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David Sarnoff: Timeline

Who was David Sarnoff, Anyway?

David Sarnoff (1891-1971) was not an inventor, an engineer, or a scientist. Instead, as a corporate manager and executive he became technology's champion, especially for broadcast communications, starting at the age of fifteen. He advocated, supported, financed, and oversaw the development of radio in the 1910s and 1920s, and then television from the 1930s through the 1950s.



Sarnoff first posed the concept of broadcast radio in 1915. At that time, more than half of the American population lived in towns of less than 5,000 people; information arrived through newspapers, magazines, mail order catalogs, letters and postcards, and word of mouth. Today, there are nearly 13,000 AM and FM radio stations in the United States, and thousands more abroad, as well as nearly 20,000 internet radio stations.

Sarnoff formally introduced RCA's electronic monochrome television system in 1939 and the world's first electronic color television system in 1946. In 2000 there were over 1,600 television stations in the United States. Only since 1990 have more households acquired complete plumbing facilities than televisions. Some 900 million people watch color TV around the world, and the color picture tube used for television and computer displays was invented at RCA Laboratories.

There is more to Sarnoff's contribution to the electronic revolution of the 20th century. He firmly believed in the possibilities of social improvement through technological progress, and supported the development of RCA's independent research laboratories. Along with Bell Labs in Murray Hill, New Jersey, the RCA Labs in Princeton were responsible for inventing or innovating nearly every device that enabled the birth of Silicon Valley, Asia's dominance of the electronics industry, and the Digital Revolution, from video displays to the integrated circuit, from electron microscopy to CCD cameras. David Sarnoff and RCA can be regarded as basic ingredients of the Second Industrial Revolution in electronics and chemistry, a revolution that continues to play out around the world today.

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Welcome

The David Sarnoff Library documents David Sarnoff's life; the history of radio, television, electronics, and communications; and the history of the Radio Corporation of America (RCA). Incorporated as the David Sarnoff Collection, Inc., an unendowed 501(c)(3) non-profit organization, the Library is located in Princeton, New Jersey. It is devoted to the study and understanding of the innovative spirit personified in the greatest technological visionary of the 20th century and realized in the accomplishments of Radio Corporation of America (RCA) employees at laboratories, factories, and offices in New Jersey and around the world.

Built in 1967 by RCA, the David Sarnoff Library contains a museum, an archives, a library, and this website. Besides Mr. Sarnoff's papers and memorabilia, the Library's holdings include 25,000 photographs and thousands of notebooks, reports, publications, and artifacts related to the histories of RCA Laboratories and RCA. At this site you will find exhibits, timelines, galleries, links, and references documenting

- David Sarnoff's life;
- RCA, Victor Talking Machine Company, and the Marconi Wireless Telegraph Company of America;
- The history of radio, television, broadcasting, audio and video recording and reproduction, electron microscopy, radar, electron (vacuum) tubes, transistors, solid-state physics, semiconductors, lasers, liquid-crystal displays, integrated circuits, microprocessors, computers, communications satellites, and other technologies RCA played an important role in inventing and developing;
- Some of the many people beside Mr. Sarnoff who made these technologies work.

With this material you can satisfy your curiosity, indulge your interests, gather information, or consider some of the themes and questions in the history and business of innovation:

- What is an innovator, an entrepreneur, an inventor, a genius?
- What is a basic invention, an innovation, a disruptive technology?
- What is required to make an idea a successful product and how long does that process take?
- Who pays for the process of innovation?
- How much innovation is good for a society?
- What are the roles of patents and monopolies in encouraging or discouraging innovation?

- How do those roles change under different circumstances?
- What's the difference between science and technology?
- Does that distinction change over time?
- Can there be a "lone inventor" of a technological system?
- What is the relationship between "lone inventors" and institutional inventors?
- Can "lone inventors" exist or thrive in a corporate environment?
- What are the advantages and disadvantages of corporate research and development (R&D)?
- How do corporations change the nature and goals of R&D in response to economic, political, cultural, scientific, and technological changes?

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David Sarnoff

Michael O'Toole

David Sarnoff was born to Abraham and Leah Sarnoff on February 27, 1891. His father was a Jewish painter in a shtetl of Uzlian in Russia. Needless to say, they were very poor. In 1896, Abraham came to the United States with a large influx of other Russian Jews. The idea was to make enough money to bring the rest of the family over in time. David would not see his father again for four years. During this time, his mother sent him off to his grandmother's brother who was a rabbi to teach him to become one himself. He spent four years eating and sleeping the "Talmud". He literally had to sing for his supper. If he missed a portion of his memorization, he did not eat. Even though he hated this strict regimen, he said later in life that it served him well in business.

In 1900, his father had made enough money to bring the rest of his family over to the United States. His father had endured some hard times in New York, doing menial jobs which only sometimes included house painting or paperhanging. This did much in destroying his health. Instead of coming over to the United States and into the harbor, his mother chose a cheaper much longer way of getting to the United States. They finally arrived in Manhattan on July 2, 1900. Through a mixup in communications, Abraham was waiting for them at a different dock. They finally met up later that evening. The family was quite shocked at the sheer magnitude of the city. They obviously had never seen anything so huge as the city of New York in their lives. They also were shocked to see the poor health David's father was in. Their new home was a fourth story flat on Monroe Street on the lower East Side. Obviously Abraham had not fared too well in America. David saw the squalor they lived in and decided that he had to do something about it. At nine years of age, he was going to have to become the family breadwinner.

David began selling Yiddish newspapers every afternoon at a penny a piece. For every fifty papers he sold, he received a quarter. In order to be successful, he had to beat out other boys in covering the territory before they sold theirs. In order to make more money, he took up delivering another paper in the morning. At 4:00 a.m. every morning he would wake up and grab the bundle of papers as they were tossed from the elevated train. He trained himself to wake up at the sound of the oncoming train. His days were filled with delivering newspapers, with little time in between to study and read. On weekends he made extra money singing in his synagogue. He also enrolled in English classes at the Educational Alliance. This was a school set up by German Jews who had come to the United States in the 1800's. David spent much time in the school's library and attending lectures held at the school auditorium. After only five months in America, he had learned enough English to read the English newspapers. By the time he was old enough for his bar-mitzvah, he had developed into a proficient speaker. He was also busy learning how to become an entrepreneur. He opened a newspaper stand at age fourteen with money which was anonymously given to him. He put his brothers to work as well as his ailing father. By his fifteenth birthday, he graduated from elementary school. High school was out the question and his father was near death. This meant that the responsibility of supporting the family fell upon him.

David decided that he would try to get a job with one of the newspapers in town as a reporter. He went to the paper he admired most, the New York *Herald*. He made his way uptown to the building of the *Herald* but went into the wrong office. He ended up in the office of the Commercial Cable Company. A mistake he never regretted.

He delivered messages to the *Herald* and other businesses around town on a bicycle which the company provided. He didn't keep this job very long though, because when he asked for a three day leave of absence for Rosh Hashanah and Yom Kippur, his boss said no. David protested his boss's decision and was fired. This was one of his first but not his last run ins with anti-semitism.

It was during his time at the Commercial Cable Company that he first saw the telegraph key. He became very interested in it and with one of his first paychecks he purchased his own key. From this time on he was never far from a telegraph key. Through hours of practice, he developed one of the best fists in the business. After being fired from the Commercial Cable Company, he applied for a job with the American Marconi Wireless Telegraph Company as a junior telegraph operator. Working for Marconi was the next best thing to happen to David Sarnoff. He would work for Marconi and its successor, the Radio Corporation for the next sixty years. American Marconi Telegraph Company was not a money making company at the time. It was a money losing presence in America, for its parent company in England.

Davey Sarnoff as he was known at the time didn't actually start out as a telegraph operator. He started out as an office boy sweeping floors and running errands. He read everything that he was supposed to file and soon learned everything there was to know about the company. He even read letters from Marconi himself which allowed him to see how the management worked firsthand. One evening in December, 1906, Davey introduced himself to Marconi as the newest employee of the American Marconi Telegraph Company. His bold gamble of introducing himself paid off. Shortly after his sixteenth birthday, he was promoted to junior wireless operator. Sarnoff was on his way to working himself up the ladder at American Marconi Telegraph Company. He eventually worked his way up to Chief Inspector for Marconi. It was in this position that he met a very important person in the new world of radio.

Edwin H. Armstrong was an inventor who had been working on developing a receiver that would pick up wireless signals better. Sarnoff and three other Marconi engineers went to see a demonstration of Armstrong's new powerful "regeneration receiver." Sarnoff and his engineers were amazed at this new device. They were able to pick up signals from Glace Bay, Labrador and Clifden, Ireland. They also tuned in a station from San Francisco. This made a great impression on Sarnoff. He and Armstrong immediately liked each other and got to know each other better when they spent the last two days of January, 1914 together at a transmission station at Belmar, New Jersey. There they listened to transmissions from around the world. Sarnoff reported to his superiors that this new receiver warranted careful investigation of the patents because this device had advantages which unless there were other systems out there which he was not aware of, it was the most remarkable system in existence.

Sarnoff saw great potential with this new technology. Unfortunately, the higher ups didn't feel the same way. Sarnoff saw a way of moving into a new field of "broadcasting", sending a signal from one point to many receivers. Marconi said that they were a point to point operation and were quite profitable in this procedure. In 1906, an inventor named Fessenden experimented transmitting voice over the air to wireless receivers on boats. In 1914, Sarnoff experimented in sending music and voice to the Wanamaker Dept. Store in Philadelphia. He accomplished this by putting a transmitter on the roof of the Wanamaker building. In 1916 he sent a memo to Edward J. Nally, the vice-president and general manager of American Marconi of prophetic sense that would take Marconi Company sales into a new direction. "I have in mind a plan of development which would make radio a household utility in the same sense as the piano or the phonograph," said Sarnoff.

