening, folks. This is my regular concert. How do you like it?' he asked. 'Lancaster people do not want opera anyway. Radio reception in Lancaster depends entirely upon me' [35].

Also in the mid-1920s, instruments were being modified and made anew so that they would be able to broadcast directly over the ether. So there was the 'pianorad', the

‘tromborad’, a ‘new radio violin’, with a pickup for amplification, a ‘giant-tone radio violin’, and a pipe organ modified for broadcasting [36].

The foregoing are all everyday uses of radio, but this new technology found its way into life practices that occur less frequently. There was, for example, a spate of radio weddings in the 1920s. One such wedding, in Chicago in the spring of 1924, featured a broadcast of the wedding march from Richard Wagner’s opera *Lohengrin*. The bride’s brother, a radio enthusiast, arranged with the local radio station to have the work broadcast at precisely 8 p.m. while the bride and groom stood before the minister at the church [37]. On New Year’s Eve in 1926 in Belleville, NJ, a couple waited in the bride’s parents’ home for the orchestra they had hired. But it didn’t appear. An enterprising bridesmaid, the bride’s sister, telephoned station WAAM in Newark and requested they play a wedding march. As soon as the bride’s father turned on the radio, the ceremony proceeded [38]. In 1928, a more spectacular musical event at a wedding occurred when the composer and conductor Ernest Schelling played Mendelssohn’s Wedding March on the piano from his villa on Lake Geneva to his friends in Manchester, Massachusetts, at their wedding [39].

There was also a move to include radio music at another important ritual, the funeral. In late 1929, a funeral director at a meeting of the New Jersey State Funeral Directors’ Association introduced a resolution that special radio programs should be established to broadcast suitable music for funerals. ‘The arrangement of such a program might be fixed for a certain hour in the afternoon, so as to fit in as part of the funeral services’, read the resolution, ‘and such services could be readily timed so as to permit the rendering of music in keeping with the solemnity of the occasion’ [40].

Not all stories in this era about radio were favorable, however. At a party in Brooklyn in February 1927, a young Frenchman was arrested for smashing a broadcasting microphone because he objected to the broadcasting of the ‘Marseillaise’, shouting something about ‘desecration’ as he wreaked havoc [41].

Radio Music and Healing

Pre-existing attitudes about music were newly tested with the advent of radio. Radio music, for example, was said to soothe savage beasts. At the Bronx Zoological Park in 1923, Chief Keeper John Toomey played music over the air to various animals. The lion, as evidenced by an accompanying photograph, ‘lacked musical appreciation’, but the bears liked the music, especially the organ music, and ‘Grandpa’, the ancient tortoise estimated to be 269 years old, seemed ‘decidedly pleased’ with the radio music [42].

And, perhaps most curiously, radio could soothe and heal people. Well, it was *music* that was thought to have healing powers, but this belief was buttressed by the novelty of radio, so that in many contemporary writings there was a good deal of slippage from the healing ability of music to the wonder of radio itself. For example, in May 1922, a doctor in Boston put a radio receiver in his office for patients to listen to while waiting.

The patient is naturally feeling blue and sick at heart as well as body. Either the doctor or Mrs. FitzGerald [his wife] takes a seat at the radiophone and plugging in starts tuning up to catch Medford, Pittsburgh or Newark. The patient’s mind is immediately taken up with the wonder of the new invention, which is explained to him while pop-eyed he hears songs sung thousands of miles away [43].

In June 1922, an ambulance in Fort Smith, Arkansas was equipped with a radio, to play 'soothing music' for a patient being transported to the hospital. 'Music was furnished all the way from the train to the hospital', reported *Radio Digest*, accompanying its article with a photograph of the ambulance, the radio barely visible [44].

In August 1922, Dr. W. F. Jacobs, Medical Superintendent of the Cumberland Hospital in Brooklyn, said that 'Radio deserves to be ranked with the best mental therapeutic agencies. In fact, for hundreds of cases the radio telephone can be prescribed as the one best treatment' [45]. Dr. Jacobs had been experimenting with radio on his patients since the previous September, and installed some sets at his own expense in the hospital. A new hospital was being built which was completely equipped with loudspeakers and connections for headsets in all the wards. 'Think what it will mean', continued Dr. Jacobs,

for some poor devil, friendless, homeless, laid up with a broken back, never receiving any visitors, with nothing to do from one day to another but look at the wall and think. I have put headsets over the ears of many such men, and have seen them transformed in a few minutes from creatures that were just dully existing to the intelligent, interested men they once were and now soon will be again, permanently, and much quicker because of the interest, the life, the health that radiates from radio [46].

The New York City Visiting Committee, whose activities mainly consisted of providing concerts in municipal hospitals and almshouses, helped solicit funds to equip Jacobs' new hospital, for it was the Committee's 'firm conviction that in the near future every institution will be equipped with radio apparatus. Endless vistas are opened for the bed-ridden and shut-ins generally'.

