

I.

RADIO AND TELEVISION:

A Background

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The History of Radio

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IN 1947, Lee De Forest, inventor of broadcasting instruments and one of the first to use radio for presenting programs to the public, said in a letter to the National Association of Broadcasters:

What have you gentlemen done with my child? He was conceived as a potent instrumentality for culture, fine music, the uplifting of America's mass intelligence. You have debased this child. . . . Soap opera without sense floods each household daily. Murder mysteries rule the waves by night, and children are rendered psychopathic by your bedtime stories.

Sorrowful, but not too depressed for a joke, he then said of the audion tube, the instrument that had opened the door to public broadcasting, "This is De Forest's prime evil." Since those words were written, television has brought about profound changes in the nature of radio programing. The soap operas, murder mysteries, and children's programs of which he complained have been transferred to the TV tube, but there is some question whether De Forest, were he still with us, would approve of what is left. We shall review the present situation, but before doing so let us take a look back to see how radio broadcasting came into being.

Invention of Radio

Although most of radio's development has taken place in the memory of living men, the foundations were laid as long ago as classical times, when the phenomena of magnetism and static electricity were first noted. These discoveries led eventually to the invention of the dynamo, which provides energy for broadcasting, and to the development of

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the microphone, which translates sound into electrical energy through the vibration of a magnet.

The immediate prelude to the radio age was the publication between 1865 and 1873 of a series of papers on electromagnetic energy by a Scotch physicist, James Clerk Maxwell. His theories were substantiated experimentally by a German, Heinrich Hertz; between 1885 and 1887 he succeeded in transmitting and receiving electromagnetic waves, often called Hertzian waves in his honor.

Hertz died before he could convert his experimental apparatus into workable equipment, but the task was taken up by a young Italian, Guglielmo Marconi, who in 1895 invented a wireless instrument that could broadcast a distance of a mile. From that point on Marconi strove unceasingly to attain more distance; his struggle had a triumphant conclusion in 1901, when he succeeded in transmitting a Morse code signal more than 2,000 miles across the Atlantic Ocean.

Development of Radio Broadcasting

The dots and dashes used by Marconi were adequate for point-to-point communication, but they could never have become a means of broadcasting to the public. The first step toward making electromagnetic energy a vehicle for transmitting speech and sound was taken in 1906, when Reginald Fessenden, a Canadian physicist working in the United States, managed to broadcast music to navy radio operators; prior to that time they had never heard anything through their earphones except the Morse code. An even more significant step was taken the next year with the invention by Lee De Forest of the audion tube, an instrument that could amplify radio energy without distortion and could produce the high-frequency waves needed to convey speech and sound.

As the years passed, radio equipment was steadily refined until a development took place in 1935, unnoticed by most people at the time, that today is assuming greater and greater importance. That event was the invention of the frequency modulation (FM) system of broadcasting, by Edwin Armstrong.

During a period when most people viewed radio as an instrument for sending messages, Lee De Forest was one of

the few who recognized its potentialities for presenting programs that could be heard by millions of people simultaneously. In 1910, he broadcast a Metropolitan Opera production of *I Pagliacci* starring Enrico Caruso and, in 1916, established a radio station comparable in its service to those operated today. This endeavor was ended by America's entry into World War I, but after the armistice there was renewed interest in broadcasting.

In 1920, two stations, WWJ in Detroit and KDKA in Pittsburgh, began a regular schedule of broadcasting that has continued without cessation to the present day. Within two years, 500 stations had joined them on the air, and intense rivalries among the leading stations developed. Since the measure of victory was acceptance by the public, the general effect of this competition was to stimulate the production of programs that would appeal to the largest number of listeners.

During this same period another development of major significance took place—the addition of networks to the broadcasting scene. The first connection of two stations to carry the same program occurred in 1923, when WEAF in New York fed a five-minute interlude of saxophone music to WNAC in Boston. Soon networks were being established temporarily to carry events of national interest. The broadcast of the boxing match in which Jack Dempsey lost his heavyweight championship to Gene Tunney is an example.