He wanted to bring music into the homes of America by wireless. Another problem with Sarnoff's idea was timing, World War I was about to break out. He would have to put his idea on hold until after the war.

After the war General Electric and American Marconi were discussing an important business transaction. Marconi wanted to buy what was then the most powerful generator of radio waves. General Electric held the patents and Marconi wanted to buy the exclusive rights. Unfortunately the Navy did not want to see radio fall into the hands of foreigners like the Marconi Company. Foreign companies already dominated the submarine wire industry. It was through this problem that a new American company arose that Sarnoff was to eventually come to run. On October 17, 1919, the Radio Corporation of America, with the patents of General Electric and Marconi, was incorporated in the state of Delaware. Sarnoff was made the commercial manager of "RCA". He was now second in command to Edward Nally. Nally relied heavily on Sarnoff to run RCA. He worked hard at capturing back all the radio business that Marconi lost to the Navy during the war. He was also instrumental in building a transmitter using one of the powerful generators acquired by General Electric which would become the center of RCA's international radio communications. All this led up to his ideas from before. He sent a twenty-eight page memo to Owen D. Young, the once vice-president of General Electric and now chairman of RCA which shared Sarnoff's vision. His memo contained nine sections with headings like "Patent Situation," "Marine Business," "Sales to Amateurs," and "Sales and Merchandising Policies." It stood as a blueprint for making RCA a dominant radio company in the world.

RCA began building radios and the radio craze took off. RCA had competition with companies like Westinghouse who built radio stations first then built a demand for the product with broadcasts. Although this sometimes made things difficult for RCA it helped in that it redefined RCA as a broadcaster and a radio manufacturer as well as an operator of international telegraph communications. Sarnoff reveled in the fact that it was he that had the vision to see where broadcasting would take RCA. In 1921, Howard Armstrong came up with another discovery. This he called super regeneration. Although it had some bugs to be worked out, Sarnoff didn't want to lose the patents to it like the ones he had lost to Westinghouse. He moved aggressively to purchase rights to the invention from Armstrong. Instead of working with lawyers and middlemen, he went straight to Armstrong. Sarnoff soon found out though that Armstrong was a tough bargainer. Sarnoff eventually obtained the rights by using cash and stocks. This made Armstrong the largest private stockholder in RCA at the time. To avoid letting Armstrong get the best of him again he insisted that Armstrong from now on give RCA first refusal of any future inventions. In 1923, RCA was having some problems with another invention

of Armstrong's which RCA obtained from Westinghouse. The "superheterodyne" circuit which worked well was too complex to manufacture. Sarnoff asked Armstrong to simplify it. Armstrong was successful and received another 20,000 shares of stock to add to his already 60,000 shares.

In the late 1920's, radio had become a household item. Sarnoff had seen many changes at RCA. The creation of the National Broadcasting Company, a new president of the corporation, threats by the government with regulation, and increasingly under attack as a monopoly. RCA needed someone to run it that was well known. Edward Nally stepped down as president and Owen Young picked a new president in 1923 by the name of James Harbord. Sarnoff was also appointed vice-president, he was 31. Although he was not president, it fell on his part to train Harbord about the radio industry. Radio was having a profound effect on the country. He didn't remain president for long. The stock market crash of 1929 left Owen D. Young in financial problems. He stepped down as chairman and Harbord filled his spot. Owen knew that RCA needed someone like Sarnoff to keep things going. On January 3, 1930, David Sarnoff became the third president of RCA, He was 39.

Sarnoff's next idea in where to go with radio was supplying sight with sound. He wanted to get into the field of television. Unfortunately, many years would pass before this came to fruition. To help him on his way, he recruited a man by the name of Vladimir K. Zworykin. He was destined to be the greatest engineer at RCA. Also about this time the new RCA building was built in 1933. It was the tallest building at the time. Sarnoff had his office on the 53rd floor. It was a corner office with windows facing the north and west. His office had everything you could possibly imagine. It had a secret wall that led to a room with a barber chair, where he was serviced daily. This room also held a wardrobe, a toilet and a shower. At his desk he had a telegraph key installed so he could communicate to a wireless friend named George Winterbottom who was head of the RCA Communications on Broad St. The most interesting fact about this new building was the large red neon "RCA" logo on the building above his office.

The Rockefellers who built this building didn't even have their name on their building. But they felt that RCA and Sarnoff had saved them. John D. Rockefeller wanted to build a Metropolitan Opera at the center of a large commercial development in midtown Manhattan. Unfortunately when the stock market crashed, the opera abandoned the project. Even though sales had slipped for RCA at this time, it was still making quite a bit of money from NBC. Through negotiations with Sarnoff and Young, they made arrangements for radio to take the opera's place and for many of the buildings in the center to be known as "Radio City".

In December, 1933 Sarnoff met with Armstrong at Sarnoff's office. Together they drove out to Columbia University where Armstrong was working on another project. Armstrong had always hated the static that was inherent with radio and was trying to clean it up. What he came up with was "FM", Frequency Modulation. Up until then radio consisted of "AM", amplitude modulation. It was noisy and full of static when there were lightning storms or other such atmospheric conditions. What Sarnoff saw was a room full of tubes and wires. Sarnoff showed little interest. He was more interested in getting television off the ground than a new revolution in radio. The friendship between Sarnoff and Armstrong started to diminish. At the 1939 World's Fair Sarnoff introduced television.

World War II came and Sarnoff wanted to be a part. Anti-Semitism had left him out of World War I, but by pulling a few strings, he was able to get commissioned. He was instrumental in planning the radio communications for D-day. For his services, he was made a General. A title which he would carry for the rest of his life and made sure everyone knew. Armstrong also was a part of WWII. He voluntarily gave all his FM patents to the government for the use of the war. As soon as the war was over, a new war started at home. This one was between Sarnoff and Armstrong.

The war over FM was a battle that eventually killed Armstrong. In a statement by Armstrong he said that he would fight til he was dead or broke. Sarnoff had been instrumental in having FM which originally had been put in the 40-50 Megacycles range moved up to the 88-108 Megacycles range. The old 40 -50 Megacycles range was filled by Sarnoff's baby, television. This basically made all the radios that were built to work on Armstrong's Yankee Network useless. This and some other spats over patent rights made bitter enemies of Armstrong and Sarnoff. By 1954, Armstrong had spent millions fighting the big RCA which had much time and money on its side. His patents on FM were running out as well. In 1953, his lawyers urged him to settle. Unhappily he did. He wouldn't see the money though until 1961. On January 31, 1954, Armstrong jumped out of a thirteenth story window. Sarnoff learned about the death of his once friend and made a statement, "I didn't kill Armstrong." His death obviously had left him shaken. For five years the annual reports of RCA contained a sentence "A patent infringement suit brought against the Corporation and NBC, Inc. by Edwin H. Armstrong is pending in the District Court of the United States for the District of Delaware." He knew what the litigation was doing to his old friend, but the corporate interests always prevailed.

Something Sarnoff was working on as well as television was the introduction of color television. In May, 1954, Sarnoff announced to the shareholders that color television was to be introduced in a 19" package. This was his final triumph, although it came with many setbacks and frustrations. RCA was being hassled by Philco, Motorola, and Westinghouse over the rights to RCA's color tube. Knowing when to settle, he agreed to add all of RCA's 100 patents on color television to a pool of color patents that any manufacturer could draw from royalty free. This allowed television sets to be built by other manufacturers and proliferated the use of color broadcasts. Up until then NBC was the main user of color programs. CBS only had a couple of programs and ABC had none.

In 1961, Zenith, the last holdout among manufacturers to build color sets, said they would start making color sets. At this time, Sarnoff tripled RCA's advertising budget for color television. He installed free sets in the White House, Blair House, and influential offices of newspapers. He did everything he could to promote color television. It eventually caught on. His investments in color began to pay off and color was becoming the accepted medium. Sarnoff was now reaching his mid sixties.

Sarnoff was now concerned about his own future. He had achieved just about everything he could possibly achieve, but he wanted more. He now looked into advancing his rank in the military. Others had been promoted to Major General in the Reserves, why not he. He made several attempts to be promoted but never made it. He would have to be satisfied with just Brigadier General. He then went on to lobby for other medals and awards. He even received a "Father of the Year" award. By 1965, he decided that a book about him needed to be written. He employed the services of his cousin and personal friend Eugene Lyons. After he read the first draft, he became upset with Lyon's because he felt he had not portrayed him in the best of lights. In 1966, *David Sarnoff* was released. Most reviewers felt it was hagiography. He then decided to have another book compiled about him called *Looking Ahead*. This one didn't go over very well either. Although his books weren't going over very well, he had another idea of how to keep his legacy alive.

David Sarnoff had several children. One of whom was Robert Sarnoff. David Sarnoff more or less manipulated RCA in to grooming Robert for David's position as president of RCA. On January 1, 1965, Robert Sarnoff became president of RCA. David Sarnoff became the chairman of the board. One of Robert's first changes to the company was the change of the RCA logo. The old encircled letters underscored by a lightning bolt gave way to large bulbous squared letters. The secondary trademarks of Nipper and "His Master's Voice," were put aside as well. Finally, the very name of Radio Corporation of America was done away with as well. From now on it would be known as RCA Corporation. David was not happy. He threatened to call a meeting to have the name reinstated. Robert relented and the old name stayed, although it was hardly used. RCA changed in a number of ways. RCA used to be a radio company with little interests outside of this world. Now RCA had become a conglomerate, acquiring such companies as Hertz Rent-a-car, Random House Publishing, and Banquet Foods. Earnings made on color television started to diminish.