No matter how excellent the medical care, nor how scrupulous the attention to material needs, the average patient in a municipal institution, where visitors are allowed only about twice a week, is apt to be discontented. He feels bored, out of touch with the world, impatient of delay. Imagine the change which a radio would make in this atmosphere! Without any tiring effect he can feel himself again a part of the world; his thoughts will be turned to something other than his own troubles and he will want more than ever to get well. There is reason to think that the period of convalescence would actually be shortened by the presence of the right sort of radio apparatus [47].

Even those whom radio couldn't heal could nonetheless be touched by it. Radio's cultural force was so potent when it was new that even the deaf reported that they could 'hear' radio music. In 1926, for example, some deaf listeners claimed to be able to perceive jazz.

This information has been conveyed to Paul Ash, orchestra leader and radio star of KYW in letters from several women who explain that these are the only sounds they have been able to hear and that they enjoy the jazz music although otherwise deaf. A famous ear specialist of Chicago has become interested in the subject, it is reported, and is conducting a series of tests to determine the possibilities of utilizing this means of 'bone conduction' of sound so that those who have lost normal hearing may through radio have the pleasures of music. When the unique investigation has been completed the renowned specialist promises the issuance of a report and a test program over the air is to be given with deaf persons asked to 'listen in' and to report what they 'hear' [48].

More spectacular, however, was the rapturous letter to the Symphony Society of New York by Helen Keller in 1924, worth quoting at length.

I have the joy of being able to tell you that, though deaf and blind, I spent a glorious hour last night listening over the radio to Beethoven's 'Ninth Symphony.' I do not mean to say that I 'heard' the music in the sense that other people heard it; and I do not know whether I can make you understand how it was possible for me to derive pleasure from the symphony. It was a great surprise to myself. I had been reading in my magazine for the blind of the happiness that the radio was bringing to the sightless everywhere. I was delighted to know that the blind had gained a new source of enjoyment; but I did not dream that I could have any part in the joy. Last night, when the family was listening to your wonderful rendering of the immortal symphony some one suggested that I put my hand on the receiver and see if I could get any of the vibrations. He unscrewed the top, and I lightly touched the sensitive diaphragm. What was my amazement to discover that I could feel, not only the vibrations, but also the impassioned rhythm, the throb and the urge of the music. The intertwined and intermingling vibrations from different instruments enchanted me. I could actually distinguish the cornets, the roll of the drums, deep-toned violas and violins singing in exquisite unison. How the lovely speech of the violins flowed and flowed over the deepest tones of the other instruments! When the human voices leaped up thrilling from the surge of harmony, I recognized them instantly as voices. I felt the chorus grow more exultant, more ecstatic, upcurving swift and flame-like, until my heart almost stood still. The women's voices seemed an embodiment of all the angelic voices rushing in a harmonious flood of beautiful and inspiring sound. The great chorus throbbed against my fingers with poignant pause and flow. Then all the instruments and voices together burst forth—an ocean of heavenly vibration—and died away like winds with the atom is spent, ending in a delicate shower of sweet notes.

Of course, this was not hearing, but I do know that the tones and harmonies conveyed to me moods of great beauty and majesty. I also sensed, or thought I did, the tender sounds of nature that sing into my hand—swaying reeds and winds and the murmur of streams. I have never been so enraptured before by a multitude of tone-vibrations.

As I listened, with darkness and melody, shadow and sound filling all the room, I could not help remembering that the great composer who poured forth such a flood of sweetness into the world was deaf like myself. I marveled at the power of his quenchless spirit by which out of his pain he wrought such joy for others—and there I sat, feeling with my hand the magnificent symphony which broke like a sea upon the silent shores of his soul and mine.

Let me thank you warmly for all the delight which your beautiful music has brought to my household and to me. I want also to thank Station WEAJ for the joy they are broadcasting in the world [99].

Keller's letter is remarkable, but no more remarkable than the everyday stories. So many of these accounts are presented simply to illustrate just how powerful radio had become, just how deeply it infiltrated the sacred and the profane aspects of everyday life.

Clearly, some of these uses of radio are faddish. Fads, though, can be social ways of dealing with the new and different. Once a fad is over, the object of the fad is usually normalized, if it is not forgotten altogether. Most of these stories retold above are from the early days of radio, a strategy chosen neither by design nor accident: such stories abounded when radio was new. But by the 1930s, what excited people's interest was less radio as technological object, signifier of modernity, but what was on the radio—programs.

Whose Everyday Life?

