

# Direction of Development of Radio

## *What We May Expect in the Next Few Years*

An Interview with DAVID SARNOFF, General Manager, Radio Corporation

YOU know the old song, "I Don't Know Where I'm Going, but I'm on My Way." That is perhaps not quite as pleasant as the other ditty, "Show Me the Way to go Home." So if it is possible to point out how radio is headed in its development, it may save broadcast listeners considerable time and money.

In discussing the progress and direction of radio development, let us begin with that branch of the art which forms such a vital part of our international communications. For after all, wireless telegraphy is the father of radio.

### Drawing Strands are Invisible

The year 1925 closed with the United States in the undisputed position of leader in world-wide wireless. From our powerful transmitting stations we have drawn the leading nations of the world toward us by invisible strands of communication. Radio circuits are now in operation between the United States and England, France, Germany, Italy, Poland, Sweden, Norway and the Argentine. Across the Pacific we are connected with Japan, Hawaii and the Dutch East Indies.

But the art of radio communication still challenges our imagination. It is not enough, measured by the possibilities of the art, that radio has lowered the rates in all classes of international messages; it is not enough that it has speeded up to a remarkable extent the service of messages across the seas; that it has established direct links with countries hitherto connected only by numerous relays through foreign countries; it is not enough that in the direct flashing of a message through the air, radio protects communication from censorship or interference by intervening countries. Since the successful demonstration of the photo-radiogram transmission early this year, when photographs and facsimile messages were sent not only across the country,

but over the Atlantic Ocean, and later, half way across the Pacific to Hawaii, our engineers have continued unceasing development in this direction.

### Lost in Flight to Hawaii

This service was demonstrated in the most dramatic fashion when the thrilling news arrived one day last September that Commander Rodgers and his crew, lost for nine days in their seaplane flight to Hawaii, were safe in Nawaili Harbor. It would have been

letter and word for word into a completed sentence and paragraph, will open a new era. Letters, drafts, notes, checks, contracts and other commercial and legal documents could then be almost instantaneously reproduced thousands of miles from the sending point, and thus greatly add to the momentum of business, economy and convenience.

Already we are operating photo-radiogram circuits from Honolulu to San Francisco, and from San Francisco to New York daily for test purposes, and



Fig. 1. The Output of the Radio Industry is Increasing So Fast That it May Reach Half a Billion Sooner Than You Think.

many days ordinarily before an intensely eager public in the East would have had photographs of Commander Rodgers and his brave crew through newspaper publication.

The transmission of a photograph of Commander Rodgers from Honolulu and a picture of seaplane PN-1 as it was being towed into the harbor, transmitted over a distance of more than five thousand miles, was accomplished by the Radio Corporation of America in twenty minutes. On the same day the pictures were published by nearly every leading newspaper in the East.

### No More Woven Letters

The perfection of this system to a stage of commercial success will be an extraordinary event. The day when a facsimile message can be flashed across the seas instead of woven letter by

very soon service by this method to and from Europe will be opened upon a commercial scale.

### The Florida Land Boom

And the industry has developed almost as fast as a land boom in Florida. Consider that less than five years ago there was only one broadcasting station in the United States organized for the service of a public program, and that today there are over six hundred dotted throughout the country. Secretary Hoover has estimated that more than five millions of American homes are equipped with radio sets, and that approximately twenty-five million people listen in nightly to the programs of music and speeches broadcast through the air.

Consider that in 1920 the total expenditure in the industry was little

more than one million dollars for the year, and that in 1924 the sales of radio apparatus and supplies exceeded \$300,000,000. For the year 1925, our statistical studies indicate a total of approximately \$350,000,000. And it will not be long before radio will be a half-billion dollar a year industry. See Fig. 1.

### It Made the Big Noise

Consider the phenomenal advance made by radio in the direction of service to the public, since the almost forgotten days of five years ago when phonograph or player piano music constituted the "big noise" of the broadcasting program. To-day the great symphony orchestras of the country and the leading artists of the operatic stage and concert hall serve the listening public.

Nevertheless, there are those who ask "Where do we go from here?"

Perhaps the next turn in the road may come into sight if we follow some of the directions which radio has been taking, as a service, as an art, and as an industry.