Sarnoff's health was starting to diminish. In 1968, he came down with shingles. This was a prelude of things to come. He developed an infection in his mastoids. He had several surgeries to try and cure it but it didn't work. It eventually spread to his nervous system. It slowly ate away his ability to see, speak, or hear. In 1970, he was moved to his house to die. He eventually died on December 12, 1971.

Sarnoff had spent his whole life trying to make something for himself. Along the way he made a lot of enemies. He also made a lot of advancements in the world of "broadcasting." His foresight allowed him to plan for the future of radio and television, as well as become the head of one of the largest companies around, RCA.

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'Hear-and-See Radio' in the World of Tomorrow: RCA and the presentation of television at the World's Fair, 1939-1940.(Radio Corporation of America)

Historical Journal of Film, Radio and Television, Oct, 2001, by Ron Becker

When the 1939 New York World's Fair opened, the Radio Corporation of America (RCA), the National Broadcasting Corporation (NBC) and the newly emerging technology of television were there. NBC officially inaugurated the nation's first regular television service on 30 April with its live coverage of the opening ceremonies direct from the fairgrounds in Flushing Meadows. Panoramic shots of the Fair's symbols, the Trylon and Perisphere, transduced into electronic signals by NBC's recently acquired mobile television units, were sent eight miles via radio waves to the NBC antenna atop the Empire State Building which, in turn, 'sprayed' the images across a 50-mile radius [1]. Viewers watching on the estimated 200 television sets scattered around the New York area could see gathering crowds, the opening parade, and an address by President Franklin Roosevelt. Meanwhile, fairgoers anxious to avoid a chilly breeze or the jostling spectators could have gone to RCA's World's Fair Building located just yards away from the parade route and observed the same events on one of the nine RCA-built receivers on display in the lobby. Over the subsequent weeks and months, hundreds of thousands of fairgoers would stream through the RCA Building, gaze at carefully designed television exhibits, watch live TV broadcasts, and listen to RCA spokespeople extol the virtues of 'hear-and-see radio' [2] and of the corporation whose research efforts and dollars, it seems, made it all possible.

While most broadcasting histories identify television's debut at the Fair as a noteworthy if oddly-placed milepost in (the initial, if tentative and ill-timed, baby step toward) the development of commercial television, no account fully explains how television was presented to the public in specific exhibits nor adequately situates TV's debut within the wider contexts of industry competition, government regulation, or the World's Fair itself. [3] This article describes the incorporation of television into various exhibits around the Fair, paying particular attention to the efforts of RCA.

The New York World's Fair of 1939 offered the Radio Corporation of America an invaluable opportunity to announce the long-awaited arrival of television and, in doing so, establish itself as the preeminent force in building television's future. The World's Fair promoted a vision of a not-so-distant future in which new technology, provided by industry and guided by social ideals, would lead to a better society where consumerism and democracy triumphed. [4] Companies like RCA, anxious to promote both themselves and their consumer products, wrapped their exhibits in public relations rhetoric which worked hard to convince visitors that corporations were not simply profit-hungry businesses that sold consumer goods, but rather vital components of a democratic society that provided the tools needed to build a better tomorrow. Such lofty rhetoric, as we will see, served RCA and NBC particularly well in the late 1930s--a period during which they faced FCC investigations into monopolistic practices, competed with others in the television standards battles, and waited impatiently for an FCC green light on the commercialization of television broadcasting.

Building the 'World of Tomorrow' Today

At the New York World's Fair of 1939, the objectives of its planners and its corporate participants dovetailed considerably. The Fair's organizers, particularly those involved in developing the event's overarching theme,

believed that the Fair could be a powerful force of social change. Grover Whalen, the Fair's president, announced that the Fair was 'determined to exert a social force and to launch a needed message' [5]. In the eyes of its planners, the Fair was to offer an antidote to the anxieties caused by the Great Depression and by the rise of fascist and communist threats to democratic principles [6]. More specifically, the Fair, with its theme 'Building the World of Tomorrow,' presented a vision of what its planners believed to be an attainable future in which technological advances, consumerism, and social planning would lead to a 'promised land of material abundance' [7].

Attuned to the principles of the corporate system, the Fair's organizers stressed what the Official Guide Book called 'the interdependence of man on man' [8]. In modern industrialized societies with national economies, large-scale industries and mass-produced goods, people were (Fair's organizers explained) living within an increasingly extensive network of dependent relationships. A focal exhibit for the Production and Distribution Zone, for example, graphically illustrated how the action of a woman powdering her nose initiated a complex web of activities involving 'great and small industries and an army of workers in mine, factory, warehouse, office and store, and on railroads, steamships, trucks, and delivery wagons' [9]. Similarly, the Communications Building's focal exhibit that presented 'the story of man's progress in communications from the sign language of the earliest ages to the modern marvel of television' stressed the 'socializing and humanizing force' of communication networks and their role in linking 'man to man'. According to an inscription on one wall of the exhibit hall, 'Modern means of communication span continents, bridge oceans, annihilate time and space ... They offer all men the wisdom of the ages to free them from tyrannies and establish co-operation among the peoples of the Earth' [10]. The emergence of such interdependence and the technological advancements that propelled it, these exhibits claimed, were responsible for the average American's improved standard of living, and the expansion of such networks would produce ever increasing levels of peace, prosperity and leisure in the not-so-distant future.

The importance of the consumer in the production and distribution focal exhibit was also symptomatic of the Fair and of its planner's objectives. Organizers claimed that, unlike earlier international expositions which had celebrated the marvels of industry and the means of production, the New York World's Fair was to be a 'consumer's fair.' The consumer and the promotion of consumption played key roles in plans for 'Building the World of Tomorrow', especially in overcoming the economic problems of the Depression and the rise of communism and fascism in Europe. By the end of the 1930s, many realized that mass production demanded mass consumption [11]. According to the Fair, however, there was no need for systemic social, political or economic changes. Instead, technological innovations, transformed into useful consumer products and implemented by social planners, would create the broad distribution of wealth and a culture of abundance in which everyone would have ample purchasing power and leisure time to consume [12]. Fair organizers, thus, encouraged the design of exhibits that addressed visitors as consumers and that engaged their interests by explaining the processes behind production practices and by illustrating the practical applications of scientific innovations [13]. Consequently, focal exhibits and many corporate displays de-emphasized the scientific principles behind new technologies in order to illustrate how science was being transformed into products which would improve the visitor's life and lead to a better society [14].

Although its theme looked forward to a utopian world of tomorrow, the Fair told visitors that they could and should start building that world today. The Official Guide Book, for example, advised its readers: 'Here are the materials, ideas, and forces at work in our world. Here are the best tools that are available to you; they are the tools with which you and your fellow men can build the World of Tomorrow' [15]. Democracy, a detailed diorama and light show featuring an imagined 'City of Tomorrow', served as the ultimate expression of the Fair's official message. Visitors gazed down upon the skyscrapers, satellite towns, broad highways, and open countryside that supposedly would define the American landscape of the future. As the show neared its end, the lights dimmed, night fell on Democracy, and a chorus sang the Fair's theme song: 'We're the rising tide coming from far and wide/Marching side by side on our way,/For a brave new world,/Tomorrow's

world,/That we shall build today' [16]. At the show's climax, a burst light flashed, the music stopped, and visitors found themselves at the dawn of a new day. Leaving the exhibit with the words of the chorus still ringing in the ears and the image of a new day's light shining in their eyes, fairgoers descended a long curving ramp from which they had a perfect view of the fairgrounds. Here, in the Fair's focal exhibits and corporate-sponsored buildings, Fair organizers claimed, awaited 'the best of the tools available ... today' to build that tomorrow [17].

The vision of the future advocated by the Fair's official theme, then, was clearly corporate-friendly. While the focal exhibits themselves did privilege the role of the social planner, fair organizers were anxious to involve corporations in their plans for building the future. Although many on the Fair's various steering committees were urban planners, architects, social critics, and industrial designers, the Fair's founders were businessmen who developed the Fair as a way to draw business to Depression-weary New York and as a business venture in and of itself. They realized from the beginning that the enthusiastic participation and investment of corporations would be essential to the development of a profitable world's fair and worked hard to attract their involvement. In a bulletin sent to prospective exhibitors, for example, Grover Whalen emphasized the important role corporate participants would play in New York's 'consumer's fair':

We of the Fair Corporation believe that business and industry possess today most of the implements and materials necessary to fabricate a new World of Tomorrow. We believe that what are needed at present are not so much new inventions and new products as new and improved ways of utilizing existing inventions and existing products [18].

Whalen tried to impress companies with the unprecedented promotional possibilities of the Fair, claiming that it offered business and industry 'a great opportunity--an opportunity to construct their own World of Tomorrow' [19]. Participation in the Fair was sold not as simply an expenditure but rather an investment that would surely pay off in the long run [20].

The Fair's public relations opportunities were particularly appealing to many companies at the end of the 1930s. Faced with New Deal legislation, increased labor tensions, and a public dissatisfied with the role of big business in the Depression's economic crisis, corporations paid more and more attention to conducting solid public relations [21]. Articles in business magazines like *Fortune* advised companies that it was no longer enough to offer customers products at a decent price; a business also needed to convince the consumer that it was also 'fulfilling what he regards as its social obligation' [22]. Thus, companies initiated industrial advertising campaigns that tried to demonstrate to the public how the efforts of big business actually 'contributed to the advancement of the American standard of living' [23]. General Electric's national campaign at the time with its slogan, 'More goods for more people at less cost', for example, stressed the contribution its corporate-backed research efforts and consumer products made to the social good.