All of the above stories illustrate how radio was pushed and pulled into everyday life, and its uncommon cultural power. But it is important at this point to wonder just who was permitted to participate in 'everyday life'. If radio in the 1920s was a sign of an American technological modernity, it had to be counterposed against those premoderns who didn't possess this technology—or understand it. In order to sustain the modern/premodern binary, uses of radio technology had to be found for every modern person—man, woman, and child.

It was this last group that posed the greatest problem, for how does an infant use a radio? Uses had to be found, otherwise infants were dangerously unmodern like the natives peoples against whom American technological modernity was being compared. And uses weren't long in coming. In May 1921, some Union College students, members of the college Radio Club, rigged a 'wireless receiving station' on an ordinary baby carriage, with a small megaphone attached (these were before the days of radios with speakers). With the baby in the carriage, a young woman back at the campus sang a lullaby, which was distinctly heard more than a mile away. The *New York Times* reported that 'the baby was "as good as could be," soothed by the lullaby from start to finish ...' [50].

The question of the lullaby is particularly interesting. Since the lullaby was something normally sung by women, broadcasting lullabies was also a way of extending this new technology to women. Broadcasting lullabies seems also to have been a way for fathers to become more involved with their children. A cartoon published in *Radio World* in 1922 depicted a father in pajamas walking back and forth with his baby while mother is seen sleeping in the bedroom. The radio loudspeaker is spouting musical notes, a song whose title we are told is 'Go to Sleep My Radio Kid'. The caption reads: 'Mr. Jones says he doesn't mind walking the floor with the baby at all, now the radio is installed' [51].

Also in 1922, the *London Opinion* published a cartoon with baby in the cradle throwing a tantrum while dad read the newspaper. The caption: 'Harassed Parent: "Good heavens! I suppose I must have switched the little beggar on to the political meeting at Limehouse instead of the lullaby concert at the Linoleum Hall"' [52].

The idea of a lullaby concert wasn't unusual. In the early days of radio, several stations presented women singing lullabies and telling stories at bedtime. In Chicago in 1922, Miss Louise Forester sang thousands of babies to sleep every night [53]. Later, Agnes Lenard told stories and sang children to sleep accompanying herself on the ukulele on station WJZ in Newark in 1924; in Chicago, Mrs. J. Elliott Jenkins told bedtime stories and sang songs for children on WMAQ in 1925; Val McLaughlin conducted the popular children's program that was sometimes known as 'Lullaby Time' on station WLS in Chicago in 1926. In New York, May Sprintz sang sleepy time songs, read poems, and told stories for children on her popular children's show. She

told many Mother Goose stories on WINS, New York City in 1932, for fifteen minutes Monday through Saturday, 7:00–7:15 p.m. [54].

Even children's nighttime programs weren't free of the stunt mentality. On 13 September 1924, Gus Carey, otherwise known as 'Uncle Wip', a bedtime storyteller on station WIP, owned by Gimbel Brothers' department store in Philadelphia, donned a diving suit and jumped off the end of a pier in Atlantic City, New Jersey, shortly after 7 p.m. He had a receiver inside his helmet so he could hear his pianist, Harry Link, sitting at the piano on the end of the pier. Uncle Wip's microphone was inset in a rubber sponge and connected to a broadcasting unit on the end of the pier so that Link could hear him. Thus situated, Uncle Wip told a bedtime story first, as usual, followed by a recitation of the names of those youngsters who had written him. Then he sang his lullaby. 'The accompaniment was perfectly timed', wrote the *New York Times*, 'and to listeners-in the song sounded as if it was being sung beside a piano in the usual manner' [55].

Radio, the Intimate Medium

Retelling the above stories was meant to demonstrate radio's integration into social lives, how the 'social' was in some sense defined by who wasn't in it—racialized and ethnicized others—a juxtaposition that also highlighted the newness and technological achievement of radio compared to the supposed backward premoderns depicted in so many photographs in the 1920s. These pictures showed how radio was thought to have conquered both space, and time, from modern to premodern.

Even as radio was brought into the realm of social life, however, it was at the same time reconfiguring the nature of the private, of intimate space—it was being integrated into individual lives, into individual private fantasies. As many authors have noted, radio was a crucial factor in the blurring the distinction between public and private in America in the 20 century [56].

While it was perfectly possible before radio to hear music in the home, either music one made oneself or played recordings with the phonograph, radio was different [57]. In the 1920s, radio music, unlike the phonograph, was live. And radio, unlike most home musicking, offered the best musicians around, as sponsors never tired of telling listeners.

It would be difficult to underestimate the impact of radio on live entertainment. A particularly vivid firsthand description of the changes wrought by radio appears in a memoir by George Burns:

The only problem was that just as we were becoming stars, vaudeville was dying. No one could pin the rap on us, though. Everybody believes it was the movies that killed vaudeville. That's not true. Movies, vaudeville, burlesque, the local stock companies—all survived together.