I begin here, for it must be recognized that upon the sending station is dependent the future both of the art and the industry. The social revolution created by radio broadcasting will become more apparent as time goes on. Five years ago the man who even once during his lifetime heard the living voice of the President of the United States was among the privileged few of his fellow citizens. To-day President Coolidge can speak, and has spoken, simultaneously, to an audience of approximately 25,000,000 people. Five years ago it was a mark of distinction, confined to residents of metropolitan areas, to attend an opera or listen to a great symphony orchestra. To-day millions in this land are able to tune in by radio and listen to concerts broadcast by leading operatic stars and symphony orchestras.

### Ladies Attending Prize Fight

In less significant respects also has radio affected the social outlook. Pious ladies, who would be shocked at an invitation to attend a prize fight, have found themselves thrilled by the description of a championship contest broadcast by radio. Hardened sinners, who could not be dragged to the doors of a church,

have surrendered themselves to the lessons of prayer brought to their homes by radio. I am even told that some ambitious men are learning to cook, as a result of the household talks broadcast regularly from many stations. But the element of *entertainment* thus far has been the predominant appeal of the broadcasting program.

And yet the fact remains that entertainment is but one field of public appeal from which broadcasting may draw. Radio, as the latest and greatest means of mass communication known to man, must be essentially popular in appeal, but its true mission, I desire to emphasize, is that of service, of which enter-

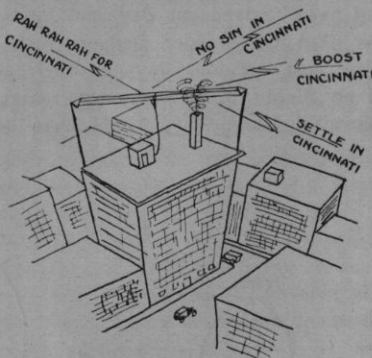


Fig. 2. Many Cities Are Now Supporting a Municipal Station.

tainment is but a part. Motoring began as a sport, but the automobile industry reached its greatest stability when the motor car became an essential element of transportation. The telephone was a toy at the beginning and a novelty later on. To-day it is a point-to-point communication service, of incalculable utility to business and the home. But it required more than fifteen years to develop the automobile to the transportation stage, and over a quarter of a century to make the telephone a general service in the home.

Broadcasting service clearly is destined to cover the following elements:

### A Lifetime in an Hour

**Music**—The invisible audience which greets a great singer during one concert from the broadcasting studio is many times greater than the aggregate audience which even the most famous artists could hope to face in a lifetime. No other means has given to the indi-

vidual artist so wide an opportunity for recognition.

**Entertainment**—Radio has a distinct function to perform in the field of entertainment. In no other way can the home be made happy with as wide a range of entertainment and at so little cost.

**Political Education**—Hardly any subject should be, or could be, made of more universal appeal than political education. Many will recall the thrill of the first national conventions broadcast by radio. Popular interest in government would be enormously increased, if great national issues were fixed for debate by Congress at special night sessions and sent out by radio. Similarly issues debated at State Capitols might be broadcast by local stations.

### Colleges are Already Alive

**General Education**—Radio already has penetrated into millions of homes in the United States. It is not improbable that within the next five years the radio audience in this country will reach more than 50,000,000 people. Some of our great universities are already alive to the tremendous opportunity for educational influence that radio offers. And I look forward to the day when the Board of Education of every big city in the United States will include in its activities a special extension course to be broadcast by radio from local stations.

**Information and Instruction**—Recently it has become increasingly clear that the great events of the day from this time forward will not only receive newspaper, but radio presentation, as well. Beyond this there are the services to special classes of the population—like market prices and agricultural information so vital to the farmer—which no other medium can convey so promptly. Lectures on household economics, child welfare, public health, and other subjects are program features still subject to systematic development.

### Problem Solves Itself

And now, it may be asked, "How is this elaborate structure of service to be permanently supported? There is no direct tax upon the listening public; there is no governmental operation of broadcasting, as prevails in other countries."



My answer is that the problem has begun to solve itself.

Notwithstanding the fact that most broadcasters have found no way of obtaining direct payment from the listening public, the indirect returns are, in many cases, sufficiently impelling motives for them to continue sending. Already there is a long waiting list for the privileges of the air; the problems of congestion and interference within the limited waveband available for broadcasting have become so serious that Secretary Hoover has found it necessary to suspend the further issuance of transmitting licenses.

#### Six Elements in List

The elements of permanent support for broadcasting in the United States are becoming clearly defined in the following list:

1—*The Radio Industry*: Whether by individual or organized group effort, the radio industry must and will continue to contribute, for it is clear that without broadcasting there can be no radio industry.

