

## THE EVOLUTION OF TELEVISION IN THE USA

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### Summary

This paper presents an overview of the development of television. Individual elements that make up television were invented and improved upon long before the medium reached people's homes. Guglielmo Marconi, Vladimir Zworykin, Philo Farnsworth, and David Sarnoff are only a few of the people responsible for particular aspects of television. Westinghouse, RCA, and General Electric were among the first corporations to enter the world of television. The early networks were radio networks, RCA's Red and Blue networks. When NBC and its parent company RCA were forced to divest themselves of one network, the Blue Network then became the American Broadcasting Company (ABC). Columbia Broadcasting System (CBS) was created when the United Independent Broadcasters merged with the Columbia Phonograph Company to form the Columbia Phonograph Broadcasting System, later to become CBS. The network had trouble competing with David Sarnoff and NBC until William Paley was elected president. DuMont Laboratories attempted to compete with the other three, but it was forced out of the competition by 1939. Early television programming was reminiscent

of radio programming in the beginning; in fact, many radio programs moved to television. Television began to develop its own style in the 1950s. Each decade has seen changes in entertainment programming types, beginning with a plethora of westerns in the 1950s and 1960s. Family shows evolved from the typical 1950s US family, with its mostly ordinary two parents and two children, to bizarre family arrangements in the 1960s, as illustrated by *the Munsters* and *the Addams Family*, and then to the anti-family, as represented by *All in the Family* and *Married with Children*, and alternative families such as those with all-male or all-female casts.

## **1. Introduction**

Fessenden, Marconi, and Nipkow never imagined cable, satellites, or hundreds of channels. Zworykin and Farnsworth did not think of Direct TV or Pay Per View. However, the inventions of these men and others led to the late-twentieth century developments that are now associated with television (see *History and Development of Mass Communication*). While there are those who believe that television is the child of radio and/or the cinema, this is only partly true (see *Radio and Motion Pictures*). Radio is an entirely aural medium without the ability to produce the instantaneous picture that is the soul of television. The motion picture has its roots in photography, while television emerged from the field of electrical communication, which also produced the telegraph, telephone, and facsimile. Thus, while television shares elements of these other media, it is unique in many aspects of both technology and programming.

## **2. Early Years of Broadcasting**

Broadcasting owes its existence to more than a few people from more than a few countries. One can go back as far as Benjamin Franklin, who identified positive and negative electrical charges in 1752, as well as to other inventors of things electrical in the eighteenth and nineteenth centuries. In the interest of space, the focus here shall be on those who were more directly concerned with broadcasting. They were men working alone in their basements, or men associated with such companies as General Electric, whose creations eventually resulted in wireless communications, one called radio and the other called television.

### **2.1. Creation of Radio**

Most inventors in the late 1800s were not concentrating on inventing television, but on improving wireless communications or radio. Italian Guglielmo Marconi's first contribution to broadcasting was to apply for a patent on a complete system for both the transmission and reception of wireless communication. After reading about electromagnetic wave experiments by Heinrich Hertz, Marconi conceived the idea of using electromagnetic waves as a means of communication. Using a device invented by Edouard Branley called a coherer as the detector in his receiver, he invented in 1896 a black box that could communicate over long distances. In 1889, after moving his operations to England, Marconi successfully transmitted messages across the English Channel, ushering in the age of international radio communications. In 1899, he formed the Marconi Wireless Company of America (American Marconi), which was not an American company, but his British company's attempt to take over American radio.

One of Marconi's major competitors, Reginald Fessenden, was the first major experimenter in the United States. In 1902, he developed the continuous wave—rather than interrupted—voice transmission that became the standard for radio. He began in 1900 with wireless experiments for the weather bureau of the US Department of Agriculture, then formed his own company, National Electric Signaling Co., where he concentrated on voice transmissions called “wireless telephone,” “radio telephone,” “radiophone,” and “radio.” He transmitted what was probably the first publicly announced broadcast on radio from his station at Brant Rock, Massachusetts in 1906. At about the same time, Lee de Forest was also working on voice transmission. He developed the audion tube, a detector of radio waves that played a key role in electronics for several decades.