Then radio came in. For the first time people didn't have to leave their homes to be entertained. The performers came into their house. Gracie and I knew that vaudeville was finished when theaters began advertising that their shows would be halted for fifteen minutes so that the audience could listen to 'Amos & Andy'. And when the 'Amos & Andy' program came on, the vaudeville would stop, they would bring a radio onstage, and the audience would sit there watching radio.

It's impossible to explain the impact that radio had on the world to anyone

who didn't live through that time. Before radio, people had to wait for the newspaper to learn what was happening in the world. Before radio, the only way to see a performer was to see a performer. And maybe most important, before radio there was no such thing as a commercial.

Radio made everybody who owned one a theater manager. They could listen to whatever they wanted to [58].

People home alone listening to the radio were free to construct fantasies about themselves, about the people they were listening to, as Susan J. Douglas writes [59]. And once again, music was one of the best vehicles with which to do this, particularly since radio ushered in a new style of performing that came to be known as 'crooning'. Crooning arose because other styles of singing, operatic, Broadway, and vaudeville, were too loud for radio equipment in the 1920s. A softer style of singing was necessary to preserve the equipment, and it was a woman, Vaughn de Leath, who pioneered this new style. But this new style was quickly picked up by male singers such as Whispering Jack Smith and Gene Austin. Rudy Vallee became the first hugely popular crooner, however, and indeed, he was the first national mass media popular music star in America [60].

The striking feature about crooning was that, even when broadcast or played back on phonograph records, it offered a greater sense of intimacy than live singing. Opera singers are specifically trained to sing loudly so that they can be heard, unamplified, in the back of the concert hall. Vaudeville and other popular singers cultivated singing styles that utilized a piercing, nasal singing style, and/or a mode of enunciating words, almost barking, that rendered them audible to people sitting in cheap seats. Pre-radio singing styles, therefore, were manifestly 'public'—meant to be heard by many listeners.

Crooning, on the other hand, had the effect of the singer singing to only one listener. Whereas the other styles mentioned above were clearly intended for listening in public spaces, the singers singing as loudly and/or as penetratingly as possible, crooning was just the opposite—it was as if the singer was singing only to you in your home, through the miracle of radio. Few recordings of these early programs survive, but Rudy Vallee and other crooners in the 1920s and 1930s made commercial recordings that are still easily available. Listening to them today, one is struck by the unremarkable singing style—since crooning was the first of the modern singing styles to employ the microphone like all singers today use it. And yet, the strangeness of this style is accessible to us. Listening to Rudy Vallee sing songs such as 'I'm Just a Vagabond Lover', in which he doesn't simply croon but seems to be deliberately decreasing the volume, one is struck by the strikingly private nature and directness of this style [61].

Crooning as a singing style thus introduced a paradox: while radio was proclaimed as uniting disparate Americans into a single national culture, this singing style that had been ushered into existence by radio helped create and maintain an illusion that listeners' relationships to singers and other broadcasting individuals were unmediated, personal. Even when broadcast, crooning was a more personal mode of musical expression than those that people could have heard live.

Crooning, combined with the intimacy that was thought to be intrinsic to radio because of its placement in the home, resulted in an unprecedented intrusion into people's homes and lives. The focal point of this intimacy, however, was not all listeners, but women. Singers such as Vallee became hugely popular with women fans, though there were many male fans as well. Vallee's popularity with women and the underlying questions of gender have been recently discussed by Allison McCracken and

thus don't need to be considered here, except to note that her argument centers on the ways in which Vallee's supposed effeminacy was why he was eclipsed by Bing Crosby fairly quickly in popularity [62]. Rather, the question of intimacy, not central to McCracken's discussion, will be addressed.

A 1930 *Radio Revue* contest designed to elucidate the reasons for Vallee's popularity was won by a 'mere man', though the second prize letter was by a woman who addresses the intimacy issue in her letter. Vallee is the 'eternal love', she writes. 'Always breathing romance, singing the praises of love, enrapturing his phantom sweetheart with his ardent whisperings, and at the same time yearning for his own dream girl—he makes the women believe that each one is the only one—that she alone is his beloved' [63].

At the same time, *Radio Revue* held a different contest for the best letters on the subject of 'Who is my favorite radio artist—and why?' Margaret H. Heinz of Buffalo won first prize for her letter about Vallee. Rudy Vallee, she says, 'is a clever youngster—he knows how to use that voice. He knows that every woman likes to feel that he is singing just to her—and so he sings to every woman as an individual' [64].

McCracken quotes a woman's fan letter on the same theme: '“Your voice is strangely similar to that of a friend, of whom I've lost track, that I act like one in a trance while you're singing”' [65]. 'It is a real treat for me to hear the voice of an old friend each night', wrote another [66].