2—*Commercial Stations*: Radio, by virtue of its mass appeal, is bound to become an important economic force; there is a definite place in business for this character of service. The doctrine of *public service* enunciated at the recent Washington Conference, and the force of self-interest, I believe, will determine the situation, for every broadcasting station knows that the loss of public good will means the forfeiting of confidence. Of course, no advertiser will be so blind to his own interests as to forget that only public acceptance can make his message of any value.

#### Harvard and Yale Endowed

3—*Educational Support*: The day will come, I believe, when every metropolitan Board of Education will have an appropriation for radio; when such great educational institutions as Harvard and Yale in the East, and universities and colleges in other parts of the country will have endowments for special broadcasting services that will carry the sphere of their influence far from the lecture room.

4—*Organized Social Support*: Many millions of dollars are spent annually in the United States for the promotion

of important social services, the improvement of public health, child welfare work and similar causes. Radio offers a means of public contact upon a scale unapproached by any other medium. Men and women who have devoted vast sums to the creation and support of cultural, educational and social endowments will not fail to see great opportunities for public service which radio makes possible.

#### Cincinnati Starts Something

5—*Community Broadcasting*: Cities and states throughout the country have spent large sums in the past ten years to tell the American public about their



97% in favor



3% opposed

Fig. 3. When the New Bound Brook Super Broadcasting Station Opened, the Mail Was as Above.

progress, their possibility and their needs. Perhaps Los Angeles and Miami were the first. But the Chamber of Commerce of Cincinnati, I believe, already has seen the handwriting in the heavens and business men of that city only recently have contributed generously to the support of a great broadcasting program from Cincinnati, Ohio, Fig. 2.

6—*Institutional Broadcasting*: Under this heading I include newspapers, department stores, and other organizations which have found in radio an important means of developing their prestige and of obtaining public good will.

These are among the permanent bases of support upon which broadcasting service is being erected.

#### Areas Have no Choice

With all that has been done along these lines, however, the fact remains that the country as a whole is not yet adequately served. There is a multiplicity of radio entertainment in some parts of the country, while other parts of the country are but poorly served. In the larger metropolitan centers the radio listener has a wide choice of programs; in other parts of the country he

is restricted to the offerings of the nearest local stations. Certain areas as yet remain completely uncovered by the useful range of any good broadcasting station.

Here lies the true significance of high-power broadcasting. The furore of discussion created by my proposals at the Washington Radio Conference in 1924 with regard to the erection of high-power broadcasting stations has subsided and there is now eager interest in what super-power may do towards the improvement of broadcast reception.

#### Half of Bound Brook Power

In the meantime, I may inform you that preliminary tests already carried out by our engineers, and conducted at approximately half the available power of our new broadcasting station at Bound Brook, indicate that the claims made for high power transmission will be fully met. Much remains to be done before we can say that we have even an insight into certain puzzling phenomena of radio transmission. But this much I can say:

If the evidence of nearly 50,000 letters, 97 per cent. of which are commendatory, thus far received by the Radio Corporation of America gives a reasonable cross section of public opinion, the experimental demonstrations of super-power broadcasting were extraordinarily successful.

#### 5,000 Watts is "Low Power"

We did not expect to bridge the transitional period from low to high power without occasional complaint, justified or otherwise, of temporary interference. The time is still fresh within the memory when the five kilowatt station was feared as a menace to broadcasting. Today, no opposition on this score is heard, and 5 kilowatt stations are classed by many as "low power." But we did not hope for the results that actually have been achieved in the elimination of complaints.

Following upon engineering advice and assistance rendered by our organization, investigation discloses that not more than one-eighth of one per cent. of dissatisfied listeners registered objection against the operation of our super-power station, after they had adopted

simple measures to attune their sets to the new conditions of reception.

#### Musical Center at Crossroads

Super-power broadcasting, controlled by proper engineering conditions, will open a new era for the general radio listener in the United States. It is as impossible, practically and economically, for 600 local broadcasting stations to give the supreme character of program that may be organized by a group of super-power stations as it would be to

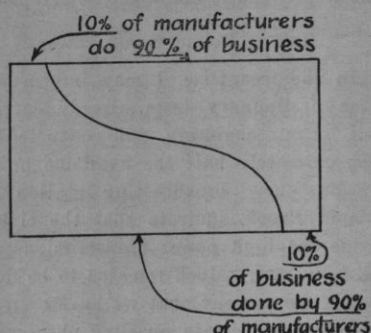


Fig. 3. Autos Are Made as Shown Above. Is Radio Coming to it, Too?

erect an operatic or musical center at every crossroad in the country.