## **2.2. RCA and Network Radio**

These men did not work entirely alone; like Marconi, many started their own companies, while others were employees of companies that were trying to find their own niche in the broadcast field. In addition to American Marconi and Westinghouse, corporations involved in the early years of broadcasting included American Telephone and Telegraph Company (AT&T), United Fruit, and General Electric (GE). These companies worked not only on technological inventions, but also on the set up and maintenance of stations. In 1919, the Radio Corporation of America was formed to create a monopoly on radio in the United States. In other countries, the government was taking control of radio and the US Navy thought that should happen in the US as well. There were also concerns about British Marconi's attempts to expand its transatlantic services. Though the bill to create a government monopoly did not pass, the bill to create a private monopoly did pass with GE as primary stockholder, replacing British Marconi as parent company. As most of its stations were in US government hands, American Marconi was forced to transfer all its assets to RCA. Within three months, AT&T, United Fruit, and Westinghouse became partners with GE. Another reason for forming RCA was to take more control in international communication, which it did almost from its birth.

David Sarnoff, eventually to become one of RCA's most valued employees, got his start as a wireless operator with American Marconi. Legend has it that he was the only link between the Titanic and the rest of the world for 72 hours as he gathered information about survivors and those who did not survive. However, the truth is that Sarnoff's station in the Wanamaker building was closed the day the Titanic sank, and the first list of survivors came not from Sarnoff but from the Marconi station at Cape Race in Newfoundland. Sarnoff's participation was limited to being one of those who picked up some of the early accounts; he used his role in the event to develop a public persona and further his career. It worked. Following the Titanic tragedy, all large ships were required to carry wireless equipment, and Sarnoff was appointed chief inspector of ships carrying Marconi equipment. Later he became commercial manager and then general manager at RCA. Following squabbles among RCA's parent companies over which company was allowed to handle the various aspects of television production, it was his idea to put all the stations owned by each of them into one broadcasting company.

And so, the National Broadcasting Company, NBC, was created in 1926. NBC would lease phone lines from AT&T, which meant that AT&T was getting out of active

broadcasting but under terms it could live with. By 1927, NBC had two national networks, the Red network and the Blue network; the latter eventually became the American Broadcasting Company when NBC was told to divest itself of one of its networks. In 1927, a competitor for NBC appeared on the scene, although, abandoned by its first backer and on the verge of bankruptcy, it did not appear to be major competition. Then a cigar magnate named William S. Paley sold a 49 % interest to Paramount, and the Columbia Phonograph Broadcasting System—later Columbia Broadcasting System—was on its way up.

### **2.3. The Fathers of Television**

Television is only peripherally the child of radio. At the same time that radio was being invented and perfected, others were working on the development of television. Paul Nipkow of Germany in 1884 patented the Nipkow disc, which scanned images into their elemental points with a disk punched with holes in a spiral pattern. A beam of light shot through the disc scanned the subject, and the scanned information was transformed into electrical impulses. Unfortunately, the picture was fuzzy and reception was bad; however, most theories and research over the next several decades were based on the Nipkow disk.

The two inventors in the United States most directly connected with television, and considered the inventors of television, are Vladimir Zworykin, a Russian immigrant, and Philo Farnsworth, a Mormon farm boy who did not experience electricity until he was 14 years old. As a student, Zworykin had worked with Boris Rosing of the St. Petersburg Technical Institute on television experiments. Rosing designed a mechanical scanner with a cathode-ray tube receiver in 1907, and in 1911, achieved the first distant transmission of images. Zworykin then left Russia to become a Westinghouse researcher. Because of Zworykin's connection with Westinghouse and later with RCA, he has been given most of the glory, while Farnsworth has been mostly ignored. RCA claimed, supposedly against Zworykin's wishes, that Zworykin invented television. No one at RCA would admit that anyone else had anything to do with the development of television, and its patents and publicity departments refused to give credit to anyone else.