The public relation campaigns of many companies dovetailed nicely with the lofty rhetoric of the Fair's 'World of Tomorrow' theme. The Fair-of-the-Future committee faced little resistance in suggesting that 'Both the Fair and Industry [would] be best served if industry adopt[ed] the strategy of emphasizing its place as a servant of man and demonstrate [d] that it serves itself best by serving civilization' [24]. Corporations like GM, Du Pont, Heinz, and GE spent millions of dollars designing exhibition buildings that avoided a hard-sell approach by draping their corporate identities and products in the mantle of social responsibility that came along with 'Building the World of Tomorrow'. Visitors, for example, could see Bordens' 'Dairy World of Tomorrow', in which milk production and husbandry were automated and sanitized through conveyor belts and mechanical milking machines [25]. Ford's 'Road of Tomorrow' displayed elevated highways that promised to make travel faster and safer [26]. A General Electric ad for its exhibit succinctly expressed the way corporate exhibitors used the Fair's ideological message to link their products and themselves to a better 'World of Tomorrow':

We invite you to see these and other features of the G-E exhibits ... not only because they are entertaining and spectacular, but because they reveal the secret of America's progress. They show how American industry, by developing new products, improving them, and learning to make them inexpensive, has made it possible for millions of people to have more of the good things of life [27].

Similarly, an ad by Sealtest for its World's Fair exhibit addressed the connection between attaining a better tomorrow with the technological tools of today as it informed the reader, 'You will see how Sealtest builds to a healthier, happier tomorrow by making life safer, today' [28]. Such ads and exhibits led Fortune magazine to dub the Fair 'that great free-for-all of industrial public relations' [29].

More than any other building, General Motors' Futurama best exemplified corporate exhibitors' attempts to capitalize on the Fair's social message for public relations gain. By far the Fair's most popular and expensive attraction, GM's Futurama, with what was, at the time, the largest diorama ever built, transported fairgoers to the future and presented them with a 16-minute bird's eye view of 1960 America as envisioned by GM's industrial designer. Visitors, seated on moving chairs, experienced the sensation of traveling hundreds of miles across the landscape. Below, they saw animated towns, cities, rivers, fields, and forests. GM's narrator drew the visitors' attention to the superhighways, speed lanes, multi-decked bridges and to the 50,000 scale-model automobiles which not only crisscrossed the countryside but also demonstrated how 'by multiplying the usefulness of the motor car, the industry's contributions toward prosperity and a better standard of living for all [would be] tremendously enhanced' [30]. The world laid out before them, the narrator informed the spectators, would come not only as the result of 'new concepts in science and research', but also by 'a new understanding of the true function of industry as an integral part of the nation's social and economic life' [31]. At the end of the ride, as the moving chairs descended for a close-up view of GM's idea of a typical 1960 street intersection, the narrator announced: 'In a moment we will arrive on this very street intersection--to become part of this selfsame scene in the World of Tomorrow--in the wonder world of 1960--1939 is twenty years ago! All eyes to the future!' [32]. Upon exiting the exhibit, fairgoers found themselves within a full-scale reproduction of that street corner of the future, complete with elevated sidewalks, pedestrian bridges, and 1939-model GM cars and trucks.

Typical of the public relations soft sell that dominated Fair exhibits, Futurama did not so much sell GM products as promote a vision of a prosperous tomorrow shaped by networks of high-speed super highways which just happened to make GM cars seemingly indispensable [33]. The smog-free, slum-free order of Futurama's world presented an appealing, if idealized, alternative to Depression-era cities. By providing the materials and imagination that could help forge that future, GM tried to sell itself as a civic-minded corporation apparently more interested in promoting the social good than in generating profits. GM's vision of the future, of course, didn't depend solely on its own products, but also on the construction of a federally-funded interstate highway system--a project that would be paid for with the tax dollars of those same fairgoers flying over GM's diorama. By linking its specific corporate goals with the Fair's utopian rhetoric, GM worked hard to mobilize general support for itself, its vision of the future, and its products and thus exemplified industrial public relations at the Fair.

Television and RCA Go to the Fair

By 1937, communications giant RCA had decided to participate in the World's Fair and on 21 June 1938, began construction of the 60,000 square foot RCA Building. Designed to resemble a giant radio tube, the building housed exhibits from a variety of RCA's companies, including RCA Manufacturing, RCA Communications, Radiomarine Corporation and the National Broadcasting Company [34].

Sarnoff appointed NBC President Lenox Lohr to oversee the corporation's presence at the Fair, capitalizing on

Lohr's experience as an organizer of Chicago's Century of Progress Exposition. In tune with the perspective of many corporate exhibitors and the Fair's organizers, Lohr informed RCA's World's Fair Committee that it couldn't successfully develop a hard-sell approach at the Fair but rather should focus on executing an 'industrial sales job' [35]. Consequently, RCA's exhibits weren't intended to push specific products per se but to build good will and name recognition among the corporation's various constituencies. In a lengthy memo to Sarnoff, Lohr explained that RCA's exhibits were designed

[a] to present to the ultimate consumer, in the most entertaining visual manner, company products, aims, and purposes;

[b] to consolidate dealer, distributor, and sales organizations;

[c] to personalize their industries to consumers, stockholders, and their own employees;

[d] to propagandize subtly their problems with the government [36].

RCA's goal, then, was to present the public, widely defined, with 'all of the products and services of the RCA companies' [37].

In line with the Fair organizers' emphasis on addressing average consumers not specialized experts, RCA filled its building with exhibits that would not only capture visitors' attention amid the din of the crowded fairgrounds but also demonstrate the practical and beneficial uses of RCA research and products to the average citizen. As Lohr put it, RCA developed exhibits 'with the accent on showmanship' [38]. Exhibits proposed in the earliest planning stages, for example, included microwave circuits and transmitters that would allow visitors to talk to each other across the room, a magic singing fountain operated by a beam of light that could play the NBC chimes, and a miniature high-voltage smoke dispeller [39].

A number of exhibits featured radio technology, RCA's primary product, in a broad range of applications that were intended to highlight RCA's contributions to advancing the social good. In the garden just outside the building, for example, visitors could tour a floating yacht designed to demonstrate marine radio technology, while inside, an animated diorama featured RCA-built radio technology as the indispensable tool that helps save the lives of those aboard a sinking ship. Other exhibits illustrated how radio technology worked to link people around the globe by making air travel safe and providing the most effective means of communication.

The centerpiece of RCA's exhibit, however, was television. From the earliest planning stages to the opening day ceremony, RCA's presence at the World's Fair was carefully staged to serve as television's debut for NBC's regular service, the Federal Communications Commission (FCC) and the public [40]. Since 1935, RCA had been looking to move television technology 'out of the laboratory and into the field' [41]. In subsequent years it expanded its attempt to refine transmission and reception quality in the laboratory, intensified experimental broadcasts from the NBC tower atop the Empire State Building, and started remote shooting experiments with its telemobile unit. By 1939, RCA, having spent nearly \$10 million on television, was anxious to start earning a return on its investment, and the Fair seemed to promise a wealth of opportunities. RCA tried to exploit its presence at the World's Fair in order to advance its public image, gain valuable experience in television broadcasting, and obtain an advantageous position vis-a-vis both its competitors and the FCC.

Like many corporations in the 1930s, RCA felt the heat of government regulation and a suspicion of big business. In 1938, amid the antitrust push of the second New Deal, the FCC initiated an investigation into possible monopolistic practices in network radio--an investigation that would continue until 1941. The chain

broadcasting investigations clearly threatened NBC, who, with two national radio networks, had as much to lose by stricter government regulations as any one in the industry. At the same time RCA finalized plans for its exhibit at the Fair, David Sarnoff, RCA President and Chairman of NBC, appeared before the FCC to explain its network practices. In defending NBC's position in the industry, Sarnoff referred to RCA's pioneering work in television. RCA had spent millions of dollars advancing television to a usable state, Sarnoff argued, yet was ready to share its technology with others in the industry. Only a large-scale corporation like RCA, Sarnoff claimed, could marshal the resources need to develop such costly, yet socially beneficial, services [42]. RCA's presentation of television at the Fair worked to reinforce such claims, and internal memos suggest that those involved in designing the exhibits believed RCA's World's Fair presence could influence government perceptions of the corporation and hopefully its regulatory decisions [43].

At the time, RCA also faced challenges more directly related to television. Throughout the 1930s, a number of companies had rushed to develop the technology that would become the standard for television service in the United States. By 1939, anxious to move ahead with commercial television, a number of key players in the race, led by RCA, formed the Radio Manufacturers Association. Settling upon certain technical standards for television transmission, the RMA urged the FCC to approve them and open the door for commercial service [44]. The FCC, however, believed it was too early to set standards or to commence commercial broadcasting, fearing such moves would retard any future refinement in the technical quality of television or might lead consumers to purchase receivers which could quickly become obsolete if technical advances were made. Although the FCC refused to give the official go-ahead for commercial television, a number of companies began marketing sets in the hope of gaining the advantage for when the green light was finally given. Thus, RCA found itself jostling with a number of competitors, including Philco, General Electric, Westinghouse, and Du Mont for leadership in the newly emerging television industry.

RCA's objectives for television's advancement were also threatened by the emergence of FM radio. Although instrumental in Edwin Armstrong's early development of frequency modulation technology, RCA abandoned Armstrong's invention in 1935, allegedly because Sarnoff considered it a threat to television. Armstrong, however, struck out on his own and by the late 1930s was asking the FCC for valuable frequency allocations for FM stations. At the same time, RCA and others working in television were anxiously applying for the same limited spectrum space, escalating to a full-scale battle between the two newly emerging communications systems.