Vallee's fans weren't the only people who believed that he sang to them directly; this was the highest praise that only the best radio entertainers could receive. And musicians themselves seem to be well aware of this. Bradley Kincaid, an early country musician, wrote in one of his songbooks to his fans that

When I sing for you on the air, I always visualize you, a family group, sitting around the table of the radio, listening and commenting on my program. Some of you have written and said that I seem to be talking right to you, and I am. If I did not feel your presence, though you be a thousand miles away, the radio would be cold and unresponsive to me, and I in turn would sound the same way to you [67].

Advertisers seemed to be aware of crooning's intimate qualities. Herman S. Hettiger, an early scholar of broadcast advertising, wrote in 1933 that 'The real success of crooning has been not in its musical aspects, but in the personal touch and atmosphere of romantic intimacy which the crooner has been able to build up through his distinctive delivery' [68].

Crooning might have been the most intimate form of singing at the time, but radio itself was thought to be intimate, even though, at the same time, listeners well knew they were tuning in simultaneously with thousands or millions of others. The idea that the radio waves were entering almost directly into one's own head was powerful, as the following poem by John Webster from 1922 suggests.

The Radioman's Love Song

I am high on the breast of the swelling sea,
And your voice comes from faraway home to me;
It comes clear and true from the weird above—
And you sing of love—you sing of love.

I start—I look! But you are not near!
 I wonder—I ask: Is it you I hear?
 Yes—'tis you!—though your voice comes o'er leagues of sea—
 For you sing to me—you sing to me [69]!

Though, of course, she sings to anyone who has a radio.

A cartoon from early 1923 entitled 'Perfectly satisfied' depicts a young couple of a love seat, his arm around her, each with their own headphones—separated, yet united by their connection to a radio. The dialogue reads, '“Gee, Annabelle! Ain't it nice of them to broadcast 'That Ever Lovin' Pair' for our benefit. They know us, all right”' [70].

This belief about intimacy and directness was so potent that there was an occasional tragedy. In February 1927, Karoline Groschek committed suicide in her bedroom. She was in her 50, a cook for a wealthy family. She had fallen in love with a singer on the radio in Vienna and wrote him many letters, to which the only response was an autographed photo [71]. Yet even this tragedy was reported by the unremittingly boosterish American radio press in radio terms, not human ones: 'The first suicide for love of a broadcast artist', was the title of the report in *Popular Radio* [72].

Some programs were particularly adept at invoking the changing nature of the public and private, even going so far as to invoke each sphere. Chase and Sanborn's enormously popular program with Eddie Cantor, for example, *The Chase and Sanborn Hour*, began with the announcer opening the program, followed by a lush orchestral introduction that could have served just as well as the musical introduction to a major Hollywood film. Then a musical transition to the announcer: 'Rubinoff and his violin.' (Russian violinist Rubinoff—who went by his first name—was a fixture on Cantor's program). This is followed by a trumpet fanfare, then Rubinoff playing a dreamy, romantic solo accompanied by the orchestra. The intimate quality of the solo serves to move the listener from the 'public' mode of the announcer and the opening music to the 'private' mode of home listening, a privacy and intimacy emphasized by Cantor's opening lines and style of delivery, which is essentially crooning in speech: 'Are you listenin', folks, huh? This is your old pal Eddie Cantor just a'callin' round for a good old visit with you all. Pull yourself up an easy chair by the good old fireplace, folks, and we'll smoke a herring together' [73]. Cantor's deliberate southernisms—'a'callin'' and 'you all'—further heighten the sense of hominess and intimacy listeners were supposed to receive.

Perceptions of the intimate character of radio went beyond listeners' infatuations with singers and songs. Susan J. Douglas writes of the ways that radio was seen as mysterious and even spiritual in its early history. The issue of radio's telepathic-like mode of communication, however, is arguably a separate issue from the spiritualism that sprang up around it in some quarters. Radio, unlike any previous communications technology available to the public, was live: people heard it in real time, and knew that others were hearing it in real time at the same time. This was a difficult concept to grasp for people still caught up in a print culture.

And radio was often understood in terms of telepathy. This is the fulcrum upon which Douglas makes her arguments about spiritualism, but it seems possible that radio as telepathy has as much or more to do with the intimacy of the medium. As we saw with respect to radio crooners, to listeners in the 1920s, radio really seemed to be speaking to them individually, particularly in the early days of radio when people listened directly with headphones [74].

Douglas is right, however, to focus on the discourses of telepathy with respect to radio in the 1920s, for there are plenty of examples. For instance, in May 1925, Hugo Gernsback, editor and publisher of *Radio News*, wrote an intemperate column about 'mental radio', in which he debunks the beliefs of people who claimed to be able to receive radio signals in their heads. Gernsback writes that he receives ten to fifteen letters per week from people who 'possess this affliction'. Gernsback goes on to relate how he 'cured' a woman of this 'delusion' by suggesting she sleep with a magnet under her pillow, and suggesting later that she sleep with her ears tightly closed [75].