Zworykin had convinced Westinghouse to let him work on his all-electronic television system. However, following a demonstration of his camera tubes, Westinghouse officials told him to stop working on television parts and do something useful. He did, but worked on television on his own. On the advice of one of the vice presidents at Westinghouse, he took his ideas to RCA and David Sarnoff, who agreed to finance his experiments. He and Sarnoff would change the direction of television development. In 1929, he patented the kinescope, a cathode-ray picture tube. In 1931, he patented the iconoscope video pickup tube, a true electronic television camera, the first device to pick up live scenes with brightness and clarity. These inventions were the forerunners of modern television. He and Farnsworth would enter a patent race. Farnsworth was 22 years old when he created a cathode-ray system that could transmit from a motion picture camera. It was the first working, all-electronic television system. He formed a public company with his investors and his share of the stock was well over US\$100 000. His image dissector camera, the first low-velocity storage camera tube, became the envy of Zworykin and RCA until Zworykin invented the iconoscope. The patent race ended

when RCA realized that it needed some of Farnsworth's patents to market a complete television system. It agreed to pay Farnsworth US\$1 million for his patents, so that both his and Zworykin's patents could be used to make television cameras and receivers. Although RCA was the frontrunner, it was not alone in television manufacturing; other companies included DuMont, Philco, which for a while backed Farnsworth's research, and Zenith.

Zworykin and Farnsworth were, of course, not the only people inventing television parts or systems. In 1906, Max Dieckmann attempted to create a picture with a cathode-ray tube and designed an all-electronic television system that did not work. About the same time, Campbell Swinton proposed a cathode-ray tube for scanning and receiving. Charles Francis Jenkins transmitted still pictures by wireless with a mechanical system in 1922, when Farnsworth was 15 years old. Hungarian Denes von Mihaly not only filed for television patents in the early 1920s, but also wrote the first book about television.

In the race to achieve television "firsts" it was not the United States but Britain that really won. John Logie Baird, beginning work in 1923, achieved the world's first television picture based on the Nipkow disk and demonstrated it in 1925 at Selfridges department store in London. A year later, he was granted the first license ever to transmit television. In 1928, he transmitted from London to New York. By 1930, he was telecasting three nights a week on the British Broadcasting Corporation (BBC). By 1933, however, Baird was on his way down. His mechanical system was not showing the promise of electronic television, and the BBC set up a competition between Baird and his chief competitor, Electric and Musical Industries, known as EMI. In February of 1937, the BBC declared EMI the winner.

The competitions did not end with Farnsworth and RCA, or with EMI and Baird. The next great race was to develop a color system that would be the standard. As with other aspects of television development, color did not spring from black and white systems, but was instead created and perfected over a long period. Beginning in 1902, inventors applied for patents for color systems that did not work. Zworykin applied for one in 1925, and in 1928, Baird produced a system using his spinning disk. Bell Labs first demonstrated color in the US in 1929, but it was a mechanical system, and color would need an electronic system. Color would not appear to be a viable option until 1940, when Peter Goldmark of CBS announced a color system that actually did work. RCA fought back, saying the CBS version would not be compatible with black and white television while the RCA version, when completed, would be both compatible and of much higher quality. RCA's color system eventually became the standard. In 1954, the first RCA color television sets went on sale for US\$1000.

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## Biographical Sketch

**Kate Peirce** is Professor of Mass Communication at Southwest Texas State University and has degrees from the University of Texas and Florida State University. Her research interests are primarily in the area of gender, race, and class in the mass media. She has published in various journals, including *Sex Roles*, *Journalism Quarterly*, and *Journalism Educator*, and has contributed numerous book chapters on a variety of subjects.