Amid such struggles, RCA demonstrated the marvel of television for fairgoers and inaugurated the nation's first regular broadcast service at the opening of the World's Fair. On 21 October 1938, David Sarnoff, in an address to the Radio Manufacturers' Association, had declared that NBC would commence regular broadcasting on 30 April 1939, in conjunction with the opening of the exposition and that RCA would simultaneously begin marketing sets for home use [45]. By the time the Fair opened, Sarnoff promised, NBC would be providing at least 2 hours of programming per week. According to Sarnoff, RCA was 'convinced that experimental research [had] reached a point where a practical image receiver [could] be offered to the public without fears of it soon becoming obsolete' [46]. RCA's efforts at the Fair clearly were a bid not only to stimulate public interest in its products and advance its corporate image, but also to encourage or even force FCC action to approve commercial television.

RCA's presence at the Fair also gave the company a significant advantage over its competitors. Although RCA's sets were joined on store shelves by several other brands, the only companies besides RCA able to promote their work in television at the Fair were Westinghouse and GE. Smaller firms like Philco and DuMont were nowhere to be found amid the elaborate and costly corporate buildings dominating the fairgrounds [47]. This advantage afforded RCA a valuable public relations opportunity—one they were keenly aware of. Lenox Lohr, NBC president and head of RCA's World's Fair Committee, for example, told Sarnoff that RCA's exhibit offered them the perfect chance to

educate important leaders from all parts of the country and from all walks of life to think of television as an RCA-NBC product and to cement in their minds the thought that we are the pioneers in this new field of endeavor. In other words, to make television practically a trade name for RCA-NBC [48].

RCA, then, worked hard to capitalize upon its participation in the Fair, carefully planning the exhibit and exploiting every possible angle to get the most out of television's 1939 debut. Along side GM's superhighways, Borden's electrified dairy farms, and Du Pont's high-tech plastics, the new technology of 'hear-and-see radio' was brought to the public (courtesy of RCA) as an integral part of the World of Tomorrow'.

Plans for how to best present television to the public were carefully developed and revised. The earliest designs included a set up in which visitors would be recorded by a television camera and could then watch their images instantly transmitted to nearby receivers [49]. Initial plans also included the installation of television sets in small viewing rooms 'so as to demonstrate, as nearly as possible under World's fair conditions, the normal situations of television in the home' [50]. Aware that General Electric and Westinghouse would also be incorporating television into their exhibits, the RCA Fair Committee concluded that 'it was essential that [RCA's] receivers be of the best and latest type' and ordered RCA's manufacturing division to start making receivers with 15 to 18 inch tubes. Committee members also stressed that at least one projection tube be included in the exhibit [51].

The constraints of early television technology, however, led to two major problems. First, a key objective for the demonstration was to expose as many fairgoers as possible to the new technology. Both the size of the television screens and of the small, living-room-like viewing rooms, however, greatly limited the number of people who could see each demonstration. Designers initially decided to simply increase the number of demonstrations per hour. In December 1938, however, the RCA Fair Committee decided 'to expand the television exhibit to meet possible competition in view of the present activities' [52]. As General Electric and Westinghouse increased the role of television in their exhibits, RCA felt it vital to maintain their preeminence in the demonstration of television. Consequently, they rearranged the interior of the building and turned the small viewing rooms into one large hall. Once the Fair opened more than 50,000 fairgoers a week could watch a 10-minute TV show on 12 9X12 inch receivers. Visitors to the RCA building could also see the technical story of television's development in various displays such as a television laboratory, a camera set-up with a model transmitter, a laboratory type television receiver, and a glass-encased receiver that revealed the inner workings of the new technology [53]. In a manner typical of exhibits at the consumer's fair, RCA also made sure to demonstrate what it envisioned television's practical uses to be. In place of the small viewing rooms, RCA presented visitors with a full-scale model radio living room of today side by side with a radio living room of tomorrow designed to illustrate the most efficient use of television in the home [54].

RCA's second problem involved the programming needed to demonstrate its receivers. In the preliminary plans, RCA hoped to rely primarily on programming from its Radio City studio (sent to an on-site tower located just outside the RCA Building via the antenna atop the Empire State Building). Engineers, however, couldn't predict the effect local noise from devices in nearby exhibits might have on television signals. Consequently, they constructed a small building on an isolated corner of the RCA lot at the Fair to house a 16 mm film projector and a small, local transmitter that would feed receivers in the exhibit with filmed programming. While they hoped that this arrangement would provide a clear signal over the air, even under the worst conditions, they also laid a cable connection to guarantee a clear signal [55]. The film was planned to run about 10 minutes and be comprised of newsreel footage edited semi-weekly and introduced with a 'leader' that welcomed the visitor to the RCA exhibit. Again, in line with the consumer-fair approach that aimed to entertain while promoting specific uses for TV in the 'World of Tomorrow', Lohr claimed that this strategy would have the advantage of 'simulating the program service which promises to have the greatest

appeal-that of showing the drama of current events'. Further, by editing the newsreels to only the best topics presented in 10 minutes, the number of demonstrations per hour could be maximized [56].

When the Fair opened, RCA broadcast programming to its demonstration sets every day between 11 am and 9 pm, relying on three programming sources. Of the 311 hours broadcast in the Fair's first month, 114 hours consisted of the filmed newsreels transmitted from the outbuilding. Another 136 hours originated from the Radio City studios and the remaining 61 hours came from NBC's roving telemobile units which provided live programming by conducting on-the-street interviews with fairgoers, covering special events at the Fair, and touring other exhibits [57]. When they weren't scouring the grounds, the telemobile units were to be parked in front of the RCA's Building, making it easy to send the electronic feed via cable and hopefully drawing a crowd of curious onlookers-'an important item in the competition for interest at the world's fair' [58].

RCA's exhibit was far from the only one to include 'hear-and-see radio'. Television, of course, was prominently featured in the Communications focal exhibit. Meanwhile, visitors to the Hall of Pharmacy's futuristic Drug Store of Tomorrow display could see a television-telephone booth alongside a streamlined 'Soda Fountain of the Future' [59]. At the General Electric Building, visitors got a first-hand view of television production work. Just off the main lobby, GE built a television studio where, as crowds looked on through glass walls, one fairgoer, plucked out of the audience, was interviewed in front of the cameras. The interview was immediately transmitted across the lobby to a row of monitors on the opposite wall as friends and onlookers rushed to see their companion's image live on TV. The Westinghouse Building followed a similar formula. Such demonstrations by GE and Westinghouse, as well as RCA's man-on-the-street remote interviews, resembled many other exhibits at the Fair which worked hard to incorporate the crowd as an integral part of the exhibit [60]. AT&T, for example, randomly selected visitors who could use display telephones to make free long-distance calls anywhere in the country; meanwhile, hundreds of fairgoers eavesdropped on the conversations. Consistent with the consumer's-fair approach, the technology of television wasn't the only thing on display; the public's use and enjoyment of it were featured as well. Such design strategies clearly had advantages to companies trying to promote their products not just as technological marvels but also as appealing consumer goods. At the same time, the demonstrations offered viewers glimpses of television's interactive capabilities-qualities which, years later under network control, would rarely, if ever, be experienced by consumers.

As far as RCA was concerned, however, television wasn't simply on display at the Fair; it also covered it, and its various telecasts from the fairgrounds provided valuable experience for its engineers and publicity for the company. On 17 November NBC, in the first experimental broadcast from the Fair, covered a celebration for the arrival of 1,000,000 tulips from The Netherlands [61]. On 27 February the fairgrounds served as the site of the first experimental broadcast of a commercial radio program as NBC cameras transmitted the images of Amos n' Andy stars Freeman Gosden and Charles Correll [62]. The final broadcast before the official opening of the World's Fair took place on 20 April at the dedication ceremony for the RCA World's Fair Building. After a few introductory remarks by an announcer at the Radio City studio, the program cut to the fairgrounds. As the radio 'eye' scanned down the Avenue of Patriots, viewers watching at Radio City and those few perhaps watching at home saw scores of workers lining the streets eating lunch with the Fair's landmarks-the Trylon and Perisphere- in the background. The program cut to the RCA garden where Lohr, - Sarnoff and others addressed a crowd of 100 guests [63]. At the conclusion of the program, NBC returned to the Radio City studio and coverage of a boxing match. Such experiments also served as valuable publicity stunts, and the press took great interest in them. Stories in The New York Times, for example, nearly always included a photograph of the image just as it appeared on television screens and often reminded readers that NBC would be starting regular television service in conjunction with the opening of the Fair.

On 30 April television finally made its official debut with its 3-hour coverage of the opening ceremonies for the Fair [64]. At 12:30pm an estimated 1000 people were watching as far as 50 miles away on the 100 or so

sets in New York area homes, eight miles away at RCA's Radio City facilities, and just a few hundred yards away on the 12 television receivers set up in the RCA Building. The 'electronic eye' of the NBC television cameras opened the program with a shot of the Trylon and Perisphere. Sweeping across the Court of Peace, the cameras provided a panoramic view of the gathering crowd, flags, fountains, and, eventually, the parade and ceremonies. NBC covered the event with one camera situated some distance from the central platform and grandstand where most of the ceremony took place. The procession ended with the arrival of a number of dignitaries including New York Major La Guardia, Grover Whalen, and President Roosevelt. After a number of speeches and ceremonial events, the telecast was over [65].

Bruce Crotty, the producer in charge of the mobile units, saw the event as yet another learning experience in the young art of television broadcasting. Viewers complained that the camera was too far away from the podium, making the images much too small; few of the notable guests, for example, could be identified. When LaGuardia walked directly up to the camera as the procession of dignitaries walked by, however, viewers watching at Radio City had no problem identifying him, and NBC engineers would later rate him 'the most telegenic man in New York' [66]. The small television audience also complained about the static camera and long takes, indicative of the fact that NBC used only one camera to cover the event. Engineers realized they would need to use a number of cameras to provide the varied angles and close-ups required to create exciting coverage [67]. Finally, some mention was made of white streaks marring the image which were attributed to the instability of the metal platform on which the camera rested. At future events, NBC engineers learned, the traditional facilities used by film newsreel crews would be insufficient and special platforms and locations would need to be provided for television coverage [68]. In the end, however, Crotty believed that the program, though far from perfect, was very successful, especially since it had been the first attempt at covering such a huge outdoor event in America [69].