Now, the question is not whether or not people were actually receiving radio signals. Rather, Gernsback's column serves as one of many examples of discourse of the era that held radio as a personal and private mode of communication. This belief was widespread enough that telepathy was termed 'mental radio' for a time, as in Upton Sinclair's book by that title published in 1930 (Sinclair conducted experiments to uncover the nature of his wife's telepathic powers) [76]. Trained scientists carried out similar experiments about radio. In March 1922, three psychology professors, from Northwestern University, Columbia University, and Antioch College, attempted to send thought waves through the radio from station WJAZ Chicago; no mention of their reception has been found [77]. Aimee Semple McPherson established her own radio station and described the antenna towers as 'alive, tingling, pulsing spires of steel, mute witness that at Angelus Temple every moment of the day and night, a silent and invisible messenger awaits the command to carry, on the winged feet of the winds, the story of hope, the words of joy, of comfort, of salvation' [78]. McPherson exhorted listeners to place their hands on the radio and pray with her, as if they could all be connected [79].

Conclusions

Any new technology needs to be promoted; uses need to be found for it, or else it won't develop a social life, social uses. Radio was no different. But radio was never simply a technological gadget: it is a communications technology, a medium. By foregrounding the historical moment after radio's invention and before its unquestioned acceptance in everyday life, this paper has shown the myriad avenues that radio's proselytizers pushed it into everyday people's lives.

And once people found uses for it in everyday life, from lullabies to weddings to hospitals, radio's social existence began to shape people's experience of music and entertainment more generally. No longer did one have to leave the home to hear professional-quality live music, for the radio brought it into the home, transforming people's conceptions of public and private as formerly public voices and sounds and modes of discourse were listened to in private settings. With music and voices, radio connected people from distant places, even as those people maintained a notion that radio was speaking to them alone.

With all of these innovations, all of these alterations to social life, radio in the 1920s and 1930s came to symbolize perhaps more than any other technology, with the possible exception of the automobile, Americans' sense of themselves as moderns, especially compared to peoples without radio. And yet radio allowed Americans to maintain a premodern sense of unmediated relationships as it seemed to speak to listeners directly. While radio may seem to be a humble technology today compared to television in many real and important ways—bureaucratically, legally, and culturally—television is but a footnote to radio.

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NOTES

- [1] How about the antenna? *Radio Digest*, 17 June 1922, p. 6.
- [2] Don Slater, *Consumer Culture and Modernity* (Malden, MA, 1997), p. 13.
- [3] Neil Postman, *Technopoly: the surrender of culture to technology* (New York, 1993). For the earlier version of this ideology, see Jacques Ellul's conception of 'technique', which he defines as 'the totality of methods rationally arrived at and having absolute efficiency (for a given stage of development) in every field of human activity'. Jacques Ellul, *The Technological Society*, John Wilkinson (trans) (New York, 1964), p. xxv; emphasis in original. Postman's work is essentially an updated version of Ellul's critique.
- [4] Lynn Dumenil, *The Modern Temper: American culture and society in the 1920s* (New York, 1995), p. 59.
- [5] See Dumenil, *The Modern Temper*, p. 148, for a similar point.
- [6] Susan J. Douglas, *Inventing American Broadcasting, 1899–1922* (Baltimore, 1987), especially the chapter called the social construction of American broadcasting.
- [7] This kind of juxtaposition has been one of the central interests of much of this author's work. See, for example, *Global Pop: world music, world markets* (New York, 1997) and several of the chapters in *Strange Sounds: music, technology and culture* (New York, 2001).
- [8] For just a few examples: Eskimos step to tunes from CFCN, *Radio Digest*, 23 December 1922, p. 9; First radio music for an Indian dance, *Radio World*, 24 February 1923, p. 30; the photograph captioned In the village of Juan Diaz, Panama, *Radio Broadcast*, November 1925, p. 35; the photograph captioned Indians hear songs by radio, *Radio World*, 17 June 1922, p. 14; the photograph captioned Oskenonton, a Mohawk Indian inspecting WEA, *New York Times*, 4 May 1924, sec. 9, p. 16; the photograph captioned Real Hawaiians at KHJ, *Radio Broadcast*, June 1927, p. 97; the cover photograph captioned Some original Americans enjoy a broadcast program, *Radio World*, 1 September 1923, p. 1; the cover photograph captioned These Romany people appreciate radio broadcasting, *Radio World*, 22 September 1923, p. 1; the cartoons entitled When broadcasting was in flower, *Radio News*, February 1924, p. 1069.
- [9] Hears white fathers' signal fire, *Radio World*, 24 June 1922, p. 25.
- [10] The Buffalo nickel Indian broadcasts, *Popular Radio*, December 1925, p. 588.
- [11] Onondaga Indians, *Radio Broadcast*, October 1924, p. 487.
- [12] An Eskimo lullaby at WGY, *Radio Broadcast*, October 1927, p. 373.
- [13] For an example of one of these ads, see *Radio News*, May 1924, p. 1613. Michael Adas writes that by the middle of the 18th century, one of the most important, and sometimes, the most important, way that Europeans judged other cultures was by their scientific and technological advancement. *Machines as the Measure of Men: science, technology, and ideologies of western dominance*, Cornell Studies in Comparative History (Ithaca, 1989), p. 3.
- [14] Little Chief Bear hears big radio, *Radio World*, 27 May 1922, p. 30.
- [15] Marvin Plotke, Radio's 'one and only' Indian tenor, *On the Air*, January 1926, p. 10.
- [16] The Yellow Peril via radio, *Popular Radio*, September 1926, p. 494.
- [17] Thanks are due to Sherry B. Ortner for help on this point.
- [18] For a discussion of the importance of the immigrant saga and early radio, see Michele Hilmes, *Radio Voices: American broadcasting, 1922–1952* (Minneapolis, 1997), especially Chapter 1, Radiating culture.
- [19] Erik Barnouw, *A Tower in Babel: a history of broadcasting in the United States to 1933* (New York, 1966), p. 91.