In 1926, the Radio Corporation of America established the first permanent network, the National Broadcasting Company, and a year later set up a second NBC network. The organization that was to become the Columbia Broadcasting System came into being in 1927; in 1934 a group of four stations, which eventually grew to 500, established the Mutual Broadcasting System. During the 1940's it became illegal for one company to operate two networks. Therefore, the second NBC network became, as World War II ended, an independent operation known as the American Broadcasting Company.

Regulation and Financing

In addition to the development of station and network facilities, there were two other requirements for putting

broadcasting on a firm foundation. One was the establishment of a system of regulation that would permit the kind of development appropriate to a free-enterprise system and which at the same time would protect the public's interest in the use of air channels. This compromise was fashioned in the Radio Act of 1927 and in its revision, the Federal Communications Act of 1934.

The second requisite was financial stability. In 1922, the American Telephone and Telegraph Company pointed the way when it made its New York station, WEAf, available to anyone who wished to bring programs and messages to the general public. From then on, advertising support of broadcasting grew until dependence on revenues from this source became virtually complete.

Permitting the use of radio frequencies to sell goods did cause some twinges of conscience, at least in the more sensitive. Herbert Hoover, Secretary of the Department of Commerce, which licensed radio stations during this early period, warned against drowning the air waves in "advertising chatter." The first code of the National Association of Broadcasters, published in 1929, forbade advertising between 7 p.m. and 11 p.m. This provision was never enforced for by then those hours had already become the prime commercial period. Some who accepted advertising as proper frowned on direct methods such as the quoting of prices. There was also a question at one time as to whether such an intimate product as toothpaste should be advertised on the air.

The compunctions regarding commercialism gradually disappeared. Much more intimate products than toothpaste were soon being advertised regularly; listeners were barraged with price quotations, and they could be sure of hearing commercials no matter what time of the day or night they might tune in. The new attitude was summed up by Mark Woods, president of the American Broadcasting Company, when he said just after World War II that broadcasting's primary aim was to sell goods.

With its course settled, radio by 1930 was at the portal of its golden age. Millions of people became aware of the amusement available to them at the click of a switch. For the next three decades, radio was the main purveyor of

entertainment in the United States, providing listeners with a wide range of entertainment including drama, music, sports, news, variety shows, and comedy. The ownership of radios grew until almost every home in the country had one or more sets and more than three-quarters of the nation's automobiles were radio equipped.

Radio Today

After three decades of prosperity, radio in 1950 faced ominous competition from its sister medium, television, which it had helped to promote and develop. As millions of Americans deserted their radio receivers for the TV tube, the survival of the medium seemed to be in jeopardy. Radio has emerged from this struggle, not intact, but with its future existence apparently assured. In terms of certain indices, indeed, it seems to be healthier than ever before.

There are over five times more stations on the air than at the end of World War II, commercial revenues have risen sharply, and radio receivers have continued to be the largest-selling electrical appliance in this television age. There are now more radios than people in this country since the number of receivers has risen to more than 242 million.

There is another side to the picture, however, and one that more truly reflects the real situation. The number of hours people spend listening to the radio has been drastically reduced and its separate programs have been replaced with continuous services. Radio's role has become the secondary one of providing news and music for those whose primary interest is focused elsewhere. As the wide variety of programs that used to distinguish the medium has disappeared, production has been squeezed down to one man speaking into a microphone or to a needle riding in a groove. Radio actors have fled to other media, and the ingenious equipment that produced its sound effects is gathering dust.

Lee De Forest would probably disapprove of the type of service now offered by many stations, the endless repetition of a few popular records designed for an audience whose taste in music is primitive and indiscriminate, a cacophony punctuated regularly by commercials and occasionally by

newscasts. Still, fine music is being presented by many FM stations.

Radio, having lost its mass audience, can now indulge in specialization. It can help to satisfy the needs of various ethnic groups; it can cater to those who tune in largely for news and information; it has even broadcast such cultural specialities as readings of the Dialogues of Plato. In other words, there are elements in the present situation that might satisfy even De Forest.