NBC's programming staff continued to capitalize on the Fair well after the opening ceremonies ended. Having just inaugurated regular broadcast service, NBC suddenly needed entertaining material to fill its scheduled hours, and the Fair's many carefully designed and visually exciting exhibits seemed to offer excellent material for television shows. Consequently, NBC crews scoured the fairgrounds with the mobile units. Yet many of the exhibits, especially those designed by business and industry, also offered valuable programming and marketing lessons for NBC's young television department. Preparing for the advent of commercial broadcasting, NBC realized that effectively selling sponsors' products on a visual medium like television would require different tactics than had been developed for radio. At the same time, NBC was surrounded by dozens of corporate exhibits all carefully designed to skillfully promote products and services through visually and aurally entertaining displays like dioramas, murals, and staged skits. Lenox Lohr urged NBC's television programming staff to seek out and learn from 'exhibits which [were] presented with subtle merchandising and strong visual entertainment value'. Lohr referred specifically to Westinghouse's 'The Battle of the Centuries'--a humorous theatrical show designed to promote the company's latest dishwashers [70]. Visitors watched as two housewives faced the chore of post-dinner clean-up in a skit that seemed to presage both the domestic sitcom of the 1950s and the commercials that sponsored them. In one kitchen, a harried woman, up to her neck in suds, frantically tried to wash an seemingly endless pile of dirty plates, dishes, and glasses. Meanwhile, the woman in the other kitchen leisurely read a stack of magazines while her Westinghouse dishwasher did all the work [71].

While NBC's television department explored ways of advancing TV programming [72], RCA worked hard to exploit the public relations possibilities of the Fair by wrapping itself and its new product in the lofty rhetoric of the Fair's theme. Like so many other goods and services on display, television wasn't simply just an abstract scientific technology developed in laboratories nor just another consumer product. Instead, it was an essential tool in the construction of the 'World of Tomorrow'. While GM invited people to see a world filled with superhighways and automobiles, RCA presented fairgoers with its own glimpse into the future--one in which everyone's living room was outfitted with an RCA-made TV set. Sarnoff's televised speech at the RCA

Building's dedication ceremony vividly illustrates how RCA used the Fair's utopian rhetoric and growing fears of war in Europe to promote its corporate image (amid FCC hearings and Depression-era anxieties) and its product (on the eve of its public debut):

It is with a feeling of humbleness that I come to this moment of announcing the birth in this country of a new art so important in its implications that it is bound to affect all of society. It is an art that shines like a torch in a troubled world. It is a creative force which we must learn to utilize for the benefit of all mankind. This miracle of engineering skill which one day will bring the world to the home also brings a new American industry to serve man's material welfare. Television will become an important factor in American economic life [73]:

Echoing Sarnoff, RCA's film, *The Birth of an Industry*, introduced television to fairgoers as 'a new service whose purpose is constructive in a world where destruction is rampant' [74]. In a world defined by the interdependence of man on man, television, it seems, would be indispensable.

Central to the Fair's message, however, was the conviction that the tools needed to build the utopian future were available today, and RCA's presentation of television worked as well as any exhibit to bridge the gap between today and tomorrow and to exploit the exciting idea that the future was already here [75]. Although visitors to RCA's 'Living Room of Tomorrow' saw their homes reconfigured to include a working television receiver, those very same fairgoers could drive downtown and purchase their own TV set from Bloomingdale's or Macy's. Throughout the summer of 1939, as RCA worked hard to exploit the public's attention on the Fair, the difference between fairgoers watching forward-looking demonstrations at RCA's World's Fair Building and customers listening to sales pitches at Manhattan department store showrooms were as blurred as the line between today and tomorrow. As consumers, visitors to the RCA exhibit could turn tomorrow into today in a way that those seeing GM's Futurama or Democracy couldn't [76].

Despite RCA's efforts, television's tomorrow wouldn't arrive until the end of the 1940s. In retrospect, RCA's bid to propel television out of the laboratory and into America's living rooms appears ill-timed. The entry of the United States into World War II turned both the government's and much of the industry's attention to the war effort. At the same time, William Paley and CBS challenged the acceptance of RCA's black-and-white system as the standard for commercial television, leading to more debate and more delays in FCC approval of commercial television. While such forces helped thwart RCA's larger goal for the development of television, we are left wondering whether its presence at the Fair achieved RCA's more focused goals: stimulating public demand for television and immediately influencing FCC opinion.

Sources offer conflicting reports about people's reactions to television's debut at the Fair. One news report claimed that the various television displays were so popular that they caused pedestrian traffic problems, and GE claimed that many visitors, so impressed with the demonstrations, wanted to know where they could buy their own sets and how much they cost [77]. Such reports support a 1940 survey of public reaction to television conducted by the World's Fair which indicated that 'the cross-section of visitors interviewed were 100 per cent "in favor" of television as a new form of entertainment' [78]. Conducted by Barry Gordon, a former newspaper correspondent, the questionnaire was given to a select sample of visitors to television exhibits in both 1939 and 1940 [79]. In 1939, visitors were queried 'on whether they "favored" television, their ratings of images, whether they believed home television is practical and when they expected to purchase sets'. The second survey also asked visitors whether they thought television had improved, when they would most like watching TV, how much they would pay for a set, and what types of entertainment they would most like to see televised. The survey's results, however, are suspect since the questionnaire was clearly set up to elicit positive answers. Although a bolded question 'What do YOU think of TELEVISION?' serves as a headline for the 1940 survey, a following explanatory paragraph informs the subject that 'last year's survey revealed that the cross section of visitors interviewed were 100 per cent "in favor" of television'

and went onto to declare that since then, 'the picture quality of images has improved in brilliance and clarity'. Despite such a pro-television set up, a close examination of the results suggest ambivalent feelings towards the new medium which the analysts summary conclusion of 100% approval ignores.

Other evidence suggests even more strongly that television failed to make as big a splash as RCA and others had hoped it would. While a great number visitors may have crowded around RCA's and GE's television sets, neither exhibit was close to being the most popular destination for fairgoers. General Motors' Futurama was the most widely attended and highly rated attraction, followed by the Democracy, American Telephone & Telegraph, Ford Motor Company, the Soviet Pavilion, the British Pavilion, and the Railroad exhibit [80]. One can only speculate that television's small black-and-white images paled next to the colorful, 3-D drama of interactive dioramas like those at GM and the Theme Center or to the dramatic scientific stunts like GE's man-made-thunder machine. The idea of the Fair was to inundate the visitor's sense at every turn with spectacle. Television, despite RCA's best efforts, may have seemed unspectacular to many viewers. And despite the survey's glowing report about television's 100% approval rating, TV sales during the Fair's opening season were dramatically lower than expected. Between 1 May and 1 October, for example, RCA sold only 81 sets- not surprising since a 1939 Gallup poll reported that only 13% of those surveyed were interested in buying a set [81].

The public's apprehension about television may also have been influenced by press coverage of the new technology. Although many articles did herald television's debut at the Fair as significant, most were hesitant about predicting television's success. 'Six weeks to go and up goes the curtain on television for a test to prove whether it is "to be or not to be" a national pastime or a new industry and a theater in countless homes', The New York Times reported. 'The opening of the New York World's Fair on April 30 is booked as Act 1, Scene 1 on a performance that may run on forever' [82]. Several articles used the approaching curtain call of the Fair as a hook to seriously explore exactly what was going on behind all the television talk. Most did contain some of the anticipatory rhetoric that Sarnoff and RCA undoubtedly had hoped to generate. Of television's presence at the Fair, for example, declared, 'This means the decade's most revolutionary invention is at last ready to emerge from the laboratory and make its commercial debut in America' [83]. As in this quote, however, most laudatory comments were usually joined by a good deal of skepticism. Several articles expressed a great impatience that commercial television was taking so long in coming. Further, many weren't so willing to accept RCA's announcement that television had arrived. Articles in both the business and popular press critically examined the technical and economic state of the television industry. Far from treating it as a mysterious invention that would suddenly enrich their lives, these articles informed their readers about the complex challenges-economic, technological, and legislative-that still confronted the industry. Several articles, for example, addressed the limited broadcast range of straight-line television transmission; the cost of coaxial cable; the voracious appetite of the medium for programming; the vicious circle facing a sponsorship-driven medium during its infancy (no audience to attract advertisers, no money to create programs to attract audiences); the continuing debate over standards and FCC regulation; and the trials of television production. Finally, many articles predicted a future for television rather different from RCA's world of tomorrow-a future that included theater television, coast-to-coast relay towers every 50 miles, and acting troupes that would tour the nation, going from station to station to perform [84].

What impact RCA's efforts at the Fair had on the FCC is even more difficult to gauge. It seems clear that RCA's public relations campaign failed to influence the FCC's chain broadcasting investigations. In 1941, the FCC found network practices to be monopolistic and ordered NBC to sell one of its two networks. On the other hand, television's public debut at the Fair may have influenced, at least in part, some changes in the FCC's position on commercialization. By the fall of 1939, the FCC began to take tentative steps toward commercialization, announcing that by September 1940 it would license some television stations to operate on a semi-commercial basis. These so-called Class II station licenses would allow broadcasters to receive payment from sponsors equal to but not greater than programming production costs. Although broadcasters

like NBC wouldn't be able to make a profit, it was clearly the first step towards commercialization. Although uncertain, one can speculate that the efforts of RCA and others to get television in front of the public at the World's Fair accelerated the FCC's timeline. Consistent with its aggressive strategy with the World's Fair, RCA saw the FCC's cautious go-ahead as an opening to forge ahead with commercialization, and in February 1940, it dramatically reduced the prices of its receivers. The FCC believed RCA was again trying to freeze standards and retard research efforts by flooding the market with sets and quickly canceled plans for the allocation of Class II licenses. With the emergence of the war and CBS' bid for color television, the FCC would not assign commercial stations until the mid-1990s, and most Americans would not experience RCA's living room of tomorrow until the mid-1950s.