- [20] Frederick Lewis Allen, *Only Yesterday: an informal history of the 1920's* (1931; reprint: New York, 1964). p. 137.
- [21] See Douglas, *Inventing American Broadcasting*, for a useful discussion of radio as a male domain in its earliest usages.
- [22] Susan J. Douglas, *Listening In: radio and the American imagination ... from Amos 'n' Andy and Edward R. Murrow to Wolfman Jack and Howard Stern* (New York, 1999), p. 64.
- [23] *Ibid.*, p. 64.
- [24] Concerts for the motor boat owner (editorial), *Radio Digest*, 17 June 1922, p. 6.
- [25] Hoopskirts radio back, *Radio Digest*, 17 June 1922, p. 6.
- [26] First radio written music is sung on New York stage, *Radio World*, 8 July 1922, p. 31.
- [27] He shall have music, indeed, *Radio World*, 1 July 1922, p. 22.
- [28] See Army Reveille is now sent by radio, *Radio Digest*, 13 May 1922, p. 3.
- [29] Radiograms, *Radio World*, 9 September 1922, p. 14.
- [30] Radio adds to the pleasures of the seashore [photo caption], *Radio World*, 7 July 1923, p. 1; Velma Carson, take radio camping with you, *Radio World*, 28 July 1923, p. 30.
- [31] Advance seat sale for radio concerts, *Popular Radio*, October 1923, p. 528.
- [32] The newest radio bob, *Popular Radio*, July 1924, p. 96. See also Five minutes of radio for a nickel, *Radio News*, April 1926, p. 1433.
- [33] Many of our old institutions ..., *Radio World*, 26 April 1924, pp. 18–19.
- [34] Singing down the cattle by radio, *Popular Radio*, October 1926, p. 615.
- [35] Reward for air nuisance, *New York Times*, 31 January 1927, p. 12.
- [36] Hugo Gernsback, The 'pianorad', *Radio News*, November 1926, p. 493; G. B. Ashton, Building the 'tomborad', *Radio News*, April 1927, p. 1237; Patrick Whelan, The new radio violin, *Popular Radio*, July 1926, p. 229; R. F. Starzl, The giant tone radio violin, *Radio News*, April 1927, p. 1236; and Georges Desilets, Music by radio spark tones, *Radio Amateur News*, June 1920, p. 681. See also runs a radio piano, *Radio World*, 12 April 1924, p. 15.
- [37] Use radio for wedding, *New York Times*, 6 March 1924, p. 15.
- [38] Wedding has radio music, *New York Times*, 1 January 1927, p. 7.
- [39] Schelling in Europe plays for bride here, *New York Times*, 2 September 1928, sec. 2, p. 2.
- [40] Music by radio for funerals urged by undertaker's group, *New York Times*, 5 December 1929, p. 13.
- [41] Smashes microphone as anthem is played, *New York Times*, 11 February 1927, p. 44.
- [42] Music hath charms—, *Radio Broadcast*, September 1923, p. 415.
- [43] Concerts for doctor's patients, *Wireless Age*, May 1922, p. 37.
- [44] Maimed and sick forget pain in model radio equipped ambulance, *Radio Digest*, 3 June 1922, p. 2.
- [45] Ward Seeley, radio relief for the ailing, *Wireless Age*, August 1922, p. 35.
- [46] *Ibid.*, p. 35.
- [47] *Ibid.*, p. 35. St. Lukes Hospital in upper Manhattan was also equipped with radio in its four wards. Radiograms, *Radio World*, 3 February 1923, p. 14.
- [48] Jazzing the deaf by radio, *Popular Radio*, March 1926, p. 296. See also Radiograms, *Radio World*, 16 February 1924, p. 11.
- [49] Helen Keller gets music by radio, *New York Times*, 10 February 1924, sec. 1, part 2, p. 8. In 1916, Helen Keller was photographed with Enrico Caruso, singing into her fingers. Victor Talking Machine Company, *New Victor Records*, July 1916, p. 6. Thanks go to David Suisman for finding this.
- [50] Very latest in wireless; Union College students find a 'universal lullaby' for babies, *New York Times*, 11 May 1921, p. 12; see also A new use for radio, *Radio News*, June 1921, p. 856. This exploit was worthy of an editorial in the *Times* the following day: Anyhow, baby was good (editorial), *New York Times*, 12 May 1921, p. 16. Cornell students attempted the same experiment; see Now for a radio milk bottle! *Radio Digest*, 29 April 1922, p. 4.
- [51] Harry R. Stillman, Radio has made it a joy! *Radio World*, 16 September 1922, p. 19.
- [52] Radiograms, *Radio World*, 2 September 1922, p. 14.
- [53] See Radio and the woman, *Radio World*, 22 April 1922, p. 13.
- [54] Peeps into broadcast stations, *Wireless Age*, February 1924, p. 43; Luther sies, *Encyclopedia of American Radio, 1920–1960* (Jefferson, NC, 2000).
- [55] 'Uncle Wip' sings lullaby from ocean's floor, off Atlantic City Pier, *New York Times*, 14 September 1924, sec. 1, p. 30.

