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# The Rising Tide of Radio Wonders

David Sarnoff Discusses the Future of Radio Research

To those whose imaginations are stirred by the wonderful possibilities of radio, and are anxious to know the lines along which science is working for the better service of humanity, an address by David Sarnoff, Vice-President and General Manager, Radio Corporation of America, at the University Club, Boston, Mass., January 28, 1928, contains much that is of intense interest. Running through this distinguished leader's remarks is a vein of philosophic reflection on the economic course of events that is distinctly refreshing.

AS one who serves in an industry that has grown from infancy to manhood in a period of less than eight years, perhaps I may be pardoned for digressing somewhat from my immediate subject to touch upon some general problems of modern-day industry. Having survived the period when a new art of communication feebly trying to reach across the seas was attempting to establish itself as a permanent system of international communication, when the entrance of radio into the home created almost overnight an entirely new manufacturing industry, when production had to be organized simultaneously with the development of a widespread distribution system, when a maze of patent claims and counter-claims had to be threaded in order to establish a sound basis of operation, one, perhaps, is entitled to a sigh of relief and a brief look backwards.

Radio has faced the usual hobgoblins of industry. It has been through the Yukon rush of industrial adventure which every new art attracts. It has survived a number of acute attacks to destructive competition; it has on several occasions touched the low water mark of liquidation. It has lived a full but anxious life during the past eight years. It already has been marked as a growing young "octopus" by those who "view with alarm" the growth of any industry. However, if tentacles of communication make an octopus, radio even now can claim an important place among this species. For, starting as a communications service from ship to shore, radio now links continent to continent with its invisible strands. Through broadcasting it reaches out into millions of homes with services of music, entertainment and speech; it is on the threshold of bringing sight as well as sound to millions of firesides.

RADIO has broken, as it had to do, the ancient industrial maxim that every shoemaker should stick to his last. It plays a most important part in the field of international communication; it is happily wedded, most often in the same cabinet, to the phonograph industry; it has entered the motion picture industry with its system of synchronizing sound and sight; it has reached out to the opera, the stage, the concert hall and the pulpit. Its further industrial implications are still subjects of research in the great electrical laboratories of the country. To attack the radio art or the radio industry because of their constantly widening reach is to strike at the windmills of progress. For it is the very nature of this system of communications that its field should be as wide as space and that its reach should be, eventually, wherever the human ear and the human eye can attune itself to its signals.

## A RADIO CENTRE.

INsofar as the Radio Corporation of America reflects the wireless communication facilities of the country, the services already established have made the United States the centre of world-wide radio communication. From New York as the hub of the service, permanent links of communication radiate through the air, from the Eastern seaboard, to Great Britain, France, Germany, Sweden, Norway, Holland, Belgium, Italy, Poland, Turkey, Venezuela, Dutch West Indies, Dutch Guiana, Colombia, Porto Rico, Argentina and Brazil.

From our radio transmitting stations on the Pacific Coast of the United States, communication circuits have been established with Hawaii, Japan, Dutch East Indies, French Indo-China and the Philippines, in addition to circuits projected in the near future to China and other countries.

Our marine stations located at strategic points girdle the seacoasts and cover the Great Lakes.

In the field of broadcasting, the Radio Corporation of America and its associates in the electrical industry are represented not only in the maintenance and operation of some of the leading broadcasting stations of the country, but also in the organisation of the National Broadcasting Company, which, through the cooperative or network system, has established the first nation-wide radio service in the United States and raised the standard of broadcasting throughout the country.

Through photoradio, now a regular feature of world-wide wireless service from the United States, we are transmitting news pictures, portrait photographs, fashion drawings, fingerprints, banking documents, legal papers, etc., between New York and London and between San Francisco and Honolulu.

## PICTURES AND SOUND.

WE have also developed a complete system of synchronising sound and motion pictures on the screen. In furtherance of plans for expansion in this field, we have secured a financial interest in the F. B. O. Company, a leading and progressive institution in the motion picture industry. The development of what is popularly called the "talking-movie art" requires that the facilities of the electrical laboratory be closely combined with the technique of the motion picture studio. The "silent drama," so called, has always leaned heavily on musical accompaniment, and the synchronisation of sight and sound on the same screen accomplished by our associates in the electrical industry means the best musical accompaniment in any theatre equipped with this apparatus. New fields of conquest, undoubtedly, will be opened to the motion picture art, when sound reinforces sight in the shadow-play of the screen.