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NOTES

(1.) Dedication of RCA seen on television, *New York Times*, 21 April 1939, P. 16.

(2.) New York Fair to start television drive in earnest, *Newsweek*, 20 March 1939; p. 36.

(3.) While there are few histories of broadcasting that fail to include TV's debut at the World's Fair, most devote only a few sentences or, at most, a paragraph to the event. In general, historical accounts have simply concluded that television's debut in 1939 was either a premature attempt to instigate a television boom or a sneak preview of what was to come. Either way, media histories have considered the event noteworthy but ultimately less interesting than the technological experimentation that preceded it or the commercial boom that followed. See Erik Barnouw, *The Golden Web: a history of broadcasting in the United States, Volume 11-1933 to 1953* (New York, 1968), p. 126; Laurence Bergreen, *Look Now, Pay Later: the rise of network broadcasting* (New York, 1980), pp. 123-124; Sydney W. Head and Christopher H. Sterling, *Broadcasting in America* (Boston, 1978), p. 186; Curtis Mitchell, *Cavalcade of Broadcasting* (Chicago, 1970), p. 88; Joseph H. Udelson, *The Great Television Race: a history of the American television industry 1925-1941* (Alabama, 1982), pp. 126-128; Irving Settel, *A Pictorial History of Television* (New York, 1983), pp. 42-43.

(4.) For more on the 1939 New York World's Fair, see Joseph P. Cusker, *The world of tomorrow: science, culture, and community at the New York World's Fair*, in H. A. Horrison (ed.), *Dawn of a New Day: the New York World's Fair 1939/40* (New York, 1980), pp. 3-15; David H. Geltner, *1939, The Lost World of the Fair* (New York, 1995); Helen H. Harrison, *The Fair received: color and lights as elements in design and planning*, in *Dawn of a New Day: the New York World's Fair 1939/40*, op. cit., pp. 43-55; Jeffrey Hart, *Yesterday's America of tomorrow*, *Commentary*, July 1985, pp. 62-65; Folke T. Kihlstedt, *Utopia realized, the World's Fairs of the 1930s*, in J. J. Cohen (ed.), *Imagining Tomorrow: history, technology, and the American future* (Cambridge, 1986), pp. 97-118; Peter J. Kuznick, *Losing the world of tomorrow: the battle over the presentation of science at the 1939 New York World's Fair*, *American Quarterly*, September 1994, pp. 341-373; Francis V. O'Connor, *The usable future: the role of fantasy in the promotion of a consumer society for art*, in *Dawn of a New Day: the New York's World's Fair 1939/40*, op. cit., pp. 57-71; Michael Robertson, *Cultural hegemony goes to the fair: the case of E. L. Doctorow's World's Fair*, *American Studies*, Spring (1992), pp. 31-44; Robert Rydell, *World of Fairs* (Chicago, 1993); Eugene A. Santomaso, *The design of reason: architecture and planning at the 1939/40 New York World's Fair*, in *Dawn of a New Day: the New York World's Fair 1939/40*, op. cit., pp. 29-40; Warren I. Susman, *The people's Fair: cultural contradictions of a consumer society*, in *Culture as History* (New York, 1984), pp. 211-229.

(5.) Official Guide Book of the New York World's Fair 1939 (New York, 1939), P. 41.

(6.) See Cusker, pp. 4-6.

(7.) Rydell, p. 9.

(8.) Official Guide Book, p. 5.

(9.) Ibid., p. 175.

(10.) Ibid., pp. 74-75.

(11.) This attention to the consumer reflects wider economic shifts from an economy based on heavy industry to one increasingly focused on consumption and a cultural shift in which an emerging ideology centered on the consumer challenged the aging Jacksonian ideal of the producer. See Rita Barnard, *The Great Depression and the Culture of Abundance* (New York, 1995), pp. 3-31; Michael E. Parrish, *Anxious Decades: American Prosperity and Depression, 1920-1941* (New York, 1992), pp. 387-390; Warren I. Susman, *Culture as History* (New York, 1984).

(12.) Throughout the 1930s, a growing number of people like those behind the Fair placed new hope in technocracy, believing that together social engineers and technology could solve all social problems. See Kihlsredt, p. 98.

(13.) Michael Hare, member of the Fair's Board of Design which shaped the nature of the Fair and its exhibits, stated that the Fair should 'tell the story of the relationships between objects in their everyday use-how they may be used and when purposefully used how they may help us'. Quoted in Cusker, p. 6. Also see *New York World's Fair Bulletin*, 37 June 1937.

(14.) Kusnick describes in detail the losing battle waged by members of the scientific community who saw the Fair as a valuable opportunity to promote the social value of science and the scientific method against the Fair organizers and corporate exhibitors for whom science at the Fair should mean science applied to produce consumer goods or mystified into entertainment. The subjection of pure science to the interests of the organizers and corporate exhibitors was evidenced, Kusnick argues, by the fact that industrial designers, often trained as Broadway set designers, were hired to plan both focal and industrial exhibits. Scientists were, for the most part, excluded.

(15.) Official Guide Book, p. 41.

(16.) Rydell, p. 132.

(17.) Official Guide Book, p. 5.

(18.) Grover Whalen, *What the Fair means to business and industry*, *New York World's Fair Bulletin*, June 1937, p. 1.

(19.) Ibid.

(20.) In addressing leaders in the communications industry, for example, Whalen asserted that 'Every branch

of communications will undoubtedly be financially benefited directly and indirectly from the Fair, not only during the period of the Fair but before and after it.' New York World's Fair Press Release No. 96, 19 March 1937, p. 2. National Broadcasting Papers, State Historical Society of Wisconsin, Madison (hereafter NBC) 55/65. All NBC memos, correspondences, departmental reports, and press releases cited in this article are from the SHSW archives.

(21.) According to Fortune, 'during 1938 there was scarcely a convention that did not feature an address on public relations, scarcely a trade magazine that did not devote some space to the subject, scarcely a board of directors that did not deliberate weightily on the powers of the new goddess'. The public is nor dammed, Fortune, March 1939, p. 83.

(22.) Ibid., p. 85.

(23.) Howard Wood, Business must 'sell' itself, Nation's Business, January 1938, p. 27. Also see Business-and-government: American business can avoid committing suicide only by practicing some sound public relations, Fortune, March 1939, pp. 57-58; Public relations as good business, Business Week, 18 February 1939, pp. 50-51.

(24.) Cusker, p. 4.

(25.) Official Guide Book, p. 107.

(26.) Ibid., p. 205.

(27.) GE advertisement, Newsweek, I May 1939, p. 47.

(28.) Sealtest advertisement, Nation's Business, April 1939, p. 10. For more on industry's use of public service rhetoric, see New York Fair portrays triumph of industry, Nation's Business, April 1939, pp. 52-54+.

(29.) The public is not dammed, p. 110.

(30.) Official Guide Book, p. 209.

(31.) Roland Marchand, The designers go to the Fair II: Norman Bel Geddes, the General Motors 'Futurama,' and the visit to the factory transformed, Design Issues, Spring (1992), p. 35. Also see Roland Marchand, The designers go to the Fair: Walter Teague and the professionalization of corporate industrial exhibits, 1933-1940, Design Issues, Fall (1991), pp. 4-17.

(32.) Kihlstedt, p. 107.

(33.) Except for buses, there were no means of mass transit in GM's vision of 1960s America. Meanwhile in the same period, GM was buying up streetcar systems nationwide, dismantling them, and replacing them with buses. See Jeffrey L. Meikle, Twentieth-Century Limited: industrial design in America, 1925-1939 (Philadelphia, 1979), p. 207.

(34.) As of 15 November 1938, RCA had estimated that total cost for the building, landscaping, equipment, decorations, furnishings, exhibits, and operation would be \$300,000. Breakdown of cost for R.C.A. participation in New York World's Fair 1939, 15 November 1938, NBC 63/7.

- (35.) Minutes, World's fair Committee Meeting, 30 August 1938, NBC 63/7.
- (36.) Lenox R. Lohr, Memo to Sarnoff, 1 June 1939, NBC 79/20, p. 1.
- (37.) RCA Press Release, 16 August 1938, NBC 63/6.
- (38.) Minutes, World's Fair Committee Meeting, 30 August 1938, NBC 63/7.
- (39.) J.D'Agostino, Memo to C.W. Fitch, 18 August 1938, NBC 63/7.
- (40.) A press release, officially announcing RCA's participation in the Fair, for example, emphasized that the agreement signed between RCA and the Fair Corporation guaranteed that television would be a major attraction. NBC and RCA participation in New York's World's Fair announced by David Sarnoff, New Story Release, 16 June 1937, NBC 55/65; further, at the earliest stages, RCA thought of building the theme of its entire exhibit around television and/or having a separate television building. Frank B. Mullen (RCA Public Relations Chief), Memo to Clay Morgan, 23 April 1937, NBC 55/66.
- (41.) David Sarnoff, Statement on television, presented at the Annual Meeting of RCA Stockholders, 7 May 1935, NBC 102/4.
- (42.) David Sarnoff, Statement before the Federal Communications Commission, 14 November 1938, NBC 60/41.
- (43.) Lenox R. Lohr, Memo to Sarnoff, 1 June 1939, NBC 79/20, p. 1.
- (44.) By the early 1940s industry agreement over standards would erode with CBS's push for color television.
- (45.) On 1 May, the day after the opening ceremonies and NBC's purportedly landmark telecast. RCA sets went on sale in downtown department stores. RCA's line of receivers joined those manufactured by American Television Corp., Westinghouse, Du Mont, Andrea Pilot, and others. Some dealers prepared darkened demonstration booths to best show television to the public. At the beginning of May, NBC planned to broadcast similar, if not the same, filmed programs at 15-minute intervals for the benefit of dealers as they were for the receivers at the Fair. Set prices ranged between \$160 to over \$1000. At the same time, a newspaper advertising campaign went into full swing. In the weekend of the Fair's opening, RCA placed ads in five New York papers. The ads, some in color, all had pictures of available models, prices, and a coupon which interested readers could send in for more information. Other companies like Macy's, DaVega and Westinghouse also placed ads with copy such as 'Television has its "coming-out-party" Sunday' and 'HEAR the opening of the N.Y. WORLD'S FAIR VIA RADIO ... SEE President Roosevelt open the N.Y. WORLD'S FAIR VIA TELEVISION'. Television ads to break, New York Times, 21 April 1939, p. 34; Curtain goes up on television, Business Week, 6 May 1939, p. 15.
- (46.) Press clipping. Public television to start in spring, New York Times, 21 October 1938, NBC 102/22.
- (47.) In the Fair's second season (1940), Du Mont installed its latest television receivers in the Crosley Appliance Building.
- (48.) Lenox R. Lohr, Memo to Sarnoff, 1 June 1939, NBC 79/20, p. 5.