- [56] Many scholars of radio have argued this point. For a few useful sources, see Douglas, *Listening In*; Hilmes, *Radio Voices*; Jason Loviglio, *Vox pop: network radio and the voice of the people*, in M. Hilmes and J. Loviglio (eds), *Radio Reader: essays in the cultural history of radio* (New York, 2002); and Roland Marchand, *Advertising the American Dream: making way for modernity, 1920–1940* (Berkeley, 1985), especially the chapter called Abandoning the great genteel hope: from sponsored radio to the funny papers.
- [57] See Craig Roell, *The Piano in America, 1890–1940* (Chapel Hill, NC, 1989) for a discussion of the role of the piano in the American home.
- [58] George Burns, *Gracie: a love story* (New York, 1988), pp. 86–87.
- [59] Douglas, *Listening In*, especially the chapter called The Zen of listening.
- [60] For lengthier histories of crooners, see Douglas, *Listening In*; and Allison McCracken, ‘God’s gift to us girls’: crooning, gender, and the re-creation of American popular song, 1928–1933, *American Music*, 17 (1999), pp. 365–395.
- [61] This song is collected on Rudy Vallee, *Heigh-ho Everybody!* Pavilion Records PAST CD 7077, 1995.
- [62] McCracken, ‘God’s gift to us girls’.
- [63] Mere man wins first prize in Rudy Vallee contest, *Radio Revue*, January 1930, p. 47.
- [64] Rudy Vallee and Jessica Dragonette lauded in prize letters, *Radio Revue*, March 1930, p. 36.
- [65] McCracken, ‘God’s gift to us girls’, p. 376.
- [66] *Ibid.*, p. 377.
- [67] Quoted by Kristine M. McCusker, ‘Dear radio friend’: listener mail and the *National Barn Dance*, 1931–1941, *American Studies*, 39 (1998), p. 179.
- [68] Herman S. Hettinger, *A Decade of Radio Advertising* (Chicago, 1933), p. 221.
- [69] John Webster, The radioman’s love song, *Radio World*, 9 September 1922, p. 12.
- [70] Perfectly satisfied, *Radio World*, 10 February 1923, p. 26.
- [71] Ends life over radio love, *New York Times*, 8 February 1927, p. 3.
- [72] The first suicide for love of a broadcast artist, *Popular Radio*, April 1927, p. 408.
- [73] This program, probably aired on 13 December 1931, is one of the few *Chase and Sanborn Hours* recorded and is available on *The Eddie Cantor Chase & Sanborn Radio Show, 1931–1933*, Original Cast Records OC-8715, 1999.
- [74] The radio loudspeaker didn’t become commonplace until 1925.
- [75] Hugo Gernsback, Mental radio, *Radio News*, May 1925, p. 2043.
- [76] Upton Sinclair, *Mental Radio* (1930; reprint, Charlottesville, VA, 2001).
- [77] Thought-waves by radio? *Radio World*, 22 March 1924, p. 11.
- [78] Quoted by Dumenil, *The Modern Temper*, p. 179.
- [79] Later, Oral Roberts adopted the same technique. Thanks are due to Sherry B. Ortner for sharing this memory.

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