WITHIN the last few weeks we have seen radio television emerging from the laboratory and preparing to enter the home. The demonstration made recently at Schenectady, impressive as it was, showed an art that is yet in the "earphone" stage of development. Many technical, broadcasting and service hurdles must be leaped before the art will become firmly established in the home. Nevertheless, its direction is sure and its progress is inevitable. The mission of television is to bring to the home the panorama of life of the great world outside. To a large extent, radio already has brought the opera, the concert stage, the theatre, to the fireside. Television will complete the picture by bringing to the home the visual spectacle made possible by the stagecraft of the opera and the theatre; the stirring events of life that must be seen as well as heard in order to make their due impression. In the field of education, television will add the force of demonstration to the exposition made possible by the present-day status of broadcasting. Industry, it is not unlikely, will find in television as valuable a means of communication to the home as it has already discovered in the broadcasting of sound. Effective as may be the modern machinery of exploitation, it is the unique promise of television that a new product or a new method, not to mention the standard commodities of industry, may be introduced instantaneously and simultaneously to millions of homes when the new art has sufficiently developed to be placed upon a regular and continuous service basis.

## STAGGERING STATISTICS.

VISUALISING in figures the position of radio to-day, it might be pointed out that from a total of barely more than 60,000 receiving sets produced in the United States in 1922, probably more than 8,000,000 receiving sets were in use in this country at the close of 1927; from a few scattered broadcasting stations six years ago, a broadcasting system of nearly 700 stations has arisen in the United States; from 75,000 radio listeners five years ago, the unseen radio audience of the United States has grown to more than 25,000,000 people. In dollar values radio is now well over a half billion dollar industry annually.

But this is not to sing a paean of victory. More sober reflections follow from the experience of the past six or seven years. After all, the greatest unction that some of those who have pioneered in the industry can lay to themselves is that they saw where they were going. Radio has travelled far afield since its establishment as a wireless telegraphic service that linked ship to ship and ship to shore in the first continuous system of marine communication invented by man. When the art had bridged the oceans with an effective service, the Radio Corporation of America might have remained content to consolidate its position as a communications company and refused to follow the will-o'-the-wisps of progress that were emanating from many laboratories.

The loss that the art might have suffered by such a step is incalculable, for radio had to make contact with the home through broadcasting, before it could hope to discover many of the secrets of wireless transmission which resultant research developed. Even now it is generally recognised that a trackless field of research lies in the space that separates the transmitting station at one end from the receiving instruments at the other.

Radio, as a system of international communications, could not remain indifferent to the progress of radio as the first means of mass communication to the home. It was the experience gained in broadcasting which helped to turn the thoughts of radio scientists and engineers to hitherto unexplained phenomena of electric wave propagation.

## TELEVISION AND PHOTO RADIO.

SIMILARLY, no division of the radio art or the radio industry can hold aloof from what our electrical laboratories promise in the matter of visual communication. The inauguration of television broadcasting upon an experimental basis will involve, it is foreseen, a series of problems in radio transmission, the solution of which will make for further progress in other fields of radio development.

Nor can we be insensible to the fact that in the progress being made in the transmission of photographic images by radio, a revolutionary system of telegraphic communication appears to be unfolding itself. The dot and dash system of electrical signalling by which letters and words are scrambled into signals at the transmitting end, and unscrambled into letters and words at the receiving end, I firmly believe will be succeeded by a system of communication that will transmit instantaneously the photographic image of a letter, a word, a message, or the entire page of a newspaper, in facsimile form.

How all the possible combinations of sight and sound transmission, envisaged by present-day research and development, will further affect the progress of the radio art, is still a problem for the imagination.

It is through the inevitable unfolding of the art, therefore, that radio has entered the home, where it met the phonograph and gave it entirely new instrumentalities; that it drew from the opera, the stage and the concert hall, in order to supply a service through the air; that it came in contact with the motion picture industry through a new method of synchronising sound and sight; and that it is now marching towards goals not yet clearly definable in the progress of the art.

## STABILISATION NOT YET.

THE radio industry has not lacked those who at many stages of its progress saw the mirage of stabilisation, and acted accordingly—to their sorrow. The rock on which many an industry has sought to anchor itself has too often proved its tombstone. Modern industry is learning slowly that nothing is more deceptive than the illusion that progress is at an end.

And here, perhaps, we might well pause to consider to what extent the problems of the radio industry give point to other modern-day industrial problems.

We are still largely in the throes of ancient conceptions of the forces that make for or against industrial and commercial growth. Competition is still worshipped as the life of trade, denounced as an uneconomic force, embraced as a balance between buying and selling interest—nursed upon one hand and hated upon the other. Mass production is still offered as a cure-all for failing markets and ailing sales. More lately high pressure salesmanship, which would solve all distribution problems with one fell swoop, has been currying favour with many industrial elements.

## ECONOMIC PHILOSOPHY.

MORE recently, too, there has been raised before us the spectre of gigantic competition as between industry and industry, wherein wheat and meat are to struggle for primacy, where coal and oil are to engage in a combat, where coffee and milk are to race for the public cup, wherein cotton and silk are to fight for favour.

Now no one can properly decry the study of these forces by business executives and the proper adjustment of them in industry, but the attempt to pigeonhole each, in its own permanent compartment, in a world of constantly shifting elements, is an uncertain procedure.

Without desiring to commit an economic heresy, the question might be raised whether competition, in the popular sense, is the modern spur to industrial progress. It bears no permanently constructive or destructive relation to industry. Instances could be cited to fit either circumstance.

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