- (49.) J.D'Agostino, Memo to C.W. Fitch, 18 August 1938, NBC 63/7.
- (50.) Lenox R. Lohr, Memo to R. R. Beal, 20 October 1938, NBC 63/6.
- (51.) Minutes, World's Fair Committee Meeting, 30 August 1938, NBC 63/7. When the Fair opened, however, television receivers would only be 9 X 12.
- (52.) Minutes, World's Fair Committee, 13 December 1938, NBC 63/7.
- (53.) NBC Report, Television activity summary, March 1939, NBC 102/33.
- (54.) Ibid.; in the 1940 season, RCA would include a 'Television Suite incorporating ten separate, air-conditioned viewing rooms furnished as typical American living-rooms where television may be seen under circumstance approximating those in the home'. The revised television displays in 1940 also included 'two television pick-up locations in the specially landscaped Television Garden and in an indoor studio'. Executive Vice President, Memo to all RCA New York employees, 15 May 1940, NBC 79/20.
- (55.) Lenox R. Lohr, Memo to R.R Beal, 20 October 1938, NBC 63/6; also see J.D'Agostino, Letter to Douglas Crone, 1 August 1938, NBC 63/6.
- (56.) Lenox R. Lohr, Memo to R.R. Beal, 20 October 1938, NBC 6316.
- (57.) Engineering Department Report, May 1939, NBC 206/19. Also see Orrin E. Dunlap, Ceremony is carried by television as industry makes its formal bow, *New York Times*. 1 May 1939, p. 8; Visitors rake part in television show, *New York Times*, 4 May 1939, p. 19; Lenox, R. Lohr, Memo to Sarnoff, 1 June 1939, NBC 79/20.
- (58.) Lenox R. Lohr, Memo to R. R Beal, 20 October 1938, NBC Archives 63/6.
- (59.) In the 1940 season, GM and RCA would join efforts to demonstrate a working prototype of a 'telephone of tomorrow' which joined television technology with phone service. The presentation was widely covered and closely tied to military purposes. One of the most touted applications would be for government use at times of crisis. Fears generated by Nazi success in deceiving Allied forces in the North Sea with fake messages made the idea of a visual link attractive. GM stated that the demonstration showed 'how television may in the future be used for utilitarian as well as entertainment purposes'-- a comment that suggests how television was otherwise being promoted at the Fair. Milton Bracker, Television phone shown, *New York Times*, 18 June 1940, p. 28.
- (60.) See Warren Susman, pp. 211-229.
- (61.) Press clipping, Television trucks set up at the Fair, *New York Times*, 18 November 1938, NBC 102/22. Just days later, scenes of murals and statues from the Fair were sent the seven and a half miles to the NBC studio at Radio City. Spectators reportedly described the 'telepictures' as very good. The engineers were equally pleased with the transmission, since it was raining and the cameras had to work with relatively poor light.
- (62.) Two 'firsts' marked up by the World's Fair, *New York Times*, 28 February 1939, p. 1.

- (63.) Other participants in the dedication ceremony included James G. Harbord, chairman of the board of RCA; Neville Miller, president of the NAB; and Vladimir Zworykin; Dedication of RCA seen on television, *New York Times*, 21 April 1939, p. 21.
- (64.) Throughout the spring NBC had been offering programming like the RCA dedication, boxing, and other studio produced shows, but regular programming officially started with the Fair.
- (65.) The opening day telecast kicked off 'television week' in New York, during which NBC broadcast 25 hours of programming, Dunlap, 1 May 1939, p. 8.
- (66.) *Ibid.*, p. 8.
- (67.) Observers from the BBC were amazed by 'the nerve' of NBC to use only one camera. The fear of technical difficulties alone would have convinced them to use multiple cameras. The problem of close ups was precipitated by the Secret Service's refusal to allow television cameras close to the podium while the president spoke. See *ibid.*, p. 8, Orrin E. Dunlap. Act I reviewed, *New York Times*, 7 May 1939, p. 12; Gerald Cock, My impressions of American television, *Television and Short Wave World*, August 1939, p. 453.
- (68.) Dunlap, 7 May 1939, p. 12.
- (69.) Dunlap, 1 May 1939, p. 8; When NBC camera crews returned to cover the 1940 re-opening for the Fair they did have more cameras, and close ups. See Radio will carry opening ceremony, *New York Times* 5 May 1940, p. 46.
- (70.) Lenox R. Lohr, Memo to Sarnoff, 1 June 1939, NBC 79/20, p. 5. Exhibits like this one were, Lohr argued, 'the best known methods in motivated visual presentations to the ultimate consumer as conceived by industry'.
- (71.) See Robert Rosenblum Remembrance of Fairs past, in the Queens Museum (ed.), *Remembering the Future the New York World's Fair from 1939 to 1964*, (New York, 1989), p. 15.
- (72.) Internal memos also suggest that RCA examined how the exhibit could promote improved relationships with dealers, distributors and sales organizations. See Lenox R. Lohr, Memo to Sarnoff, 1 June 1939, NBC 79/20, p. 1.
- (73.) Dedication of RCA seen on television, *New York Times*, 21 April 1939, p. 16.
- (74.) Kihlstedt, p. 111.
- (75.) An advertisement for RCA's World's Fair exhibit, for example, uses Rip Van Winkle as a narrative device to tell 'The story of the services of RCA!' A modern day Van Winkle falls asleep in 1901 and awakens to suddenly find himself in 1939. The ad's readers then follow Van Winkle as he explores the strange new world of his future (their present) and discovers the marvelous inventions RCA has given society. In the final frame, Van Winkle encounters television--the latest innovation from RCA. Suddenly Van Winkle's future and that of the 1939 readers merge in the today of RCA's exhibit at the 1939 World's Fair. An adventure in discovery, advertisement by Radio Corporation of America, *New York Times*, 5 March 1939, World's Fair Section, pp. 36-37.

(76.) Several articles about television played with the same tension. A New Yorker article copies the strategy of GM's Futurama as it is written from the perspective of 1965. Instead of a world where television has blossomed, the writer gives a mock historical look at the rise and fall of television. The history reports on the dramatic changes television made to the American landscape and way of life. According to this history, the television industry ended in the aftermath of a televised Orson Wells expletive. The article offers a fascinating example of how television's introduction was negotiated through the tension between today and tomorrow. Russell Maloney, The age of television, New Yorker, 27 July 1940, pp. 22-23. Also see Waldemar Kaempffert, Look what's ahead, American Magazine, May 1939, pp. 14-15+. According to the article's introduction, Kaempffert's forward-looking discussion of television 'has that rare quality of imagination which makes the miracles of tomorrow live today' (p. 14). Kaempffert paints a picture of a future in which, among many fanciful things, television serves as a virtual-reality-like means of communication by which two people across the globe from each other will be able to 'shake hands electronically' (p. 81).

(77.) Television causes traffic problem, p. 20. GE workers were reportedly embarrassed, for while sets were currently being manufactured, they hadn't yet arrived in stores and prices were still under discussion.

(78.) Harry Gordon, Letter to Frank E. Mullin, 10 January 1941, NBC 103/21.

(79.) The questionnaire used in the 1940 survey and its results are provided in the 10 January 1941 letter to Frank Mullin. While I did not find a copy of the first survey, the 8-page memo systematically compares the results of the two.

(80.) See What shows pulled at the Fair?, Business Week, 4 November 1939, p. 22; Susman, p. 21; Gelernter, p. 159.

(81.) Television Report, 30 October 1939, NBC 103/17; Susman, p. 22. Also see What's television doing now?, Business Week, 12 August 1939, pp. 24-25.

(82.) Orrin E. Dunlap, Act I Scene I, New York Times, 19 March 1939, pp. XI. 12.

(83.) Television, Life, 20 February 1939, p. 45.

(84.) See Irving Fiske, Where does television belong, Harper's Magazine, February 1949, pp. 265-269; Alva Johnston, Now what can we do with television, Saturday Evening Post, 30 May 1939, pp. 20-21 +; Denver Lindley, Before your very eyes, Collier's, 18 March 1939, pp. 12-13 +; Television: a \$13,000,000 'if', Fortune, April 1939, pp. 52-59 +; Too early for television? Time, 15 April 1939, p. 81; Francis X. Welch, The economic birth pangs of television, Nation's Business, June 1940, pp. 20-21 +.

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