And yet the fact remains that the farmer and his family in their prairie home and the small town dweller are entitled to as good a broadcasting service as is available to those who live in any metropolis, for unlike the mountain which would not come to Mahomet, there is that virtue in radio, that it can bring the city to the farm. Its mission from the high-power station is eventually to transmit to every home in the country the music, the entertainment and the educational influences developed in the great centers of population.

#### Local Stations are Permanent

Not only public but national interests demand a system of nation-wide broadcasting. For regardless of the number of local stations—and the local station, like the local newspaper, theatre and concert hall, will remain a permanent institution—there is need for a system of national broadcasting, ready for any public emergency, with facilities adequate to cover the entire country and to reach across the ocean whenever desired.

True, a sufficient number of stations to cover a considerable part of the country may be, and often are, interlinked by wire to act as one transmitting unit, but the fact must be faced that whereas the President of the United States may pick up his telephone in Washington tonight and talk across the continent to San Francisco, he could not without vast preparation, large expense and the voluntary co-operation of many broadcasting stations owned and operated individually, talk to even half the nation by radio. High-power broadcasting from a suitable number of stations connected by wire or linked eventually by short-wave radio relay would give the country a national system to supplement the services already offered by local broadcasting stations, and the system of interconnecting local stations by wire now in effect.

#### Crashing Through the Barriers

Last, but not least, are the problems of natural or atmospheric interference in radio transmission. Thus far the art has developed but one solution: Power—enough power from the broadcasting station to over-ride the barriers in the air and crash through the electrical disturbances now beyond man's control.

The principles accepted at the Fourth National Radio Conference in Washington this year, under the leadership of Secretary Hoover, will go far to develop broadcasting as a great and growing service to the American public. Radio is just emerging from the chrysalis of experiment and development to the solid basis of service. Much has been done in the creation of a web of local broadcasting stations that now dot the country; more will be done by the establishment of a national service, and the consequent extension of our broadcasting facilities to girdle the world. The programs that will soon come to us from the nations of Europe will only emphasize the need and purpose of further communication. For when we have brought Europe to our homes, South America and the Orient will still beckon.

#### Putting America in Lead

Now let us turn to the radio industry. Commercially speaking, this industry is the most dramatic enterprise in

business history. It might be said to have begun less than six years ago, when the Radio Corporation of America in 1919 was formed to take over foreign controlled wireless interests in the United States and give to America its well-deserved leadership in a new and great system of communications.

The first broadcasting station in the United States, organized for the regular service of a radio program to the public, was erected by the Westinghouse Electric and Manufacturing Company in East Pittsburgh, Pa., in 1920. This was at a period when the most intense laboratory activity, conducted by the great electrical and communication interests, was in progress. Radio engineers were working at fever heat in the inventive processes, which soon gave to this country an undisputed position in the art.

#### A Blockade is Threatened

The U. S. Patent Office was besieged with claims and counter claims. A gigantic battle for patent supremacy loomed upon the horizon. The diverse ownership of patents, methods, apparatus and circuits involved in the manufacture of radio apparatus and used in radio telegraph and radio telephone communication, threatened to create a blockade in the art.

In the immediate period that followed it seemed as if everyone who could turn a lathe and even some who couldn't, rushed, pellmell, into the radio industry regardless of patent rights, fitness or experience. At one time, over three thousand manufacturers of radio supplies and equipment were listed in the United States. To many these were glorious days of rising demand and unchecked inflation. The public apparently accepted anything that was offered in the name of radio.

#### Rode in on the Crest

As in every new industry, there were those who built for permanency upon the solid basis of safe financing, continued laboratory experiment and sound industrial development, and there were those who rode in upon the crest of "high finance," craving for a hectic industrial life, even if a short one.

The responsible factors in the industry saw clearly that the safe road to follow was the well-trodden path of eco-



conomic and industrial experience. They set out to grapple with the fundamental problems that confront every new industry, viz.:

1—To develop the art from the experimental to the practical stage.

2—To raise the standard of broadcasting so that the industry would be built upon a solid foundation.

3—To provide the necessary distribution system for radio products.

#### 46 Per Cent a Year

The best industrial parallel of the growth and development of radio is in the automobile industry. In the automotive business, the period of experimentation, which extended from 1895 to 1903, manifested the same symptoms as have been evident in these first years of radio. The period from 1903 to 1916 constituted, I understand, the period of development in the automobile industry. During that period production increased at the rate of 46.5% per annum.

The period of stability, it seems, did not begin until 1916. This is manifested by a decline in the rate of production more commensurate with the demand, and the concentration of production in the hands of a comparatively few manufacturers. More than 90% of the total production of motor cars is now in the hands of less than 10% of the manufacturers by number, Fig. 4.

#### Told by Dun and Bradstreet

All of this is no more than the phenomena of economic progression. It is typical of every basic industry. The commercial casualties which occurred among automobile manufacturers during this time form a considerable part of the vital statistics of commerce, as recorded by Dun and Bradstreet.

It would have been easy indeed, during the period of liquidation, for the leading manufacturers in the radio industry to follow the sales tide if they were indifferent to the further loss and disorganization which would have resulted from such practice.

It would have been easy indeed to join the chorus of "Stabilization" when the radio art called for further experimental development. It would have been easy to concentrate upon production, regardless of the inadequacy of the apparatus produced. It would have been easy to pile on immediate profits regard-

less of future losses, by producing and selling radio apparatus upon an experimental rather than a service basis.

#### Not Following Easy Path

Records prove that industrial history generally repeats itself. Those who have not followed the easy path, but instead are contributing to the art and pursuing sound and financial and sales policies, and those who are helping to raise broad-

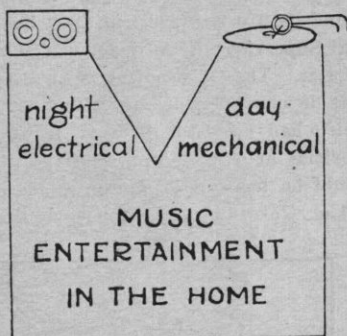


Fig. 5. Although Phonograph and Radio Started Out Differently, They Are Now Happily Mated

casting to higher levels, either by better operation of broadcasting stations or the contribution of improved broadcasting programs, will find that the radio industry is entering upon an even more prosperous era than has passed.

Radio bears a constructive relation to many arts and also industries, but in the combination with the phonograph industry, it has achieved the perfect flower of union.

Nowhere in the annals of business does quite such a parallel exist. The phonograph was a prosperous and soundly established industry when radio development loomed in its path.

#### Meeting Other Half Way

Radio brought more than the old phonograph could give, but both industries soon recognized the mutual relationship; both served the public with the arts of music and entertainment, Fig. 5. Radio receiving sets and phonograph recording devices had technical problems in common. Both made their primary appeal to the home. Each advanced half-way to meet the other in problems.

To-day they are happily married in the same cabinet. Radio has given to the phonograph its achievements in the electrical art, both in recording and re-

producing. The electric phonograph that has thus been born and the combination phonograph-radio receiving sets in their housings of splendid cabinets, which the leading factors in the phonograph industry are now distributing, have created a new service for the home.

#### Has the Great Artists

The phonograph industry in turn, through its contact with the great artists of the day, with years of technical experience in the study of acoustics and the well-organized distribution and trade channels at its command, will make a great contribution to the radio industry.

The great progress made in the development of radio receiving devices during 1925 are only now becoming apparent, as the latest products achieved by the art are being made available to the public.

The marked improvement in broadcasting, both from the standpoint of technique and of programs, will soon be demonstrated on a wide scale by high-power broadcasting.

The selective processes which have been going on in the upbuilding of distribution systems will be marked by stronger and better equipped retail sales channels, by servicing arrangements and by modern time-payment plans.

I look forward to a period of sounder, better and more prosperous development of the radio industry in 1926 than in any preceding year.

#### A CORRECTION

The article "This 'B' Eliminator Won't Burn Out," in our January 15th issue carried the author's name as McMurdo Silver. This was in error, and should have been Vance.

#### A Slight Omission

A few minutes after an alarm of fire was given in a hotel, one of the guests joined the group that were watching the fire, and chaffed them on their apparent excitement. "There was nothing to be excited about," he said. "I took my time about dressing, lighted a cigaret, didn't like the knot in my necktie, so tied it over again—that's how cool I was."

"Fine," one of his friends remarked, "but why didn't you put on your trousers?"—Everybody's Magazine.